AN APPRAISAL OF ELECTRONIC WALLET COMMUNICATION IN GROWTH ENHANCEMENT SUPPORT SCHEME OF AGRICULTURAL TRANSFORMATION AGENDA IN NAERLS

BY

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BEING A THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA, IN PARTIAL FULFILLMENT FOR THE AWARD OF MASTER OF ARTS (M.A) IN DEVELOPMENT COMMUNICATION

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DECLARATION

I AFOLABI Ekundayo declare that, this thesis is my original work, and was carried out by me in its entirety. This thesis has never been submitted for any publication or previously presented for any higher degree. All quotations are indicated and the sources of information are suitably acknowledged by means of references.

_____ _____

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CERTIFICATION

This is to certify that this thesis, entitled; "A critical Appraisal of the Use of Electronic Wallet Communication in the Growth Enhancement Support Scheme of National Agricultural Extension and Research Liaison Services, by AFOLABI EKUNDAYO, (MA/ARTS/20494/2012-2013) meets the regulations governing the award of the degree of Master of Arts (M.A) in Development Communication of the Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This thesis is dedicated to my family and friends for always being there for me.

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My utmost gratitude goes to my maker, the Omnipotent; the creator of Heaven and Earth, Omnipresent, Omniscient; the giver of wisdom and knowledge. Your grace and faithfulness throughout these years also proved your everlasting love for me. I and my family would always praise and proclaim your name forever.

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ABSTRACT

The study appraises the Electronic Wallet communication platform under the Growth Enhancement Support Scheme (GESS). The revolution in the media has greatly altered communication in all spheres of life including agriculture. The integration of the ICTs to some extent has brought possible solutions to developing countries especially in their utilization for agriculture. Though, for more than two decades, Nigeria's agriculture has been plunged into several reformation crises which have demanded the use of different communication strategies with little or no results in some cases. All these brought about the recent deployment of the e-wallet as part of the schemes by the Federal Government to reform the agricultural sector since 2011. It is therefore imperative to assess the new communication strategy as it has been operated under the reformation which is the focus of this study. In this study, 80 (40 from each village) farmers were administered questionnaire to in Nassarawan Buhari and Nwogi communities. They are registered farmers who have participated in the e-wallet scheme since its inauguration. The adopted villages were selected because they were part of the communities where the registration of farmers under the scheme commenced earlier in the North Central and North West agro-ecological Zones of Nigeria. So far, the study appraised e-wallet's effectiveness, usability and acceptability among farmers in the selected villages. The Diffusion and Innovation Theory and the Participatory Communication Theory underpinned the study in order to generate solid argument for effective communication approaches. For data analysis, this study used tables and simple descriptive statistical tools. The study discovered that farmers are aware of the e-wallet scheme through many sources especially the radio as the highest source. The study revealed that the e-wallet is an effective scheme that has helped drive Agricultural Transformation Agenda. Meanwhile, there were challenges of interconnectivity and network failure as experienced by the farmers in this study. Though the scheme is acceptable by farmers, but the process has not been really participatory. Thus, there is a need for the Federal Ministry of Agriculture and Rural Development to build improved e-wallet system that will enable the farmers interact very well and strengthen their involvement in the sustainable development of the system beyond the present regime. Also, the e-wallet scheme communication approach should be deployed in other value chains of the Agricultural Transformation Agenda (in order to take care of farm-to-market) process in order to help farmers get responsive and viable market prices and sales. More so, the Federal Government should consolidate the success of the scheme by establishing a National Helpline Center that will accommodate complaints, and allow farmers to contribute to the policy making and development of the sectors through enriched information from in-depth mobile phone communication system. The platform should be fortified with error detector mechanism in order to put a stop to false alert and inconsistency in redemption information as witnessed by some farmers in this study.

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CHAPTER ONE

GENERAL INTRODUCTION

1.0 Background to the Study

In the last century, a revolution in the media has greatly altered communication in all spheres of life including agricultureby providing platform for long distance communication. These information and communication technological advances are believed to have revolutionized the processes of one-to-one, one-to-many, many-to-one, many-to-many, and also for synchronicity of messages, thus, enhancing the range, efficiency and effectiveness of information delivery via electronic signals (Gateway, 2010). This advancement has helped in the projecting of development through the Internet all over the world (e-Marketer, 2013).

For more than two decades, Nigeria has been plunged into food crisis which has seriously affected the well-being of the large sections of its population, as well weakened the cohesiveness of the nation by increasing social and political tensions. The continued social challenges emanating from such economic crisis has always been tackled with 'reactive' policy initiatives aimed at ameliorating the crises rather than eradicating them. Nigeria is presently undergoing reformation processes with profound implications for all sectors of the economy as the country attempts to set out plans for sustainable development (www.academia.edu/.../development_plans_and_visions_cor).

Agricultural revival strategies are one of the policies and programmes targeted at turning around the fortunes of Nigeria's agricultural sector.In this regard,the revival strategies consist of deliberate policies, measures and programmes aimed at fine-tuning activities in the sector with a view to boosting production, eliminating corruptionand constraints to other sectors of the

economy. The current agricultural reform is in the form of microeconomic and sectorial policy initiatives relating to specific sectors and subsector of an economy.
In the case of agriculture, Awoseyila, (1997:30) pointed out that the reform focused mainly on the production effort therein. Furthermore, some of the reformation strategies for agriculture in Nigeria since 2009 are either indirect via macroeconomic policy measures or direct intervention programmes.

Nigeria has had a legion of agricultural revival strategies/programmes, perhaps in apparent recognition of the strategic role of the sector in the country's developmental aspirations. In the 1960s, most of the strategies were initiated within the framework of a series of periodic National Economic Development Plans before the adoption of the Structural Adjustment Programme and Rolling Plans in the 1980s. These were targeted at key areas, including infrastructure provisions, extension services, input supply, credit and marketing (Balogun&Otu 1997:138).

It should be noted that these strategies were largely influenced by the agricultural policy objectives, the macroeconomic management and the framework in existence. For instance, prior to the Structural Adjustment Programme (SAP), the disposition favoured direct government participation in the production efforts of the sector. At inception in 1986, SAP was guided by a new philosophy that regarded agricultural production as a private sector business. Eyo (1997:47) opined that the government's role was seen as merely supportive.

The SAPs policies reflect the neo-liberal ideology that drives globalization (WHO 2014). They aim to achieve long-term or accelerated economic growth in poorer countries by restructuring the economy and reducing government intervention. The Structural Adjustment Programme implementationsetbacks include: currency devaluation, managing balance of

payments, reduction of government services through public spending cuts or budget deficit cuts, reduction of tax on high earners, reduction of inflation, wage suppression, privatization, lowering of tariffs on imports and tighter monetary policy, increased free trade, cuts in social spending, and business deregulation. Governments are also encouraged or forced to reduce their role in the economy by privatizing owned industries includingthe agricultural sector, and opening up their economies to foreign competition under SAP (www.who.int/trade/glossary/story084/en/).

Like many developing countries, Nigeria embarked on SAP in 1986, the policy emphasized on domestic production over expensive imports, and a lesser dependence on oil revenues. Such emphasis is also clear in the new Agricultural Transformation Agenda (ATA), but with different implementation plans and tools. Nigeria engaged in Structural Adjustment Programme as a reform strategy designed to achieve recovery and growth via the availability of foreign aid which is one of the characteristics of SAP, as a dependency development ideology.

Under this dependency arrangement, a balanced budget was sought, and foreign capital investment was pursued by Nigeria from foreign donors and the International Monetary Fund (IMF) and the World Bank. There were serious negative effects of SAP on Nigeria development reform: Large price increase for essential services and other materials (up to 400% between 1985 and 1987); the SAP was producing more hardship, inflation on the small salaries that most average people earn, while the wealthy upper class were not really affected.

The SAP, just like many other economic reformation plans and initiatives failed and was unsustainable because the design and implementation approach were not participatory. These development strategies were mainly prepared for the scientific transfer of knowledge (top-down approach) to the assumed local farmers who need advanced interventions to salvage their deplorable livelihood and agricultural practices.

The ministry of agriculture and that of communications and technologypartnered together in demand for the change of policies and strategies by the government to actually empower the local farmers and sustain their involvement in government development programmes, which brought about the conceived and implementation of some new policy and development approach e.g. the Growth Enhancement Support Scheme (GESS) platform which uses the electronic (e-wallet) communication strategy to connect directly with the Nigerian farmers for the distribution of fertilizers, farm inputs and to get a feed-back from the beneficiaries under the Nigeria AgriculturalTransformation Agenda (ATA) since 2011.

In order to achieved the above reformunder the Agricultural Transformation Agenda (ATA) ofNigeria, the Growth Enhancement Support (GESS) schemewas established, and the implementationstarted in October 2011, with the hope that the needs of famers particularly in areas of new innovations, input supply, seedlings and fertilizer distribution can be met through the utilization of e-wallet (a mobile phone platform where registered farmers can be reached by agricultural development agencies) in order to create direct access thereby cutting off middlemen and reducing the cost of fertilizer and non-availability of unprocessed and unadulterated input inthe market (Score Card, 2013).

According to Adesina (2012), Growth Enhancement Support Scheme (GESS) is an indispensable platform,and was adopted for farmers to connect with Government to receive relevant information particularly in areas of agricultural innovations, technology and input supply distribution through utilization of Electronic Wallet (e-wallet) to create direct access to farmers in April 2012.With the advent of the New Media (of which the mobile phone is a tool) many would never think to associate farmers, dairy farmers, animal keepers, aqua-culture with the Internet communication, but the fact remains that, in advanced nations, they actually

represent the larger group of active users of agricultural networking sites while, practitioner in developing countries like Nigeria, the adoption of the New Media tools for agricultural communication is partially adopted by few large scale farmers with the capacity and facilities to use them, while for many small scale farmers, this technology is far from their reach or in some cases not appropriately incorporated in their farming activitieshitherto.

As a matter of fact, the advances in technology have drastically changed agricultural production strategies over the decades. Now, new strategies of communication are also changing the way the public learn about agriculture and production. As a nation many Nigerians are becoming further removed from the farm environment, to sell their farm produce and this sometimes leads to unplanned rural urban migration of high productive section of the rural farmers.By so doing agriculture is becoming more diversified with the advent of information and communication technology. It is therefore important that agricultural communication explore different communication strategies of linking up with these farmers and keeping them intact in their farming environment for sustainable small scale farming (Ekundayo 2014).

Currently, Nigeria cannot rely only on the face-to-face communication in extension system anymore to communicate agricultural innovations and best practices to farmers and get them to adopt them as well to receive prompt feed-back from same for development policy analysis and amendment. According to Kamani and Kathiriya, (2014), more and more farmers are becoming technology savvy and getting involved with the New Media to connect with other stakeholders on a personal level. Therefore, agriculturists have to take advantage of as many tools as possible to convey messages of agricultural related issues to the consumers.The Growth Enhancement Support Scheme'scommunication approach is one of the many critical components of the Agricultural Transformation Agenda using the e-wallet mobile tool.

Nigeria is the first country in Africa to develop the e-wallet for input delivery to farmers. It was designed for the specific purpose of providing affordable farm inputs to active farmers through e-wallet in order to increase their yieldsper hectare and make it comparable to world standard. The targeting of the farmers is based on the farmer bio metric information registration exercise being conducted throughout the country in July-November, 2011. The GESS scheme which is the nerve center of the on-going agricultural revolution in Nigeria was on Monday October 14, 2013 acclaimed by the National Assembly to be a success with a promise to sustain its operation through a legal document (Agriculture in Nigeria, 2013).

Agricultural communication is concerned with the gathering, processing and disseminating agriculture-related information among agricultural stakeholders and between agricultural and non-agricultural stakeholders. It is done formally and informally by agricultural extension and is considered a subset of science communication. Benor and Baxter (1984), two prominent international exponents of agricultural extension in Saliu and Age (2009), suggested that, sustained high levels of agricultural production and income are not possible without an effective agricultural communication supported by agricultural research that is relevant to farmers' need.

Moise (1994) explains that a study conducted and published in 1992 by the World Bank revealed that about 60 percent of the general cost of the agricultural projects financed by World Bank was absorbed by the communication components, while the governments of the benefitting countries were responsible for an average of 18.5 percent of the total cost of the projects. In effect, external financial assistance for agricultural communication projects is as high as 80 percent of the total cost in 1992 to maintain a supposedly permanent governmental administrative structure. Agricultural extension cannot happen without communication. According to Oladeji (2008), Agricultural extension work involves communication which could be referred to as agricultural

communication or extension communication. Communication forms the premise for all human interaction. Beyond communication, the farmer is enabled to act upon the information he received and the conviction thereof for sustainable farming. With introduction of the e-wallet in Nigeria, farmers can share what is important to them and what changes they wish to see in the agriculture industry.

As earlier stated, the GESS is an innovative scheme, which seeks to remove the difficulties usually associated with the distribution/production enhancing agro-inputs including fertilizers and hybrid seeds to farmers. In the past there were complaints of diversion, exorbitant cost and adulteration of various inputs to farmers, which ultimately led to low productivity, increased poverty, unemployment and lack of interest in farming. Thus, the objectives of the GESSsignificantlyare:

i. To provide subsidized agricultural inputs like fertilizer, hybrid seeds and agro-chemicals to farmers
ii. To remove the usual complexities associated with fertilizer distribution
iii. To encourage critical actors in the fertilizer value chain to work together to improve productivity
iv. To enhance farmers' income and promote food security
v. To increase farmers' production and productivity
vi. Promote public-private partnership in improve efficiency and effectiveness in the purchase and distribution of inputs.

The Growth Enhancement Support Scheme is one significant innovation in the Nigerian agricultural sector that has spurned a lot of interests among the stakeholders many of whom are desperate to make it succeed. The scheme is said to have effectively gotten the government out of direct procurement and distribution of farm inputs, and simultaneously bringing the private sector

actors such as financial institutions, agro-dealers, suppliers, marketers etc. to own the value chains for agricultural inputs supply and distribution. Through the e-wallet, farmers receive and pay for GESS from both the Federal and State governments and are linked to agro-dealers, suppliers, marketers, extension services and financial institutions including insurance.

Meanwhile, at the fore of the extension aspect of the reformation is the National Agricultural Extension and Research Liaison Services (NAERLS), Ahmadu Bello University Zaria. The NAERLS is involved in the GESS activities through the dissemination of information to farmers and research into the progress and challenges of the programmes. One of the platforms used for carrying out such services is the Adopted Village initiatives. The Adopted Villages are the trial/demonstration of agricultural innovations and practices for farmers' adoption.

It is imperative that the GESS scheme is assessedto ascertain how the strategy has feared since its inception in 2011, even though there are many evaluation reports and thematic surveys that have reported the success of the scheme, there are also some challenges recorded by farmers and other stakeholders. The importance of this study is to have different angles to such assessments, with a view to examininghow the scheme has performed especially with focus on the deployment ofe-walletusing mobile phonesfor the distribution of fertilizers and farm inputs for the last threeyearsin Nigeria2011-2014.Though, there are other components being implemented on the GESS.

1.1 Statement of the Research Problem

Nigeria with an estimated population of 167 million people (NPC, 2011) is growing at the rate of 3.65% per annum; Nigeria's population by the year 2020 will be about 201,000,000 million. Oparaeke and Ofor (2010), opined that the country's future may be in turbulence if the current food production growth trend at arithmetic progression annually is not increased to tally with or surpass the population growing at geometric progression. In the past, popular knee jerk approaches have

been employed in a bid to raise adequate food supply for Nigerians through innovative agrarian programmes; unfortunately, they have all suffered huge setbacks. The most remarkable campaign of these sorts was the Operation Feed the Nationcampaign (OFN).

The OFN was launched by the Federal Government on May 20, 1976 with the motive of producing more food, specifically by persuading farmers to adopt new technological packages such as improved seeds, fertilizers, feeds, pesticides and herbicides (Anyanwu et. al., 1997). In Emenyeonu (1987), the OFN is today regarded as a classic example of a diffusion campaign in which the mass media were involved without adequate participation of farmers.

In the operational structure of the programme, the media were assigned the herculean role of disseminating the campaign exhortations to farmers. The media diffusion strategies used in the campaign have been identified as including news stories, commentaries, editorials, features, cartoons and national adverts. Others include slogans, radio talks, discussion panels and special documentaries. In addition to these, publicity vans were used to address villagers; posters and handbills were distributed; films on modern agriculture practice were shown and plays popularizing OFN were performed, all in a bid to demonstrate the benefits of modern farming. Extension workers were also drafted to give further education and guidance to local farmers on the new farming techniques. Unfortunately, all these efforts have not been able to effectively restore sustainable productivity to the agricultural sector.

Information about the OFN was so profusely diffused that even till this day the impact was not felt. This however, could not induce the much-needed agricultural excellence in terms of farmers' direct and sustainable participation beyond a single regime. Between the demise of the Green Revolution and the emergence of the Agricultural Transformation Agenda in 2011; a series of

innovative campaigns have been quietly launched. The food situation, however, does not seem to show any signs of improvements and agricultural productivity has not been sustained.

One consistent challenge in all the failed agricultural development programmes in Nigeria since 1960 has been the communication strategies used for the dissemination of such programmes. Agricultural communication has been engaged formally and informally by the Nigerian government for agricultural development programmes: however, it has evolved into its own professional field which now addresses all subject areas related to the complex enterprises of food, feed, fibre, renewable energy, natural resource management, rural development and others.

In order to help agricultural reformation in Nigeria, government needs to move away from the project oriented to feasible and sustainable development programme.This study sets out to explore the Growth Enhancement Support Scheme via the use of the electronic wallet as a communication approach to involve the farmers and directly afford them opportunity to participate in Agricultural Transformation Agenda (ATA) in the selected adopted villages of NAERLS.

Furthermore, agricultural communication is being influenced greatly by the New Media of which the mobile phone applications are tools for inputs and services delivery.Subsequently, the ability of agricultural communication to take care of all participants, from scientists to consumers - and all stages of those enterprises, from agricultural research and production to processing, marketing, consumption, nutrition and health cannot be said to be sustainable especially in the on-going Agricultural Transformation Agenda (ATA). Hence, the need for an independent research work like this to determine how the e-wallet platform can maximally drive agricultural reformation beyond a single regime in Nigeria.

1.2Aim of the Study

The aim of this study is to explore the electronic wallet communication approach effectiveness in NAERLS' adopted villages and by extension in Nigeria since the deployment.

1.3Objectives of the Study

This research intends to achieve the following objectives:

a) To critically investigate the existing communication approaches for the implementation of the Growth Enhancement Support Scheme (GESS) in the selected adopted villages.

b) To investigate the deployment of e-wallet and how it has influenced the realization of Agricultural Transformation Agenda (ATA).

c) To determine the level of usability and acceptability and the challengesof the e-wallet platformamong the farmers in the selected NAERLS adopted villages.

d) To articulate a way forward on how e-wallet communication approach can achieve a higher impact on the Growth Enhancement Support Scheme for the effective and sustainable realization of Agricultural Transformation Agenda in Nigeria.

1.4 Research Questions

1. How can the use of e-wallet help farmers to get access to genuine agro-inputs and services?
2. How can the level of usability and acceptability of the e-wallet among the farmers in the selected adopted villages be determined?
3. What are the existing communication approaches for the implementation of GESS in the selected adopted villages?

4. In what ways can e-wallet approach be more effectively deployed to achieve a higher impact on GESS for sustainable and realization of Agricultural Transformation Agenda in Nigeria?

1.5 Significance of the Study

From the foregoing, it has been argued that agricultural development initiatives in Nigeria have not been sustained due to many problemsof which communication challenges are included. It is therefore imperative that research works in development communication put their search light on the communication strategies and modalities being deployed for the implementation of the ATA in order to help Nigeria surmount the hurdles of sustainable development projects in the agricultural sector.

As matter of fact, data generated by this research on the Growth Enhancement Support Scheme through the deployment of electronic wallet for inputs supply to farmers will serve as an important feedback on how the scheme has performed in NAERLS selected adopted villages.

Furthermore, the discussions and analyses from this study will add to other numerous appraisal reports of the Agricultural Transformation Agenda which will subsequently influence how policy makers in the sector will handle possible communication challenges in the GESS via the improvement of agricultural extension communication strategies on a more participatory form (i.e. collaboration between researchers and farmers; farmers and government extension agents; farmers and development agents etc.) for the adoption of innovations, best practices and commercial farming initiatives as being propagated by the ATA larger framework.

However, it will also contribute to the subsequent works of students, research organizations, field workers and other stakeholders in the agricultural sector. The research will add to the numerous literatures in development communication and strengthen the burning advocacy for the

harmonization of community based and participatory system for sustainable agricultural development in Nigeria.

1.6 Scope of the Study

The study is going to investigate communication approach employed in the deployment of the e-wallet of the GESS scheme in NassarawaBuhari in Giwa Local Government Area of Kaduna State and Nwogi in Katcha Local Government Area of Niger State from 2011 to 2014 under the NAERLS Adopted Villages programme (which is one of the collaboration platforms on which NAERLS is participating in the Agricultural Transformation Agenda). The choice of the two villages rests on the fact that they are among the first set of adopted villages from which NAERLS has been piloting innovations, best practices and policies for adoption by farmers (in the last five years). Thus, the villages have been part of the GESS at the inception in 2011. Meanwhile, respondents will be limited to registered farmers under the scheme who are also members of the adopted village network. This is to help the research guide against spillovers from members of the community who are not registered farmers (as one of the criteria to enjoy the GESS is appropriate registration with the redemption centers nearest to the farmers). Therefore, this study intends to know how the scheme has performed in the last four years in order to help realize the target population after the first four years.

1.7 Terminologies

Electronic Wallet

Electronic Wallet is one of the most effective and innovative uses of mobile technology in the delivery of inputs and services. Nigerian government in the quest to support its agricultural sector through the distribution of inputs and other services to the farmers in the country, use the e-wallet to transform the government's relationship with the farmers. Generally, the payment

process is:User registers, inputs their phone number, and the provider sends them an SMS with a PIN. User enters the received PIN, authenticating the number. User inputs their credit card info or another payment method if necessary (not necessary if the account has already been added) and validates payment.

New Media

New media refers to on-demand access to media content anytime, anywhere, on any digital device as well as interactive user feedback and creative participation. The concept New Media is a 21st Century catchall term used to define all that is related to the internet and the interplay between technology, images and sound. It also allows more people to have a voice in their community and in the world in general.

Agriculture Development

Agriculture development means providing assistance to the crop producers with the help of various agricultural resources; comprises of pollution issues, estimates or evaluates the latest technologies used for the purpose of agriculture. Agriculture development brings about a revolution in the agriculture sector to give birth to an agriculture which is profit giving, providing protection, assisting in the research sphere, employing latest techniques, controlling pests and facilitating diversity all fall within the purview of agriculture development and at the same time eco –friendly to bring about development.

Communication

Communication (from Latin commūnicāre, meaning "to share") is the activity of conveying information through the exchange of ideas, feelings, intentions, attitudes, expectations, perceptions or commands, as by speech, gestures, writings, behavior and possibly by other means such as

electromagnetic, chemical or physical phenomena. It is the meaningful exchange of information between two or more participants (machines, organisms or their parts). Communication is the exchange and flow of information and ideas from one person to another; it involves a sender transmitting an idea, information, or feeling to a receiver. Communication requires a sender, a message, a medium and a recipient, although the receiver does not have to be present or aware of the sender's intent to communicate at the time of communication; thus communication can occur across vast distances in time and space. Communication requires that the communicating parties share an area of communicative commonality. The communication process is complete once the receiver understands the sender's message.

Agricultural Communication

Agricultural communication (or agricultural communications) is a field of study and work that focuses on communication about agriculture-related information among agricultural stakeholders and between agricultural and non-agricultural stakeholders.

1.8 Research Methodology

In order to appropriately collect relevant data for this study, the researcher combined both the qualitative and quantitative research methods.

The qualitative research is the non-numerical analysis which elicits from the interviewee what he/she considers to be important questions relative to a given topic. It helps him/her describe some situations being explored and conveyed on a guided conversation in order to elicit rich information which the close ended questionnaire may take care of (i.e. personal emotional attachment to issues or events).

Qualitative research also finds out what kinds of thing are happening beyond figure analysis: It is usually exploratory in nature and avoids jaw-breaking statistical analysis. This research method was suitable for the present study because it affords the researcher the opportunity to be physically present among the people or community to observe and record participants' conversation. In a qualitative study the investigator is the primary instrument for gathering and analysing data, especially through focus group discussion.

The quantitative research is the numerical data inquiry into a social or human problem based on analysis, testing a theory composed of variables, measured with numbers, and analysed with statistical procedures, in order to determine whether the predictive generalizations of the theory hold true. (Creswell, J. Research Design: Qualitative and Quantitative Approaches. Sage: 1994).

Quantitative research is widely used in health & human development, gender and political science,psychology, economics, sociology, marketing, community health, and less frequently in anthropology and history.Quantitative research on the other hand is the systematic empirical investigation of observable phenomena via statistical, mathematical or computational techniques. The objective of quantitative research is to develop and employ mathematical models, theories pertaining to phenomena (Burns & Grove, as cited by Cormack, 1991, p. 140).

Generally, it has been argued that when doing qualitative or quantitative research, a substantial amount of time should be spent in the field collecting data. However, there is less agreement on how long should the researcher be in the field collecting data. It is of great importance to look at the two research methodologies to be adopted for this study because it will create room for verification/validation of arguments generated from data collected to get a reliable data for analysis and results as well as bring about new ideas for future references.

1.8.1 Research Instruments and Data Collection

This research used Questionnaire, Focus Group Discussion as well as internet and the library materials to gather relevant data for analysis. These instruments are discussed below based on their mode of application and relevance to the present study.

1.8.2 The Questionnaire Technique

A questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents. Although they are often designed for statistical analysis of the responses, this is not always the case. The questionnaire was invented by Sir Francis Galton (Mellenbergh,2008).

Usually, a questionnaire consists of a number of questions that the respondent has to answer in a set format. A distinction is made between open-ended and closed-ended questions.

An open-ended question asks the respondent to formulate his own answer, whereas a closed-ended question has the respondent pick an answer from a given number of options. This study combined both the open-ended and the close ended questionnaire techniques.

In this study, 80 farmers were involved as respondents. Eighty copies of questionnaire were administered on farmers from two selected adopted villages managed by NAERLS in Kaduna State and Niger State of Nigeria. In Niger State, 40 Questionnaire were administered to farmers from Nwogi Adopted Village in Katcha Local Government Area. Meanwhile, in Kaduna State, 40 Questionnaire were alsoadministered to farmers from NasarawanBuhari Adopted Village in Giwa Local Government Area. Meanwhile, another 20 copies of the questionnaire were administered to NAERLS Staff who officially perform their duties in the adopted village as facilitators.

From these 20 NAERLS staff, 12 were further selected to participate in an interview. The purpose of the interview was to get more information on the staff perceptions on the existing communication approaches for distributing farm inputs and fertilizers to farmers. This was due to the fact that these staff has facilitated the registration of farmers for the GESS under ATA. Thetwenty NAERLS Staff were selected in order to find out how NAERLS has been involved in the implementation of the GESS in the selected adopted villages.

1.8.3 The Focus Group Technique

Focus Group Methods were originally called "focused interviews" or "group depth interviews" (Marczak& Sewell, 2005). A focus group is a group of people who are asked about their attitudes and opinions about a service, issue, concept, idea or product. Members in the group are free to talk with other members in the group. The role of the researcher is that of a moderator who listens, observes, asks questions and keeps the group on track.

The focus group is typically 7-10 people who are unfamiliar with each other and selected because they have certain characteristics in common that relate to the topic of the research question. Focus group provides valuable information or insights when the memories, ideas and experiences of individual members are stimulated when listening to others to verbalise their experiences.

Meanwhile, the two villages were selected in order to have variety of responses for in-depth analysis. The two selected villages have also been part of the adopted villages where NAERLS has been facilitating farmers' registration under the GESS platform in the last three years. Furthermore, 16 randomly selected farmers participated in Focus Group Discussions. There were two Focus Group Discussions conducted in this study- one each from the selected adopted villages.

This means that 8 farmers from NasarawanBuhari village in Kaduna State and another 8 farmers from Nwogi village in Niger State participated in the Focus Group Discussions in this study. This has helped the study to have a good representation of the GES scheme beneficiaries in the study areas.

1.8.4 Key Informants Interview (KII) Technique

The key informant interview being a potent instrument of qualitative research proves to be very useful,and it was adoptedfor purpose of this research. This is because interviews are usually carried out in place that offers privacy to protect confidentiality, often at a distance from the field site. Here the researcher and a key informant is generally personal and intimate and endures overtime. Interviewing is a technique of gathering data in an in-depth way from humans by asking those questions and getting them to react verbally to discover how they think and feel about a topic and why they hold certain opinions, sensitive topics which people may feel uncomfortable discussing in a focus group and add human dimension to impersonal data. Though, there are many ways of conducting interviews.

For instances, Structured interviews use an interview schedule that is similar to the survey questionnaire. Structured interviews are widely used in surveying opinions, beliefs and perceptions of people. Individual interviews are expensive and you should consider whether the same amount of data can be more efficiently collected using written questionnaire.

Semi-structured interviews and unstructured interviews are widely used in qualitative research. Semi-structured interviews consist of a list of open-ended questions based on the topic areas the researcher intends to study. The open-ended nature of the questions provides opportunities

for both the interviewer and interviewee to discuss certain topics in more detail. If the interviewee has difficulty answering a question or hesitates, the interviewer will probe.

Three types of probes commonly used by the interviewer: Unstructured interviews aim to obtain in depth interviews of persons interviewed. Only a limited number of topics are discussed, sometimes as few as one or two topics. Although only a few topics are discussed, they are covered in great detail. Unstructured interviews are used to find out about a specific topic but have no structure or preconceived plan or expectation as to how the interview will proceed.

Face-to-face or personal interviews are labour intensive but can be the best way of collecting high quality data, especially when the subject matter is very sensitive, if the questions are very complex or if the interview is likely to be lengthy (Mathers, Fox and Hunn, 2002).

In view of the above significance of KII method via participatory data collection, this research benefit greatly from the method for the effective realisation of the study.

1.8.5 Use of Library and Internet Sources

The library proves to be very significant in the realisation of the study objectives. This was greatly employed to enrich the review of related literature, and vital aspects of the research especially in the area of agricultural communication, development communication and the advent of Information Communication Technology (ICT). The internet is the World Wide Web that is publicly accessible with aid of interconnected computer networks; which carries various information and services such as electronic mail, online chat, file share and transfer, institutional data base etc. to different users at different location for different purposes.

1.8.6 Research Population

This study adopted both the Qualitative and the Quantitative research approaches for data collection and analysis. In this study, 80 farmers were involved as respondents. The researcher

administered 100 pieces of questionnaire. Eighty copies of questionnaire were administered on farmers from two selected adopted villages managed by NAERLS in Kaduna State and Niger State of Nigeria. In Niger State, 40 questionnaire were administered to farmers from Nwogi Adopted Village in Katcha Local Government Area. Meanwhile, in Kaduna State, 40 questionnaire were also administered on farmers from NasarawanBuhari Adopted Village in Giwa Local Government Area.

The two villages were selected in order to have variety of responses for in-depth analysis. The two selected villages have also been part of the adopted villages where NAERLS has been facilitating farmers' registration under the GESS platform in the last three years. Furthermore, 16 randomly selected farmers participated in Focus Group Discussions. There were two Focus Group Discussions conducted in this study- one each from the selected adopted villages.

This means that 8 farmers from NasarawanBuhari village in Kaduna State and another 8 farmers from Nwogi village in Niger State participated in the Focus Group Discussions in this study. Meanwhile, another 20 copies of the questionnaire were administered on NAERLS Staff who officially perform their duties in the adopted village as facilitators. These Staff have facilitated the registration of farmers for the GESS under ATA. The twenty NAERLS Staff were selected in order to find out how NAERLS has been involved in the implementation of the GESS and the experiences of the facilitators. This study also used the Key Informant Interview with the regional managers of the ATA/GESS platforms in the North West and the North Central who cover both the Kaduna State and the Niger State respectively. Only the regional manager from Niger State was available and participated in the Key Informant Interview in this study. In total, 101 respondents participated in this study i.e. 80 and 20 NAERLS staff and 1 Key Informant.

1.8.7 Justification for the Instruments Used

In any investigation of this nature, a major task is to gather the ideas and evidences that the inquiry has generated in order to summarize its findings. This is the reason why “FGD” and “KII” methodsare used, in order to complement other methods earlier mentioned. It is also significant, because, it allowed the researcher to get first-hand information to enrich the study, by directly visiting relevant institutions, people, and recording verbal and non-verbal communication which have gone a long way in improving the quality of the analysis.

1.9Method of Data Presentation and Analysis

An inferential approach to data analysis was adopted to help the researcher identify issues emerging from each of the data sources for relational analysis. The Qualitative and Quantitative methods; using the Questionnaire, Focus Group Discussion, Key Informant Interview as the Primary sources; Library and Internet as the Secondary sources, were used to analyze the data. According to Davies, & Dodd, (2002), the method of data analysis entails summarizing the information generated in the research.

Data collected were presented in graphic and descriptive forms, and the analysis of findings gathered from respondents’were triangulated for the purpose of the study, because the respondents have different perceptions of the same event, none of which may be obviously false.

CHAPTER TWO

REVIEWOF RELATED LITERATURE

2.0. Introduction

A literature review is an evaluative report of information found in the literature related to your selected area of study. The review should describe, summarise, evaluate and clarify this literature. It should give a theoretical base for the research and help you (the author) determine the nature of your research.

2.1 An Overview of Agriculture in Nigeria

Agriculture belongs dominantly to the global rural demography with a total arable land of 1.386 MHa as of 2008 (FAO, 2013). Nigeria is a country with an estimated population of 167 million people, and it is growing at the rate of 3.65% per annum; the country's population by the year 2020 will be about 201,000,000 million (NPC, 2011). Oparaeke et al.,(2009) stated that if the current food production growth trend of 1.35% annually is not increased to tally with or surpass the population growth rate; Nigeria may be in for a turbulent future because at the heart of development is agriculture; it sustains the poor who are mostly rural dwellers and constitute the larger percentage of Nigeria's population. This category of Nigerians also earn their income from, thus, the development of agriculture must remain critical to every government

development plans. According to Adesina (2013), a one percent growth in agriculture GDP will lead to more than three to four times reduction in poverty than growth driven by the non-agricultural sector.

In the past, series of agricultural strategies were employed to raise adequate food supply in the country through the intensification of innovative agrarian programmes. Agriculture's end is to provide resources and food to sustain mankind irrespective of geography or social class. Nigeria has huge agricultural potential with an arable land potential of 98 million hectares, out of which 84 million hectares are cultivatable; Nigeria's agricultural potential remained untapped; only 34 million ha is cultivated or 48%, the available land for agriculture and optimal cultivation is from only 10% (Adesina, 2012).

Agriculture is a major industry in the world and understandably it attracts the attention of the United Nations in all its activities. The Food and Agricultural Organization (FAO) of the United Nations has the mandate to "raise levels of nutrition, improve agricultural productivity, better the lives of rural populations and contribute to the growth of the world economy". Most of the third world countries have relied upon agriculture for their development (Daniel, 2011). According to Hartmann (2011), agriculture is one of the world's most powerful tools in addressing its goals of creating more employment, better public health, and greater economic growth. Oji Okoro, *cited in* CBN (2011) is of the opinion that agriculture resource has been an important sector in the Nigerian economy in the past decades, and is still a major sector despite the oil boom; basically it provides employment opportunities for the teeming population, eradicates poverty and contributes to the growth of the economy. The pervasive influence of agriculture on Nigeria's economic and social development has also been articulated by Oluwasami (1966). A strong and efficient agricultural sector would enable a country to feed its

growing population, generate employment, earn foreign exchange and provide raw materials for industries. The agricultural sector has a multiplier effect on any nation's socio-economic and industrial fabric because of the multifunctional nature of agriculture (Ogen, 2007).

Notwithstanding,the enviable position of the sector in the Nigerian economy over the past three decades position the agricultural sector arguably the most important sector of the economy. Agriculture's contribution to the Gross Domestic product (GDP) has remained stable at between 30 and 42 percent, and employs 65 per cent, of the labour force in Nigeria (Emeka, 2007). Similarly,Patachu, (2012) opined that, Agriculture has been the mainstay of the Nigerian economy for several years and is still contributing significantly to the Gross Domestic Product (GDP) of the country.

According to the National Bureau of Statistics (2012) Agriculture contribute about 40 percent of the country's GDP. Agriculture has the potentials for employment generation, food security and poverty reduction in Nigeria. This potential, however, has remained untapped over the years. Agricultural production in Nigeria is mainly carried out by farmers in rural areas. Most of the farms are fragmented, have low input and low output.The usages of farm machines, fertilizer and improved seeds have been very low.

According to World Bank (2013), only ten tractors are available per 100 hectares of farmland in Nigeria as compared to 241 tractors per hectare in Indonesia. Also, IFDC (2013) affirmed that the average usage of fertilizer in Nigeria is 13kg/hectare while the mean time rest of the world average annual usage is 100kg/hectare. Furthermore, the average usage in Asia reached up to 150kg/hectare. Asides, less than ten percent of Nigerian farmers could access improved seeds. Irrigation covers only 0.8% of the arable land as compared to 18.7% in Thailand. (THAICIDnd, Earth trends, 2003).

Analysis of the relative increase in crop yields in developing countries shows that Nigerians crop yields have the lowest growth rate of 0.2% from 1986 to 2008 as against 1.2% for China, 2.3% for Indonesia and 3% for Malaysia(World Bank, 2013). The farm outputs could hardly feed the farmers and his families. Hence, a large percentage of the farmers depend on imported foods for their family sustenance. Generally, the agriculture sector contributes to the development of an economy in four major ways product contribution, factor contribution, market contribution and foreign exchange contribution, (Kuznetz, 1961; Mackie, 1964; Abayomi, 1997; Abdullahi, 2002; WorldBank 2007) and these called for urgent attention and the push to utilize the potentials of the sector.

In the bid to push for the utilization of these potentials and to champion food security in Nigeria, the most remarkable campaigns were lunched among these was theColonial Commodity Extension Approach: the early part of this era-1893-1921 marked the beginning of scientific agricultural in Nigeria and the beginning of direct government involvement in agricultural development. The agricultural policy of the colonial government was primary focused on encouraging only export crops like cocoa, rubber, palm oil, cotton and groundnut to support the agro-industries in Europe. The extension strategy was clearly a commodity approach with some enforcement components. More so,the extension delivery at this embryonic stage has the dual but conflicting roles of education and law enforcement.

Subsequently, the near absence of a dynamic research and an effective extension strategy for food crop production in the earlier era was worsened by the oil boom in 1970-1979, which turned out to be an “oil doom” for agriculture in Nigeria. Against this backdrop, the National Accelerated Food Production Program (NAFPP) was conceptualized, the strategy which

incorporated research, extension and input supply (through a network of agro-service centers) and farmers only minimally involved in participatory technology development.

Also, deployed later was the Operation Feed The Nation campaign (OFN) on the 20th of May 1976, with the motive of producing more food, specifically by persuading farmers to adopt new technological packages such as improved seeds, fertilizers, feeds, pesticides and herbicides by the Federal Government.The OFN could be regarded as a classic example of a diffusion development campaign in which the mass media (through the diffusion of information) was involved for the communication component.

Anyanwu et al. (1997) concluded that information about the OFN was so profusely diffused that even today, OFN remains a household slogan in the discussion of agriculture and development in Nigeria. But the sustainability of the gains from this campaign was short. This short lived experience was indicated in food importation and high rise of food crops few years later while the prices of exported cash crops decreased. In 1977, for example, N780.7 million worth of food was imported. A year later, the import bill rose higher. With the inauguration of a new civilian regime in 1979, the OFN was labelled a dismal failure, discarded and replaced with a supposedly more radical agrarian revolution.

Likewise in 1980, the Green Revolution was launched with the usual goal of attaining self-sufficiency in food production, this time, through increased production and processing of raw materials, livestock, fish and cash crops. In the manner of its forerunner, the Green Revolution was propagated through the mass media but did not enjoy as much publicity as the OFN.

Part of the problem was that the Green Revolution was launched in 1979 in a tense political climate. This approach was premised on the Asia success story, and was to replace the

OFN with the primary objective to achieve food self-sufficiency for Nigeria in five years. Similar to the ministry extension strategy, it also placed emphasis on input supply, improvement of infrastructure and provision of price incentives. The strategy/approach failed due to lack of focus and diversification of efforts that could not be sustained. For the mere sake of discrediting the political party controlling the center, state governments controlled by other parties insisted that the media under their control never gave space or time to the programme.

On the other hand, the distribution of inputs followed a blot system in which only political party loyalists who turned farmers overnight were granted loans, inputs and other related facilities to the detriment of genuine full-time agriculturists and peasant farmers. So, at the end of it all, the Green Revolution failed to produce enough food for the nation. Rather, Nigeria's import bill, as ever before, continued to mount. Between April and December 1983, a staggering sum of N5.5 billion was spent on food importation, especially rice. Between the demise of the Operation Feed the Nation, Green Revolution and now, a series of innovation campaigns have been quietly launched which have made no critical impact in meeting the need of farmers'. The food situation, however, does not seem to show any signs of improvements. If anything, it is worse than ever.

Adesina, (2012) asserted that, Nigeria spent about N98 trillion ($632 billion) importing food into the country as it is estimated between 2007 and 2010. Rural communities slid into poverty and yet have an abundance of resources – 84 million hectares of arable land, two of Africa's largest rivers, and a large and young workforce to support agricultural intensification (Anyanwu et al 1997:10; Eriemo 1997:57; Tomori 1979:11; CBN 1997:31; Eyo 1997:46.

As earlier mentioned, Nigeria does have the potential to develop a vibrant agricultural sector. The country is well endowed with expansive, arable and fertile land (www.total-facts-

about-nigeria.com/agriculture-in-nigeria.html). Thus, Nigeria is well positioned to be self-sufficient in the production of food and cash crops for local consumption and export as well as raw materials for her industries (CBN 1997; 31).

Meanwhile, the existent unbridled activities of middlemen in the market system have left the farmers at the expense of greedy businessmen and politicians who are involved in the distribution channels. The failure of many of the agricultural development programmes could be linked to the sharp practices of these middle men who divert subsidized inputs and subvert farmers' activities (www.freepatentsonline.com).

For a developing country like Nigeria, agriculture raises the level of savings and capital formation foreign exchange from exports. This sector has also generated development capital, revenue for the government, employment for labour because economic activities are still predominantly agricultural, especially in the rural areas. Indeed, as observed in some quarters, the country received its principal stimulus for growth from agriculture in the 1960s and 1970s. Moreover, it was self-sufficient in food production. (Anyanwu et al., 1997; Eriemo 1997; Tomori 1979; CBN 1997; Eyo 1997).

However, at the dawn of the 1970s the bubble burst in the agricultural sector.The sector lost its dominant position to crude oil and natural gas in terms of contribution to GDP, the export basket, foreign exchange earnings, and government revenue and so on. Output deteriorated and the sector generally stagnated. The food situation became disturbing and almost alarming to the extent that, Nigeria, once one of the leading producers of certain agricultural goods, became an importer of some of the same products especially food grains (CBN 1997; Tomori 1979), and up till today, the sector has not picked up fully.

Nigeria needs a major transformation of the agricultural sector for sustainable national development and the change had to be across the entire value chain from field-to-mill-to-table. In order to reverse the ugly trends of the yester years, the country initiated a transformation agenda in 2011 in which series of agricultural revival strategies and programmes are targeting different activities in the agricultural sector ranging from finance, pricing, infrastructure, institutions, marketing to storage.

These efforts are well documented in the Agricultural Transformation Agenda (ATA) (a component of the larger National Transformation Agenda). Massive funds have been invested in the sector, several institutions and platforms have been created while the work force developed for the successful implementation of the agenda. One of such platforms is the Growth Enhancement Support scheme (GESS) which is expected to liberate farmers from the sharp practices of the agro-allied suppliers so that farmers can maximize profit through high productive value chain system(www.forbes.coml).

All these factorsstated above,prompted the deployment of the Growth Enhancement Support scheme in May 2012, as a pilot project in 36 states and the Federal Capital territory. The initiative was adopted to actualize the Agricultural Transformation Agenda (ATA) by the Federal Government of Nigeria. According to the Federal Ministry of Agriculture and Rural Development (2011) about 14 million farmers have registered for the scheme throughout the federation. Inputs have been distributed in three seasonal production cycles to farmers.

Thus,this development necessarily called for an examination especially in the face of its deployment through the Information and Communication Technology (ICT) i.e. the mobile phone Apps. This study therefore, is motivated by the need to achieve this enormous potential through the use of new communication strategy to communicate the planned development

strategies in agriculture for national development because according to Olajide et al., (2011) there is a strong correlation between Nigerian's total Gross Domestic Productand the agriculture that suggests that the prospects of the non-oil sub-sector and the overall economy are closely tied to the performance of the agricultural sector. Therefore, Nigeria should shift from the old system of the vertical and top-down approaches to development communication in order to achieve the needed sustainability in the sector (www.journalofnaturalproducts.com).

2.2 Agricultural Communication-Information and Communication Technology

Information and Communication Technology (ICT) is often perceived as a catalyst for change and change in many activities includes access to information (Watson, 2005). Meanwhile, in this study, "technologies" refer to devices (hardware or software) that provide access to information through telecommunications. Without doubt, the crucial role of information and communication technologies (ICTs) cannot be over-emphasized in today's world.

Globalizationis perceived as a major driver of the world's economies.Itis powered and enhancedby the use of ICTs on which virtually every sector now relies. More so, the current dispensation of competitiveness within the global market space could not have been made possible without the interconnectedness of institutions and people. More importantly, the global South that is largely agrarian has continued to strive to find relevance at the international frontiers. Consequently, e-commerce, e-governance, e-banking and the likes are becoming more and more popular within emerging economic and political spaces. That implies many factors have continued to impinge on the increased drive towards the use of ICTs in developing economies particularly in Nigeria (Sebusang and Masupe, 2003; Torimiro, et al., 2007).

The study investigates why the Federal Government of Nigeria has adopted the telecommunication potentials in alliance with the mobile phoning as one of the approaches for the

transformation of the agricultural sector in the form of electronic-wallet (using mobile phone and internet service) of the GESS scheme. The ICT's capability is fundamental to participation and engagement in modern information society. Thus, it is important that knowledge-based information communities through the Internet are established as effective tools for harnessing resources for sustainable agriculture (Surendran, 2008).

Therefore, the data base for farmers profile as being operated under GES scheme is an effort by the Nigerian government to use ICT to find, develop, analyze and present information, as well as to model situations and solve problems in agriculture. On a broader range, ICT enables rapid access to ideas and experiences from a wide range of people, communities and cultures, and allows users to collaborate and exchange information on a wide scale (Crown, 2010).The purpose of ICT in agriculture is generally to familiarize numerous stakeholders including farmers with the use and workings of computers and related information, social and ethical issues that are development driven. Use of different information communication technologies, particularly the telephone has become inevitable for agricultural stakeholders and farmers in information sharing across the globe.The account of Andres and Woodard (2013), has it that mobile phones can serve as invaluable substitutes for and complement traditional information and communication technologies (ICTs) in many developing countries.

Evidences from other developing nations show that ICTs are networking tools between and among the stakeholders in agriculture (Adejo et al., 2013). In countries like Mauritius, India, Bangladesh, Chile, Mexico, Egypt, Peru, South Africa and Uganda, ICT has played a major role in diffusing information to rural communities and showed even much unexpected potentials (Munyuga, 2000). By using modern information communication technologies, Internet and the telephone, the

Nigerian farmers can retrieve required information and interventions within a short time along the value chain from government.

In Nigeria, apart from the recent e-wallet, one of the innovations used to utilize the potentials of the Internet was the introduction of the internet Farm Radio Network by the Nigerian government in collaboration with Food and Agricultural Organization of the UN in 2004 (Idu&Obinne, 2009). Krishna Kumar, as cited in (Rajesh et. al., 2014), refers to a digital wallet as an electronic device that allows an individual to make electronic commerce transactions. This can include purchasing items on-line with a computer or using a smartphone to purchase something at a store. Increasingly, digital wallets are being made not just for basic transactions but to also authenticate the holder's credentials.

2.3 Electronic Wallet (E-Wallet)

According to Krishna Kumar, as cited in(Rajesh Krishna et al.2014), a digital wallet refers to an electronic device that allows an individual to make electronic commerce transactions. This can include purchasing items on-line with a computer or using a smartphone to purchase something at a store. Increasingly, digital wallets are being made not just for basic financial transactions but to also authenticate the holder's credentials. For example, a digital-wallet could potentially verify the age of the buyer to the store while purchasing alcohol.

A digital wallet has both software and information component that are crucial to agricultural development planning and production, electronic wallet can be used to monitor and evaluate the growth of plants. The software provides security and encryption for personal information and for the actual transaction.

Typically, digital wallets are stored on the client side and are easily self-maintained and fully compatible with most e-commerce Web sites. A server-side digital wallet, also known as a thin wallet, is one that an organization creates for and about you and maintains on its servers. Server-side

digital wallets are gaining popularity among major retailers due to the security, efficiency, and added utility it provides to the end-user, which increases their satisfaction of their overall purchase. The information component is basically a database of user-inputted information. This information consists of your shipping address, billing address, payment methods (including credit card numbers, expiry dates, and security numbers), and other information.

The key point to take from digital wallets is that they are composed of both digital wallet devices and digital wallet systems. There are dedicated digital wallet devices such as the biometric wallet by Dunhill, where it is a physical device holding someone's cash and cards along with a Bluetooth mobile connection. Presently there are further explorations for smartphones with Near Field Communication (NFC) digital wallet capabilities, such as the Samsung Galaxy Nexus smartphone utilizing Google's Android operating system. Digital wallet systems enable the widespread use of digital wallet transactions among various retail vendors in the form of mobile payments systems and digital wallet applications.

It is useful to approach the term "digital wallet" not as a singular technology but as three major parts: the system (the electronic infrastructure) and the application (the software that operates on top) and the device (the individual portion). An individual's bank account can also be linked to the digital wallet. They might also have their driver's license, health-card, loyalty card(s) and other identity (ID) documents stored on the phone. The credentials can be passed to a merchant's terminal wireless via Near Field Communication (NFC) (Kayode O. et al, 2014).

Krishna Kumar, as cited in Rajesh et. al., (2014) explained that chips are already appearing in smart phones which provide very close range, low power, easy to setup up point-to-point communication which assumes that the cell phone owner secures his digital wallet with a good password; the chip will ensure that thieves are unable to access the digital wallet embedded in the

stolen phone. Biometric could also be integrated into cell phones and used for quick and easy authentication as being done by the GESSin Nigeria.

In the case ofe-wallet in GESS platform of the ATA, the activities of the telecom industry unfolds in three distinctly different dimensions in the use of the mobile phones applications:

i. As a generic technology that is applied in most economic activities including agriculture;

ii. As an industry producing the equipment and software support for the generic technology;

iii. As a broad and fast-growing service industry using the technology, equipment and software support mentioned earlier.

It is the combined effects of the three areas that give the ATA's e-wallet system its vast potentials to attract farmers because before the advent of the programme, Nigerian farmers are already connected to different telecom service providers for personal use (Adesina, 2013). Hence, it is from the combination of government programme with private telecommunications infrastructures related to the Internet and mobile services that the biggest potentials are emerging (www.agronigeria.com).Generally, the payment process is:User registers, inputs their phone number, and the provider sends them an SMS with a PIN. User enters the received PIN, authenticating the number. User inputs their credit card info or another payment method if necessary (not necessary if the account has already been added) and validates payment (en.**wikipedia**.org**/wiki/**Online**_wallet)**.

The researcher believeswith more success using the e-wallet communication approach, it would encourage many farmers to jump on board with the electronic wallet. While some farmers are resistant to the e-wallet of the GESS, many are beginning to see the benefits of building relationships with leaders in other industries (Agro-allied) and other farmers and scientific

community (Adesina, 2013). Internet and mobile phone are another tool that can help farmers maximize their productivity output and profits.

As a matter of emphasis, the ambition of the GESS is to create a competitive market with the virtues of lower prices and faster service and technology development on which farmers can maximize productivity. The GESS is one of the many critical components of the ATA. It was designed for the specific purpose of providing subsidized at 50% agricultural inputs through e-wallet like fertilizers, seedling, seeds, agro-innovations and services to farmers in order to increase their yields per hectare and make it comparable to world standard. The Growth Enhancement Support Scheme which is the nerve centre of the on-going agricultural revolution in Nigeria has been acclaimed by the National Assembly to be successful with a promise to sustain its value- chain operation through a legal process (Agriculture in Nigeria, 2013).

The above observations show that access to ICT potentials by rural farmers is under the control of the government and the service providers who are in business partnership with government. Despite the efforts of the Federal Ministry of Agriculture and Rural Development to reform the agricultural sector, according to Adejo (2013), the limited access to ICTs is manifested in digital divide between rural and urban area in Nigeria. In Nigeria, urban centers have witnessed development in the establishment of computers and Internet Cafes in the last few years: meanwhile the rural areas are left behind in this development (Adejo, 2013).

In his findings, Akpomuvie (2010) revealed that the majority of the people in Africa (including Nigeria) live in the rural areas and are abreast of information about government programmes aimed at improving them. No doubt Nigeria has enough media houses both electronic and print to carry out mass enlightenment and inform the populace but local people usually do not get informed (accurately and timely) about real government development initiatives (Ismail, et al.

2013). The Internet and the New Media tools like the iPad, laptop, and mobile phones applications are all communication technologies that can be engaged for development in agriculture.

But the question of their efficiency, adequacy and sustainability especially in GESS platform (e-wallet) of the ATA are some of things this study will be factoring into its findings. It has been claimed by DrAdesina, that within two years, the Growth Enhancement Support Scheme reached six million (6,000.000) genuine farmers and this has improved the food security of thirty million (30,000.000) persons in rural farm households.

The impact on food production has been said to be significant as farmers have produced additional fifteen million (15,000.000) metric tons of food within these two years. This is over seventy percent (70%) of the food production target we set for 2015. Farmers growing cash crops are being supported across the country, whether growing cocoa, oil palm, cotton or cashew, farmers have never seen a better time when government resources are sharply focused on them (Agriculture in Nigeria, 2013).

In the cash crop area, cocoa farmers are being provided with one hundred and fourteen million (114,000.000) seedlings of high yielding cocoa varieties, which will allow doubling our cocoa production. Over nine million (9,000.000) sprouted nuts of oil palm seedlings are said to have been provided to farmers growing oil palm through the GESS. From the North, South, East and West, the agricultural transformation agenda is creating wealth, reviving hope and lifting millions of our farmers out of poverty. Despite the gains which have been achieved, there is still much to do. The country must continue to expand the access of farmers to better agricultural technologies, for sustainable increases in agricultural productivity. For this to happen, Nigeria farmer requires an efficient technical assistances and farmer-responsive agricultural extension communication system (Agriculture in Nigeria, 2013). That is why an assessment like this study is relevant and important.

2.4 Educational Level and ICT Compliance of Farmers in Nigeria

At this juncture, it is very imperative to consider the following variables; illiteracy, poverty, corruption, poor infrastructures and a host of other variables. These have contributed largely to the inability of the average individuals in the less developed economies, to access and use ICTs for the purpose of achieving personal and socio-economic development. Largely, dependent on farming and other agro-allied activities for their [daily] survival, smallholder farmers are still constrained to access up-to-date agricultural information on new technologies and best practices for sustainable development. The Agricultural Development Projects (ADPs), which were, at inception, sponsored by the International Bank for Reconstruction and Development (World Bank) played very important roles in information and service delivery to farmers. Nonetheless saddled with so many hiccups, its novel Training and Visit (T&V) system of extension was laudable (Benon, et al., 1984).

Sadly enough, however, most of these projects have become moribund and have not been able to meet the current challenges of information sharing and dissemination amongst small farmers. Its inability to reach a wide spectrum of smallholder farmers within a limited period of time and with up-to-date information has been worrisome to the people in agricultural development initiatives.

In the recent times, new programmes have been put in place to address Africa's food insecurity challenges. This is with a view to addressing the foremost issue of the Millennium Development Goals (MDGs), which is halving extreme hunger and poverty in 2015 (CAADP, 2008; IFAD, 2010; UNDP, 2000). Complementing the existing efforts at the grassroots level and finding ways of achieving improved service delivery therefore becomes very imperative. As such, this action research intends to explore the possibility of reaching local farmers through a more pragmatic approach by developing the e-wallet approach which would serve as a bridge between agricultural extension agents and small farmers (See for instance Torimiro et al., 2007 143-154).

The project aims to enlist this group of vibrant farmers with the use of ICTs in generating agricultural information for the purpose of enhancing agricultural productivity for food security in Nigeria. The involvement of the experts (NAERLS) in coordinating the activities of the small farmers, agricultural extension agency, research and other relevant agencies and organisations is central to the design of the project.

Nigeria is, indeed, developing in the area of ICT but there are still some loopholes, which are affecting its total advancement in this area, lamented Opara and Ituen (2009) referring to the International Telecommunication Union (ITU) report which listed the following as indices for ICT compliant and benchmarking tool globally, regionally and at the country level. "These are related to ICT access, use and skills, such as households with a computer as well as the number of Internet users; and literacy levels," says ITU, adding that, "The major challenge is that the use of computer, access to Internet and other tools of ICT are limited greatly to the urban areas, and the challenges faced by the ICT sector in the country include particularly the fact that the people in the rural areas are yet to know how to use the computer," stressed LanreAjayi, the President, Nigeria Internet Group, noting that the people in rural areas are key-board-shy.

However, the researcher disagrees with the position of the Presidentof the Nigeria Internet Group on the above assertion. Therefore, it is obvious that the rural Nigerians were not being keyboard-shy but were never empowered on ICT because of the unavailability of ICT facilities, structures and corruption in rural Nigeria. There are no power supply in some rural areas, nor social amenities and lack of educational training facilities for people to be ICT compliant, computer literate and internet savvy. People in rural Nigeria are willing to learn new things through formal and non-formal education settings, if such opportunities are provided. Nigerians are smart and resourceful no matter where they reside.

Nigerians are always ready to learn new things and open to change, as well as adapt easily to new environment and technologies. The absence of non-formal education centers in rural communities of Nigeria discourages ICT training and knowledge acquisition by the citizens. ICT resource availability, corruption and affordability are major handicaps. Thus, the citizens are to fully utilize the potentials of ICT if they have unlimited access to the Internet facilities and computereducation. Even in urban areas, access to personal computers and internet is largely limited and expensive to most Nigerians.

All these issues, notwithstanding, the Federal Executive Council of Nigeria, approved a national Information Technology (IT) policy in March 2001, in order to solve ICT problems in the country. Government established the National Information Technology Development Agency (NITDA) and was charged with the implementation of ICT policies. The policy recognized the private sector as the driving engine of the IT sector. There are calls for an ICT policy reform in Nigeria so that individual citizens could access the training and services.

In this light, the governments setup the Nigerian National ICT for Development Strategic Action Plan committee to develop a new ICT policy for development as the ICT action plan / roadmap for the nation. The Nigerian government should ensure that this agency provides the needed services for a sustainable intervention, and environment for creating affordability and accessibility to ICT gadgets and trainings.

In addition, ICT policies should be concise with understanding of the practical uses and services of the GESS which could be integrated with the developmental needs of the target communities nationwide. Emphasis on rural ICT infrastructure, provision of trainings and services is very important at this period of ATA; Nigeria’s ICT development would reduce emigration to urban centers and increase agricultural productivity.

2.5 Agricultural Extension System in Nigeria

According to Arokoyo*et al,* (2011), the agricultural extension system in Nigeria collapsed in the 1980s shortly after the Structural Adjustment Programs (SAP). The Agricultural Development Projects (ADPs), which formed the backbone of the extension system, worked well before the structural adjustment period. Within this framework is the National Agriculture Extension and Research Liaison Service (NAERLS) which has been serving as the first known institution that disseminated extension service information to farmers through pamphlets, radio and other media

The major factor for the collapse of the Training and Visit (T&V) extension system in Nigeria was the withdrawal of the World Bank financial support to the Agricultural Development Projects ADP. The ADPs ran into difficulties due to lack of access to financial resources to support their operations. Invariably, the performance, and hence the effectiveness of Nigeria's agricultural extension service became seriously impaired by poorly trained staff, lack of synergies with other donor supported projects. All these were the outcome of the predominantly top-down approaches of the communication process which did not pay more attention to indigenous knowledge and felt needs in development projects design and Implementation(Arokoyoet al.2011).

According to Akinolaet al. (2011), most of the failed programs were heavily weighted in favour of male farmers leaving out the women and youth. And yet, women and the youths are pertinent factors for sustainable agricultural development in a continent like Africa where inclusiveness is paramount to community development. Hence, it was an error of the extension system to leave these parties out in the development agenda. Thus,Nigerian government needs to rapidly upgrade the extension system to absorb the emerging development realities as they emerge in the agriculture sector especially in the area of sustainability.

Farmersin Nigeria face increasingly complex challenges in today's rapidly changing food, fibre and agricultural markets. New demands imposed by supermarkets and consumers, stringent environmental regulations, high demands for grades and standards, require farmers to be better informed and supported. The extension system needed today is not just to produce more food. Farmers need to be supported to use the right kinds of seeds, fertilizers, meet maximum residue levels in food commodities, and improve food handling, storage, packaging and marketing of produce. As food chains become increasingly complex, food safety standards are being strictly enforced in local, regional and global markets. What is needed today is a highly knowledgeable extension service backed up by Information and Communication Technology (ICT) infrastructures to support farmers from the farm to the mill, and to the market in a chain of added values at each stage of the processes (Agriculture in Nigeria 2013).

Nigerian farmers need market-informed agricultural extension workers with the modern skill of the communication advancement more than the traditional agronomists that usually dominate extension services through village meeting and community/group discussions. The old system consumes more time and energy and full of corruption (Agriculture in Nigeria, 2013). Meanwhile, modern extension workers must be equipped on how to use the Internet to help link farmers more effectively and responsively to domestic and international markets, to enhance crop planting diversification, sustainable technology transfer (through updating platforms on best practices, input and output markets, rainfall pattern, trans-boundary crop and livestock diseases).

Against this backdrop, at the national level, the Agricultural Extension Transformation Agenda was launched to propel the sector. This vital farmer support system is imperative to ATA's success to achieve food and nutrition security, wealth and job creation and indeed to make Nigeria a major player in global food markets. Among the goal is to put in place a knowledge-based, demand-

responsive, pluralistic, market-oriented and ICT-driven participatory agricultural extension service for Nigeria. This is a new step in the country's agricultural sector but stakeholders in the sector have been clamoring for such dynamism (Adesina 2012).

In Score Card (2013), the GESS is in line with global best practices in order to digitalize extension work. Even though Nigeria has practised extension for more than eight decades, it has never had a Federal Department of Agricultural Extension which analysts have said is an important office for the effective delivery of e-extension through the generation and maintenance of accurate farmers' data bank The absence of this office has made it difficult over time to coordinate and streamline agricultural extension operations across the country, leading to multiplicity of disjointed efforts and unrestricted corruption in the distribution of farm inputs by government.

However, in 2013, the first Federal Department of Extension was established to provide the much needed impetus for leadership, coordination, monitoring and quality assurance to drive the transformation of extension delivery at all levels through agricultural extension advisory service providers among which is the National Agricultural Extension and Research Liaison Services (NAERLS Quarterly, 2014). This single step has led to the award of the contract by the Federal Ministry of Agriculture and Rural Development for the building of Farmers' Help Centers in all the agro-ecological zones of the country. These centers when completed are expected to provide one - step information platform to farmers at no cost and at their request through mobile phones or other communication devices.

In 2013, Adejo et al. in a study entitled *"Informational and Communication Technologies and Agricultural Extension Service Delivery in Nigeria"* concluded that it has become imperative for extension to explore the opportunities offered by this digital age. They further stated that in the area of agricultural extension, communication can play an important role in raising the productivity of

farmers. However, Ismail et al (2013) observed that the Nigerian media environment has not really favoured the farmers especially in terms of access to viable and responsive information on modern practices and innovations in agriculture. The authors argued substantively to establish a relationship between information technology and development especially in agriculture, meanwhile, they advised that government should step up the development of infrastructures like roads, electricity and transportation system to help the mass media and ICT utilization at the rural areas.

In another study by Gadzama and Akinola (2013) entitled the *"Adoption and Diffusion of ICTs in Extension Services: Implication for the Agricultural Transformation Programme in Nigeria"*, the authors averred that the rapid development of information and communication technology (ICT) is the biggest factor for change in extension services, one which facilitates and re-enforces other changes. This position is logically supporting the submission of Ismail *et al*. (2013) on the fact that other infrastructure must be developed along the ICT for optimal result. Therefore, assessment of the e-wallet platform by the current study will help integrate many of these findings in the course of sustaining e-wallet of the GESS in ATA.

Using the value chain approach in the ATA programme requires a more knowledge and skills based demand responsive extension and advisory services.Therefore capacity building for the extension agents and farmers is important in order to reap the gains of ICT for agricultural transformation. This position was also taken by Issa (2013), when he recommended in a study that extension workers and farmers plus other stakeholders be properly trained as enshrined in the ATA document for the success of the initiative. In a related study, Krunal and Dhaval (2013), in "Cultivating ICT & Networking: The Role of Social Media in Agriculture", believe that agriculture is a key sector in most developing countries, as the general opinion is that a happy nation is one that is able to feed their citizens.

However,Krunal and Dhaval (2013)were also of the opinion that, social media will be useful tools in that regard because they surpass geographical limitations and are rapidly becoming the new shining of online society. Thus, the role of social media is to establish connections, create awareness. Hence, farming community, agricultural researchers, scientists and extension people should increase their participation to connect, network and communicate agricultural issues promptly on social networking sites.

But to do this, the extension workers must be technically equipped. Lack of mobility is one of the most limiting constraints to the performance of agricultural extension workers aside the fact that many rural areas are far behind in telecommunication infrastructures. In order to bridge this gap, government has distributed seven hundred (700) motorcycles to all the ADPs and Sasakawa Africa Association to support agricultural extension agents across the country (Naerlsquarterly, 2014). To further revive the extension service, the Federal Ministry of Agriculture and Rural Development has entered into partnership with the Sasakawa Africa Association.

Under this partnership, five thousand (5000) agricultural extension workers will be trained. Management training plots will be established in each of the five pilot states (Ogun, Kastina, Anambra, Benue and Cross Rivers), postharvest management extension support, strengthen farmer field and farmer business schools in each of the states. The Ministry will embark on monitoring, learning and sharing of experiences from these schools through the uploading of information for other framers' use.

In support of this, the Federal Ministry of Agriculture and Rural Development have provided ₦ 200 million to support the take-off of the extension activities in the five pilot states.

This will be supported with the upgrading of infrastructures and facilities in allAgricultural Development Projects (ADPs) across the country.

The Federal Department of Extension has started work on a digital information framework where farmers' cell phone numbers will be mapped to their information needs. They will soon get information such as good agronomic practices, market linkages and weather news on their phones. To ensure that farmers can get information in their local languages, the African Language Translation Institute of National Open University of Nigeria is engaged to develop a language application for selected crop value chains that will be deployed on this digital platform. Also initiated is a 'Farmers Helpline', which is a web and mobile phone-based extension service with audio and video call-in facility. Through the Farmer Help Line, connection with farmers is created across the country directly with universities and colleges of agriculture. With a 24 hour service, extension toll free line, where farmers can call experts (in their local languages) and seek extension information and advice (Score Card2013).

This will significantly increase the relevance of agricultural universities in reaching millions of farmers. It will also provide practical experience for young agricultural graduates, who can become agriculture extension service providers. Additionally, Nigeria is partnering with Columbia University, USA, on a revolutionary technology for testing soil health conditions right in the farmer's field before planting. It is called the Soil-Doctor. Instead of sending a sample to a laboratory, which can take months, farmers will be able to get their soil samples tested on their fields and get their soil test results right away. Just like doctors treat sick people, soil doctors will treat sick soils (Agriculture in Nigeria, 2013).

To this end, the Department of Extension is engaging relevant organized private service providers in the areas such as seeds, fertilizers, agrochemicals and machinery to strengthen Nigeria's extension service delivery. All these are expected to help Nigerian government diversify and expand delivery of extension services by encouraging the participation of private sector, civil society

organisations (CSOs), farmer-based organizations (FBOs), universities and research institutes. The involvement of these FBOs will strengthen the country's national extension system and ensure smallholder farmers have access to critical services such as training on new agricultural technologies and advice in areas such as farm input supply, credit, marketing and farm management.

Farmers will fully exploit opportunities in the agricultural value chains by transforming agricultural products and improving product quality to meet market grade and standards and demands. All these are focus of the GESscheme which will be packaged through ICT and other mobile telecommunication devices (Agriculture in Nigeria, 2013).

2.6 The Agricultural Extension Transformation Agenda

For Nigeria to tackle the current situation of food insecurity, rural poverty, and un-competitiveness of Nigeria in the world global food market, the federalgovernment of Nigeria therefore initiated an Agricultural Transformation Agenda that will create jobs, especially for the masses of unemployed youths, create wealth by making Nigeria a global competitor in the world food market, and ensure food security.It is unfortunate that Nigeria's awesome National Agricultural Research and Extension System (NARES), the largest in Sub-Saharan Africa, has not been able to engineer a sustainable agricultural development that would have ensure both National and household food security, improved rural livelihoods and indeed, make Nigeria's agriculture competitive in the world agricultural market today.

Some of the major challenges of Nigeria's agricultural extension and advisory services have been identified to include:

i. lack of a legislated agricultural extension policy compounded by policy.
ii. Somersaults in the sector; grossly inadequate and untimely funding; poor leadership and coordination.
iii. low private sector participation.
iv. a very weak Research-Extension-Farmer-Inputs Linkages system and

v. driven by ineffective top-down, supply-driven, extension approaches.

2.6.1 Responsibilitiesof Agricultural Extension Transformation Agenda

AETA in ATA, has the followinggoals

i) To establish a Federal Department of Agricultural Extension (FDAE) whichwill oversee, monitor and provide the leadership needed for an efficient and effective agricultural extension and advisory service delivery in Nigeria.

ii) To review the agricultural extension policies within the subsisting agricultural policies and recommend appropriate policies that will ensure the effective participation of all stakeholders in a stable policy environment and adequate funding for the delivery of efficient and effective agricultural extension and advisory services.

iii) To recommend appropriate Institutional Structures and arrangements for the delivery of effective and efficient multi-plural agricultural extension and advisory services in Nigeria, using the value chain approach.

iv) To recommend demand-responsive extension systems/approaches and tools that will ensure the delivery of efficient and effective agricultural extension and advisory services for all the multi-actors in the targeted commodity value chains for productivity.

Theseare clear road map to address the critical challenges of agricultural extension and advisory services to transform it into a participatory, demand-response, market-oriented and ICT-driven service that will provide for all the extension needs of all actors,the roles and responsibilities of all the stakeholders (the various tiers of government, the private sector, including the Farmers' Associations, NGOs and CBOs), funding, and institutional arrangements, and gender mainstreaming etc.The establishment of the new Federal Department of Agricultural Extension will provide the needed impetus for the leadership, coordination, monitoring & evaluation and the quality control and

quality assurance to drive the extension transformation agenda using the appropriate extension systems/approaches under a pluralistic delivery system, methods and tools (both electronic and print; traditional and modern).

Finally, the Extension Transformation blueprint would propeland provide for the cross-cutting issues comprising: Women, Youths, Vulnerable groups; Growth Enhancement Support Scheme (GESS) items (fertilizers, agrochemical and improved seeds and credit); strengthening of farmers'/producers' associations and more conducive service conditions for extension agents including mobility for better performance along the targeted commodity value chains of interest to increase agricultural productivity and development.

2.7 Agricultural Communication

Agricultural communication is a field of study and profession that focuses communication in agriculture. It is concerned with the gathering, processing and disseminating agriculture-related information among agricultural stakeholders and between agricultural and non-agricultural stakeholders. It is done formally and informally by agricultural extension and is considered a subset of science communication. Benor and Baxter (1984), two prominent international exponents of Agricultural Extension in Saliu and Age (2009), suggested that, sustained high levels of agricultural production and income are not possible without an effective agricultural communication supported by agricultural research that is relevant to farmers' need. Communication in agriculture as explained by Van den Ban and Hawkins (1996), involves the conscious communication of information to help people from sound opinions and make good decisions. It involves a deliberate and systematic attempt to share knowledge and insight with someone in a way that the person is able to take decisions for the betterment of hi/her wellbeing (Van Gent and Kants, 1980).

As a matter of fact, sharing of knowledge happens only through the process of communication; in the case of agriculture it is through agricultural communication that the new agricultural innovations are shared with farmers. Even though, there are arguments against public agricultural extension services with the most prominent being that the public cost is high and unsustainable as a communication strategy. If the cost is high, it is only logical that the impact is huge to justify this high cost and its gains must be enormous to ensure that the investments are profitable.

Moise, (1994) explains that a study conducted and published in 1992 by the World Bank revealed that about sixty percent (60%) of the general cost of the agricultural projects financed by World Bank was absorbed by the communication components, while the governments of the benefitting countries were responsible for an average of eighteen point five percent (18.5%) of the total cost of the projects. In effect, external financial assistance for agricultural communication projects is as high as eighty percent (80%) of the total cost in 1992 to maintain a supposedly permanent governmental administrative structure.

Communication in agriculture has not been spared the influence of globalization. Globalization (or globalisation) is the process of international integration arising from the interchange of world views among the people, products, ideas and governments of different nations, a process driven by international trade and investment and aided by information technology and other aspects of culture.The definition of "globalization" affects all countries of the world in such a manner that it is now a concept that generates debate in international circles. The globalization process is all embracing and includes human migration, trade goods and services, movement of capital across national boundaries, and integration of the financial markets. It is a process that has been driven by the rapid development of communication, technological innovations (agricultural

technology inclusive), as well as major changes in public policy and economic management (Ajeigi, 2005). The communication process is such an essential element in agricultural extension education process that all extension workers must be aware of, knowledgeable about and put into use every time.

Basically, extension communication is designed to elicit behaviour in the life of people (farmers). Agricultural extension cannot happen without communication. According to Oladeji (2008), Agricultural Extension work involves communication which could be referred to as agricultural communication or extension communication. Communication forms the premise for all human interaction. It is a core resource input. It involves the exchange of ideas, facts, feelings, methods, thoughts, impression, concerns, and solutions in an approach that each has a common understanding of the actual meaning, intent, and use of a given message (Oladeji, 2008).

Beyond communication, the farmer must be enabled to act upon it based on the information received and the conviction thereof. Communication in this century has been largely influenced by the morphing of the media to what is today called a new media. The rise of the new media therefore shifts attention to how the new media can be used to aid the communication process and model of agriculture. New media in the context of this study refers to the Internet based digital communication that allows on-demand admittance to unregulated content in real time and anywhere using any digital device. For the purpose of this study, the social media component is also viewed as an important sub-set of new media technology for communication given its interactivity.

In actual fact, the parallel communication approachesof the pre and immediate post-independence era,wasineffective and inefficient using the classical Training and Visit (T&V) 1991 system supported by the World Bank (1975-1995), the “One-Stop” approach with non-involvement of the key actors (farmers) and development partners in policy articulation to improve effectiveness

and efficiency of the approach andResearch-Extension-Farmer-Inputs Linkages system, were all driven by ineffective top-down extension approaches, and was not able to meet the challenges of information sharing and dissemination amongst small farmers.

Its inability to reach a wide spectrum of smallholder farmers within a limited period of time, and with up-to-date information has been worrisome to the people in agricultural development initiatives. The communication approaches was top-down making the context not participatory and content diffused non-interactive (conveyor belt system) among the farmers and stakeholders.

2.8 Appraisal of Electronic Wallet for Agricultural Development

In the words of the minister DrAdesina, emphatically, the Growth Enhancement Support Scheme (GESS) through the e-wallet for input and service delivery to Nigerian farmers, it is the first in Africa. It was designed for the specific purpose of providing subsidized agricultural and inputsservices through e-wallet (on their mobile phones) genuine fertilizers and seeds to farmers in order to increase their yields per hectare and make it comparable to the world standard. The targeting of the farmers is based on the farmer bio metric information registration exercise being conducted throughout the country in July-November, 2011. The GESS which is the nerve centre of the on-going agricultural revolution in Nigeria was on Monday October 14, 2013 to beacclaimed by the National Assembly with a promise to sustain its Value- Chain operations through an act of parliament(Agriculture in Nigeria, 2013).Looking at the Scheme's Approaches, the Scheme's approach is to target beneficiaries through the use of electronic wallet and by encouraging the engagement of the private sector in the distribution and delivery of fertilizers and other critical inputs directly to farmers. The GESS is an innovative scheme, which seeks to remove the difficulties usually associated with the distribution of fertilizers and hybrid seeds to farmers. In the past there were complaints of diversion, exorbitant cost and adulteration of various inputs to farmers, which

ultimately led to low productivity, increased poverty, unemployment and lack of interest in farming.

Thus, the objectives of the GESSare:

i. To provide subsidized agricultural inputs and services and agro-chemicals to farmers
ii. To remove the usual complexities associated with fertilizer distribution
iii. To encourage critical actors in the fertilizer value chain to work together to improve productivity
iv. To enhance farmers' income and promote food security, creating of wealth, creation of jobs for women and youths making Nigeria a major player in the global markets.
vi. To shift provision of subsidized agro-inputs and services away from a general subsidy to genuine small holder farmers.

The Growth Enhancement Support Scheme is one significant innovation in the Nigerian agricultural sector that has spurned a lot of interests among the stakeholders many of whom are desperate to make it succeed. Among is the National Association of Nigerian Traders (NANTS), NANTS has been involved in monitoring and tracking investment (budgets and allocation) on agriculture, trade and investment sectors of the economy through the Nigerian Agricultural Policy and Investment Observatory (NAPIO) project it designed.

The NAPIO project is focused on measuring effectiveness, efficiency and clarity of implementation of policies in the agriculture and trade sectors. Against this backdrop, National Association of Nigerian Traders (NANTS) has continued to monitor the Federal Government's implementation of the Growth Enhancement Support Scheme with a view to identifying the gaps in the implementation and the lessons learnt while also espousing possible recommendations that can be applied to improve the success of the policy initiative. Thus, the overall goal is to use the GESSas an instrument for

assisting small scale farmers (SSFs) to achieve increase in productivity towards a food security and sufficiency in Nigeria.

In addition, the minister of Agriculture and Rural Development Dr. Adesina, as well stated that the agricultural sector in Nigeria is witnessing significant changeswhich have ended the era of agriculture as a development program, and shifted to agriculture as a business and the approaches are working. More so,it was proposedto register 20million farmers by December 2015 at about 5million a year,already as at the time of study 14.5million already registered.

The Growth Enhancement Support Scheme is working and impacting the lives of millions of farmers. Within two years, the GESS reached six million (6,000.000) genuine farmers and this has improved the food security of thirty million (30,000.000) persons in rural farm households. The impact on food production has been significant as well, as our farmers produced an additional fifteen million (15,000.000) metric tons of food within two years. This is over seventy percent (70%) of the food production targeted for 2015. The scheme effectively gets government out of direct procurement and distribution of farm inputs and simultaneously bringing the private sector actors, such as financial institutions, agro-dealers, suppliers, marketers etc. to own the value chains for agricultural inputs supply and distribution.

Through the e-wallet, farmers receive and pay for GESS support from both the Federal and State governments and are linked to agro-dealers, suppliers, marketers, extension services and financial institutions including insurance. According to the minister, in less than 160 days after launch, 1,460,908 and farmers had benefited from the GESS through the e-wallet, receiving 150,000MT of fertilizers and about 10,000 metric tons of seeds supplied through agro-dealers, and covering seven million transactions (deposits and payments) on the system. Monetarily, the

transactions totaled $294.0million of subsidy disbursements on behalf of both Federal and State government into the wallets of farmers.

Farmers utilized $55.0million of the deposits and agro-dealers received $50.0million as matching funds from farmers. The sum of $192.0million of the unused funds, which potentially might have been lost to corruption, was returned to government coffers after the first season of operation. Essentially, the e-wallet has turned out to be a most successful technology-enabled policy reform for fertilizer and farm inputs procurement and distribution in Nigeria. Despite the gains which have been achieved, there is still much to do, to expand the access of farmers to better agricultural technologies, for sustainable increases in agricultural productivity. For this to happen requires an efficient and farmer-responsive extension system (Agriculture in Nigeria, 2013).

The African Union, AU, has promised to adopt Nigeria's e-wallet agriculture strategy with a view to ending fertilizer corruption on the continent as African leaders re-focus on deriving highest possible outputs from the sector as a growth-driver in the years ahead: "AU has now said it will adopt the e-wallet to stop fertilizer corruption in Africa", following high level meetings of Heads of Governments and Minister of Agriculture at the World Economic Forum (WEF).

2.8.1Report Highlight;

The GESS of the ATA seeks to grow and develop agriculture as a business and thereby create jobs, assure food security, promote private sector investments for wealth creation and maximize agriculture productivity's contribution to the country's economic growth.

According to the Minister of Agriculture and Rural Development Dr. Adesina,stated that with the e-wallet system, the ministry is eliminating many of the obstacles that currently limit farm yields and output. The e-wallet system has had a long gestation, though with impart from a pilot project that was rolled out in Taraba State to try and improve fertilizer usage rates amongst

farmers. The new system has taken an innovative approach, allowing seed and fertilizer companies to sell and market directly to farmers, bypassing the government and the middlemen, which in turn has helped to encourage a significant increase in fertilizer usage (Agriculture in Nigeria, 2013).

The Nigerian farmers have generally supported the GESS by admitting that it has been consistently effective in delivering subsidized inputs than previous programmes of a similar nature. However, the author based his argument on the appraisal of the programme that it has not received many accolades from some quarters, who believed that the communication component of the GESS is not participatory enough to allow farmers have greater control of the information flow.

Onajite (2013), agreed that much still remains to be done for the GESS strategy to spread and become sustainable; awareness must be raised through the show-casing of the advantages of fertilizers to farmers and facilitating a shift from subsistence to commercial farming. However, to further verify these controversies and the mixed reactions about the impact as an approach as well to ascertain how realistic the e-wallet as an approach is can be better understood through the investigation of the effectiveness of this approach as a tool or communication strategy actually being deployed by the Federal Ministry Agriculture and Rural Development in the implementation of the GESS through e-wallet for the ATA to achieve premium agricultural productivity for food sustainability and development.

2.9 A Snippet of Agricultural Communication in Nigeria

Although "agriculture remains the key component of Nigeria's economy the sector has however, significantly underperformed its potential" (FGN, 2008). According to Arokoyo (2003), the manifestationsof this are representatives in the very high food prices nationwide,

food insecurity both at the household and national level and malnutrition especially in children. It is unfortunate that Nigeria's National Agricultural Research and Extension System (NARES), the largest sub-Saharan Africa, has not been able to engineer a sustainable agricultural development that would ensure national cum household food security, improved rural livelihoods and indeed make Nigeria's agriculture competitive in the world agricultural market today.

A growing market for agricultural journalists and broadcasters led to the establishment of agricultural journalism and agricultural communication academic disciplines. The academic field originated from communication courses that taught communication experts in the agricultural sciences how to communicate. There are wide variety of agricultural newspapers and magazines TV, radio and ICT based throughout the world. Radio programmes are frequently used for agricultural communication and Farm Radio International is a leading organization in providing programming to developing countries on agriculture.

However, it has evolved into its own professional field. Agricultural communication also addresses all subject areas related to the complex enterprises of food, feed, fibre, renewable energy, natural resource management, rural development and others, locally to globally (Doerfert, 2011). Furthermore, it spans all participants, from scientists to consumers - and all stages of those enterprises, from agricultural research and production to processing, marketing, consumption, nutrition and health. Agricultural communication must be understood as a strategic communication that demands special training away from just extension (which is more or less adult education based system of communication to rural farmers). The understanding of agricultural communication beyond the regime of extension will help modern extension workers appreciate the blend of communication approaches available especially with the advent of the New Media for responsive development communication.

2.2.1 New Media

What is new about new media came from the particular ways in which they refashion older media and the ways in which older media fashion themselves to answer the challenges of new media (Bolter, 2000). Lievrouw and Livingstone (2006:64) posit that 'newness' is a relative notion with regard to both time and space. What is new today is older tomorrow, and what is new in one culture context maybe unknown or outmoded in another context, newness to a large degree, is a socially constructed phenomenon and often deviate substantially from the designers' original inter.

The need for information is real and it plays a decisive role. Information about a newly discovered knowledge can change productivity in a specialty like agriculture. New communication technologies play crucial role in the process of development. The impact of modern communication technologies which determines the kind of information people have access to cannot be discounted. Though the powerful agents of change in the political economic system may continue to control these technologies and use them to promote planned and directed socio-economic change (Nair and White, 1993).

Also, the advancement in interactive technologies, such as satellite communication, video stream and computers, as explained by Nair and White, (1993) can benefit local-level communication and be participatory in nature. It is through interactive technology forms that participation and equitability which is the thrust of development communication and agricultural communication can be achieved.

In essence, this is what the new media forms of communication can avail people. The new media is a modern communication form which puts the development process in the hand of the people.

Despite this, it still retains some elements of the traditional models despite its capability to facilitate dialogic interaction between the specialists and the people. New media communication holds the possibility of development along lines of cultural uniqueness and ethnic identities.

As a matter of fact, globally nearly one in four people connect to social networks on a monthly basis. These numbers continue to climb every quarter as populations in developing nations increasingly come online. For agricultural development practitioners, social media tools can expand the reach of one's community, strengthen partner relationships, support programmatic initiatives, and provide a vital means to increase the visibility of your public profile and engagement. Social media in the context of agricultural communication also refers to internet-based tools for sharing and discussing information among people in the sector. Farmers can share what is important to them and what changes they wish to see in the agriculture industry, (www.csi-india.org).

According to Krunal and Dhaval (2013), social media will help strengthen agriculture's messages because it captures widespread users. As farmers more and more are becoming technology savvy and getting involved with social media to connect with consumers on a personal level. Emphatically, agriculture is a key sector in most developing countries, as the general opinion is that a happy nation is one that is able to feed their citizens.

However, there is the need to make researches available and accessible to people, if agricultural research is to achieve real impact on productivity and livelihoods. Social media will be useful tools in that regard because they surpass geographical limitations and are rapidly becoming the new shining of online society *as cited in* (Krunal and Dhaval, 2013). Therefore, it is not out of order to say that today, agricultural communication has formed the critical part of development communication as a course of study even in Ahmadu Bello University.

This new dimension to communication to agriculture will surely influence how, the training modules for the extension agents to be involved in the campaign for the use of the e-wallet would change in Nigeria.

2.2.2 Development Communication and Agricultural Communication

The term "Development Communication" was first coined in 1972 by Professor Nora C. Quebral, who defines the field as "the art and science of human communication linked to a society's planned transformation from a state of poverty to one of dynamic socio-economic growth that makes for greater equity and the larger unfolding of individual potential."

Development Communication is recognizing the power of communication as a catalyst for social development. It is also the utilization of existent communication tools and applicable theories for result-driven strategies for the advancement of society.Development Communication can also be defined as purposive communication intended for a specific target audience that allows for the translation of information into action resulting in a higher quality of life.

It is greatly linked with the concepts of Sustainable Development (which can be defined as the improvement of a community using information and technology and the community's ability to maintain the created ideal state without compromising its environment and resources). It also relies greatly on Community and People Participation, which is the voluntary involvement of a group of people in a development activity with full knowledge of its purpose that will allow them to grow individually and as a community (QuebralNora, 2001).Also, Development Communication is the systematic utilization of communication channels and techniques to increase people's participation in development and to inform, motivate, and train rural populations mainly at the grassroots.

Development Communication has been alternatively defined as a type of marketing and public opinion research that is used specifically to develop effective communication or as the use of communication to promote social development.This describes an approach to communication which provides communities with information they can use in bettering their lives, which aims at making public programmes and policies real, meaningful and sustainable(Manyozo, L, 2006).

As agriculture is a development subset, the concept of agricultural communication is also seated in development communication. Development communication as a field of study is an attempt to make the subject of development owned by the people in participatory way. With this, cultural identities, values, religious and ethnic identities are pronounced. It thus means that what works in one community may not work in another community.

Nair and white (1993) point out that the future agenda for development communicators must deal with the process of people's participation in message development in which related processes such as communication competency, decision-making, information generation and flow and resource allocation are all addressed. This applies to the various thematic areas of development workers; health, agriculture, governance, human rights and gender amongst others. Development communication is not just letters, report, telephone conversation, radio, television or mobile phoning alone. It is all embracing. It is the action of the people that is, talking and feeling, listening, seeing and reacting to one another's experiences and their environment as it affects their likes (Yahaya, 2008).

Earlier, Quebral (1973) had defined development communication as the art and science of human communication applied to the speedy transformation of a country from poverty to a dynamic state of economic growth that makes possible greater economic and social equality and

the larger fulfillment of the human potential. The relationship between the 'brighter' of development and the 'seeker' of development is at best skewed.

Nair and White, (1993) also explained that the top-down strategy of development and the source-Message-Channel-Receiver-Effects (SMRCE) model was used and it approached people condescendingly while claiming dominance in the communication transaction. Development Communication offers a process into all communication as captured by Yahaya (2008), as special communication planned and well defined for development;in agreement to that,it is purposely designed to achieve positive changes in income, equal opportunities, improved living standards, dignity, justice and liberty. Additionally, development communication process is an essential part of the agricultural extension education process to elicit behaviour change in the life of farmers (Oladeji, 2008:123).

Agricultural communication is being extended beyond the role of agricultural extensionists because of the convergence of three important technological advances; computer technology, audio and video electronics, and laser technologies-interactive video which is heralding sweeping changes in agricultural instructional methods. Also, development communication is an action-orientated endeavor in human survival mechanism, social responsibility and development (Yahaya, 2008).

Extension services in agriculture are exact instances even though it was initially a non-formal education for the farming community. At conception, this relationship with farmers was primarily paternalistic. It is in the extension component of agricultural development that agricultural communication is foregrounded. Maunder (1973) perceives extension as a service or system that assists farm people through educational procedures, in improving farming methods

and techniques, increasing production efficiency and income, bettering their level of living and lifting social and educational standard.

National Agricultural Extension and Research Liaison Services (NAERLS) is one of the 18 National Agricultural Research institutes (NARIs) under the Federal Ministry of Agriculture and Rural Development. The institute is responsible for development, collation, evaluation and dissemination of proven agricultural innovations and to research on extension methodologies and policy. The extension and research activities of the institute take into account the long-term ecological, economic and social consequences of changes in rural life and linkages. These activities are conducted in partnership with the international collaborators.

2.2.3Historical Origin of NAERLS

The Agricultural Extension and Research Liaison Services (AERLS) organizations such as the ones at Ahmadu Bello University, Samaru-Zaria and ObafemiAwolowo University, Ife were established mainly to serve as a link between research and farmers by putting research results from the Research Institutes and Universities' Faculties of Agriculture into readable forms which are appropriate for teaching farmers. The AERLS at the Ahmadu Bello University, Samaru-Zaria was given national mandate in 1987, thus the current nomenclature of National Agricultural Extension and Research Liaison Services (NAERLS) whose activities were hitherto limited to the Northern States, are now being implanted all over the country. Extension Services Units have also been established in every Agricultural Research Institute in the country.

These Extension Services Units serve as direct links with research in their Institutes and with the Agricultural Development Boards and farmers in their mandate zones, while the NAERLS coordinates their activities.

NAERLS contributes to national development through technology transfer and adoption process research, extension publications, electronic media packages and trainings. Its expertise spans the social sciences, agricultural engineering, animal science, food technology, veterinary sciences, agronomy, soil science and fisheries. The Institute adopts the multidisciplinary approach to problem solving. NAERLS has six(6) programme areas namely: Crop and Forestry, Livestock and Fisheries, Agricultural Engineering and Irrigation, Agricultural Extension and Economics, Food Technology and Rural Home Economics, and Agricultural Communication Research. The Institute has six(6) Zonal Offices, one in each of the six (6) agro-ecological zones of the country – Umudike (South-East), Ibadan (South-West), Elele (South-South), Maiduguri (North-East), Badeggi (North-Central), Zaria (North-West).

NAERLS has more than four hundred (400) employees, with over seventy (70) Extension Specialists, and with the functional electronic platform of the NAERLS the institute truly has national authority in agricultural extension and research.

2.2.4 NAERLS in ATA

As the only government extension agent established in 1963, the National Agricultural Extension and Research Liaison Services (NAERLS), there was no way the Agricultural Transformation Agenda (ATA) development plans could be implemented without the service of this agency. Thus, at the inception of ATA in 2011, the Federal Ministry of Agriculture and Rural Development charged the institute with the responsibility of disseminating the government intention to all Nigerian farmers.

The institute therefore has embarked on massive production of radio jingles (since, this was the most common medium of communication in the rural Nigeria) for dissemination through

the Federal Radio Corporation of Nigeria (FRCN) stations. The institute has also produced more than ten (10) different bulletins on ATA selected crops and livestock.

Meanwhile, the institute has continued to participate in the weekly executive meeting at the Ministry through its representative, the Deputy Director, Dr. Dele Tologbonse. The weekly meeting with the minister and all State Directors of Federal Extension usually discusses the progress of the ATA especially the e-wallet of the GES scheme. It is on record that wherever there are complaints from farmers or any stakeholder on the implementation of the e-wallet, the minister generally sets up ad-hoc investigation team to address the issues raised therein(Naerlsqurterly,2013).

The institute has commenced another radio programme *Agricultural Transformation Forum* (weekly comment on ATA) with the intention of keeping the Nigerian farmers abreast of happenings on ATA. The agency was also part of the institutional collaboration that trained field officers on how to register the farmers in 2012/13. Since the inception of the GES scheme, NAERLS' annual agricultural performance survey has created a column for the assessment and reporting of the platform. It has equally produced state reports from this survey for executive and stakeholders use.

For the construction and equipping of the Farmers' Help Centers Headquarters at NAERLS and the hubs at the Zonal Coordinating Research Institutes has been collaborating with for the actualization of this ICT project. And,proposed integration with the likes of FADAMA III and other for national coverage. One of the Help Centers to be used for trial in the North West has been completed in the premises of the Institute for AgricultureSamaru Zaria,Kaduna State.

In the views of agricultural communication practitioners, social media tools can expand the reach of one's community, strengthen partner relationships, support programmatic initiatives,

and provide a vital means to increase the visibility of the public profile and engagement. Based on the above significance,Nigeria needs to adopt a communication strategy that will bring major transformation of the agricultural sector for sustainable productivity and national development, while the change has to be across the entire value chain from field-to mill-to table.

And additionally, the new e-wallet system has taken an innovative approach by allowing seed and fertilizer companies to sell and market directly to farmers by by-passing the middlemen; there is no doubt that the government will need to put in place a responsive monitoring system for the sustainability of such scheme because some unscrupulous middlemen will always want to find their ways back into the new system.

Though, today farmers are sharing their stories through social media, and NAERLS believes that it is a starting point that will forever change the agriculture industry. The internet technology is not just the tool to help agriculturalists inform the farmers in order to continue utilizing advanced technologies in the field; agriculturalists will first need to understand the power of social media and how it could be used to better adoption level and options for Nigerian farmers. Since agriculture has been judged to have failed to keep pace with the rapid growing population of Nigeria, the effective use of the Internet and the telecommunication technologies (mobile phone) can turn around the small farming households of the Nigerian agriculture for increased participation in farming and high productivity.

CHAPTER THREE

3.0 THEORETICAL FRAMEWORKS

A good theory helps predict what will happen in future by giving practical insight into how the phenomenon being studied works (Kaye 2000). This study was underpinned by Rogers' Diffusion of Innovation Theory and Participatory Communication Theories to support the approach.

3.1 Diffusion of Innovation Theory

Diffusion of Innovation Theory has its root in agriculture following a 20 year research on Iowa farmers.Diffusion of Innovations Theory describes how new ideas or practices are introduced and adopted in a social system, with a special focus on the communication relations and information flow that promotes adoption (Rogers, 1995). Diffusion is a specialization of communication research that combines theories of personal influence and persuasion with the analytical techniques and

theories of social structural or network analysis in sociology (Blau, 1982; Wellman and Berkowitz, 1988). Medlin (2001) and Parisot (1995) submit that Rogers' diffusion of innovations theory is the most appropriate for investigating the adoption of technology in an educational environment.

Though diffusion processes are studied in many social contexts and disciplines, the diffusion of new ICTs (like the mobile phone) has been studied most extensively in sociology, communication research and economics and this study - a development communication research.

Rogers (2003) defines technology as a design for instrument action that reduces the uncertainty in the cause-effect relationships involved in achieving a desired outcome. This has two components; the hardware which is the tool that embodies the technology and the software which is the applications base for the tool.

The Internet and the New Media tools like the iPad, laptop, and mobile phones are wares that accept applications for all communication technologies that can be engaged for development in agriculture. But the question of their effectiveness, adequacy and sustainability especially (e-wallet) in GESS of the ATA are some of the things this study will factor into its findings.

As a matter of fact, in communicating agricultural innovations many technologists believe that advantageous innovations will sell themselves, that the obvious benefits of a new idea will be widely realized by potential adopters, and that the innovation will therefore diffuse rapidly. However, most innovations diffuse at a disappointingly slow rate (Rogers 1995).

An innovation, according to Rogers is "an idea, practice or object that is perceived as new by an individual or other unit of adoption"; while diffusion is seen as "the process by which an innovation is communicated through certain channels over time among members of a social system". A technological innovation usually has two components: a hardware aspect (the tool, product) and a software aspect (how to use the hardware). For good reasons, studies of diffusion of innovations

have often addressed individual innovations while in practice, innovations often come in packages – clusters – and are interrelated and interdependent.

The characteristics of innovations explain their rate of adoption. Five such characteristics of importance are discerned: 1) The relative advantage reflects how the innovation is subjectively perceived superior to the previous idea; 2) Compatibility reflects how the innovation is perceived "consistent with the existing values, past experiences, and needs of potential adopters"; 3) Complexity reflects the perceived difficulty to understand and use the innovation; 4) Trialability is "the degree to which an innovation may be experimented with on a limited basis"; and 5) Observability reflects how the results of an innovation are visible to others.

Again an innovation can further be changed or modified (re-invented) by a user, and through communication channels can as well, provides information to a social system with the purpose of influencing the knowledge and assessment of the innovation. The mass media are often more effective in creating awareness of an innovation, whereas personal contacts are more effective in forming an opinion about a new idea. Such interpersonal communication is possible with the mobile telephoning (though with the absence of face-to-face) if conveyors of information are optimally similar to the receiver in certain attributes.

In this case, the farmer and the extension agents who share the optimal goal of improving agricultural productivity. Information is sought at the various stages of the conversation to reduce uncertainty about the usefulness of an innovation. The decision stages result in adoption or rejection of the idea.

Also, innovativeness is an expression for how early an individual or other unit of adoption is adopting a new idea compared to other members of the social system. Adopters are divided into five categories, each with its own characteristics: 1) innovators, 2) early adopters, 3) early majority, 4)

late majority, and 5) laggards. Finally, rate of adoption is the relative speed with which an innovation is adopted by members of a social system. The social system with its interrelated units shares an interest in finding solutions to a common goal, i.e. to improve their agricultural system to enhance livelihoods. Such a system has a social and communication strategy that facilitates the diffusion of innovations in the system. Norms, being part of the social system, are the established behaviour patterns for system members. Often, opinion leaders play a crucial role in influencing system members. Change agents (agriculturists) may have the explicit role to influence members in a certain direction. Both opinion leaders and change agents are central actors in diffusion of innovations.

In addition, technologies may show improved performance over time, or become cheaper due to economies of scale, and therefore gradually become more attractive to farmers, ceteris paribus. Diffusion of technologies is more complex than the spread of influenza. Potential adopters are uncertain about what an innovation may offer. Over time information from different sources and from the farmer's own experience reduces this uncertainty. A better base is established for adoption/rejection and intensity of use decisions.

Farmers gradually learnt how to make better use of the innovation. Risk has been included in many models. Production, incomes and costs are not deterministically known. Farmers have their subjective perception of risks involved, and consider not just the expected mean outcome but also the distribution of risks around the mean. The subjective perception of risk may well deviate from the objective reality.

It is often assumed that farmers are risk averse with the extent depending on several characteristics. To the farmer, the riskiness of an innovation compared to the old idea then matters; also whether the risk varies together with risks in other parts of the system or moves in the opposite

direction. Some models suggest safety-first decision behaviour, implying that farmers have to be assured of a minimum result, and not base their decision on expected results.

3.2 Participatory Communication Theories

Participatory communication theory is an approach capable of facilitating people's involvement in decision-making about issues impacting their lives - a process capable of addressing specific needs and priorities relevant to people and at the same time assisting in their empowerment. In fact, participatory communication is “a necessary component, consistent with a democratic vision of international development, needed to increase projects sustainability and ensure genuine ownership by the so-called 'beneficiaries' ”.

Promoting the sustainable and systematic use of communication approach in the development process helps to ensure people's participation at all levels, as part of an effort to identify and implement appropriate technologies and policies for the increase in productivity.

Participatory communication is a term that denotes the theory and practices of communication used to involve people in the decision-making of the development process. It intends to return to the roots of its meaning, which, similarly to the term communicate, originate from the Latin word communis, i.e. common (Mody, 1991). Therefore, the purpose of communication should be to make something common, or to share...meanings, perceptions, worldviews or knowledge.

In this context, sharing implies an equitable division of what is being shared, which is why communication should almost be naturally associated with a balanced, two-way-flow of information." The participatory communication model sees people as the controlling actors or participants for development. People will have self-appreciation instead of self-depreciation; the approach sees people as nucleus of development. Development means lifting up the spirits of a local

community to take pride in its own culture, intellect and environment. Development communication research embraced participation virtually as a panacea for development (Servaes 1992).

For the purpose of this study, as discuss earlier, it is also imperative to outline the prospects in the theory(participatory communication approach) that promote its adoption for the purpose of this study on implementation of development projects such as the e-wallet of the GESS under the ATA which development communication is advocating for to bring about sustainable development.

Participatory theories considered necessary a redefinition of Development Communication. One set of definitions stated that it meant the systematic utilization of communication channels and techniques to increase people's participation in development and to inform, motivate, and train rural populations mainly at the grassroots.

For others, development communication needed to be human-centered rather than media-centered through mobilization, and the basic aim is to involve the people under study co-operatively in the planning and research process, with the planner or researcher as a facilitator and participant, this is in line with the adoption of the e-wallet.

Emphatically, communication means a process of creating and stimulating understanding as the basis for development rather than information transmission (Agunga 1997). Communication is the articulation of social relations among people. People should not be forced to adopt new practices no matter how beneficial they seem in the eyes of agencies and governments. Instead, people needed to be encouraged to participate rather than adopt new practices based on information.

The above understanding of communication was central to the ideas developed by Brazilian educator, Paulo Freire, whose writings and experiences became an influential strand in participatory communication. Freire's work in northeastern Brazil in the 1960s and early 1970s challenged dominant conceptions of development communication, particularly as applied to literacy training. He

argued that development programs had failed to educate small farmers because they were interested in persuading them about the benefits of adopting certain innovations. Development programs tried to domesticate foreign concepts, to feed information, to force local populations to accept Western ideas and practices without asking how such practices fit existing cultures. The underlying premise of such programs was an authoritarian conception of communication that stood against the essence of communication understood as community interaction and education.

Freire, (1973)purposed the concept of liberating education that conceived communication as dialogue and participation. The goal of communication should be conscientization, which Freire defined as free dialogue that prioritized cultural identity, trust and commitment. His approach has been called "dialogical pedagogy" which defined equity in distribution and active grassroots participation as central principles. Similarly, communication should provide a sense of ownership to participants through sharing and reconstructing experiences. Education is not transmission of information from those "who have it" to those "who lack it," from the powerful to the powerless, but the creative discovery of the world.

He diagnosed the problems in the Third World as problems of communication, not information as persuasion theories proposed. Solutions, then, needed to have an understanding of communication that was not limited to the application of Western ideas. Freire also challenged the value judgment in early development theories that viewed agricultural and development practices in the Third World as backwards and obstacles to modernization.

Freire's model and participatory models in general proposed a human-centered approach that valued the importance of interpersonal channels of communication in decision-making processes at the community level. Studies in a variety of Third World rural settings found that marginal and illiterate groups preferred to communicate face-to-face rather than through mass media or other one-

way sources of communication (Okunna 1995). Thus, the recommendation was that development workers should rely more on interpersonal methods of communication rather than national media and technologies, and that they should act as facilitators of dialogue.Because media and technologies were perceived as foreign to local communities [farming community], they should be used to supplement instead of dominate interpersonal methods.

The notion of “group media” drew from Freire to call the media that are means for small groups to develop a critical attitude towards the reality of self, the group, community and society through participation in-group interaction. Thus, the author submit that group media will helped marginal groups to speak to one another, to articulate their thoughts and feelings in the process of the community meeting for self-desire and evict inequality.

As a matter of emphasis, community-based forms of communication such as songs, theater, radio, video, and other activities that required group intervention needed to be promoted. More than mechanisms to disseminate information, they could provide opportunities to identify common problems and solution, to reflect upon community issues, and mobilize resources. Community members, rather than “professionals”, should be in charge of the decision and production processes. This is precisely what “small” media offer: an opportunity for media access in countries where the mass media are usually controlled by governments and urban elites.

The value of participatory media is not in being instruments of transmission but of communication, that is, for exchanging views and involving members. Community media dealt with various subjects: agricultural productivity, gender,health,literacy, safety, land ownership, and religion.

In Africa, popular theatre has been successfully used to increase women's participation and ability to deal with primary care problems. Through songs and storytelling, women were able to

raise awareness and attention to issues and address problems, something that had not been achieved through "modern" media such as television and newspapers (Mlama 1991). There have been a number of paradigmatic examples. In Latin America, miners' and peasants' radio in Bolivia, grassroots video in peasant and indigenous movements in Brazil, tape recorders in Guatemala, small-scale multimedia in Peru and other cases of low-powered media based in unions and churches were offered as concrete examples of participatory communication development (Beltrán 1993).

Community participation through popular theatre motivated rural communities to become involved in health care. Participation was credited for the reduction of preventable diseases such as cholera and severe diarrhea after communities constructed infrastructure that helped to improve sanitary conditions situation (Kalipeni and Kamlongera 1996).

In stressing the relevance of "other" media and forms of communication, participatory theories lifted development communication out of the "large media" and "stimulus-response" straitjacket and opened new ways of understanding interventions. Participatory communication identified encouraging participation, stimulating critical thinking, and stressing process, rather than specific outcomes associated with modernization and progress, as the main tasks of development communication (Altafin 1991). Participation needed to be present in all stages of development projects. Communities should be encouraged to participate in decision-making, implementation, and evaluation of projects. This would give a sense of involvement in their lives and communities, and provide them with a sense of ownership and skills that they can use beyond the timetable of development projects (Kavinya, Alam&Decock 1994).

Community empowerment has become one of the main contributions of participatory theories to development communication. Empowerment is possible only if community members critically reflect on their experiences and understand the reasons for failure and success of

interventions (Bradford & Gwynne 1995, Purdey, Adhikari, Robinson & Cox 1994). Community participation is a vital ingredient in successful development projects for adoption; this is dueto the acknowledged of failures of an entire generation of "top down" projects.

By so doing; this research employed these theories to investigate the effectiveness and sustainability of the deployment of the electronic-wallet in the study area [farming community].

However, there is no magic formula that will guarantee that a firm's new invention (i.e. the e-wallet) will become a commercially viable (sustainable) innovation. As Rosenberg (1982) argues that being the first to produce a product does not guarantee that you will be the winner and inventions that have lain unused for years may suddenly be found to be profitable innovations as circumstances evolve.

This observation logically may mean that a successful development policy today may become obsolete in another regime, thus, the necessity for making development projects or practices peoples oriented through grassroots participation. Rosenberg (1982) echoes this sentiment by describing diffusion as a cumulative and interactive process between users and suppliers of a new innovation.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.0 Introduction

This chapter captures the presentation and analysis of data collected through four research instruments: the Questionnaire, the Key Informant Interview (KII), the Focus Group Discussions and the Library and Internet sources. This study adopted both the Qualitative and the Quantitative research approaches for data collection and analysis. In the study, 80 farmers were involved as respondents.

The researcher administered 100 pieces of questionnaire. Eighty copies of questionnaire were administered tofarmers in two selected adopted villages managed by NAERLS in Kaduna

State and Niger State of Nigeria. In Niger State, 40 copies ofquestionnaire were administered to farmers inNwogi Adopted Village in Katcha Local Government Area.Similarly, in Kaduna State, 40 copies ofquestionnaire were also administered to farmers from NasarawanBuhari Adopted Village in Giwa Local Government Area. The two villages were selected in order to have variety of responses for in-depth analysis. The two selected villages have also been part of the adopted villages where NAERLS has been facilitating farmers' registration under the GESS platform in the last three years.

Furthermore, 16 randomly selected farmers participated in Focus Group Discussions. There were two Focus Group Discussions conducted in this study- one each from the selected adopted villages. This means that 8 farmers from NasarawanBuhari village in Kaduna State and another 8 farmers from Nwogi village in Niger State participated separately in Focus Group Discussions in this study. Meanwhile, another 20 copies of questionnaire were administered to NAERLS Staff who officially perform their duties in the adopted village as facilitators.

These Staff have facilitated the registration of farmers for the GESS under Agricultural Transformation Agenda (ATA). The twenty NAERLS Staff were selected in order to find out how NAERLS has been involved in the implementation of the GESS and the experiences of the facilitators.

This study also used the Key Informant Interview with the Regional Managers of the ATA/GESS platforms in the North West and the North Central agro-ecology zones ofNigeria who cover both the Kaduna State and the Niger State respectively. Only the Regional Manager from Niger State was available and participated in the Key Informant Interview in this study. In total, 101 respondents participated in this study i.e. 80 and 20 NAERLS staff and 1 Key Informant.

The data collected are interpreted using the simple descriptive statistical tools in the form of tables and pie charts for graphical explanation. The analysis took into consideration some relationships between the variables for comparison while 'percentage' is used to explain the degree of involvement or understanding of the most questions in the questionnaire and the interview checklists.The analysis in this study is divided into 5 sections A, B, C, D, and E. The first section (A) represents the demographic characteristics of the respondents while sections (B, C and D) focus on the objectives of the study as highlighted below:

a) To critically investigate the existing communication approaches for the implementation of the Growth Enhancement Support Scheme (GESS) in the selected adopted villages.
b) To investigate the deployment of e-wallet and how it has influenced the realization of Agricultural Transformation Agenda.
c) To determine the level of usability and acceptability of the e-wallet among the farmers in the selected NAERLS adopted villages.
d) To articulate a way forward on how e-wallet communication approach can achieve a higher impact on the Growth Enhancement Support Scheme for the effective and sustainable realization of Agricultural Transformation Agenda in Nigeria.

Section E captures the discussion of presentation and analysis of data collected through the administration of questionnaire, focus group discussion and key informant interviews on the effectiveness of the use of e-wallet for inputs supply of the GESS platform under the ATA in NAERLS selected adopted villages.

4.1 SECTION A: Demographic Characteristics of the Respondents

Table 1: Sex Distribution of Farmers from NassarawanBuhari&Nwogi communities

	Frequency	Percentage	Cumulative

	Nassarawa Buhari	Nwogi Community	Total Respondents	of Sex Distribution	Percentage
Male	40	36	76	90%	90%
Female	-	4	04	10%	10%
Total	40	40	80	100%	100%

Source: Field Survey, NassarawanBuhari and Nwogi Community, 2014.

The Table 1 above captures the sex distribution of the respondents from the two communities where questionnaire and interviews were conducted in this study. From the above, it shows in NassarawanBuhari, 40 men participated in the Focus Group Discussion.

In Nwogi community of Katcha Local Government, Niger State, 36 male farmers and 4 female farmers participated in the Focus Group Discussion. Again, the low percentage of female farmers was not due to any traditional or religious prohibition. The 4 women that actually participated were selected by the four women groups operating in the communities. They were their leaders and were selected by the women to represent them in the discussions. Therefore, in this study, there were more male farmers than the women farmers; however both the men and the women participate in agricultural activities including the ones operating on the GESS platform. In this study, 90% of the farmers (from the two communities) are men which may translate to the submission that male farmers practically dominate farming activities (under GESS) in these communities.

This result equally corroborates the findings of Olowologbon et.al. (2013) which put the number of the male farmers at 69 and the female farmers at 20 out of the 89 farmers who participated in a research to find out the effect of agro-chemical on the health of farmers in Oyo State.Meanwhile, it could be deduced from the table that both the men and the women farmers

registered with the GESS platform and also participated in the use of electronic wallet to receive agricultural inputs supply for their farming activities under the adopted villages' of NAERLS in these two communities. This result, therefore, corroborates the findings of Akinboro and Arokoyo, (2014) who said that the GESS is a special scheme which seeks to increase farmers' (irrespective of gender) access to subsidized farm inputs such as fertilizers and improve seeds through a well-designed and monitored public and private sector partnership. A total of 80 farmers participated in this study.

Likewise, in the past, some specific programmes on women alsoreported that marginalization of women farmers is part of a set of factors that undermine agricultural productivity (Edache, 2006). Thus, where development issues relating to gender are in focus, the men will logically make the greater number than women; but not marginalizing them. 'Marginalized' is not used here to mean maltreated but to capture a group or groups that have not been critically considered or included in development issues in rural Nigeria due to some traditions or religious practices.

The significance of this to this study is that there are divergent views and numerous reports on the percentage of male farmers and female farmers in Nigeria, in line with this findings men farmers and women farmers were aware of the GESS platform and participated in the use of electronic wallet to receive agricultural inputs supply for their farming activities under the adopted villages' of NAERLS.

4.1.1 SECTION B:Existing Communication Approaches Deployed by NAERLS and the Effectiveness

Table 2: NAERLS Staff's responses to the issue of the existing Communication Approaches Used for Interaction in the adopted villages

Communication Approaches	Appropriateness of Communication Approaches in Terms of (Time, Cost & Level of Interactive)					
	Time Management		**Cost Effectiveness**		**Interactive**	
	Agree	**Disagree**	**Agree**	**Disagree**	**Agree**	**Disagree**
(A) Is the Farmers Field Day communication approach appropriate for inputs supply	6	6	5	6	11	1
(B) Is the Meeting communication approach appropriate for inputs supply	3	9	6	6	12	Nil
(C)Is the Mass media (radio) communication approach appropriate for inputs supply	7	4	3	9	1	11

Source: Field Survey (NAERLS Staff Zaria, 2015.

The Table 2 above shows the number of NAERLS staff who responded to the question regarding the existing communication approaches deployed by NAERLS to reach out to farmers for farm inputs and fertilizers procurement and distributions before the introduction of the e-wallet approach. The responses of the staff are arranged in terms of 'time management', 'cost effective' and 'interactivity' of the communication approaches as presented below.

(A) The Farmers Field Day Approach: On Table 2 above, for the Farmers Field Day (FFD) approach, 6 staff agreed it was effective in terms of 'time management' while another6 disagreed. Five respondents agreed that the approach was cost effective but 6 people said it was not cost effective. Furthermore, 11 respondents stated that the FFD approach was effective for interaction while one person disagreed. The implication of this is that the FFD approach has challenges with cost effectiveness.

(B) Meeting Approach: On the table, 3 people agreed that the approach was effective but 9 respondents disagreed on time management. For cost effectiveness, 6 people agreed that the approach was cost effective while another 6 respondents said it was not cost effective. Meanwhile, 12 respondents agreed that the approach was effective for interaction. There was nobody that disagreed with the fact that the approach was effective for interaction. The implication of this is that the meeting approach was effective for interactive but has challenges on time management.

(C) Mass Media (radio) Approach: Seven people agreed that the radio was effective while 4 respondents disagreed in terms of time management. On cost effectiveness, 3 people agreed that the radio was cost effective while 9 disagreed citing the cost of production and air time charges as the factors. However, for interactivity, 1 person agreed that radio was effective especially when farmers are allowed to make contributions to agricultural programmes through telephone: but 11 people stated that radio was not effective for interactivity especially where the farmers would not see face-to-face with the producers regardless of the fact that they could participate in some 'phone-in' programmes. The implication of this is that the radio approach has challenges in terms of interactivity and it was also not cost effective in terms of programme production and air time charges from both public and private radio stations.

From the above therefore, it is understood that the existing communication approaches used by NAERLS to disseminate information and distribute farm inputs and fertilizers to farmers were facing various challenges raging from 'poor time management' to 'high cost of production/operation' and 'poor interactivity'. Hence, the imperative for the integration of other communication approachesto complement existing approaches in order to get agricultural

information to farmers while at the same time helping them to procure genuine farm inputs and fertilizers.

4.1.2 SECTION B:The Deployment of e-wallet and its effectiveness among Farmers in the Adopted Villages

Table 3: Farmers' Awareness of E-Wallet and GESS Platforms

	Number of Farmers		
	Nassarawan Buhari	**Nwogi Community**	**Total Respondents**
Number of Farmers	40	40	80
Source of Information	1. Radio -80% 2. Friends-15% 3. Others -5%	1. Radio -60% 2. Friends-30% Others -10%	70%

Source: Field Survey, NassarawanBuhari and Nwogi Communities, 2014.

Table 3 indicates the percentage of farmers who were aware of the e-wallet and the GESS provision by the Federal Government.

The table equally provides information on the sources of information on e-wallet. On this table, 70% of the farmers indicated they are aware of the e-wallet scheme as soon as it was launched. In NassarawanBuhari community, 80% of the farmers attributed their source of information on e-wallet to radio announcement and agricultural programmes usually anchored by NAERLS, 15% of them claimed their friends who had listened to such announcement that told them about the e-wallet. Another 5% stated that family members who are workers with the Federal Ministry of Agricultural actually told them about the development programme.

Meanwhile, in Nwogi community, 60% of the farmers said that the radio announcements were their source of information, 30% indicated that their friends who have registered or heard

about the programme told them while another 10% informed that extension agents from NAERLS and other government agents informed them of the e-wallet during farmers' field day and other farmers' meetings. The implication is that most of the farmers became aware of the e-wallet in the selected communities through radio announcements.

4.1.3 SECTION B:

Table 4: Effectiveness of the E-Wallet Registration Processes

	Number of Participants	Very effective	Effective	Fairly effective	Not effective
Frequency	80	74	0	6	0
Percentage	100%	92.5%	0%	7.5%	0%

Source: Field Survey, NassarawanBuhari and Nwogi Communities, 2014.

Table 4 above presents the information on the perception of the farmers about the effectiveness of the e-wallet registration processes as a communication strategy for the agricultural transformation programme. On the table, 92.5% of the farmers i.e. 74 respondents accepted that the exercise was very effective, this was against 7.5% i.e. 6 of the farmers who said the process was fairly effective in terms of availability, time and accuracy. Seventy-four of the farmers admitted that the exercise has helped them know some of the personal data they need to carry with them every day especially where electronic transactions are required.

They said the flexibility of the registration which allows them to start the process and continue it where there is an interruption due to other personal assignment or technical challenges is effective.

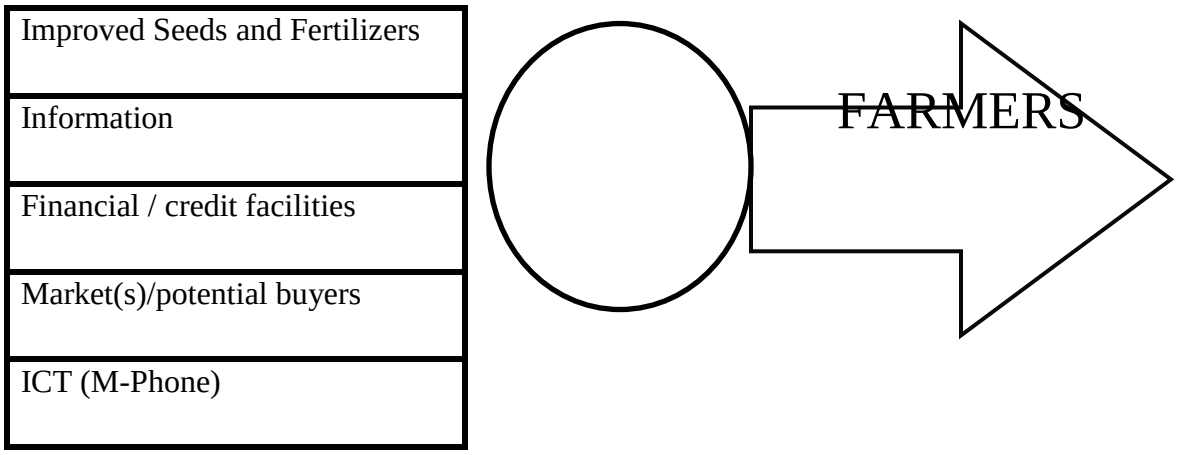
Elsewhere, in contrast to this, a study of online shoppers' registration showed that majority of the applicants/ customers abandoned their order due to frustration in filling the forms

(Graphic Arts Monthly, 1999). The digital wallet combats this problem by giving users the option to transfer their information securely and accurately. This simplified approach to completing transactions results in better usability and ultimately more utility for the farmers due to its smoothness.A farmer testifies in Nwogi village, "I no suffer before I do my registration …you can see my card". Another farmer affirmed in Nwogi village, "The registration process is simple and ok". From the table, it could be deduced that not all participants (farmers) have good knowledge of how the registration exercise worked.

This result can equally be justify by the findings of Akinboro and Arokoyo, (2014) thatGES scheme is a special scheme which seeks to increase farmers' access to subsidized farm inputs such as fertilizers and improved seeds through the private sector.Through the e-wallet, farmers receive and pay for GESS support from both the Federal and State governments and are linked to agro-dealers, suppliers, marketers, extension services and financial institutions including insurance.

In the same findings, they also put it that in less than 160 days after launch, 1,460,908 farmers had benefited from the GESS through the e-wallet, receiving 150,000MT of fertilizers and about 10,000MT of seeds supplied through agro-dealers, and covering seven million transactions (deposits and payments) on the system as represented in operational matrix below.

Figure 1: Showing how the e-wallet influences key factors of sustainable farming for improved agricultural practices.



Adapted from: Agricultural Progress Report (2012).

Note: The influence of five variables in the figure above are not usually analysed based on their order of appearance. The context and type of stakeholders and institutional arrangement involved in the deployment of these variables affects or influences which variable comes first or triggers the rotational nature of the influence of these variables on farmers' activity/productivity. For instance, in an environment where credit facility is presented as the highest challenge to farmers, the provision or availability of viable and responsive credit facility many trigger the search for viable information on genuine seed and fertilizer suppliers which may influence the use of ICT facilities or quest for their installation, while after the harvest the farmers may critically need information again on viable market and buyers which may again mean the farmers would employ ICT to get the actual link. This circle of rotation goes on and on to influence farmers' activities day in day out.

Based on the figure in (page 85), the e-wallet communication strategy has been able to bring about; First-Ever Database of farmers developed – 4.2 million farmers registered and now being updated annually; Cell-phone-based system developed and deployed to send subsidies via electronic vouchers (e-wallets) directly to farmers via their cell-phones; Ended four decades of corruption within 90 Days; Ended direct procurement and distribution of fertilizers and Seeds;

Private-sector seed and fertilizer companies now sell directly to farmers thus, strengthening the advocates of change; improve its impact on farmers' participation and increase agricultural productivity (Agricultural Progress Report 2012).

4.1.2 SECTION C: The Potential of the E-Wallet as an Agricultural Development Communication Strategy

Table 5: Farmers' Perception of E-Wallet as an Agricultural Development Strategy

	Number of Participants	Very Effective	Effective	Fairly Effective	Not Effective
Frequency	80	75	3	2	0
Percentage	100%	93.75%	3.75%	2.5%	0%

Source: Field Survey, NassarawanBuhari and Nwogi Communities, 2014.

Table 5 indicates the responses of the farmers about the potential of the e-wallet (an electronic media) as a rural development communication strategy. The farmers were asked to indicate their view of the electronic wallet as an effective tool or otherwise considering the high level of illiteracy and low level of telecommunication infrastructure in many rural areas in Nigeria including the communities selected for this study.

From the table, 93.75% of the farmers indicated that the electronic wallet has high potential to promote rural farming. This percentage also stated that the approach has been very effective in linking the farmers with fertilizers and farm inputs suppliers at no cost. This is because all the farmers need to do is to register and wait for further instructions to redeem their fertilizers and inputs through text messages from the operator of the GESS. In this way, majority of the farmers stated that the approach has helped in inputs supply and information flow i.e. information, delivery services to genuine farmers and the voucher mechanism for redemption through their mobile phones with little difficulties. Meanwhile, 3.75% agreed, it was 'effective', against a 2.5% i.e. 2 respondents who argued that the system was 'fairly effective': their

arguments was based on the fact that they experienced some challenges which include bad network connection and delay in alert messages even where it has been confirmed that the messages for redemption have been sent by the operators.

In a focus group discussion the farmer commended government efforts to use electronic media to improve agriculture. One of the farmers, MallamAuduJubrilin NassarawanBuhari, said "... the government has tried for us by providing these fertilizers and seed, we only pay 50 per cent and collect' through text instruction …truly, it's good!!! Meanwhile, the farmers complained about the location of the warehouse which they said are located a bit far from their communities

The Redemption Supervisor helps in verifying farmer's identity as well as a farmer's code in the text message received by the farmer, and then compares it with the name and code listed in the farmers register which the supervisor received from the cellulant. Each state Agricultural Development Project (ADP) supplied the helpline staff and about 3-5 helpline staffs are assigned to each of the Local Government Areas. The helpline staff and supervisors connect to the farmers on a daily basis to attend to their needs especially on the provision of basic information on the registration, alert and redemption processes. The farmers still want to have one-on-one physical contact with these agents. The farmers felt that thereare more information they could get from the helpline staff through interpersonal communication rather than the telephone contact.





Figure 3: Redeeming 50% of fertilizer and inputs price by farmers in Nwogi village





Figure 4 & 5: Shows some beneficiaries with the inputs after the payment of 50% discountNassarawanBuhari and Nwogi village

Source: Field Survey, NassarawanBuhari and Nwogi Communities, 2014.

4.1.3SECTION D: Relevance of the E-Wallet in achieving the Agricultural Transformation Agenda Objectives

Table 6: Farmers' Assessment of the E-wallet Relevance to ATA

	Number of Participants	Very useful	Useful	Fairly useful	Not useful
Frequency	80	68	12	0	0
Percentage	100%	85%	15%	0%	0%

Source: Field Survey, NassarawanBuhari and Nwogi Communities, 2014.

Table 6provides information about the relevance and influence of the e-wallet on ATA. The table indicates that 85% of the farmers i.e. 68 respondents accepted that it was 'very useful'

against the 15% i.e. 12 respondents who agreed it was useful, with these findings. It is obvious, that the e-wallet as adopted under ATA is a powerful communication strategy that has tremendously influenced the Agricultural Transformation Agenda. This finding is in accord with the official report on ATA which indicates that 53.5% of registered Nigerian farmers benefited from the subsidized improved maize seed while 51.0% benefited from subsidized improved rice seed and 87.5% got fertilizer at a subsidized rate through the e-wallet. The farmers also confirmed that e-wallet of the GESS has helped in other areas which include supply and retrieval of information i.e. the transfer of information, delivery services to genuine farmers. This flow of information has equally helped in fighting the corruption in the fertilizer procurement and distribution that abound in the agricultural sector.

During an interview with the Regional Manager (Agriculture) who is in charge of the e-wallet programme in North Central, in person of MallamSaliu Bello, it was revealed that the e-wallet has provided a rich data bank of Nigerian farmers which can be used to solve many agricultural challenges including land disputes.

According to him:

> The data would form a platform for planning purposes for the country in terms of farmers that exist in every ward, and the types of farming system they're engaged in; "if we have livestock farmers, we would be able to analyse the numbers of livestock farmers or irrigated lowland and upland farmers in Nigeria," this would form the bases of other planning activities for Nigeria. (Interview with Mallam Bello, Minna, Niger State, 2014).

Furthermore, Mallam Bello said that through the e-wallet, 10 million farmers have been registered as at 2013 while 6 million farmers have been reached in same year and by so doing the programme is impacting on about 30 million lives in Nigeria. However, he corroborated the farmers' submission that the GESS scheme is facing some challenges which include late delivery

of input and fertilizer long after the farmers have received the alert. Thus, it could be deduced that in spite of the above achievement of the e-wallet, the system has not created enough forums for full participation of farmers in the communication process which could increase farmers' confidence about the information they get on their mobile phones.

The study findings have been able to identify and establish the level of effectiveness of the 'e-wallet' communication approach adopted and, as well point outs the communication flaws/gaps, and other issues in the e-wallet service delivery as experienced by registered farmers under the GES scheme in the areas of registration, information delivery and inputs collection under ATA.

4.2 SECTION E: CRITIQUE OF FINDINGSAND DISCUSSIONS

From the foregoing, this study has explored the use of electronic wallet as a communication strategy for agricultural transformation. The study is concerned about the awareness level of farmers on the e-wallet, the acceptability among farmers, the effectiveness and relevance of the electronic wallet (e-wallet) to the Agricultural Transformation Agenda (ATA).

Before the advent of ATA in 2012, the Federal Government has always relied on the reports and documentation of activities between farmers, the state Agricultural Development Projects (ADPs) and research institutes like NAERLS to formulate most of its policy for agricultural development. Under these former arrangements, the ADPs and research institutions like NAERLS used farm visit where group discussions and meetings were held with farmers before, during and after planting season to discuss farming challenges and find solutions to them. For instance, discussion before the planting season usually included challenges on access to genuine seeds and fertilizers.

One of the solutions to such challenges was an institutional arrangement between farmers and genuine suppliers by ADPs or research agencies like NAERLS. Under this arrangement, farmers paid for the inputs and fertilizer through group contributions, they did not enjoy subsidy as in the case of the current GESS arrangement, but they enjoyed access to genuine seeds and fertilizers from genuine suppliers while they paid on installment basis. This system has its own challenges of which long protocol in the process of linking up with suppliers and lack of continuity of visiting system were common. To redress some of these challenges, one of the reasons was the introduction of e-wallet to reduce the list of protocol in the arrangement and also to help farmers to get genuine seeds and fertilizers (under subsidized prices from the government).

In this study, majority of the farmers are aware of the e-wallet scheme through radio jingles and announcement. This means the farmers have access to information about the scheme. Meanwhile few of them who did not register claimed they did so because they doubted if the scheme would bring them any benefit. Thus, some of them who registered did so after friends who have registered showed them the inputs; seeds and fertilizers received.

It therefore means that apart from the use of electronic media to mobilize and sensitize farmers to embrace government development programmes, it is important to use evidence-based communication packages where beneficiaries could convince farmer of the authenticity of government development programme like this. Meanwhile, some farmers indicated that the e-wallet which partly operates through the mobile phone have been effective in terms of the simple interactive process which has enabled even the illiterate farmers to participate. The study found out that apart from the quick and simple registration process, farmers usually do not have challenges accessing their phones to read alert.

This study has also discovered that Information Communication Technology (ICT) could enhance agricultural development by way of data generation and analysis which could be used to design or develop sustainable agricultural practices.

In this study, the social characteristics of registered farmers will generate useful information which will later be used by government to develop other development programmes. Thus, the e-wallet has great influence on the successful current and future implementation of ATA in Nigeria. Wireless technology saves time, increases accuracy, improves collaboration and generally enhances overall efficiency.

However, it was discovered that the e-wallet scheme is still much operating on a one way communication system where the farmers only read alert and proceed to carry out the instructions therein. The farmers only have the opportunity to ask questions when they are at the redemption center or during occasional meeting with extension agents or officials from the ministry of agriculture. Even in these forums there was usually no enough time to engage the officials in thorough dialogue. Thus, the farmers mostly take directives from a programmed system generated by the operators of the e-wallet scheme.

The farmers want more participation where they can ask questions and send their opinions and experiences through their mobile phones to the operators of the scheme. Also, the number of shortcomings and challenges observed are in line with the statement above; the communication approach for the e-wallet of the GESS is to ensure that information is broadly and effectively shared with farmers to enable more beneficiaries participate in the scheme.

In a Focus Group Discussion, it was revealed by the farmers that the redemption process usually began late while inputs did not arrive in time for the planting season. But they applauded

the short time spent to collect inputs at the redemption center even though they said the centers are far away from their villages. According to HajiaHajara Ahmed, in Nwogi village:

> …yes, fertilizers and seeds should be made available on time, before we start planting, we need them on time …because of the rains. The redemption centres …the store, should be increased and open every day to collect them anytime ...when we get money. (Focus Group Discussion, Nwogi village, Niger State, 2014).

In addition, the focus group discussion further revealed that some farmers did not receive alert to redeem their inputs while some could not redeem their inputs in spite of the alert they received. In the key informant interview with the Regional Manager of GESS, it was further revealed, that there was the need to improve the e-wallet service system to accommodate farmers participation in the form of dialogue in order to generate rich communication data that could be subsequently used in designing agricultural communication strategy in Nigeria.

During the 2013 Borlaug Dialogue which takes place October 16-18 in Des Moines, Iowa,it was revealed that in the United States, farmers, processors, researchers and policy-makers at all levels work together to promote and ensure a vibrant agricultural economy. The result is that Americans enjoy not only an abundant food supply, but also nutritional choices and affordability. Nigeria is now beginning to understand the critical link between agriculture and prosperity. Now making agriculture the "new oil", as agriculture is fundamental to every country's prosperity, security and sovereignty.

As a matter of fact, Nigerian farmers, especially the smallholder farmers that contribute more to food production, lack the access to information about new farming technologies and innovations and inputs; and leaving them to use sub-standard ideas and inputs which in turn affect their produce.

The researcher believes, that Mobile phone can effectively encourage farmers to understand that working together with ‘experts’ will enable them to discover and put in place better, and more sustainable solutions for a more food secure future. Beyond promoting interactivity, it can also help to create participatory forum between agricultural researchers and farmers.

Consequently, the Mobile telephoninghas changed the way researchers connect to rural communities. For instance, Mobile Phone Application, also have enabled a two-way engagement in which communities work together to discover and put in place better, more sustainable solutions for a more food secure future. Wireless technology saves time, increases accuracy, improves collaboration and generally enhances overall efficiency. Of course, we cannot talk about the growth of wireless networks without mentioning the **mobile phone’s** increasing ubiquity in Nigeria and the World at large “Global village”.

CHAPTER FIVE

SUMMARY, RECOMMENDATIONS AND CONCLUSION

5.0 Summary

The study appraises the communication strategyof the Electronic Wallet effectiveness, the benefits and the constraints therein. The revolution in the media has greatly altered communication in all spheres of life including agriculture. The Integration of the mobile phone to some extent has brought possible solutions for developing countries in utilizing their available resources in agriculture, in the case of Nigeria, yet, with some constraints as it steps towards productivity and sustainable rural development. Though, for more than two decades, Nigeria's agriculture has been plunged into several reformation crises which have demanded the use of different communication strategies with little or no results in some cases. All these, brought about the recent deployment of the e-wallet as part of the schemes by the Federal Government to reform the agricultural sector since 2011. It is therefore, imperative to assess the new communication strategy as it has been operated under the reformation which is the focus of this study.

In this study, 80 (40 from each village) farmers were administered questionnaire to in NassarawanBuhari and Nwogi village. After that, the farmers in each village were divided into 4 groups from which 2 farmers were randomly selected to participate in Focus Group Discussions. A total number of sixteen farmers (8 from each village) were further randomly selected and participated in 2 Focus Group Discussions. In total, 80 farmers participated in this study. The farmers were selected from two adopted villages of NAERLS in Niger and Kaduna states. They

are registered farmers who have participated in the e-wallet scheme since its inauguration. The adopted villages were selected because they were part of the communities where the registration of farmer under the scheme commenced earlier in the North Central and North West agro-ecological Zones of Nigeria.

More so, 20 copies of the questionnaire were administered to 20 NAERLS staff who work directly with the selected adopted villages. Furthermore, the researcher interviewed 1 Regional Manager under whose authority the e-wallet in the North Central operates. So far, the study appraised e-wallet's effectiveness, usability and acceptability among farmers in the selected villages. In total, one hundred and one (101) respondents participated in this study.

The Diffusion and Innovation Theory and the Participatory Communication Theory underpinned the study in order to generate solid argument for effective communication approaches. The research methodology for this study is built around the Quantitative and Qualitative methods which involved the use of; Questionnaire, Focus Group Discussion, Key Informant Interview as well as the Library and Internet sources for data collection. For data analysis, this study used tables and simple descriptive statistical tools.

The study discovered that farmers were aware of the e-wallet scheme through many sources with the radio as the highest source. The farmers responded that the e-wallet is an effective scheme that has helped drive ATA. Meanwhile, there were also the challenges of interconnectivity and network failure experienced by the farmers in this study. Though the scheme is acceptable by farmers, the process has not been really participatory.

5.1 Key Findings

In relation to the objectives of this research work, the study findings are shown as follows:

i. The study discovered that farmers were aware of the e-wallet scheme through many sources with the radio as the highest source. The farmers opined that the e-wallet is an effective scheme that has helped drive ATA.

ii. In this study, the farmers revealed that the challenge of interconnectivity via the network of the telecommunication service providers frustrated many farmers out at the registration stage, and this subsequently affected their level of confidence about the scheme.

iii. Furthermore, it was found out that the e-wallet communication approach has not been deployed in other value chain areas of the entire ATA framework. This has great effects on the process of farm-to-market chain in the GESS.

iv. This study equally discovered that the Growth Enhancement Support scheme "Operational Model", is not participatory. This means, it is a one way flow of information and a conveyor belt system with which farmers could only act on text messages (e.g. act on information on where and when to redeem fertilizers and farm inputs) without the opportunity to complain through same way.

v. It was revealed that some farmers found it difficult to make complaints due to bad network (poor services) and it was iterative at that period.

vi. Again during the focus group discussions it was revealed that some farmers never received alert or text messages for further action to redeem fertilizers or farm inputs.

vii. Meanwhile, it was discovered that some farmers who received text messages to redeem fertilizers and farm inputs could not redeem those items even though they were prompt at the redemption centers.

viii. While the study found out that many farmers redeemed there were no adequate information on the number of hours or days they have to wait before collecting the items. Thus, the farmers relied on speculations to plan their daily schedules which they stated affected many other engagements they had.

ix. Considering the time lag between the redemption stage of the e-wallet system and the period for planting of inputs, it was discovered that the farmers were not satisfied with the delay of the arrival of inputs which affected planting calendar and farm productivity too.

x. In this study, a significant number of the farmers (i.e.15%) lamented that the inputs provided were not enough to meet their farm size and plantation projection.

xi. In the two communities where the farmers were engaged in Focus Group Discussion, it was found that farmers complained of the high prices of the inputs.

xii. The key informant interview findings further also revealed that government was aware of the gap for feed-back mechanisms for more farmers and beneficiaries contributions through the mobile phone.

1.6 Recommendations

From the foregoing, it is recommended that:

i. The Federal Ministry of Agriculture and Rural Development should build stronger mobilization and sensitization communication approaches that will improve the success of the e-wallet by increasing the percentage or degree of farmers' involvement and adoption.

ii. Government should develop telecommunication infrastructure in the rural areas to enable farmers have unimpeded access to information on their mobile phones irrespective of location and weather conditions.

iii. The e-wallet scheme communication approach should be deployed in other value chains of the ATA (in order to take care of farm-to-market) process in order to help farmers get responsive and viable market prices and sales.

iv. The Federal Government should consolidate the success of the scheme by establishing a National Helpline Center that will accommodate complaints, and speed up the completion and equipment of the National Farmers' Helpline Center to allow farmers to contribute to the policy making and development of the sectors through enriched information from in-depth mobile phone communication system between agricultural development agents and farmers in order to enhance sustainable productivity.

v. The Federal Government should organise continuous capacity building and training for Farmers on the effective use of the mobile phone application on e-wallet.

vi. The e-wallet connectivity should be fortified with error detector mechanism in order to put a stop to false alert and inconsistency in redemption information as witnessed by some farmers in this study.

vii. There should be evidence based sustainable agricultural policy, i.e. planning,review and integrated programming in the light of the multifunctional aspect of agriculture, particularly with regard to food security and sustainable development.

viii. The farmers should link up withagricultural experts for more information about GESS on regular bases and not relied on speculations in planning their farming schedules.

ix. The farmers should complement Government efforts by adopting the inputs and services received to bring about the desire productivity for sustainable development.

1.7 Conclusion

From the findings of this study on the appraisal of the effective use of the electronic wallet communication strategy under the Growth Enhancement Support Scheme of the Agricultural Transformation Agenda in some selected NAERLS adopted villages, it was discovered that farmers were aware of the e-wallet scheme through many sources, with the radio as the highest source. Through the administration of a set of Questionnaire and Focus Group Discussions the farmers indicated that they possessed mobile phones and have registered with the e-wallet scheme as at the period of this study. More than 93.75% of the respondents (farmers) showed that they have benefited from the subsidized farm inputs (seeds), and fertilizer supply, even though some of the farmers experienced telecommunication network challenges before and after inputs redemption. The effect of such interconnectivity challenges on the adoption level of the e-wallet by the farmers in the selected adopted villages was a distorted curve: while some farmers were still interested to register for the e-wallet, they felt some fraudsters could use the connectivitylapses in the telecommunication system to defraud them by sendingfalse alert messages.

Meanwhile, the study further discovered that about 2.5%of the farmers never got alert for the inputs, and about 3.75% of the farmers never got the inputs in spite of the alert received due to late supply or inadequate supply of the inputs and fertilizers at the redemption centers. All the farmers (including those who could not redeem their inputs) indicated that the e-wallet communication strategy has actually increased their knowledge of how the mobile phone could connect them to the government in order to benefit from government development interventions.

The significance of this to the productivity of the farmers was that more than 93.75% of the farmers have enjoyed higher productivity with high quality farm produce that have attracted more income for their family.

During the focus group discussions, more than 60% of the farmers (especially the older ones) revealed that for many years, they have not experienced such flexible and easy farm inputs and fertilizers procurement and distribution system like the e-wallet. Thus, the farmers agreed that the e-wallet has been effective at connecting them to government programme at the grass roots level. Though most of the farmers were not aware that the e-wallet was part of the larger ATA development programme, they agreed that the e-wallet has actually sold the best part of the government efforts to transform the agricultural sector in the last four years.It is therefore concluded that the e-wallet (as a communication strategy) has helped in the effective delivery of the ATA framework.

Meanwhile, the farmers wanted to know more about ATA and its connection with the e-wallet.The farmers equally opined that e-wallet communication strategy should also be adapted in other value chain areas. Majority of them cited the areas of marketing of agricultural produce, linking farmers with viable and responsive buyers via mobile phones.Subsequently, the study also discovered that the farmers feared that thee-wallet may not be sustained beyond a particular regime. They wanted a bigger national platform that could host many farmers especially an interactive one where the farmers can contribute their own experiences by interrogating experts and other stakeholders of agricultural development issues. In this way, the farmers believed the e-wallet would become more participatory and their voice would help influence the conceptualization and implementation of development policies that will sustain the scheme beyond the government that started it.

Thus, the study is suggesting for more organized and continuous action in the areas of expertise, by engaging Computer Scientists to design software with Multi-Facet Platform which would allow the farmers to interact with Agricultural Communication Specialists beyond the level of responses to alert and SMS messages as it is currently done. This could be done through the newly Constructed National Farmers' Helpline Center. There should be capacity building and training for farmers by Federal Government to enable the farmers adapt the use of mobile phone applications in other areas of the value chains when it is implemented for marketing of farm produce and the development of international business chains.

Overall, within the stated objectives of this study, the findings have provided insights on theeffectiveness, level of adoption, challenges faced and benefits derived by farmers who have registered with the electronic wallet scheme under ATA from the selected adopted villages in two different local government areas from Kaduna and Niger State. The study has also shown that the e-wallet (as a communication strategy) has the potential to drive the ATA beyond information transferring from agricultural experts and end users to a full participatory communication strategy where the farmers could actively engage in electronic conversations that could influenced the conceptualization and implementation of appropriate agricultural development policiesthat will sustain the entire ATA framework beyond a single regime and secure national food security.

REFERENCES

AbudullahiN. (2008), "Imperatives of the seven-point agenda" in agenda 20 2020: Redesigning Nigeria Future, Lagos, ANAN Publication.

Adejo, P. &Haruna, U. (2009).Access of Farmers to ICTs for Agricultural Development inBauchi Local Government of Bauchi State.*Proceedings of the 43rd Annual Conference of Agricultural Society of Nigeria.2013*

Adesina A. (2013), A Speech by the Honorable Minister of Agriculture and Rural Development, Federal Republic of Nigeria at the 36th Session of the IFAD Governing Council in Rome.

Adesina, A. (2012). *Transforming Agriculture to Grow Nigeria Economy*. Convocation Lecture Delivered at the ObafemiAwolowo University, Ile Ife, Osun State. December 13.

Agricultural analysis: *Innovative solution* (2013). *Agriculture in Nigeria 2013*Oxfam, Nigeria Abuja, FMARD, Abuja Author.

AGRITEX (1998).*Learning together through participatory extension*, Department of Agricultural Technical and Extension Services (AGRITEX), Harare, Zimbabwe.

Aguuga, R. A. (1998). Communication for Development in Africa – A Clarion Call, *Communicar*e.

Agunga, R. A. (1997). *Developing the third world*:*A Communication Approach*. Commack, NY; Nova Science

Akinboro B. and Arokoyo T., (2014). The "Electronic Wallet for the Growth Enhancement Support Scheme (GES)": *The Nigerian Experience*. A Report presented to the National Working Committee on Agricultural Extension Transformation Agenda (AETA).

Akinola M.O., Issa F.O., Sanni S.A., (2011). Agricultural Extension Systems in West Africa: Adoptable Strategies for Nigeria's Agricultural Extension Reform Agenda.

Journal of Agricultural Extension Society of Nigeria http://dx.doi.org/10.4314/jae.v15i2.1

Altafin, I. (1991). Participatory Communication in Social Development Evaluation.In *Family Tree of Theories, Methodologies and Strategies in Development Communication.* Silvio Waisbord, PhD Prepared for Rockefeller Foundation.

Andres, D. & Woodard, J. (2013).*Social Media Handbook for Agricultural Development Practitioners*, U.S. Agency for International Development and FHI 360. September.

Anyanwu, J C et. al., (1997). *Structure of Nigerian Economy*: 1960-1997. Onitsha: Joanne Educational Publishers.

Arokoyo T. (2010). "*Lecture Notes and Handouts on Development Communication"*, Department of Mass Communication, A.B.U., Zaria.

Arokoyo T. (2003). ICTs in the Transformation of Agricultural Extension: the case of Nigeria. Paper presented at the 6th consultative expert meeting of CTA's Observatory on ICTs, Wageningen, September 23rd-25th.

Arokoyo T. (2008). *The concept of participation in agricultural development*,Agricultural Development Monograph, NAERLS, A.B.U., Zaria.

Arokoyo, J.O, Tologbonse, E.B, Auta, S.J; Ikani,E.I, Oyedokun.A.O&Chinaka,C. C.(2011). Comparative Study of Agricultural Extension Systems In Nigeria: Funding And Personnel Issues. Draft Report submitted to NAERLS/ABU, Zaria.

Arua E.O. "Achieving Food Sufficiency in Nigeria through the OFN Programme."Cited by Bernard NnamdiEmenyeonu.Africa Media Review Vol.1. No.2.1987

Awoseyila, A. (1997). *Appraisal of past and present policy measures for reviving Nigeria's non-oil sector and policy implications for the future, central bank of Nigeria. Economic and Financial Review,* XXXV (4): 29-45.

Azih, (2008). In Grace M. A., (2014) Effectiveness of E-Wallet Practice in Grassroots Agricultural Services Delivery in Nigeria - A Case Study of Kwara State Growth Enhancement Support Scheme. *Journal of Experimental Biology and Agricultural Sciences. Retrieved* http://www.jebas.org

Balogun, E. D. & M. F. Otu, (1997). *Credit policies and agricultural development in Nigeria, central bank of Nigeria. Economic and Financial Review*, XXIX (2): 138-55.

Benor, O. & Baxter, M. (1984).Training and Visit Extension. Washington DC: *The world bank p.3. In Journal of Sustainable Development in Africa (Volume 11, No. 2, 2009)*. Clarion University of Pennsylvania

Blackmore, J., Hardcastle, L., Bamblett, E., & Owens, J. (2003).*Effective Use of Information and Communication Technology (ICT) to Enhance Learning for Disadvantaged School Students.ICT, Learning, and Disadvantage*.

Boone, K., Meisenbach, T., & Tucker, M. (2000).Agricultural communications: *Changes and challenges,* Iowa State University Press.

Bradford, B and Gwynne, M.A. (1995).*Down to earth*: *Community perspective on health, development and the environment*. England: Kumarian Press

Brimer, J. T. (1980). Financing agricultural development: *Implications from Nigeria*.*The Nigerian Journal of Economic and Social Studies,* XXII (2): 100-21.

Bryant, A., &Charmaz, K. (2007).The Sage Handbook of Grounded Theory. London: Sage Publications.

Central Bank of Nigeria (1997).*The changing structure of the Nigerian economy and implications for development*. Lagos: Realm Communications.

Clark, S. (2013). *NTT Docomo to take Japanese mobile wallet global*. *NFC World. Retrievedfrom:www.nfcworld.com/.../ntt-docomo-to-take-japanese-mobile-wallet-globa*

Covan, E. (2007).*The discovery of grounded theory in practice*: *The legacy of multiple methods.* In Bryant, A., &Charmaz, K. (Eds.), *The Sage Handbook of Grounded Theory,* London: Sage Publications.

Crawford, J. (2003). *The use of electronic information services by students at Glasgow Caledonian University. Library and Information Research* 27(86): 30-36.

Creswell, J., (2007) "Review of the Literature", Chapter 2, in: *Research Design: Qualitative, Quantitative, and Mixed Method Approaches*. Thousand Oaks: Sage Publications.

Creswell, J. W. & Miller, D. L. (2000).*Determining validity in qualitative inquiry*. *Theory into Practice*, 39(3), 124-131.

Creswell, J. W. (1994). *Research design: Qualitative and quantitative approaches*. New York: Sage

Doerfert, D. L. (Ed.) (2011).*National Research Agenda: American Association for Agricultural Education's research priority areas for 2011-2015*. Lubbock, TX: Texas Tech University, Department of Agricultural Education and Communications.

Dosi, Giovanni. 1982. *Technological Paradigms and Technological Trajectories*. *Research Policy*. 11 (June): 147-162.

Edache, (2006). In Grace M. A., (2014) *Effectiveness of E-wallet practice in grassroots agricultural services delivery in Nigeria* - A case study of Kwara State Growth Enhancement Support Scheme. Journal of Experimental Biology and Agricultural Sciences.*Retrieved from http://www.jebas.org*

Esonu, B. O., Nwandikom, G. E., Okeudo, N. J., Etuk, E. B. (eds.), *Proceeding of the International Conference on Global Food Crisis*, Federal University of Technology, Owerri, Nigeria,19th– 24th April, 2009, pp. 304 – 307.

Evans, J. (2008). *Agricultural Communication oral history project*.Agricultural Communications Documentation Center.*Retrieved from* http://www.library.illinois.edu/funkaces/acdc/oralhistory/podcasts.html

Ezeh A. N. (2013) *Access and application of information and communication technology (ICT) among farming households of east Nigeria*.Agriculture and Biology JournalofNorthAmerica.doi:10.5251/abjna.2013.4.6.605.616 .

FAO (2013). FAO *statistical yearbook-Land use*" (Excel). FAOSTAT. P. A4. *Retrieved* 02 June 2013

FAO (1995).*Communication: A key to human development*, Rome: Food and Agricultural Organization.

FAO (1995).*Understanding Farmers; Communication Networks*: *An Experience in Philipines*, Rome: Food and Agricultural Organization.

Federal Ministry of Agriculture and Rural Development Abuja, Nigeria (2011) Agricultural Transformation Agenda: *We will Grow Nigeria's Agricultural Sector*. *Retrieved from*: http://www.unaab.edu.ng/attachments/Agricultural%20Transformation%20Blue%20Printpdf access on March 25, 2014.

Femi A. (2013). *Nigeria's agricultural sector undergoing massive transformation'*. A Business Day Media Ltd.*Retrievedfrom*:businessdayonline.com/.../nigerias-agricultural-sector-undergoing-massive

Freire P. (1973). *Education as the Practice of Freedom in Education for Critical Consciousness*. New York: Continuum. *Review* by Alison Kreider (UCLA), 1998

Fuglestad, A.B. (2005). *Students' use of ICT tools: Choices and reasons. Proceedings of the 29th Conference of the International Group for the Psychology of Mathematics Education.* Vol.3: 1-8.

Gadzama I. and Akinola M., *Adoption and Diffusion of ICTs in Extension Services: Implication for the Agricultural Transformation Programme in Nigeria*. *Proceedings 18th Annual Conference of Agricultural Society of Nigeria.2013*

Gateway, D.R. (n.d). (2010). *Defining ICT in Education*. *Retrieved from:* http://www.rwandagateway.org/ICT4E/spip.php?rubrique6

Grace M. A., (2014) Effectiveness of E-Wallet Practice in Grassroots Agricultural Services Delivery in Nigeria - A Case Study of Kwara State Growth Enhancement Support

Scheme. *Journal of Experimental Biology and Agricultural Sciences. Retrieved from*: http://www.jebas.org

Hagerstrand, T. 1967. *Innovation Diffusion as a Spatial Process*. Chicago: University of Chicago Press. (Original Swedish version published in 1953).

Herbert W. (2008), "Critical Perspectives of Mr. President's 7-Point Agenda" in *Agenda 20 2020: Redesigning Nigeria's Future*, B. C. Osisioma (Ed.), Lagos, ANAN. *Retrieved from*http://en.wikipedia.org/wiki/Digital_wallet

Idu, E. &Obinne, C., (2009).Promoting effective research-extension-farmer-input linkage system in Nigeria: information and communication technology as a Cornerstone.In Agbamu, J. (Ed.), *Perspectives in Agricultural Extension and Rural Development*.pp. 182-194.

Ismail F., Issa F., Adebowale W., Tenuche S., & Bashir S. (2013). The Mass Media and ICT: Predictable Strategies for Sustainable Extension Services in Nigeria. *Journal of Humanities and Social Science.*pp 71-76. www.Iosrjournals.org

Ismail F. &Tenuche S., (2012).*The Media and Information Technology: Inevitable Tactics for Sustainable Development in Nigeria*. In the proceeding of 21st Annual Congress of the Nigerian Rural Sociology Association Ibadan.University of Ibadan.

Issa F.O., (2013). Building the capacity of agricultural extension personnel of effective implementation of agricultural transformation agenda in Nigeria.*Journal of Agricultural Extension vol. 17 (1) Retrieved from:*http://dx.doi.org/10.4314/jae.v17i1.8

International Fertilizer Distribution Center (2013) International Fertilizer Distribution Center Projects in Nigeria. *Retrieved from*: onhttp://www.ifdc.org/Nations/Nigeria access on April 30, 2014.

Javier B. (2013). Nigerian farmers on frontline of reform.*The Financial Times* Ltd 2014

Jibowo, A. A. &Ajayi,A.O (2009). History of Agricultural Extension In Nigeria. In Agricultural Extension In Nigeria. *Published by Agricultural Extension Society of Nigeria (AESON)* pp1-15.

Kalipeni E. and Kamlongera C. (1996)., The Role of "Theatre for Development" in Mobilising Rural Communities for Primary Health Care: The Case of Liwonde PHC Unit in Southern Malawi. *Journal of Social Development in Africa* 1996 11,1, p 53-78.

Kavinya A., Alam S., Decock A. (1994). *Applying DSC methodologies to population issues: a case study in Malawi*. Rome: FAO.

Krunal K. &Dhaval K., (2013).Cultivating ICT & Networking: *The Role of Social Media in Agriculture. CSI Communications*, Vol. No. 37, Issue No. 3,

Leah A. & Sonia M., (ed). (2006)New Media Design and Development: *Diffusion of Innovation v Social Shaping of Technology.* Handbook of New Media Student Edition

Luambano, I., &Nawe, J. (2004).*Internet use by students of the University of Dare es Salaam*. Library Hi Tech News 21(5): 13-17.

Maharana, B., Biswal, S., &Sahu, K.N. (2009). Use of information and communication technology by medical students: *A survey of VSS medical college, Burla, India. Library Philosophy and Practice. Retrieved from*: http://unllib.unl.edu/LPP/maharana-biswal- sahu.htm

Manyozo, Linje (March 2006). "Manifesto for Development Communication: Nora C. Quebral and the Los Baños School of Development Communication".*Asian Journal of Communication* 16 (1): 79–99. DOI:10.1080/01292980500467632

Mefalopulos P. (2008). Concepts and Practices of Development Communication – a World Bank perspective.*Development Communication Sourcebook*: Broadening the Boundaries of Communication.

Mlama P. M. (1991) *Culture and development*: *The popular theatre approach in Africa*. Uppsala: Scandinavian Institute of African Studies, 1991. 219 p. ISBN 91-7106-317-X.

Munyua, H. (2000). *Application of ICTs in Africa's agricultural sector: A gender perspective*. In: Rathgeber, E. and Odera, E., International Development Research Centre (IDRC) Books. Pp23-85.

Murphy, D. (2013). *Dunhill Wallet Uses Biometrics.PC Magazine. Retrieved from*: www.pcmag.com › Reviews › Consumer Electronics › Gadgets

NAERLS (2011) *Deplorable state of Nigerian agricultural extension services: The challenges, way out and the way forward*. A submission to the Minister of Agriculture and Rural Development on his familiarization visit to Ahmadu Bello University, Agricultural Complex, September, 15th, 2011. 3pp.

NAERLSQUARTERLY (2013). NAERLS Press (Author). (2). (2). Pp.13-14

NAERLSQUARTERLY (2014). NAERLS Press (Author). (3). (1). Pp.8-9

Nair, K.S. & White, S.A. (1993a).The Development Communication Process. In: Nair, K.S. & White, S.A. (eds.), *Perspectives on Development Communication, New Deli*: Sage, pp. 47-70.

National Bureau of Economic Research (2014).*Global demographic change*: *Dimensions and Economic Significance*.NIBER working Paper series.*Retrieved from*: http://www.nber.org/papers/w10817 on April 23, 2014.

National Bureau of Statistics (2012) Review of the Nigerian Economy in 2011 and Economic Outlook for 2012-2014, National Bureau of Statistics

Ndinoshiho, J. M. (2010). The use of electronic information services by undergraduate nursing students at the University of Namibia's Northern Campus: *a descriptive study*. Information Development 26(1), Pp. 57-65.

Neil D., Dan B., Garcia-Molina H., Steven K., & Andreas P., SWAPEROO, *A Simple Wallet Architecture for Payments, Exchanges, Refunds, and Other Operations*. Stanford University. Retrieved from: http://www.slideshare.net/KrishnaKumar272/digital-wallet-ewallet

Nelson, Richard & Sidney Winter. 1982. *An Evolutionary Theory of Economic Change*. Cambridge, MA.: The Belknap Press of Harvard University Press.

Newman, I. & Benz, C. (1998).*Qualitative-quantitative research methodology: Exploring the interactive continuum.* Carbondale: Southern Illinois University Press

Njagi, K. & Isbell C. (2003).*Assessing students' attitudes towards web-based learning resources.Retrievedfrom:*http://www.unb.ca/naweb/proceedings/2003/PosterNjagiIsbell.html

Obadan, M. I. (1989). *Agricultural Development Strategies and Performance in Nigeria*: From OFN to DFRRI. Paper Presented at the 5th Biennial Conference of the West African Economic Association, Accra, Ghana, May 29-31, 1989.

Ogen, .O. (2007).*The agricultural sector and Nigeria's development: Comparative Perspective from the Brazilian Agro-Industrial Sector Economy* (1960-1995)".Nebula March 2007@Noble World Archives.

Ogunjimi S. I., Farinde A. J., Adesoji S. A., (2012). *Assessment of Mini-Livestock Farming in Peri-Urban Areas of Southwestern Nigeria*: *Implication for Policy Formulation, Food Security and Poverty Alleviation*

Oji-Okoro, I. (2011). *Analysis of the contribution of agricultural sector on the Nigerian economic development*.world review of business research, 1(1), 191–200.

Olashore, O. (1988). *Perspectives on Finance, Banking and Economic Policy in Nigeria. Ibadan, Nigeria:*Heineman.

Olayemi, J. K. (1976). Food Prices and Current Nigerian Inflation, Standard Bank of Nigeria.*Quarterly Bulletin*, Lagos: 25-36.

OLIVAREZ-GILES, N. (2012). *Sprint's Galaxy Nexus: Can a Second Google Wallet Phone Ignite Mobile PaymentsWired*. *Retrieved from*: www.wired.com/2012/.../sprints-galaxy-nexus-can-a-second-google-wall.

Oliver, R. (2002). The role of ICT in higher education for the 21st century: ICT as a change agent for education. *Retrieved from*:http://elrond.scam.ecu.edu.au/oliver/2002/he21.

Olowologbon, et.al (2013). In Grace M. A., (2014) Effectiveness of E-Wallet Practice in Grassroots Agricultural Services Delivery in Nigeria - A Case Study of Kwara State Growth Enhancement Support Scheme. *Journal of Experimental Biology and Agricultural-Sciences. Retrieved from*: http://www.jebas.org

Onajite, O. (2013). Raising awareness: Agriculture interview.*Agriculture in Nigeria. Oxford Business Group (Nigeria). Retrieved from*: www.oxfordbusinessgroup.com

Oparaeke, A. M., (2009). Global Food Crisis and its Implications in Nigeria, In: Iloeje, M. U., Asiabaka, C. C., Obiefuna, J. C., Osuji, G. E., Udedibie, A. B. I., Orebiyi, J. S., Ofoh, M. C., Esonu, B. O., Nwandikom, G. E., Okeudo, N. J., Etuk, E. B. (eds), *Proceeding of the International Conference on Global Food Crisis, Federal University of Technology, Owerri,* Nigeria,19th– 24th April, 2009, pp. 304 – 307.

Osisioma B. C. (ed) (2011), *Transformation for National Development*, Lagos, ANAN Pub.

Osisioma B. C. (ed) (2008), *Agenda 20:2020: Redesigning Nigeria's Future*, Lagos, ANAN Pub.

Ozoemelem, O. A. (2009). *Use of electronic resources by postgraduate students of the department of Library and Information of Delta State University, Nigeria.Library Philosophy and Practice. Retrieved from*: http://unllib.unl.edu/LPP/obuh-alex.htm

Patton, M. Q. (2002). *Qualitative evaluation and research methods (3rd ed.)*. Thousand Oaks, CA: Sage Publications, Inc.

Pearson, K. (1904). *Report on certain enteric fever inoculation statistics*. BMJ 3:1243-1246.

Potter, W. (1996).*An analysis of thinking and research about qualitative methods. Mahwah:* NJ. Lawrence Erlbaum Associates.

Purdey, A. F., Adhikari. G. B., Robinson. S., and Cox. P., (1994) "Participatory Health Development in Rural Nepal: Clarifying the Process of Community Empowerment", *Health Education Quarterly* 21 (3): 329-43

Quebral, Nora (1973/72). What Do We Mean by, Development Communication. *International Development Review* 15 (2): 25–28.

Quebral, Nora (2001). "*Development communication in a borderless world". Paper presented at the national conference-workshop on the undergraduate development communication curriculum, New Dimensions, Bold Decisions.* Continuing Education

Richardson, D. 1997. *The Internet and rural and agricultural development: An integrated approach.* FAO, Rome Italy. 77 pp.

Rajesh Krishna B., Narayan R., &Giri K., *Digital Wallet: Requirements and challenges, from Singapore Management University and SUNY at Albany. Retrieved from*: http://www.slideshare.net/KrishnaKumar272/digital-wallet-ewallet

Rogers, E. M. (2003). *Diffusion of innovations (5th ed.).* New York: Free Press.

Rogers, E. M. (1993). *Perspectives on Development Communication*. In: Nair, K.S. & White, S.A. (eds.), *Perspectives on Development Communication*, New Deli: Sage, pp. 35-46.

Rogers, E. M. (1976). *Communication and Development: The passing of the dominant paradigm, communication research*, 3(2):213-240.

Röling, N.G., Ascroft, J. &Chege, F.W. (1976).*The Diffusion of Innovations and the Issue of Equity in Rural Development.* In: Rogers, E.M. (ed.), *Communication and Development: Critical Perspectives, Beverly Hills*: Sage, pp. 63-79.

Rosenberg, Nathan. (1982). *Inside the black box: Technology and Economics*. Cambridge: Cambridge University Press.

Saliu O. J. and I. A. Age (2009). Privatization of Agricultural Extension Services in Nigeria: Proposed Guidelines for Implementation. *Journal of Sustainable Development in Africa.*11 (2): 160-176

Saunders, G. &Pincas, A., (2004).*Student attitudes towards information and communication technologies in teaching and learning in the UK*. Retrieved from: http://www.itdl.org/Journal/Aug_04/article01.htm

Score Card. (2013). Agricultural Transformation Agenda.*Mid Term Report*. Abuja: FMARD.

Shehu A. Y. (2006), Corruption, Rule of Law and Sustainable development, *Nigerian Journal of Economic and Financial Crimes*, Vol. 1, No. 1,.

Smart (phone) money Financial Post 2011. Retrieved from: business.financialpost.com/2011/04/23/smart-phone-money

Stern, P.N. (2009). *In the beginning Glaser and Strauss created grounded theory*. In J.M.

Suchman L. & Jordan (1997).*The Development of New Media Technologies.*

Suchman, L. (1987) *Plans and situated actions: The Problem of Human-Machine Communication.* Cambridge University Press, New York.

Swain, D. K. (2010) *Students' keenness on use of e-resources.Electronic Library* 28(4): 580-591.

Terms, T. (2010).*Information communication technologies. Retrieved from*: http://www.techterms.com/definition/ict

Thai National Committee on Irrigation and Drainage Thailand (THAICIDnd), *Retrieved from:*http://www.icid.org/v_thailand.pdf

The Borlaug Dialogue in Des Moines, Iowa, (2013).*Why Agriculture Is Nigeria's New Oil.Retrieved from*: www.forbes.com/sites/.../2013/10/.../why-agriculture-is-nigerias-new-oil/

The Evaluation 2011: Capturing Technology for Development of World Bank Group Activities in Information and Communication Technologies. *Retrieved from:* www.wolrdbank .org

The World Bank Group (2013). Nigeria Economic overview and performance.*Retrieved from:*http://www.worldbank.org

Togia, A. &Tsigilis, N. (2010).*Awareness and use of electronic information resources by education graduate students:* Preliminary results from the Aristotle University of Thessaloniki.Retrievedfrom:http://eproceedings.worldscinet.com/9789814299701/9789814299701_0058.html

Treise, D., &Weigold, M., (2002).Advancing science communication: A survey of science communicators.*Science Communication*, 23(3), 310-322.

UNAIDS, (2008).*Guidelines and Tools for Development Communication Strategies for joint UN teams on AIDS*. WHO Library Cataloguing-in-Publication Data

United Nations Commission on Sustainable Development.*A report by Government of Nigeria to the fifth session* 1 April, 1997.

United Nations Environment Programme (UNEP) (1992). Agenda 21: *Promoting sustainable agriculture and rural development. Retrieved from*: www.unep.org/Documents.Multilingual/Default.asp?Document

Van Den Ban, A. W. and H. S. Hawkins (1996).*Agricultural extension*.Oxford Blackwell.

Victoria H., and Alexander M, (2014) .Nigeria fertiliser agriculture policy.A smallholder farmer in Northern Nigeria, *Guardian News and Media Limited.*

Watson, J., Zakaria, M. H., & Edwards, S. L. (2010).Investigating the use of Web 2.0 technology by Malaysian students.*Multicultural Education & Technology Journal* 4(1): 17-29.

Watson, M. D. (2005). Pedagogy before Technology: Re-thinking the Relationship between ICT and Teaching. *Education and information technologies.*Vol. 6(4), Pp. 252-266.

Wekipedia.(2005).Meta-analysis. Retrieved January 5, 2006, from, http://www.answers.com/topic/meta-analysis

White, K. G. (2010). Beyond the Horseless Carriage: *Harnessing the potential of ICT in education and training. Retrieved from*: http://works.bepress.com/gerry_white/11/

Winter, G. (2000).A comparative discussion of the notion of validity in qualitative and quantitative research.*The Qualitative Report*. (4). (3&4).

World Bank (2013).Nigeria/World Bank Data.*Trading Economics*.Retrieved from: http://www.tradingeconomics.com/nigeria/indicators-wbaccess on April 30, 2014.

World Bank (2004). Strategic Options for Revamping Agricultural Research and Extension Services In Nigeria. *Main Export*.71pp.

Yahaya, K. M. (2008) Development Communication: *Lesson from change and social engineering projects*. Ibadan. Kraft Books Limited.

Zakaria, M. H., Watson, J. & Edwards, S. L. (2010).Investigating the use of Web 2.0 technology by Malaysian students.*Multicultural Education & Technology Journal* 4(1): 17-29.

INTERNET

A New Media Design and Development: Diffusion of Innovations v Social Shaping of Technology." *The Hand book of New Media*. 2006. SAGE Publications. 29 Sep. 2009. Retrieved from: http://sage-ereference.com/hdbk_newmedia/Article_n14.html.

A Global Overview of Digital Wallet Technologies.*University of Toronto.* May 28, 2011. Retrieved from: propid.ischool.utoronto.ca/digiwalle_overview

Agricultural Communications Documentation Center. Retrieved from: http://www.library.illinois.edu/funkaces/acdc

eMarketer (2013). Social Networking Reaches Nearly One in Four around the World, Blog post published: April 28.

Fact sheet: 'Rural areas magnify "digital divide"'. www.ntia.doc.gov/ntiahome/digitaldivide/factsheets/ rural.htm

http//www.comminit.com

http://www.e-agriculture.org/agricultural-value-chains-and-ict

www.crtc.gc.ca

LECTURE NOTE

Jegede, E. (2014). THAP 822 Studies in Health, Gender and Agricultural Communication: Course Note. Postgraduate Class in Development Communication, Department of Theatre and Performing Arts: Ahmadu Bello University, Zaria

INTERVIEW

Interview with Mallam Bello Salihu; Regional Manager, Federal Ministry of Agriculture, Minna Niger State.

Interview with 12 Selected NAERLS Staff, NAERLS Headquarters, Ahmadu Bello University, Zaria.

APPENDIX I

INTERVIEW QUESTIONS FOR FOCUS GROUP DISCUSSION

I am AFOLABI EKUNDAYO a Master Student of **Development Communication**, in the Department of Theater and Performing Arts, Faculty of Arts, Ahmadu Bello University, Zaria. He is carrying out this Research for his Thesis: Title**A Critical Appraisal of The use of Electronic Wallet Communication in The Growth Enhancement Support Scheme of The Agricultural Transformation Agenda In Selected NAERLS Adopted Villages**

This Interview is designed to investigate the **use of Electronic Wallet Communication Device of the Growth Enhancement Support Scheme of the Agricultural Transformation Agenda in National Agricultural Extension and Research Liaison Services.**

The Findings of this study (which is going to involve gathering of data from selected adopted villages under NAERLS) will contribute to the numerous communication approaches and strengthen the Institute's Participatory Approaches to carry out its mandates by involving the farmers and rural communities In Development Programmes design, implementation and evaluation and; to empower people, and to secure better agricultural productivity.

Any personal or individual information or opinion obtained in this Interview will be used strictly in a manner to maintain confidentiality and personal rights.

Focus Group Discussion for the Farmers' Group Leaders in the Communities

Interview Questions on Growth Enhancement Support Scheme/Electronic-Wallet Communication strategy

1	Are you aware of the electronic wallet of the Growth Enhancement Support scheme (GESS)?
2	Can you describe how you first become aware of e-wallet platform of the GESS?
3	Are you making use it?
4	Can you describe your benefits using the e-wallet of the GESS?
5	Can you describe any particular difficulties or experiences in using e-wallet?
6	What, if anything, would you change about e-wallet of the GESS?
7	Do you receive inputs in the right time?
8	Overall, has the e-wallet approach effective and met your expectations in the area of agricultural productivity?

APPENDIX II

QUESTIONNAIRE FOR NAERLS STAFF

Introduction

I AFOLABI EKUNDAYO a Master student of **Development Communication**, in the Department of Theater and Performing Arts, Faculty of Arts, Ahmadu Bello University, Zaria.
He is carrying out this Research for his Thesis: Title**A Critical Appraisal of The use of Electronic Wallet Communication in The Growth Enhancement Support Scheme of The Agricultural Transformation Agenda In Selected NAERLS Adopted Villages**

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Any personal or individual information or opinion obtained in this Interview will be used strictly in a manner to maintain confidentiality and personal rights.

I. Adaptive strategy for the use of e-wallet as inputs supply.
Please select the preferred option from the options (A to E) for your answer.

1. What shortcomings, lapses or constraints have you experienced since the implementation of the e-wallet and what is your advice?
a). Untimely supply of inputs like fertilizer, seeds and seedling etc.
b). Untimely commencement of e-wallet Growth Enhancement Support scheme activities.
c). Bad GSM network connectivity particularly in the rural areas.
d). Others, please specify_____

2.Is the Growth Enhancement Support Scheme (e-wallet platform) effective under the Agricultural Transformation Agenda (ATA)?
a). Very effective b). Effective c). Fairy effective
d). Not effective e). Other, please specify_____

3. What steps or measures do you think should be taken to improve the effectiveness of the GES scheme?
a). Input supply should be timely. (b). Increase the quantity of input supply.
c). More redemption centers should be created closer to farmers.
d). Others, please specify_____

4. Was the e-wallet of the GESS effective in delivering inputs to farmers in needed quantities?
a). Very effective b). Effective c). Fairy effective
d). Not effectivee). Other, please specify_____
5. Was the use of the e-wallet an effective communication approach for inputs supply?
Yes □ No □

6. If yes. To what extent is the effectiveness of the communication device/tool?
a). Very effective b). Effective c).Fairy effective d). Not effective
e). Other, please specify_____

7. Is using mobile phone to receive inputs supply of benefits?
Yes □ No □

8. Besides the e-wallet strategy what other strategies do you think should be employed?

_____
_____
_____

9. In which other sectors do you think the approach should be adopted?

_____
_____
_____

II. Adaptive strategy of GESS for the objectives of ATA.

10. Please indicate the level of usefulness/benefits of the use e-wallet for inputs supply in the objectives of Agricultural Transformation Agenda. Place an "X" mark in the box of your answer.

S/No	Strategies Used	Very useful	Useful	Fairly useful	Not Useful
1.	In the area of increased food and nutritional security?				
2.	In enhancing income of rural populace?				
3.	In the area of export earning?				
4.	To reduce import dependency?				
5.	In the area of job creation and employment creation?				

III. Adaptive Strategy for Implementer's of the GESS using e-wallet for the objectives of ATA.

Please indicate the level of benefits of the use e-wallet for inputs supply in the objectives of Agricultural Transformation Agenda.

11. What do you think lead to the introduction of the e-wallet?

_____
_____
_____
_____

12. What in your opinion are the differences between the use of e-wallet device now and when the middlemen were involved in inputs supply?

_____
_____
_____
_____
__

13. What in your opinion are the differences between the previous agricultural communication approaches and the present e-wallet communication approach?

_____
_____
_____
_____
__

14. Has the e-wallet come to improve on the inputs supply? Yes [ ] No [ ]

15. What is the impact of e-wallet device? **Positive** or **Negative**

16. How has the e-wallet help in the farmers' farming activities for the period of its implementation?

_____
_____
_____
_____

17. What are the usefulness/benefits of e-wallet to you?

_____
_____
_____

18. What is wrong with the existing agricultural communication approaches?

_____
_____
_____

19. How has e-wallet of the GES help towards achieving ATA?

_____
_____
_____

20. What are the constraints associated with the deployment of e-wallet as inputs supply?

_____
_____
_____
_____

APPENDIX III

QUESTIONNAIRE FOR FARMERS

I am AFOLABI EKUNDAYO a Master student of **Development Communication**, in the Department of Theater and Performing Arts, Faculty of Arts, Ahmadu Bello University, Zaria.

He is carrying out this Research for his Thesis: Title**A Critical Appraisal of The use of Electronic Wallet Communication in The Growth Enhancement Support Scheme of The Agricultural Transformation Agenda In Selected NAERLS Adopted Villages**

This questionnaire is designed to investigate the **use of Electronic Wallet Communication device of the Growth Enhancement Support scheme of the Agricultural Transformation Agenda in National Agricultural Extension and Research Liaison Services.**
The Findings of this study (which is going to involve gathering of data from selected adopted villages under NAERLS) will contribute to the numerous communication approaches and strengthen the Institute's Participatory Approaches to carry out its mandates by involving the farmers and rural communities in Development Programmes design, implementation and evaluation and; to empower people, and to secure better agricultural productivity.

Any personal or individual information or opinion obtained in this Interview will be used strictly in a manner to maintain confidentiality and personal rights.

Please, kindly provide answers to the questions raised. The appropriate box can be ticked as well as filling the blank spaces.

I. Demographic Data

1. Name of village/Town_____ Local Govt._____

2. Name (optional):_____

3. Age of respondents (in year): □□□□

4. Gender: M □ F □

5. Marital status of respondent: Single □ Married □ Divorced □ Widowed □

6. Number of Family Members: □ 1-2 □ 3-5 □ 6-10 □ more than 10

7. Educational status: No formal education □ Primary □ Post-secondary □ Others (specify) □

8. Major Occupation_____

9. Type of farm you manage: Small Scale Farm □ Large Scale Farm (mechanised) □

10. Email Address (optional)/Phone number: _____

II. Farmers' Awareness on E-wallet of the Growth Enhancement Support Scheme

11. Are you aware of the e-wallet before now? Yes □ No □

12. Do you understand what is meant by electronic wallet (e-wallet)? Yes □ No □

13. Do you understand how the e-wallet works? Yes □ No □

14. How did you become aware of e-wallet? Extension agent □ Radio □ Television □

Newspaper/Magazine □ Internet □ Fellow farmers' □ Personal experience □

Others (specify)_____

15. Was the registration process smooth? Yes □ No □

16. Are the objectives and reasons for the electronic wallet clear to you? Yes □ No □

17. Did you receive adequate information on the technical requirements needed in order to

participate? [For example, were the mobile phone and access requirements made clear?] Yes □ No□

18. Was technical support available if any (in case of missing mobile phone, theft, deleted

Messages etc) and when you needed it? Yes □ No□

19. How long does it take to receive the response?

(a). Too long (b). Not long (c). Some times (d). Never receive

20. Did you find it easy checking the messages received, if any?

Yes □ No□

21. Were instructions clear and easy to follow?

Yes □ No□

22. Has the approach improved the inputs supply like fertilizer, seeds, seedlings, etc. using e-wallet?

Yes □ No□

23. What is your general assessment of this communication approach either **Positive** or **Negative** from the used of the e-wallet as source of inputs supply? Yes, for Positive. No, for Negative

24. Do you think the e-wallet is a good device?

Yes □ No □

III. Adaptive strategy used for the farmers' registration exercise.

25. Please indicate the level of effective/benefits of the farmers' registration exercise for inputs supply using the e-wallet of the GES scheme. Place an "X" mark in the box of your answer.

S/No	Strategies Used	Very effective	Effective	Fairy effective	Not effective
1.	How effective was the registration exercise?				
2.	How is the timing (period) of the registration exercise?				
3.	How is the registration process generally?				

26. How far/close is the distance of the registration centre from the community?

a). Far b). Very far c). Close d). Too close

27. What do you think government should do on the farmers registration exercise to make it better?

a). Increase the registration centers. b). Deploy more registration officer.

c). Extend the registration period. d). others, please specify _____

28. Was the time and effort required to receive the input reasonable?

a). Strongly Agree b). Agree c). Disagree d). Strongly Disagree

29. Overall the e-wallet was effective and met my expectations and goals.

a). Strongly Agree b). Disagree

c). Agree d). Strongly Disagree

IV. Adaptive strategy for the use of e-wallet generally.

30. Please indicate the level of effectiveness/usefulness of the use of e-wallet as a communication device for inputs supply. Place an "X" mark in the box of your answer.

S/No	Strategies Used	Very effective/useful	effective/useful	Fairly effective/useful	Not effective/useful
1.	In the use of phone?				
2.	At affordable prices?				
3.	On the farmers registration exercise?				
4.	The voucher mechanism?				
5.	Timing?				
6.	Store hours of opening convenient for you?				
7.	To genuine farmers?				
8.	In the right quality?				
9.	In needed quantities?				
10.	The store is accessibly located?				
11.	How would you rate your overall experience of E-wallet?				

V. Adaptive strategy for the use of e-wallet as inputs supply.

Please select the preferred option from the options (A to E) for your answer.

31. What shortcomings, lapses or constraints have you experienced since the implementation of the e-wallet and what is your advice?

a). Untimely supply of inputs like fertilizer, seeds and seedling etc.

b). Untimely commencement of e-wallet Growth Enhancement Support scheme activities.

c). Bad GSM network connectivity particularly in the rural areas.

d). Others, please specify_____

32.Is the Growth Enhancement Support scheme (e-wallet platform) effective under the Agricultural Transformation Agenda (ATA)?

a). Very effective b). Effective c). Fairy effective

d). Not effective e). Other, please specify_____

33. What steps or measures do you think should be taken to improve the effectiveness of the GES scheme?

a). Input supply should be timely. b). Increase the quantity of input supply.

c). More redemption centers should be created closer to farmers.

d). Others, please specify_____

34. Was the e-wallet of the GES scheme effective in delivering inputs to farmers in needed quantities?

a). Very effective b). Effective c).Fairy effective d). Not effective

e). Other, please specify_____

35. Was the use of the e-wallet an effective communication approach for inputs supply?

Yes □ No □

36. If yes. To what extent is the effectiveness of the communication device/tool?

a). Very effective b). Effective c).Fairy effective d). Not effective

e). Other, please specify_____

37. Is using mobile phone to receive inputs supply of benefits? Yes □ No □

38. Besides the e-wallet strategy what other strategies do you think should be employed?

_____
_____
_____

39. In which other sectors do you think the approach should be adopted?

_____
_____
_____

VI. Adaptive strategy of GESS [e-wallet]for the objectives of ATA.

40. Please indicate the level of usefulness/benefits of the use e-wallet for inputs supply in the objectives of Agricultural Transformation Agenda. Place an "X" mark in the box of your answer.

S/No	Strategies Used	Very useful	Useful	Fairly useful	Not Useful
1.	In the area of increased food and nutritional security?				
2.	In enhancing income of rural populace?				
3.	In the area of export earning?				
4.	To reduce import dependency?				
5.	In the area of job creation and employment creation?				

APPENDIX IV

CHECK LIST FOR QUESTIONNAIRE

Introduction

I am AFOLABI EKUNDAYO a Master student of **Development Communication**, in the Department of Theater and Performing Arts, Faculty of Arts, Ahmadu Bello University, Zaria.

He is carrying out this Research for his Thesis: Title**A Critical Appraisal of The use of Electronic Wallet Communication in The Growth Enhancement Support Scheme of The Agricultural Transformation Agenda In Selected NAERLS Adopted Villages**

This Interview is designed to investigate the **use of Electronic Wallet Communication device of the Growth Enhancement Support scheme of the Agricultural Transformation Agenda in National Agricultural Extension and Research Liaison Services.**

The Findings of this study (which is going to involve gathering of data from selected adopted villages under NAERLS) will contribute to the numerous communication approaches and strengthen the Institute's Participatory Approaches to carry out its mandates by involving the farmers and rural communities in Development Programmes design, implementation and evaluation and; to empower people, and to secure better agricultural productivity.

Any personal or individual information or opinion obtained in this Interview will be used strictly in a manner to maintain confidentiality and personal rights.

Please, kindly provide answers to the questions raised. The appropriate box can be ticked as well as filling the blank spaces.

I. Demographic Data

1. Name of village/Town_____ Local Govt._____

2. Name (optional):_____

3. Age of respondents (in year): □□□□

4. Gender: M □ F □

5. Marital status of respondent: Single □ Married □ Divorced □ Widowed □

6. Number of Family Members: □ 1-2 □ 3-5 □ 6-10 □ more than 10

7. Educational status: No formal education □ Primary □ Post-secondary □ Others (specify) □

8. Major Occupation_____

9. Type of farm you manage: Small Scale Farm □ Large Scale Farm (mechanised) □

10. Email Address (optional)/Phone number: _____

II. Farmers' Awareness on E-wallet of the Growth Enhancement Support Scheme

11. Are you aware of the e-wallet before now?

Yes □ No □

12. Do you understand what is meant by electronic wallet (e-wallet)?

Yes □ No □

13. Do you understand how the e-wallet works?

Yes □ No □

14. How did you become aware of e-wallet? Extension agent □ Radio □ Television □

Newspaper/Magazine □ Internet □ Fellow farmers' □ Personal experience □

Others (specify)_____

15. Was the registration process smooth?

Yes □ No □

16. Are the objectives and reasons for the electronic wallet clear to you?

Yes □ No □

17. Did you receive adequate information on the technical requirements needed in order to

participate? [For example, were the mobile phone and access requirements made clear?]

Yes □ No□

18. Was technical support available if any (in case of missing mobile phone, theft, deleted

Messages etc), and when you needed it?

Yes □ No□

19. How long does it take to receive the response?

(a). Too long

(b). Not long

(c). Some times

(d). Never receive

20. Did you find it easy checking the messages received, if any?

Yes □ No□

21. Were instructions clear and easy to follow?

Yes □ No□

22. Has the approach improved the inputs supply like fertilizer, seeds, seedlings, etc. using e-wallet?

Yes □ No□

23. What is your general assessment of this communication approach either **Positive** or **Negative** from the used of the e-wallet as source of inputs supply? Yes, for Positive. No, for Negative

24. Do you think the e-wallet is a good device?

Yes □ No □

III. Adaptive strategy used for the farmers' registration exercise.

25. Please indicate the level of effective/benefits of the farmers' registration exercise for inputs supply using the e-wallet of the GES scheme. Place an "X" mark in the box of your answer.

S/No	Strategies Used	Very effective	Effective	Fairy effective	Not effective
1.	How effective was the registration exercise?				
2.	How is the timing (period) of the registration exercise?				
3.	How is the registration process generally?				

26. How far/close is the distance of the registration centre from the community?

a). Far

b). Very far

c). Close

d). Too close

27. What do you think government should do on the farmers registration exercise to make it better?

a). Increase the registration centers.

b). Deploy more registration officer.

c). Extend the registration period.

d). others, please specify _____

28. Was the time and effort required to receive the input reasonable?

a). Strongly Agree b). Agree c). Disagree d). Strongly Disagree

29. Overall the e-wallet was effective and met my expectations and goals.

a). Strongly Agree b). Disagree

c). Agree d). Strongly Disagree

IV. Adaptive strategy for the use of e-wallet generally.

30. Please indicate the level of effectiveness/usefulness of the use of e-wallet as a communication device for inputs supply. Place an "X" mark in the box of your answer.

S/No	Strategies Used	Very effective/useful	effective/useful	Fairly effective/useful	Not effective/useful
1.	In the use of phone?				
2.	At affordable prices?				
3.	On the farmers registration exercise?				
4.	The voucher mechanism?				
5.	Timing?				
6.	Store hours of opening convenient for you?				
7.	To genuine farmers?				
8.	In the right quality?				
9.	In needed quantities?				
10.	The store is accessibly located?				
11.	How would you rate your overall experience of E-wallet?				

V. Adaptive strategy for the use of e-wallet as inputs supply.

Please select the preferred option from the options (A to E) for your answer.

31. What shortcomings, lapses or constraints have you experienced since the implementation of the e-wallet and what is your advice?

a). Untimely supply of inputs like fertilizer, seeds and seedling etc.

b). Untimely commencement of e-wallet Growth Enhancement Support scheme activities.

c). Bad GSM network connectivity particularly in the rural areas.

d). Others, please specify_____

32.Isthe Growth Enhancement Support Scheme (e-wallet platform) effective under the Agricultural Transformation Agenda (ATA)?

a). Very effective b). Effective c). Fairy effective

d). Not effective e). Other, please specify_____

33. What steps or measures do you think should be taken to improve the effectiveness of the GES scheme?

a). Input supply should be timely.

b). Increase the quantity of input supply.

c). More redemption centers should be created closer to farmers.

d). Others, please specify_____

34. Was the e-wallet of the GES scheme effective in delivering inputs to farmers in needed quantities?

a). Very effective

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c). Fairy effective

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e). Other, please specify_____

35. Was the use of the e-wallet an effective communication approach for inputs supply?

Yes □ No □

36. If yes. To what extent is the effectiveness of the communication device/tool?

a). Very effective b). Effective c). Fairy effective d). Not effective

e). Other, please specify_____

37. Is using mobile phone to receive inputs supply of benefits?

Yes □ No □

38. Besides the e-wallet strategy what other strategies do you think should be employed?

_____
_____
_____

39. In which other sectors do you think the approach should be adopted?

_____
_____
_____

VI. Adaptive strategy of GESS [e-wallet]for the objectives of ATA.

40. Please indicate the level of usefulness/benefits of the use e-wallet for inputs supply in the objectives of Agricultural Transformation Agenda. Place an "X" mark in the box of your answer.

S/No	Strategies Used	Very useful	Useful	Fairly useful	Not Useful
1.	In the area of increased food and nutritional security?				
2.	In enhancing income of rural populace?				
3.	In the area of export earning?				
4.	To reduce import dependency?				
5.	In the area of job creation and employment creation?				

VII. Adaptive Strategy for Implementer's of the GESS using e-wallet for the objectives of ATA.

Please indicate the level of benefits of the use e-wallet for inputs supply in the objectives of Agricultural Transformation Agenda.

41. What do you think lead to the introduction of the e-wallet?

_____
_____
_____
_____

42. What in your opinion are the differences between the use of e-wallet device now and when the middlemen were involved in inputs supply?

_____
_____
_____
_____
—

43. What in your opinion are the differences between the previous agricultural communication approaches and the present e-wallet communication approach?

_____
_____
_____
_____
__

44. Has the e-wallet come to improve on the inputs supply? Yes [ ] No [ ]

45. What is the impact of e-wallet device? **Positive** or **Negative**

46. How has the e-wallet help in the farmers' farming activities for the period of its implementation?

_____
_____
_____
_____

47. What are the usefulness/benefits of e-wallet to you?

_____
_____
_____

48. What is wrong with the existing agricultural communication approaches?

_____
_____
_____

49. How has e-wallet of the GES help towards achieving ATA?

_____
_____
_____

50. What are the constraints associated with the deployment of e-wallet as inputs supply?

_____
_____
_____
_____

APPENDIX V

CHECKLIST FOR INTERVIEW QUESTIONS FOR NAERLS STAFF

I am AFOLABI EKUNDAYO a Master Student of Development Communication, in the Department of Theater and Performing Arts, Faculty of Arts, Ahmadu Bello University, Zaria.

He is carrying out this Research for his Thesis: Title **A Critical Appraisal of The use of Electronic Wallet Communication in The Growth Enhancement Support Scheme of The Agricultural Transformation Agenda In Selected NAERLS Adopted Villages**

This Interview is designed to investigate the use of Electronic Wallet Communication Strategy of the Growth Enhancement Support scheme of the Agricultural Transformation Agenda in National Agricultural Extension and Research Liaison Services Adopted Villages. The Findings of this study (which is going to involve gathering of data from selected adopted villages under NAERLS) will contribute to the numerous communication approaches and strengthen the Institute's Participatory Approaches to carry out its mandates by involving the farmers and rural communities In Development Programmes design, implementation and evaluation and; to empower people, and to secure better agricultural productivity.

Any personal or individual information or opinion obtained in this Interview will be used strictly in a manner to maintain confidentiality and personal rights.

Interview Questions on Growth Enhancement Support Scheme/Electronic-Wallet Communication strategy

1 What are the existing communication approaches deployed by NAERLS for inputs supply in adopted villages?
2 How effective are these existing communication approaches in terms of (time management, cost effectiveness and interactivity?
3 Are you aware of the electronic wallet of the Growth Enhancement Support Scheme (GESS)?
4 Can you describe how farmers become aware of e-wallet platform of the GESS?
5 Are you making use it?
6 Can you describe some of the benefits of the e-wallet to farmers?
7 Can you describe any particular challenges you experienced whiledisseminating the e-wallet scheme to famersin NAERLS adopted villages?

8 What, if anything, would like to change about e-wallet of the GESS?
9 Overall, has the e-wallet approach beingeffective and met your expectations in the area of agricultural information for productivity?