

**COMMUNICATION IN AGRICULTURAL RESEARCH AND INNOVATION
PROCESS: A CASE STUDY OF NATIONAL AGRICULTURAL EXTENSION
AND RESEARCH LIAISON SERVICES (NAERLS), ZARIA**

BY

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**BEING A THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES,
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DECLARATION

I, Abu Umaru Joseph hereby declare that this Thesis entitled “Communication in Agricultural Research and Innovation Process: A Case Study of National Agricultural Extension and Research Liaison Services (NAERLS) Zaria, has been written by me in the Department of Theatre and Performing Arts under the supervision of Dr. Emmanuel Jegede and Dr. V.B. Lagwampa. The information derived from the literature has been duly acknowledged in the text and a list of reference provided. There is no part of this Thesis that was previously presented for another degree.

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CERTIFICATION

This thesis titled “Communication in Agricultural Research and Innovation Process: A Case Study of National Agricultural Extension and Research Liaison Services (NAERLS) Zaria was written by me, Abu Umaru Joseph in the Department of Theatre and Performing Arts meets the regulations governing the award of the degree of M.A (Development Communication) of Ahmadu Bello University, Zaria and it is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This thesis is dedicated to the loving memory of Professor J.Z. Okwori.

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ABSTRACT

The aim of this study is to establish that indeed communication is at the heart of change. Regardless of the sophistication of technology, its use or adoption is dependent upon the communicative processes amongst stakeholders leading to its formulation, conceptualization and design. In the first part, a general review of existing body of literature is presented. This shows that there is a major gap in the extension arm of the agricultural system in Nigeria, because as at present the top-bottom approach that has not yielded much impact is still in use for information dissemination to farmers. The thesis then goes further to interrogate the National Agricultural Extension and Research Liaison Services (NAERLS) Zaria, with the view to ascertaining the participation or otherwise of local farmers in the research and innovation process. The over reliance on mass media by NAERLS to propagate the outcome of research findings in spite of its limitation and non-participatory posture is one of the key findings of this research work. This study goes further to interrogate the rationale behind the continuous use of this method amongst others and recommends the institutionalization by NAERLS of traditional forms of entertainment as extension media. Songs, dances, poetry and drama can convey information in an interesting way. It concludes that the process of communicating research and innovation needs to be reviewed to make for the participation of farmers and all stakeholders in the research and innovation process.

ABBREVIATIONS

ABU-Ahmadu Bello University

NGO-Non Governmental Organization

FMARWR-Federal Ministry of Agriculture and Rural Development

NAERLS- National Agricultural Extension and Research Liaison Services

T&V-Training and Visit

ADP-Agricultural Development Programme

PCU-project coordinating Unit

FFS-Farmer Field Schools

NPC-National Population Commission

OFN- Operation Feed the Nation

IPC-International Potato Centre

PRA/PLA- Participatory Rural Appraisal/Participatory Learning Action

TOT- Transfer of Technology

FSRE-Farming Systems Research and Extension

FSP- Farming Systems Perspective

MDG-Millennium Development Goals

RDD- Research, Development and Diffusion

NARI- National Agricultural Research Institutes

NARP- National Agricultural Research Projects

ARCN-Agricultural Research Council of Nigeria

FDG- Focus Group Discussion

IAR- Institute for Agricultural Research

- RLS- Research Liaison Section
- ERLS- Extension and Research and Liaison Section
- AERLS- Agricultural Extension and Research Liaison Services
- FMST- Federal Ministry of Science and Technology

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CHAPTER 1

GENERAL INTRODUCTION

1.0 Background to the study

In an article on sustainability and technology transfer, Richard Wilk (1995), an American anthropologist, mentioned a file folder of materials that he had accumulated over several years. The file contained 25 separate project proposals, feasibility studies, implementation plans, and project assessments. Submitted over a period of a century, all these studies considered commercializing the production of edible palm oil from a tree native to the Belizean rainforest. In each of these initiatives, imported cracking and rendering technologies developed for use in other tropical palm-oil industries were tried. Despite easy access to dense, high-yield tree stands, all these projects failed, even those with direct government subsidies. Throughout this period, household production of edible oil by indigenous people, using a variety of simple, local technologies, never stopped.

According to Grenier (1998), this story prompts several important questions: Did anyone bother to ask the local people who, how, where, when, and why of their local palm-oil production system? By learning about the local production system, could the proponents have avoided any of these costly failures? If the researchers had established joint ventures with the communities, could development objectives and sustainable-development goals have been served? If participatory technology-development techniques had been tried, could hybrid technologies (a combination of indigenous and foreign inputs) have yielded successful ventures? What would have been the outcome had any of these proponents worked *with* the indigenous people?

With an estimated population of 167 million people (NPC, 2011) growing at the rate of 3.65% per annum, Nigeria's population by the year 2020 will be about 201,320,000 million. Oparaeke and Ofor (2010) state that if the current food production growth trend of 1.35% annually is not increased to tally with or surpass the population growth rate, then the country is in for a turbulent future. A popular knee jerk approach employed in a bid to raise adequate food supply in the country is the intensification of innovative agrarian programmes. A most remarkable campaign of this sort was the Operation Feed The Nation campaign (OFN) 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.

OFN is regarded as a classic example of a diffusion campaign in which the mass media were involved. In the organizational structure of the programme, the media were assigned the onerous 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 advertising. 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.

Information about the OFN was so profusely diffused that even till this day, OFN remains a household concept in Nigeria. The profusion of information about

OFN, however, could not induce the much-needed agricultural excellence. An indication to this fact was that food importation had ironically risen to astronomical heights during the campaign period while exportation of cash crops decreased. In 1977, for example, N780.7 million worth of food was imported. A year later, the import bill rose to N108.2 million.

With the inauguration of a new civilian regime in 1979, the OFN was labeled a dismal failure, discarded and replaced with a supposedly more radical agrarian revolution. In 1980, the Green Revolution was launched with the usual objective of attaining self-sufficiency in food production, this time, through increased production and processing of good 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 born in a tense political climate. For the mere sake of discrediting the political party controlling the centre, 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 spoil system in which only 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 Green Revolution and now, a series of innovation campaigns have been quietly launched. The food situation, however, does not seem to

show any signs of improvements. If anything, it was worse than ever. It is estimated that between 2007 and 2010, Nigeria spent about N98 trillion (\$632 billion) importing food into the country.

The Communication Challenge in Agriculture

The non-adoption of agricultural innovation by rural farmers and families can be explained by the inappropriateness to their special needs and resources of the technology to be transferred. The development and introduction of improved cotton in Northern Nigeria illustrates this point. The scientists, concerned with low yield of the local variety of cotton set out to develop an improved cotton variety. The outcome of the research was a very successful one. The improved cotton was highly productive with demonstrated yield increase of 100 percent in the farmers' fields. The improved cotton was to be planted during the months of June-July. In addition, the improved cotton was recommended for sole cropping. The improved cotton also required spraying and the recommended spraying technology was a water-based method with a hand pump. It was found out that, even at a reduced rate of 135litres per hectare, 800 kilograms of water per hectare were needed (Norman et al, 1974).

Despite the dramatic increase in yield, farmers rejected the improved cotton. An evaluation (Norman, et al, 1974) indicated a number of reasons for the rejection. First, the improved cotton was to be planted during the months of June-July, exactly during the period when labour requirements for food crops are high. In the traditional system, this constraint is avoided by planting cotton after the food crops have been planted and partially weeded, a clear sign of the family's priority for maximization of food crop production over cash crops.

Secondly, the improved cotton was recommended for sole cropping while the predominant farming system in the area is mixed cropping. In addition, the adoption of

the improved cotton costs a significant amount of money. The farmer must not only use fertilizer but must also spray the cotton. The small-scale farmer is not likely to have the resources to finance such a project from his/her meager earnings, especially when the financial demand occurs at a time when the farmer's cash resources are lowest, that is during the rainy season before any crops are harvested. Above all, the average net return from cotton using recommended practices was only 13 percent better than cotton grown in crop mixtures. The farmers' rejection of the technology forced the scientists to re-examine it and to introduce changes. First, a later planting date was accepted to avoid competition with food crops. The scientists were able to develop a new package with equivalent yield performance. A new spraying technique using an oil-based insecticide and an ultra-low volume sprayer operated with a battery-powered spinning disk was also introduced. Despite these changes most of the farmers rejected the improved cotton because the cost was more than they could afford and the sole spray cotton did not fit their farming system.

This study is therefore justified on the premise that the involvement of farmers in the research process is critical to the success of any agricultural innovation and research. As can be seen in the example above, farmer's involvement in the research process could save scientists time and cost. The cost and time devoted to the development of the sole spray cotton would have been significantly reduced if the farmers had been involved in the research process from the beginning, which would have enabled the scientists to gain an understanding of the traditional farming system. One of the reasons for advocating farmer involvement in the research process is that farmers are more aware of their own problems than outsiders and hence are in a better position to identify the issues to be researched. Although this could be a debatable point, the fact remains that the involvement of farmers would increase the relevance of

research outcomes in the field. Supporting evidence also comes from the International Potato Centre in Peru (Gamsler, 1988).

The Centre scientists, on the assumption that some potatoes were stored over a long period before marketing, and since it was known that post-harvest losses occurred, considered that a declining quality of potatoes through storage would be a problem. The Centre scientists therefore devoted much effort to developing potato strains that would endure long periods of storage, but without consulting farmers. Upon completion of their work however, they were surprised to discover that what to researchers, had seemed a critical issue, was of little importance to the farmers. The farmers said that their big problem was sprouting during storage and the new strains developed by the scientists were just as bad as the traditional ones in this respect.

The integration of farmers' perspectives and knowledge into the research process could enhance the relevance and acceptability of the technology developed. No doubt there are limitations to the farmers' knowledge, especially technical knowledge, but the examples given above clearly indicate that in many cases, scientists could have improved their research results and made the technologies recommended more acceptable if farmers' knowledge is seriously incorporated into the communication research process. The incorporation of farmers' knowledge into the agricultural research and innovation process is steeped in the participatory paradigm which requires a shift in the way individuals are considered, from passive recipients to active agents of development efforts. There are a number of reasons for this shift, a major one of which is presented by Ascroft and Masilela (1994), "If peasants do not control or share control of the processes of their own development, there can be no guarantee that it is their best interest that is being served." Common features of this perspective are the emphasis on people, the endogenous vision of development, and the attention to power and rights

issues. It recognizes that people - rather than technology-oriented approaches are required to find the right balance in achieving economic, social and environmental sustainability (Van de Fliert 2007). The underlying goal of participation is, to empower communities, groups or individuals to determine their own directions, objectives and options for change, make well-informed decisions, take collective action to achieve their goals and monitor and evaluate the initiative if they are getting where they want to be.

The goal of participation is to empower people by equipping them with capabilities and providing them opportunities to their take control and give direction to the change process in order to improve their livelihoods (Huesca, 2003). It requires open sharing of information and opinions in all directions, identifying areas of conflicting interests and collective assessment and testing of options that can fulfill needs while capitalizing on opportunities and compromising on conflicts. This places participatory communication at the core of sustainable development.

Facilitation of participatory communication processes inherently implies “giving voice”, hence power, to all parties involved. These processes should be based on a thorough stakeholders analysis. This analysis helps to understand who has what stake in the process and what functional and power relations exist amongst and within the different stakeholder groups. Understanding people’s positions, interests and relations is required to design and employ the most suitable communication and engagement methods to raise interest in and initiate the dialogue. Rather than applying a standard set of recipes from a toolbox, situation specific processes need to be designed with a clear and mutually agreed objective. The process design should be based on considerations such as existing inter- and intra-group dynamics, language choice (both from an ethnic as a vocabulary perspective), access to and suitability of

media or channels to be used, external noise that may occur and anticipated effects of both the internal processes and the external noise.

According to Joseph (1993), Participatory Rural Appraisal/Participatory Learning Action (PRA/PLA) is a set of methods drawing from the participatory paradigm, for working with village people, in line with their will. This avoids expert biases toward opinions and solutions, which allows listening to village people, the direct users.

The general philosophy of PRA/PLA is summed up as follows:

“... underlying philosophy is founded in the democratic principle that development should not be imposed from outside but should rather spring from the felt needs and aspirations of the people most directly affected. This approach aims to uncover these felt needs and aspirations. Its adoption, however, requires as a pre-requisite abandonment of those top-down, hierarchical attitudes, that (whether we care to admit it or not) almost all of us carry around with us” (Campbell and Gill 1991).

It requires a reversal of these attitudes. Rigorous rural research has increasingly demonstrated the many traditional beliefs and values. This participatory approach recognizes that rural people are capable of acting as partners, even as teachers, in the appraisal process. This in turn suggests that the traditional and basically extractive approach to data collection from such people in the past may have been wrong.

The PRA/PLA is an excellent tool to bring together development needs of the community, resources, and technical skills of government, donor agencies and non-governmental organizations. By so doing, it integrates traditional skills and external technical knowledge in the development process. The significance of its techniques is that the local communities potentially gain greater access to and control over the process of understanding and analyzing themselves, in which development workers are engaged. This would be practical when the range of methods of information collection have been utilized. This approach involves a set of tools such as community meeting, focus group discussion, record keeping, resource and social mapping, modeling,

seasonal calendar, matrix ranking, Venn diagramming, transect walk, time lines, wealth ranking, semi-structured interview, secondary data, observation, problem analysis and case studies. The varieties of tools help for improving the spread or efficiency of data collection and give wider opportunity to farmers to participate.

Local people involvement is essential at every step in the PRA/PLA process from planning the field work, through the phases of data collection, to analysis, dissemination and feedback. It encourages the local people to share accountability for the research, planning, and implementation of development. Their involvement contributes to local commitment, to see if the subsequent development activities really work, to the degree that local people feel that their inputs are taken seriously and incorporated into plans of action. This brings about greater empowerment of the people.

Chambers, Ghildyal (1985) state that Transfer-of-Technology (TOT) which represents the top-bottom approach is deeply embedded in the thinking of many professions and disciplines around the world. It is part of the structure of centralized knowledge in which power, prestige and professional skills are concentrated in well-informed 'cores' or centres. These cores or centres generate new technology which then spreads (or does not spread) to the peripheries. Highly trained civil, mechanical and agricultural engineers, medical scientists, agronomists and others develop technologies in laboratories, workshops and experiment stations, and then attempt to transfer them to would-be clients.

This approach has had some successes in industry and agriculture with resource-rich clients. For example, the development of mechanisation through combined harvesters, tractors and threshers by agricultural engineers, and the development of high-yielding technological packages by plant-breeders and others have

enabled many of the resource rich to increase their productivity and profitability. But the approach has also had severe shortcomings for the rural farmers. Within agricultural research, the participatory paradigm and its PRA/PLA system gave rise to some agricultural communication research approaches. According to Monu (1997), the Farming Systems Research and Extension (FSRE) approach was largely developed in reaction to the Transfer of Technology model. Gilbert et al(1980) hold that:

"The concept FSRE explicitly recognizes the value of the farmers' experience and their traditional experimentation as inputs into strategies for improving the productivity of existing farming systems."

In this approach, there are four successive stages in the research process description, design, testing and extension. The description or diagnostic stage is undertaken to understand the constraints, flexibility and needs within the farming systems. This information is then fed into designing, testing and extending improved technologies and strategies. Norman & Gilbert (1982) identify the FSRE approach as one that incorporates the objectives of the farm families into the research process. This involvement of the farmers ensures the use of evaluation criteria that will be relevant to them. The approach also makes effort to take into account community and societal needs. For example satisfying the short-run needs of individual farm families could lead, in the long-run, to the degradation of natural resources and increased inequalities in welfare distribution. In addition, by involving farmers, the approach draws on the pool of knowledge in the group and thereby the researcher could start with the strengths of the system, thus minimizing the time spent on 'rediscovering the wheel.'

It recognizes the locational specificity of the technical and human element. This means that for research purposes, the farm population is divided into homogeneous sub-groups. This allows the researcher and indeed the extensionist to deal with a group

of farmers with similar farming activities, social customs, access to support systems, comparable marketing opportunities and resource endowment. The process used is dynamic and interactive with links in both directions among farmers, researchers and extensionists. Unlike the Transfer of Technology approach, the FSRE approach is concerned with the entire farming system. Thus, it is able to deal with technical and non-technical or institutional issues. It can therefore be said to be more holistic than the Transfer of Technology model.

Acker & Sungusia (1986) state that the Farming Systems Perspective (FSP) identifies farmers' most pressing problems, the best expansion opportunities and the appropriate technology to solve those problems while exploiting opportunities as they come. By this process it focuses attention on to recommendations most likely to be rapidly absorbed by local farmers and enhancing the cost effectiveness of research and extension efforts. However, Monu (1997) drawing on Chambers and Liggins (1987) also states that the practitioners of the FSRE model have fallen short of their theoretical model. Although scientists have succeeded in working with farmers in diagnosis and testing, the:

"...information is extracted from the farmers and their farms and analyzed by scientists to diagnose and prescribe for the farmers ... The key decisions about what to try and what to do remain with the scientists" (Chambers & Liggins, 1987).

Secondly, the FSRE model assumes a multi-disciplinary collaboration. This cooperation between social scientists and agricultural scientists is hard to come by. As Rhoades & Booth (1983:2) have observed:

"Differences in perception and role definitions between biological and social scientists result in a mutual respect that is miserably lowthe upstart of this disciplinary tribalism (is) that social and biological scientists tend to line up on opposite sides of the fence and throw spears."

Monu (1987) analyzing Rhoades & Booth says that perhaps this 'tribal warfare' could be partly attributed to the fact that the conventional methods of social investigation have not produced the relevant, useful and timely information required. In the desire of the social scientist to have a comprehensive database, the agricultural scientist could be frustrated with the endless process of socioeconomic data collection. It is further argued that like the Transfer of Technology, the Farming Systems Research and Extension (FSRE) lack "explicit focus on resource poor farmers" since resource-rich farmers are seen as better informants and better collaborators. These resource-rich farmers who have the resources to experiment with the technology being developed are also seen as the most effective group for diffusion. This implies that in most of the on-farm trials that are undertaken most of the collaborators are resource-rich farmers whose conditions are very different from the resource-poor farmers, who form the majority of African farmers.

Owing to the perceived failure of the FSRE, Chambers & Ghildyal (1985) and Chambers & Jiggins (1987) argue that in order to truly increase farmers' participation in the research process and to make the research more relevant to peasant farmers, a change in the formulation of the FSRE model is required. Their model is referred to as the Farmer-First and Last (FFL) model. The model starts:

"...not with scientists and their perceptions and priorities, but with RPF (Resource Poor Farmers) families and theirs'. It begins with a systematic process of scientists learning from and understanding RPF families, their resource needs and problems. The main locus of research and learning is the resource-poor farm, rather than the research station and the laboratory. Research problems and priorities are identified by the needs and opportunities of the farm family rather than by the professional preferences of the scientist. The research station and the laboratory have a referral and consultancy role, secondary to, and serving, the RPF family. The criteria of excellence is not the rigors of on-station or in-laboratory research, or yields in research station or resource-rich farmer conditions, but the more rigorous test of whether new practices spread among the resource poor" (Chambers & Ghildyal, 1985).

In other words the resource poor farmers should drive the process of research and innovation so as to meet their needs. The role of the scientist should be that of a consultant and a collaborator while the main research and development location is the farmer's fields and conditions. Also, the physical features of research and development are mainly determined by farmers' needs and preferences.

According to Grenier (1998), development as planned and implemented for the last 30 years has placed unprecedented pressures on the planet's soils, watersheds, forests, and other natural resources. Some development solutions from outside are based on incorrect assumptions, are not economically feasible or culturally acceptable, and are often abandoned (for example, techniques are too complex or require too much maintenance). Some of the technical solutions are introduced to solve problems not perceived at the local level and are abandoned. While development interventions tend to benefit small numbers of people from relatively privileged groups, what we see is that top-down planning fails to promote effective natural-resource management at the local level and in most cases dependencies have been created by an outside world that orders and demands (through laws and natural resource regulations) but does not truly contribute to development. Communities are often left to find their own means (de Vreede 1996).

Development efforts that ignore local circumstances, local technologies, and local systems of knowledge have often wasted enormous amounts of time and resources. Compared with many modern technologies, traditional techniques have been tried and tested; they are effective, inexpensive, locally available, and culturally appropriate; and in many cases are based on preserving and building on the patterns and processes of nature. Western techno-scientific approaches are an insufficient response to today's complex web of social, economic, political, and environmental

challenges. The paradigm in support of - one technology, one knowledge system or one development benchmark fits all|| has been debunked. Whereas Western science attempts to isolate a problem - to eliminate its inter-linkage with various other factors and to reduce a problem to a small number of controllable parameters, traditional approaches held by farmers usually examine problems in their entirety, together with their inter-linkages and complexities (Shankar 1996).

In the field of agriculture, extension service propagates development because it provides opportunities for agricultural professionals to make expert western technological contribution in identifying, adopting and sharing technology in a way suited to diverse ecological and socioeconomic conditions (London Lane & Powell, 1996). According to Campbell (1999), in most poor countries, the extension service is mainly managed by the public sector or state. Toness (2001) emphasizes the important role of public extension in countries where most of the population is resource-poor and largely dependent on agro-based industries.

The traditional approach in public extension is the top-bottom approach where extension agents package ideas developed and tested by researchers into messages and farmers are told what to do. According to Chambers (1993), Kibwana (2000) and many other workers, the top-bottom approach does not bring about sustainable development because it neither builds on local farming experiences nor does it promote farmer empowerment.

In most agricultural sciences centres in which research is conducted are experimental stations, glasshouses and laboratories, supported by back-up services, with provision for controlled conditions, with excellent access to inputs, without significant cost or labor constraints, and without the requirement that a crop must be marketed and make a profit. Scientists in experiment stations, glasshouses and

laboratories generate, or test, new technologies and then pass them over to extension services to transmit to farmers.

In practice, the transfer of technology often presents intractable problems with resource-poor farmers. When 'good' technologies are not adopted by Peasant farmers; both social and agricultural scientists attributed this to ignorance. The large-scale social science research in India in the 1960s on 'diffusion of innovations' assumed that the technologies they made available to farmers were good and appropriate. A major premise was that, if small farmers did not adopt them, it was because they not know enough about them. The prescription that followed was increased information dissemination. In the view of the Extension Directorates of Indian Agricultural Universities they have the relevant knowledge, Ignorant farmers do not and they must be taught. From the examples of the cotton and potato farmers earlier shared, it is obvious that when peasant farmers do not adopt technology it is usually not out of ignorance but because the technology does not fit their needs as well as their physical, social and economic considerations.

The participatory approach to agricultural development entails that the roles of agricultural professionals shift from that of teaching and ordering farmers to farm properly to that of assisting farmers to make better farming decisions. However, as reported by Roling & Pretty, 1997; Toness, 2001, in many developing countries, extension methodology still remains fixed in the context where professionals regard themselves as the only experts who have all the answers.

In view of the above this research is intended to examine the existing communications approach or strategy employed by the National Agricultural Extension and Research Liaison Services in communicating agricultural research and innovation

in two of its adopted villages of Nassarawn-Buhari and Sakadadi. It will further analyze the approaches and make relevant recommendation.

Brief History of NAERLS

The National Agricultural Extension and Research Liaison Services (NAERLS), Ahmadu Bello University, Zaria, is one of the Research Institutes under the Federal Ministry of Agriculture and Rural Development. NAERLS is charged with the primary responsibility for researching into agricultural extension approaches and adoption processes. It is also involved in overall coordination of research and extension linkage activities nationwide and the collation, evaluation and dissemination of agricultural technologies to rural farm families and other interested end-users through the building of capacity of field extension workers. The Institute is generally concerned with aspects related to technical training of extension workers and promotion of food security and poverty alleviation programmes among farmers.

NAERLS grew out of the Specialist Services Section of the former Northern Nigeria Ministry of Agriculture to provide a formal link between the Institute for Agricultural Research (IAR) and the Ministry of Agriculture in 1963 as Research Liaison Section (RLS) to ensure that research results get to farmers in adoptable form. In 1968, following the dissolution of the regional structure, RLS was transferred to IAR and became known as Extension and Research Liaison Section (ERLS). Consequently, the Ahmadu Bello University (ABU) Council, in accordance with Statute 19, separated ERLS from IAR in 1975 and renamed it the Agricultural Extension and Research Liaison Services (AERLS). Thus, AERLS became an autonomous Institute within the Agricultural Complex of the University under the then Federal Ministry of Science and Technology (FMST), similar to IAR.

Following the reorganization of the research institutes by the then Federal Ministry of Science and Technology, a number of changes in the mandates of several research institutes were made in April 1987. In recognition of its contribution to successful extension and research support services in the Northern States of Nigeria, AERLS thus earned a national mandate which transformed it to the National Agricultural Extension and Research Liaison Services (NAERLS). To execute its mandate effectively, NAERLS immediately established 5 zonal offices, one each in the 5 agro-ecological zones of Nigeria with the following mandate:

- Planning and coordination of agricultural extension
- Promote dissemination of agricultural research results /technologies
- Research and develop agricultural extension methodologies
- Monitor and evaluate extension delivery services nationally
- Monitor agricultural performance and
- Provide input to policy and feedbacks to research

1.1 Statement of the Research Problem

For too long agricultural researchers and innovators have grappled with trying to get farmers to adopt research findings and innovations which in their view is best suited to meet their needs. Many years of research efforts have resulted in thousands of technologies, which are now available. But the assessment of average yields at farmers level indicates that only a few improved technologies have been adopted, (IITA Monograph No. 21 PP. 1).

The inadequate participation of farmers in the design of most of these technologies and the poor communication approaches adopted by extension agents have contributed to this development. Despite the unsatisfactory results of earlier campaigns, the government and its research institutions still consider a continued

diffusion of innovation in agricultural practices as the best bet. This strategy remains basically top-down in approach and farmers still basically remain passive receptors of information, which may not necessary meet their needs, while their involvement and participation in technology development remains low. Effective communication which includes farmer participation is a prerequisite for the successful uptake of any technology.

The purpose of this study therefore is to explore the perceived communications practices in use by the National Agricultural Extension and Research Liaison Services (NAERLS) Zaria to deploy the end product of agricultural research and innovation using two out of its adopted villages as a case study.

1.2 Aim of the Study

The aim of this study is to establish that participatory communication is at the heart of change. No matter the sophistication of any innovation, its adoption or level of its effectiveness depends on the participation of all key stakeholders right from concept formation, product development to deployment.

1.3 Objectives of the Study

- i. This study will explore the existing communication process in NAERLS.
- ii. It will also assess the level of participation of the resource poor farmers in NAERLS' adopted villages in the design of agricultural research and innovation.
- iii. It will locate the gaps in current agricultural communication efforts and suggest ways of enhancing agricultural communication approaches at NAERLS and the Nigerian agricultural system in general.

1.4 Research Questions

This study seeks to ask the following questions:

- i. What is the nature of the communication strategies adopted by NAERLS in the adopted villages?
- ii. To what extent are the local farmers involved in the design of research and agricultural innovations?
- iii. Why do farmers reject agricultural research and innovation products?
- iv. Why do profuse diffusion of agricultural information not translate into farmer's uptake of what is diffused?
- v. Does educational and social economic status play a role in effective information uptake?
- vi. Do farmers resist or react to research and innovation products that do not capture their needs, aspirations and realities?
- vii. Is it possible that they value their indigenous knowledge and applications above any outside innovation?
- viii. How can rural farmers readily accept agricultural research and innovations?
- ix. How can the communication of agricultural research and innovation products be communicated successfully among farmers?

To answer these questions, this study will investigate the communication patterns involved in agricultural research and innovations between the NAERLS and rural farmers. This perspective was chosen because no innovation ever gets accepted without effective communication. Rogers has observed that "Communication is an important element throughout the social change process; all explanations of human behavior directly stem from an examination of how individuals acquire and modify ideas through communication with others.'

1.5 Significance of the study

This research contributes to knowledge by examining existing communications approaches used in agricultural research and innovation at the National Agricultural Extension and Research Liaison Services, (NAERLS.) In Particular, this research identifies the gaps inherent in the processes, critiques it and offers recommendations that will enhance existing practices so as to bring about change in communication systems that will ultimately culminate in increased adoption of modern agricultural technologies.

1.6 Scope and Limitations

The scope of this study is limited to the communication analysis of agricultural research and innovation in Nigeria with the National Agricultural Extension and Research Liaison Services (NAERLS) Zaria, (the nation's flagship agricultural communication institution) as case study. The study identifies two communities where agricultural research and innovations have been implemented and analyses the communication strategy or methods from the point of conception to testing and implementation. These communities are Nassarawan-Buhari and Sakadadi

1.7 Terminologies

1. Agricultural Research

Agricultural research can be broadly defined as any research activity aimed at improving productivity and quality of crops by their genetic improvement, better plant protection, irrigation, storage methods, farm mechanization, efficient marketing, and a better management of resources.

2. Innovation

Innovation is the process of creating and putting into use combinations of knowledge from many different sources. This knowledge may be brand-new, but usually it is new combinations of existing knowledge. To be termed innovation, the use of this knowledge has to be novel to the farmer or the farmers, neighbors and competitors, but not necessarily new globally.

3. Communication

Communication is the basis for all human interactions and provides the means for individual or group of people to relate reciprocally and hence enable groups to function. According to Rogers et al. (1981), communication is a process that involves the exchange of ideas between two or more individuals in an attempt to arrive at convergence in meaning.

4. Adopted Villages

Adopted village concept is an extension model whereby villages with potential impact (that is, village where new ideas have been introduced in the past and households within the villages are found to be receptive and willing to adopt the new technology) are selected to be developed in an integrated manner. This includes economic development, infrastructure development and other aspects of human development such as education, health, drinking water supply etc.

CHAPTER 2

REVIEW OF RELATED LITERATURE

2.0 Introduction

The driving focus of the research is effective communication that will bring about increased level of adoption of modern agricultural research and innovation outcomes, which the study argues is at the heart of change. In essence, the reason for communication is to facilitate a change: Change in negative attitudes, behaviours, perceptions, practices and conditions that lie at the root of underdevelopment. Based on this, our review shall revolve around communications in development, Participation and other models of communication which the study largely contends is at the heart of change.

As a matter of fact, scholars in the discourse of development communication have extensively written and theorized in order to create a large understanding of global issues on the inextricable link between communication and sustainable change. Scholars like Wilkins, Panos, Okwori, Mefalopulos, Gray-Felder, Deane, Emenyeonu Chandler, Garland, Servaes, and others have strongly explored the necessity of the appropriate use of communication for change. Efforts to use communications to create development are based both on theories about nature and purpose of development as well as assumptions about how people acquire information. Before we pick on the issue of communication, we need a clear and incisive understanding and definition of the concept of communication for change or development. We shall find answers to some of these questions in this review of related literature.

2.1 Communication in Development

This first section of this chapter explores the shift in thinking about communication for development that has revolved around a core difference between the

meaning of communication: as a simple transfer of information or as a social process through which meaning is created and codified. These contrasting ways of conceiving of the meaning of communication have created two main branches of communication for development that can be differentiated by their core beliefs about the roots of development problems. On the one hand, behavior change communication generally focuses on the lack of information and the need for individual behavior changes while participatory or empowerment communication points to the need to change collective social processes and society wide power imbalances. (Melkote 2003).

According to Servaes (1999), it has only been in the past 15 years or so that culture and communication have been recognized as having a fundamental impact on the whole question of development. Now most experts agree that there is hardly a development challenge that can be met successfully without changes in the world-views, attitudes and behaviors of the people involved.

Communication is the basis for creating awareness, consensus building, making informed decisions, resolving conflicts, and generating participation in processes of change and development. When addressing any development context- population issues, violence, food security, use and conservation of natural resources, to name a few- it is large scale change in the way people live and work with each other that will make a difference (Fraser & Restrepo-Estrada 1998). This communication occurs within and between formal and informal units of people. At the most simple level, communication takes place *intra*-personally, that is within an individual as a stream of consciousness dialogue. Communication between two or more people referred to as *interpersonal*. This interpersonal communication can take place between or among individuals and small groups; local, regional, national and international networks or

coalitions; formal organizations; political units; or other groupings of people (Rosengren2000).

Traditionally, communication efforts have tended to fulfill three main roles in development practice. First, to inform and persuade people to adopt certain behaviors and practices that are deemed beneficial to them; to enhance the image and credibility of the development organizations involved in the efforts; and last, to enable community consultation on specific initiatives (Deane & Gray-Felder 1999). The focus in more recent years has shifted to providing a forum or platform for dialogue, debate, and participation for all sectors of society, especially those that have been underrepresented.

Overall, as theories of how development happens have moved away from top down donor driven approaches towards more participatory and community centered methodologies, so too has communication theory. Rogers and Hart (2001) now describe communication for development as social change brought about by communication research, theory and technology designed to increase people's social and material advancement. Scientific research is traditionally based on values dating back to Aristotle and the Enlightenment, namely reasoning, rationality and objectivity (Melkote 2003). Such researches grounded in the positivist belief that there is a single truth, separate from any human observer, which can be uncovered through a rigorous application of the scientific method. Scientists from this background hold that experimental techniques yield results that can then be generalized into models and theories and applied to other situations. This way of looking at the world leads to the idea that the only factor necessary for development to occur in a given area is the simple transfer of new information and technologies to the intended end users (Jiggins & Röling 1997).

Dominant in academic circles between 1945 and 1965, the modernization theory of development, which has grown out of positivist thinking, is based on the idea that traditional cultures, often characterized by authoritarianism, in-fighting, low levels of individualism, resistance to innovation, limited control over their environment, and a lack of formal institutions, are at the root of underdevelopment (Rogers 1969). The answer then, is the application of Western neoclassical economic development models to help post-colonial states to “catch up” with Western progress in their economic growth, political systems, education levels, and life expectancy (Rostow 1960; Huntington 1971). Because of this context, communication for development interventions have their roots in post-World War II international aid programs as a way to get the necessary modern information to developing country populations in order to change their attitudes, ideas and values and therefore their behavior (Melkote 2003). Information was seen as the basis for development and crucial to creating the necessary social environment for development to succeed. At this time it was thought that a country’s level of development could be measured not only through gross national product (GNP) but also in part through the depth of mass media penetration (Waisbord 2001).

This view of development has, in turn, informed several communication theories: diffusion of innovation (Rogers 1969, 1995), social marketing (Kotler & Roberto 1989, Walsh *et al.* 1993) and “edutainment” (Bandura 1977). In their early forms and in many cases into the present, these strategies are delivered as a mass one-way transfer of information from those who have it to those who do not. They are often delivered as organized communication campaigns directed at a selected audience for a period of time in order to reach a specific set goal (Snyder 2001). This “transmission” model assumes that unless there is something wrong with the channel (poor radio

reception, bad printing, noise, etc) that the person receiving the message will get the exact information that the communicator intended them to have (Leeuwis 2004). As dominant development theories began to receive widespread criticism for their Western biases and top-down approaches (Dag Hammarskjöld Foundation 1975; Frank 1966; Haq1976), in the mid-1970s several of the main thinkers from the modernization school of communication, such as Rogers (1976), began to publicly recognize the cultural biases that had shaped early thinking in diffusion of innovations, social marketing and edutainment theories (Huesca 2003). This shift in thinking was in large part due to the poor results and lack of change that both developments in general and behaviour change campaigns in particular were bringing about (Waisbord 2001).

In particular, communication practitioners began to notice that even in cases where the message appeared to be received by the target populations without any problems, often the intended meanings were not conveyed and the expected changes in conduct did not occur (Leeuwis 2004). Because of this, some of the basic guiding premises of the modernization theory began to be re-examined (Dube 1988; Spybey 1992). One idea that faced re-examination was that societies are fair in their distribution of resources to all individuals and groups and that all people, with just a little help and their own effort, can share in these resources. This assumption led to the idea that people who do not possess the resources or the proper attitudes to participate fully in society need to be helped and taught new skills. This “victim blame hypothesis” fell apart as large sections of the world continued to experience a state of underdevelopment in spite of receiving much aid (Melkote 2003).

Similarly, critics in Latin America noted that the outcomes of development projects often coincide with interests of the elites, indicating that development cannot be attained through simply helping the individual without addressing societal power

structures (Huesca 2003). Power imbalances were also linked to ownership of the communication channels. As mass media become more prevalent in most countries around the world, the impact of communication messages should be increasing.

However, as Gumucio Dagrón points out, in Latin America,

The higher concentration of media houses in fewer hands has resulted in a loss of diversity and quality programming...local programming on social issues has disappeared from private television, leaving room for all kinds of low level and bad taste entertainment that sells well (2003; 2). This results in a dearth of socially positive messages and an abundance of simplistic content that often contains violence, stereotyping, racism and sexually promiscuous behavior (Waisbord 2001).

Researchers such as Buchanan *et al.* (1994) and Röling (1988) began to advocate for new focus on the process of communication and for using the specific local socio-cultural context as the basis for designing intervention strategies. Because of these shifts in thought, modernization theory-based communication models are slowly being adapted to become more compatible with communication theories that focus on participation, social change, learning and empowerment.

Participation

Participation, in the development context, is a process through which all members of a community or organization are involved in and have influence on decisions related to development activities that will affect them. That implies that development projects will address those community or group needs on which members have chosen to focus, and that all phases of the development process will be characterized by active involvement of community or organization members.

People initiate, discuss, conceptualize and plan activities they will all do as a community. Some of this may be related to more common development areas such as building schools or applying for land tenure. Others may be more political, such as removing corrupt officials, supporting parliamentary candidates, or resisting pressures

from the elites. Yet others may be cultural or religious in nature--organizing a traditional feast or prayers for an end to the drought.

Most will agree that participation in decision-making is the most important form to promote. It gives people control of their lives and environment. At the same time the people acquire problem solving skills and acquire full ownership of projects--two important elements which will contribute towards securing the sustained development of their community.

Criticism of Participation

Certainly, participatory communication has not lacked critics. Even though vindicating some tenets of participatory theories, other positions argued that they were elaborated at a theoretical level and did not provide specific guidelines for interventions.

One problem in participatory models was that it was not clear that communities needed to be involved for certain results to be achieved. In some cases such as epidemics and other public health crises, quick and top-down solutions could achieve positive results. Waisbord states that participatory communication ignores that expediency may also positively contribute to development. Belaboring through grassroots decision-making process is slower than centralized decisions, and thus not advisable in cases that require prompt resolutions. He also states it might be a good long-term strategy but has shortcomings when applied to short-term and urgent issues. Another problem he continues was that participation in all stages does not have similar relevance. It was not clear what participation entailed. If decisions were made outside of the community and the latter was assigned the role of implementing and evaluating results, some positions argued, participation was limited to instances that depended on

decisions previously made, McKee 1992. It was not true participation and, therefore, maintained power inequalities.

Another problem was that the focus on interpersonal relations underplayed the potential of the mass media in promoting development as participation and process. Little attention was paid to the uses of mass media in participatory settings, an issue that is particularly relevant considering that populations, even in remote areas, are constantly exposed to commercial media messages that stand in opposition to the goals set by programs. This lack was particularly evident in Freire's theory of dialogical communication that is based on group interactions and underplays the role of the mass media.

Participatory approaches usually avoided the issue that people who lived in nondemocratic societies might be wary to participate out of fear of retaliation.

Moreover, people can be manipulated into participating. This would violate local autonomy and the possibility that members might not be interested in taking an active role. Critics argued that participatory communication, like social marketing, could also be seen as foreign, pushing for certain goals and actions that have not resulted from inside communities. Participatory communication did not offer the chance not to participate, and implicitly coerced people to adopt a certain attitude. Social marketers charged that participatory approaches were too idealistic, falling short from offering specific practical guidelines, and offering recommendations with limited impact. These shortcomings are particularly pronounced when funds for development communication are short and funding agencies are interested in obtaining cost-effective results not just at the local but also the national level. Other critics, particularly in Asia, thought that participatory models were premised on Western-styled ideas of democracy and participation that do not fit political cultures elsewhere.

To these criticisms, advocates of participatory models admitted that divisions and conflicts might result but, they argued, the answer should be teaching negotiation and mediation skills rather than opting for interventions that disempower people in the name of consensus-building. Although advocates of participatory theories viewed their critics as favoring government centralization and leaving power inequalities intact, they admitted that some original premises needed to be revised White 1994. Participatory approaches needed to:

- Be sensitive to the potential convenience of short-term and rapid solutions
- Recognize that recommendations for participation could also be seen as foreign and manipulative by local communities (just like modernization theories).
- Translate participatory ideas into actual programs.
- Be aware that the communities may be uninterested in spending time in democratic processes of decision-making and, instead, might prefer to invest their time on other activities.
- Recognize that communities are not necessarily harmonious and that participation may actually deepen divisions.

Servaes1996, admits that “participation does not always entail cooperation nor consensus. It can often mean conflict and usually poses a threat to existent structures...Rigid and general strategies for participation are neither possible nor desirable.” To prevent some of these problems, it was suggested that it was preferable that projects be carried out in communities where agencies already had linkages (McKee 1992) Previous knowledge of problems and characteristics of a given community was fundamental to identify activities and define projects. Existing linkages could also provide agents that were familiar with (or even were from) the community who could assist in creating organizations and networks to stimulate participation. No

previously determined set of activities was advisable if the interests and dynamics of communities were not known.

Workers would also provide important feedback information about the progress of projects through regular, face-to-face contact with participants. These practices function as a sort of transmission belt for making sure that community issues are addressed and that members have a voice in deciding future courses. The peril is to focus solely on professional technicians and leaders without consideration of involving the community at large. Against criticisms that participatory communication leads to the existence of a myriad, disconnected projects carried out by multiple NGOs, coordination plans were deemed necessary. Providing a sense of orientation and organization was required to prevent that development efforts become too fragmented and thus weaker. Because NGOs are closer to communities than governments and funding agencies, they have the capacity to respond relatively quickly to demands and developments. But without a more encompassing vision, projects may only obtain, at best, localized results that fail to have a larger impact. It was also recommended that relying on grassroots media was not sufficient. Populations needed media education to develop skills to be critical of commercial media and to develop alternatives that would help them gain a sense of empowerment and counter other messages. Yet, it was undeniable that local media provided a sense of ownership and participation that was key to sustainable development and could not be replaced by any other strategy.

Responding to critics who were impatient with obtaining “results,” participatory approaches suggested that development communication requires a long-term perspective that is usually missing among funding agencies and governments interested in getting quick results and knowing whether efforts pay off. Participatory theorists turned the criticisms about “timing” and “impact” onto their critics, arguing that the so-

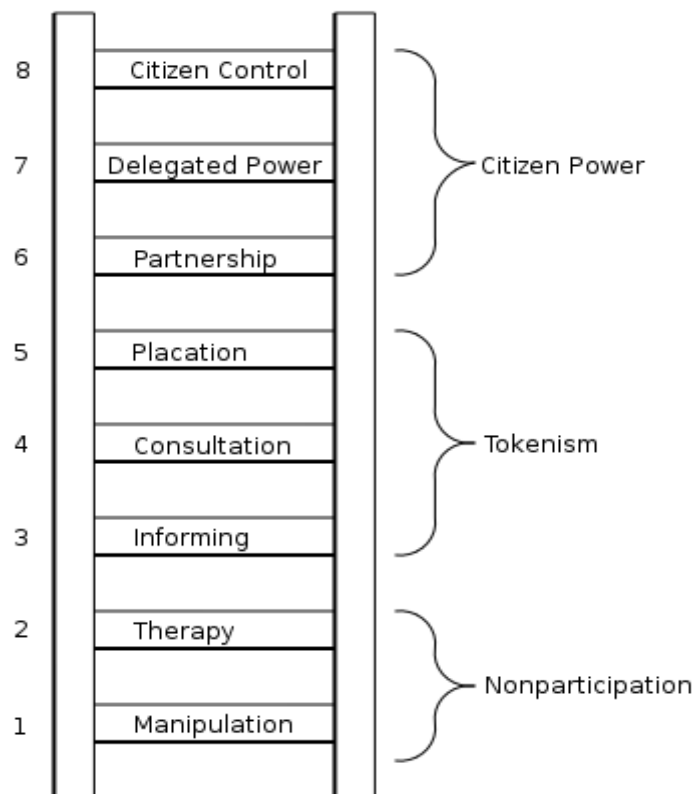
called problems of participatory approaches in “showing results” did not originate in the model but in how organizations approach development communication (Melkote 1991). Short-term projects that are prone to be terminated according to different considerations make it difficult to promote participation and examine the results of interventions in the long run. The interests of funders and politicians, who were urged to prove effectiveness of investments, ran against the timing of participatory development communication projects. For the latter to be possible, NGOs, funding agencies and other actors involved needed to be sensitive to the fact that grassroots projects cannot be expected to “produce results” in the manner of top-down interventions. Neither community development nor empowerment fit the timetables of traditional programs.

Typologies of Participation

Typologies are a useful starting point for differentiating degrees and kinds of participation. Providing a series of ideal types along which forms of participation may be ranged, most typologies carry with them implicit normative assumptions which place these forms of participation along an axis of ‘good’ to ‘bad’. Many of the typologies and ‘ladders’ of participation that have been produced focus on the intentionality, and associated approach, of those who initiate participation.

Arnstein’s 1969 ladder of participation is one of the best known. Originally developed in the late 1960s, it retains considerable contemporary relevance. ‘Citizen control’ appears at the top of the ladder, with a category of ‘non-participation’ at the bottom, in which therapy and manipulation are placed. Arnstein’s point of departure is the citizen on the receiving end of projects or programmes. She draws a distinction between ‘citizen power’, which includes citizen control, delegated power and partnership, and ‘tokenism’, in which she includes consultation, informing and

placation. It is worth noting the part that the activities she associates with ‘tokenism’ play in the efforts – and indeed the definitions of development organizations claiming to promote participation. The World Bank, for example, includes both giving information and consultations as forms of participation, and goes on to equate the provision of information with ‘empowerment’ World Bank (1996). Consultation is widely used, north and south, as a means of legitimating already-taken decisions, providing a thin veneer of participation to lend the process moral authority. Its outcomes are open to being selectively read and used by those with the power to decide. Rarely are there any guarantees that what is said will be responded to or taken into account.



Arnstein's ladder of participation

While Arnstein's ladder looks at participation from the perspective of those on the receiving end, Jules Pretty's (1995) typology of participation speaks more to the user of participatory approaches. His typology is equally normative: going from 'bad' forms of participation – the inclusion of token representatives with no real power, which he characterizes as manipulative participation, and passive participation subsequent to decisions that have already been taken – to 'better' forms, such as participation by consultation and for material incentives. 'Functional participation' captures the form of participation that is most often associated with efficiency arguments: people participate to meet project objectives more effectively and to reduce costs, after the main decisions have been made by external agents. This is perhaps the most frequently found type of participation in development (Rudqvist and Woodford-Berger, 1996).

Pretty's last two categories evoke some of the professed goals of those who promote and use participatory approaches in community development. 'Interactive participation' is described as a 'learning process' through which local groups take control over decisions, thereby gaining a stake in maintaining structures and resources. The last categories of 'self-mobilization', where people take the initiative independent of external organizations, developing contacts for resources and technical assistance, but retaining control over these resources. Self-mobilization was, and to some extent remains, very much the nirvana of participation in the 1980s and 1990s, before talk of 'participatory governance' – and a very different way of figuring the state into the equation – changed the frame.

Typology	Characteristics of Each Type
<i>1. Passive Participation</i>	People participate by being told what is going to happen or has already happened. It is a unilateral announcement by an administration or project management without any listening to people's responses. The information being shared belongs only to external professionals.
<i>2. Participation in Information Giving</i>	People participate by answering questions posed by extractive researches using questionnaire surveys or similar approaches. People do not have the opportunity to influence proceedings, as the findings of the research are neither shared nor checked for accuracy.
<i>3. Participation by Consultation</i>	People participate by being consulted, and external agents listen to views. These external agents define both problems and solutions and may modify these in the light of people's responses. Such a consultative process does not concede any share in decision making, and professionals are under no obligation to take on board people's views.
<i>4. Participation for Material Incentive</i>	People participate by providing resources, for example labour, in return for food, cash, or other material incentives. Much on-farm research falls in this category, as farmers provide the fields but are not involved in the experimentation or the process of learning. It is very common to see this called participation, yet people have no stake in prolonging activities when the incentives end.
<i>5. Functional Participation</i>	People participate by forming groups to meet predetermined objectives related to the project, which can involve the development or promotion of externally initiated social organization. Such

involvement does not tend to be at early stages of project cycles or planning, but rather after major decisions have been made. These instructions tend to be dependent on external initiators and facilitators, but may become self-dependent.

6. Interactive Participation

People participate in joint analysis, which leads to action plans and the formation of new local institutions or the strengthening of existing ones. It tends to involve interdisciplinary methodologies that seek multiple perspectives and make use of systemic and structured learning processes. These groups take control over local decisions, and so people have a stake in maintaining structures or practices.

7. Self-Mobilization

People participate by taking initiative independent of external institution to change systems. They develop contacts with external institutions for resources and technical advice they need, but retain control over how resources are used. Such self-initiated mobilization and collective action may or may not challenge existing inequitable distribution of wealth and power.

Pretty's typology of participation

Both Arnstein's and Pretty's typologies describe a spectrum defined by a shift from control by authorities to control by the people or citizens. Yet, the end-points are rather different. Citizen control goes much further than self-mobilization. For, as Pretty notes, 'self-initiated mobilization may or may not challenge existing distributions of wealth and power'. Indeed, local self-mobilization may be actively promoted by the state and international agencies as part of efficiency goals that are entirely consistent with a neo-liberal approach to development. What Pretty's typology helps make clear is that the motivation of those who adopt and practice participatory approaches is an

important factor – if by no means the only one – in shaping interventions. And what Arnstein’s points out is that participation is ultimately about power and control.

A further typology, put forward by Sarah White (1996), offers some insights into the different interests at stake in various forms of participation used less as a ladder and more as a way of working out how people make use of participation, it can be a useful tool to identify conflicting ideas about why or how participation is being used at any particular stage in a process. As noted earlier, typologies such as these can be read as implicitly normative, suggesting a progression towards more ‘genuine’ forms of participation. When these forms of participation are contextualized, however, they become more ambiguous. Participation through information sharing, for example, might limit more active engagement, although it could be argued that transparency over certain kinds of information opens up the possibility of collective action in monitoring the consistency of rhetoric with practice. But keeping a flow of information going is in itself important, rather than being simply a ‘lesser’ form of participation.

Nominal Participation is often used by more powerful actors to give legitimacy to development plans. Less powerful people become involved in it through a desire for inclusion. But it is little more than a display, and does not result in change.

Instrumental Participation sees community participation being used as a means towards a stated end – often the efficient use of the skills and knowledge of community members in project implementation.

Representative Participation involves giving community members a voice in the decision-making and implementation process of projects or policies that affect them. For the more powerful, representative participation increases the chances of their intervention being sustainable; for the less powerful, it may offer a chance for leverage.

Transformative Participation results in the empowerment of those involved, and as a result alter the structures and institutions that lead to marginalization and exclusion.

Whites typology

Transformative participation may fail to match with citizens' expectations of the obligations that the state has to them. When 'empowerment' boils down to 'do-it-yourself' and where the state abdicates its responsibilities, then resistance rather than enthusiastic enrolment might well be the result of efforts to engage citizens. What people are participating in, conditions how their participation might be evaluated. Delegated power over choosing the color of paint for a clinic's waiting room in the name of 'patient involvement' – in the absence of any involvement in decisions on what the clinic actually does – may count for little in transforming power relations. And, at the other end of the scale, even the most nominal forms of participation can give citizens a foot in the door if there has been no constructive engagement with them before. Much depends on the context and on those within it.

Different purposes equally demand different forms of engagement by different kinds of participants. A process that sought only the engagement of a small group of articulate elite community members is something very different to one in which community members delegate power to such group to engage with the authorities, remaining content to receive information and be consulted on key issues.

Participation in Agriculture

Stemming from the argument of the need for people to participate in their own development, it is necessary to also review the involvement of farmers in agricultural research. Those who have strongly advocated for greater involvements of the farmer in the research process argue that the failure of the 'Green Revolution' to improve the living conditions of the small-scale farmers could be attributed to the incompatibility of the Green Revolution technology with the conditions of the farmers. The green revolution was a programme introduced by the government of President Shehu Shagari in April 1980, aimed at increasing food production and raw materials with the use of

modern farming techniques and machines(mechanization), To ensure its success, the federal government of Nigeria, provided agrochemicals, improved seeds/seedlings, irrigation systems, modern mechanization tools, credit facilities and favorable pricing policy but it did not achieve its objectives because the primary users of these technology were not consulted in the programme design. Their voices were absent and so there was poor uptake of the Green Revolution technology. The argument further points out that had the small-scale farmers been involved in the development of the technology; the scientists would have been made aware of the group specificity of the technology. It is not surprising therefore that since the 1970s different models/approaches have been put forward to improve the involvement of the farmer, especially the small scale farmer in the research process.

Constructivism, Sustainability and Empowerment Communication

In contrast to the positivist worldview, an alternative paradigm has evolved that recognizes that what we call truth is constructed through social interaction. This new paradigm is known as constructivism, and it holds that reality itself is made up of the stories we tell each other and ourselves and that communication and dialogue are the methods we use to bring our internal world and the external world into alignment. They are the means by which new ideas and versions of reality are jointly created, agreed upon, and transmitted to others, Jiggins & Röling 1997. In this view communication serves to actively construct meaning rather than merely convey it.

Since there are multiple versions of reality depending on who is asking, observing and interpreting, people often have conflicting goals, attitudes, values, aspirations and standards, the negotiation of which can be observed in the interactions between people in any community, organization or household. Human contact and communication are therefore continuous opportunities for any combination of struggle,

negotiation, accommodation or agreement. Rölöing 1994. Because of this, new theories of development and communication hold that there are no universal approaches to creating change that can work in all situations

Huesca 2003. While both development and communication theories were undergoing changes before the constructivist paradigm became wide-spread; this paradigm has contributed to the shift in the goals of development that has occurred over the past thirty years. Dependency theories that emerged from Latin America in the mid-1960s, argued by authors such as Baran 1957, Frank 1966 and Escobar 1995, posit that the source of the problems lies in the very concept of development that uses the West as its de facto model, the history of global and local politics, colonial relationships, and the manner in which colonized countries were integrated into the world economy. Dependency theorists do not believe that lack of information is at the root of development problems, but rather that underdevelopment is a direct consequence of the level of development in the Western world (Hornik 1988).

In development theories in general, there is growing recognition that the focus must shift to meeting human needs and fostering environmental sustainability rather than securing rapid economic growth or blindly following a Western model of development. According to Engel 1997, this type of development can only be achieved where people have worked out ways to live with each other; in fact, adequate social organization maybe a prerequisite for sustainable development. Many new road maps for development including the United

Nations' Millennium Development Goals call for a restructuring of political and economic systems for a more equitable distribution of benefits, personal and communal freedom from oppression, and empowerment. Melkote 2003.

The new focus on learning and social and structural change began to evolve into a branch of development theory in the 1970s that called for participation of the people in defining, analyzing and coming up with tactics for addressing their problems. Development planning processes underwent a transition from a reliance on blue-prints designed in a central office or implemented in another part of the world to more process orientated situation-specific approaches Korten 1980. Some development workers began to claim that participation in decision-making is a basic human right and one that can only be carried out through on-going communication Melkote 2003.

Participation theorists such as Beltrán 1976, Díaz Bordenave 1977, and White et al 1994 also criticized modernization approaches for confining local people to the role of passive receivers of messages telling them what to do rather than active participants capable of shaping their destinies using their own knowledge. This lack of participation is seen as the principal reason behind the failure of many communication interventions, which has led to some measure to the abandonment of communication for persuasion models. Empowerment communication is another school of thought born of dependency development theory. It acknowledges that while knowledge is generated collectively, the knowledge of those with more power is often perceived as more legitimate than the knowledge of those with less power (Melkote 2003). The emphasis on media penetration as an indicator of development ignored questions about who owned the channels of information and controlled access to what could be said on them. These critiques imply that what is necessary in development is not more information but rather social and structural changes in order to redistribute access to power and resources Waisbord 2001.

Paulo Freire 1921-1997, an educator who worked on literacy projects in slum areas of Brazil during the 1960s and 1970s, has been one of the most influential

thinkers in the areas of popular, informal empowerment communication, with what he calls conscientization: the development of a critical consciousness that has the power to transform reality. Freire viewed most development projects as superficial, authoritarian and in opposition to the interpersonal communication processes that can help people to develop a critical perspective on their situation, resulting in a sense of ownership over their lives and collective responsibility for their own liberation from oppression. He believed that the distance between teacher and student, expert and community member, researcher and researched should be narrowed so that all parties can begin to reflect on their roles and co-learn. Huesca 2003.

According to Freire 1970, communication should be used to provide a space for dialogue; exchanging views, identifying common problems, exploring solutions, reflecting on community issues and mobilizing resources. The concept of dialogue is based on repeated and reciprocal information exchange between people; it involves not only the physical acts of speaking and listening but also is embodied in the relationship between the participants. And, unlike mass-mediated dissemination messages, dialogue is generally oral, live, immediate and bound to a physical context Peters 1999. Freire's work in north-eastern 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 offered 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. 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. Freire’s ideas ran against fundamental principles in the diffusion model, namely the sender-focus and behavioral bias that it inherited from persuasion models in the United States. 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 health 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. 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, 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. Group media has helped marginal groups to speak to one another, to articulate their thoughts and feelings in the process of community organizing Hamelink 1990. Community-based forms of communication such as songs, theatre, 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: literacy, health, safety, agricultural productivity, land ownership, gender, and religion. 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. Canada’s “Fogo process” was another experience informed by similar principles in which populations living in remote areas actively produced videos to discuss community issues of people living in remote areas and to

communicate with outsiders about their concerns and expectations Williamson 1991. 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. 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 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. They expanded the concept of participation that in modernization theories was limited to voting in party and electoral politics and championed a view of democracy that implied different forms of participation at different levels. They also removed professionals and practitioners from having a central role as transmitters of information who would enlighten populations in development projects.

People, not change agents, were central to community participation. It downplayed the role of expert and external knowledge while stressing the centrality of indigenous knowledge and aspirations in development. Communication was a horizontal process, diametrically different from the vertical model that placed knowledge in the domain of modern experts.

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 Altafin1991. 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.

Several studies have shown that members of marginal groups in society actually prefer face-to-face or small group dialogue rather than mass or one-way communication Waisbord2001. These ideas have led to a surge in small community-based projects using theatre, music, storytelling, video, photography, and radio to share ideas among local people without the need for external experts Gumucio Dagrón 2001a. While communication proponents have become aware of the importance of planning and implementing well-designed communication interventions to support development goals, often there has not been a corresponding increase in support from funders, project planners and other development workers. So in an effort to garner support, as well as to reflect the shifts in thinking from behaviour change to empowerment theories of communication, a plethora of names for communication efforts have appeared, from media advocacy, to strategic communication, development support communication, communication for human development, participatory communication, and communication for sustainable agriculture Bessette 2004;

Waisbord 2005. While the field is broadly known as communication for development now, there is a new movement towards communication that fosters social change Riaño 1994; Servaes et al. 1996; Wilkins 2000.

Communication for Social (and Environmental) Change, while clearly based on participatory and empowerment communication theories, is a “distinct way of doing communications- and one of the few that can be sustained...largely due to the fact that ownership of both the message and the medium- the content and the process- resides with the individuals or communities affected” Deane & Gray-Felder 1999; 4. This model prioritizes local content and media ownership so that the voices of those previously unheard can be amplified and channeled into existing public and political debates, thereby allowing them to set their own agendas and make them known in regard to political, economic and social development.

The complexities of modern development problems have heightened the awareness of how disease and poor health are linked not only to poverty and inadequate nutrition levels but also to prejudice, social dislocation and political, social and economic inequalities. This awareness is leading to broader calls for social and political change, which can only emerge from vigorous public debate within and between societies. Such debates depend on communication: within families, within communities, through public discourse, in short “the capacity of people to communicate is intimately bound up with their capacity to effect change” Deane & Gray-Felder 1999; 14.

The Research, Development and Diffusion Model (RDD)

This model has been labeled differently as the "Horizontal Model of Research and Development" Whyte, 1981 and the "Transfer of Technology (TOT) Model" Chambers & Liggins, 1987. The Research, Development and Diffusion model

looks at the process of agricultural research and development from the point of view of the originator of an innovation who bases his innovation on a presumed receiver's needs. The initiative of identifying problem areas is therefore taken by the researcher of the innovation who focuses on the design and development of a potential solution. This is followed by the dissemination of the solution to the receivers. Thus, in this model, the receiver is a passive partner so far as the identification of the problem or the design and development of the solution to the problem is concerned. In practice, what actually occurs is a chain of activities through which farming ideas and practices are developed and tested in the research plots and then channeled to extension services for dissemination to farmers Monu, 1982.

The Research, Development and Diffusion (RDD) model has been credited with the miracles of the 'Green Revolution.' However, it is this very 'success' that generated the criticisms against the RDD model. While the 'Green Revolution technologies led to dramatic increases in crop yields, most of the beneficiaries were large-scale resource-rich farmers. The small scale resource-poor farmers' fell behind further. In addition, these technologies were not sensitive to the environment. It has been argued that the results of the adoption of the 'Green Revolution technologies reveal the inadequacy of the RDD model especially as it applies to the resource-poor farm families. Although there have been several criticisms of the RDD model Roling et al,1976; Roling, 1985; Sands, 1986; Monu, 1982, perhaps the most thorough and comprehensive review of this model has come from Chambers & Ghildyal 1985 and Chambers & Liggins 1987.

First, unlike the practice within industry, the RDD model does not differentiate between output-oriented science and client-oriented technology. In industry scientists are trained in market research and user participation in research. In addition, the scientists are encouraged to use methods which would enhance responsiveness to user

concerns. On the other hand the RDD model is output-oriented and leads to a situation where scientists develop the technology and then expect the extension service to sell it to the farmers. Thus, in most cases scientists and pressure groups determine what is to be researched. The scientists then design and conduct the experiments under controlled conditions on experimental farms and laboratories and pass on the results to the extension service for transfer to farmers. Since resource-poor farmers are not part of the pressure groups which influence the research agenda, most of what is researched and the recommendations emanating from the research are often inapplicable to their situation.

Agricultural scientists who operate within the RDD model are committed to the model because of the education and training they receive, funding and influence of government and commercial organizations, the research methodology associated with the RDD and the professional and personal rewards and incentives the scientists receive. The training is modeled on "learning from above and teaching to below" and this is reinforced by the curriculum which is concerned with scientific method and detail. The training contains very little about technology development and how to learn from farmers.

By the time they leave universities, scientists have been deeply conditioned to believe that they know more than farmers, that their knowledge is superior. And that they should be the people who determine what research should be done and how it should be conducted. Chambers & Liggins, 1987.

Other sources of reinforcement for the RDD model are government and commercial funding and influences. Government and commercial organizations are more likely to give support to export cash crops and/or commercial food crops. This emphasis on commercial production directs attention to regions that have the natural resources (irrigation, rainfall, good soil) to support increased yields and focus on resource-rich farmers who could more readily take advantage of the technologies developed.

The research methodology of the RDD model supports the commercial orientation of the resource-rich farmers. The RDD research methodology studies only a few variables which affect the farming system at time. This type of methodology fits more the simplified cropping patterns of the resource-rich farmers e.g. mono-cropping. This type of methodology is unlikely to yield a comprehensive knowledge of the resource-poor farming systems e.g. mixed cropping. The scientists' support for the RDD model is also reinforced by the personal and professional rewards received by the scientists. Rewards are based on output and not service. These are calculated in terms of publications in academic journals or how useful the findings are for commercial organisations. In addition to the above, Chambers & Jiggins 1987 suggest that a comparison of the physical, social and economic conditions which exist on research stations with those of the resource-rich and resource-poor farmers would indicate that the technologies produced by the RDD model are likely to be inappropriate for resource-poor farmers. In most cases the research efforts have been concentrated on the individual, mostly the male head of the family as the unit of analysis. This ignores the fact that in Africa, women contribute a greater portion of the labour required in agriculture. Indeed, in certain areas women are completely in control of food production.

Furthermore, using the farm family as the unit of analysis (rather than individuals) allows us to examine the distinct roles and multiple goals of individuals within the farm family, in addition to the recognition that farming is only one of several strategies within the farm family economy. It also enables us to analyze how the farm family adjusts to different demands in order to satisfy its multiple goals which may compete with one another at times.

Finally, the RDD model fits well with the principles of bureaucratic organizations which characterize most of the agricultural research institutes/centers in Africa. Such organizations are normally characterized by close adherence to formal procedures, a centrally-administered control system with a hierarchical structure within which one's authority is a function of his/her position and organizational rank. Organizational procedures are specifically designed to limit varied responses to individual or group demands since such variations are seen as interfering with the rational functioning of the organization.

Farming Systems Research and Extension Model

The Farming Systems Research and Extension approach was largely developed in reaction to the RDD model.

The concept FSRE explicitly recognizes the value of the farmers' experience and their traditional experimentation as inputs into strategies for improving the productivity of existing farming systems. Gilbert. et al.1980.

In this approach, there are four successive stages in the research process: description, design, testing and extension. The description or diagnostic stage is undertaken to understand the constraints, flexibility and needs within the farming systems. This information is then fed into designing, testing and extending improved technologies and strategies. Norman & Gilbert 1982 have identified five attributes of the FSRE approach:

1. The objectives of the farm families are incorporated into the research process.

This involvement of the farmers ensures the use of evaluation criteria that will be relevant to them.

2. Efforts are made to take into account community and societal needs. For example satisfying the short-run needs of individual farm families could lead, in the long-run, to the degradation of natural resources and increased inequalities

in welfare distribution. In addition, by involving farmers, the approach draws on the pool of knowledge in the group and thereby the researcher could start with the strengths of the system, thus minimizing the time spent on 'rediscovering the wheel.'

3. The strategy recognizes the locational specificity of the technical and human element. This means that for research purposes, the farm population is divided into homogeneous sub-groups. This allows the researcher and indeed the extensionist to deal with a group of farmers with similar farming activities, social customs, and access to support systems, comparable marketing opportunities and resource endowment.
4. The process used is dynamic and interactive with links in directions among farmers, researcher and extensionists.
5. Finally, unlike the Research, Development and Diffusion approach, the FSRE approach is concerned with the entire farming system. Thus, it is able to deal with technical and non-technical or institutional issues.

The FSRE approach is thus more holistic than the RDD model. Through a system analysis three subsystems are delineated. These are the Research Subsystem the information-technology generating subsystem, the Extension Subsystem and the User Subsystem (farmers). These subsystems are envisaged to be in interaction with each other throughout all the stages - from description or diagnosis stage to the extension stage. Clearly the FSRE model has a number of advantages over the RDD model. As Collison suggests:

The farming systems perspective (FSP) identifies farmers' most (pressing) problems and best expansion opportunities and the appropriate technology to solve those problems and better exploit those opportunities. By this process it focuses attention on to recommendations most likely to be rapidly absorbed by local farmers, enhancing the cost effectiveness of research and extension efforts (Acker & Sungusia. 1986:172).

However, the available evidence indicates that the practitioners of the FSRE model have fallen short of their theoretical model. Although scientists have succeeded in working with farmers in diagnosis and testing, the:

...information is extracted from the farmers and their farms and analysed by scientists to diagnose and prescribe for the farmers ... The key decisions about what to try and what to do remain with the scientists. Chambers & Jiggins, 1987:150.

Secondly, the FSRE model assumes a multi-disciplinary collaboration. This cooperation between social scientists and agricultural scientists is hard to come by. As Rhoades & Booth (1983) have observed:

Differences in perception and role definitions between biological and social scientists result in a mutual respect that is miserably lowthe upstart of this disciplinary tribalism (is) that social and biological scientists tend to line up on opposite sides of the fence and throw spears.

It is further argued that like the RDD, the FSRE lack "explicit focus on resource poor farmers" since resource-rich farmers is seen as better informants and better collaborators. These resource-rich farmers who have the resources to experiment with the technology being developed are also seen as the most effective group for diffusion. This means that in most of the on-farm trials that are undertaken most of the collaborators are resource-rich farmers whose conditions are very different from the resource-poor farmers, who form the majority of African farmers.

The Farmer-First and Last Model

Chambers & Ghildyal (1985) and Chambers & Jiggins (1987) argue that in order to increase farmers' participation in the research process and to make the research more relevant to resource-poor farmers (RPF), a change in the formulation of the FSRE model is required. Their model is referred to as the Farmer-First and Last (FFL) model.

The model starts:

...not with scientists and their perceptions and priorities, but with RPF families and theirs'. It begins with a systematic process of scientists learning from and understanding RPF families, their resource needs and problems. The main locus of research and learning is the resource-poor farm, rather than the research station and the laboratory. Research problems and priorities are identified by the needs and opportunities of the farmfamily rather than by the professional preferences of the scientist. The research station and the laboratory have a referral and consultancy role, secondary to, and serving, the RPF family. The criteria of excellence is not the rigour of on-station or in-laboratory research, or yields in research station or resource-rich farmer conditions, but the more rigorous test of whether new practices spread among the resource poor Chambers & Ghildyal, 1985.

According to Chambers & Jiggins 1987, the ecological and social complexity and diversity of resource-poor farmers' farming systems demand two simplifications, namely, large-scale surveys and massive multi-dimensional data analysis and reduction of dependence on multi-disciplinary teams. In order to effect these simplifications, scientists should "encourage and enable RPF families themselves to identify priority research issues" Chambers & Jiggins, 1987. The eight major elements of the model which provide the framework for this research, and together lead to what Chambers and Ghildyal describe as reversals of explanation, learning and location are:

1. Research priorities and conduct are determined mainly by the needs, problems, perceptions and environment of farmers.
2. The crucial learning that takes place is the scientists learning from farmers.
3. The role of the farmer is that of a client and a professional colleague at the same time.
4. The role of the scientist is that of a consultant and a collaborator.
5. The main research and development location is the farmer's fields and conditions.
6. The physical features of research and development are mainly determined by farmers' needs and preferences.

7. The explanation of non-adoption of innovation is sought in farm-level resources, failure of scientists to learn from farmers and research station constraints.
8. The evaluation of the innovation is done through adoption by farmers.

This model has been criticised to be "extreme/farmer-centric" Farrington & Martin, 1988. It is argued that scientists and the scientific method have a more important role to play in the technology development process than suggested by the FFI. model. However, others would argue that this "farmer-centric" view is justified, if only to emphasise the importance of the involvement of resource-poor farmers in the research process. Despite the fact that the FFI. model has provided a number of excellent suggestions to improve farmer participation in the research process, all the recommendations cannot be adopted in a wholesale manner (Baker, 1991). According to Frankenberger 1992, farmer-articulated demands tend to relate to short-term priorities. Thus an exclusive focus on farmer priorities could lead to over-concentration of research on issues related to short-term benefits, to the neglect of those issues that would deal with long-term benefits, hence sustainable option systems.

Secondly, it should be recognised that even among resource-poor farm families there are inter-and intra-differences in household priorities in terms of gender roles, geographical location of villages, etc. These differences must be taken into account in deciding which and how farmers would be involved in the research process. Furthermore, although farmer-conducted and controlled research may provide us with useful results, we cannot run away from the fact that in order to convince policy makers and extension workers, 'quantitative' measures are of ten needed. In other words, some form of 'acceptable scientific method' is required.

The 2008 Agricultural Extension Policy:

One of the most recent and most authoritative agricultural extension policy pronouncements by government was enunciated in 2008 by way of the National Food Security Program document which provided for the establishment of a “One-stop” Agricultural Extension Services, (FMAWR, 2008). Accordingly, “the agricultural extension service will be professionalized by the State governments establishing farm support centres as “One-Stop” facilities in each local government in partnership with the private sector to train and teach new farming techniques”.

Further, the program will train 10,000 highly competent extension workers per year with the objective of “achieving a ratio of at most 1:350 Extension Agent/Farm family ratio” (FMAWR, 2008). This pronouncement is a typical government’s top-down planning process with no consultation with the States and Local Governments and the private sector. Field surveys make the proposed ratio of 1:350 totally unrealistic in the immediate future in Nigeria considering the current situation on the ground (1: EA to approximately between 2,500-10,000 Farm families depending on the State. A major worry of the policy was that modalities of implementation have neither been clearly spelt out nor subjected to wide consultations among the potential key stakeholders.

According to Akinagbe and Ajayi2010, one of the innovations in Nigerian agricultural extension is the Training and Visit (T&V) system. It was ‘introduced to Nigeria in 1986 by the World Bank and was subsequently adopted in a most religious and enthusiastic manner. The purpose of the introduction of this pattern of extension system (T&V) was to remedy the weakness inherent in the previous approaches. It was also to strengthen research extension linkages by making technology transfer and research more relevant to the needs of the small-scale farmers. It is designed to deliver

selected, timely and feasible technologies to farmers on a strict fortnightly periodicity. The system encourages strong linkages with agricultural research institutions, places great emphasis on a professional approach to extension and requires an exclusive devotion to extension work. The main feature of the T&V extension system includes a single line of government command and a well-defined geographical boundary of operation for each extension worker.

Findings from Ilevbaoje 2004, indicate that at a national professional extension dialogue in July 2002 where Nigeria's extension scientists and practitioners assembled to brainstorm on existing and emerging extension approaches with a view to evolving strategies for sustainable service delivery, the recurring message was vivid – T&V has strengths which far outweigh any weaknesses. Anchored on the merits inherent in T&V, these extensionists were unanimous in their proclamation that any attempt to replace T&V with esoteric approach, particularly, at such a time, would introduce turbulence and ripples in the nation's agricultural extension practice.

The Nigerian Government utilised part of the World Bank loans to carry out reforms in her agricultural extension efforts through the nation-wide adoption of the Training and Visit extension system. The T&V was introduced to Nigeria on an intensive and programmatic scale in 1986 through pilot testing in Oyo, Kaduna, Imo and Plateau States.

Soon after the mechanisms for implementing the system were put in place in these states through their Agricultural Development Projects (ADPs), farmers' response indicated preference for the T&V extension methodology. Guided by the experience from these pilot ADPs, implementation assistance terms (IATs) were mounted by Federal Agricultural Coordination Unit (now Project Coordination Unit (PCU)) to rapidly and systematically replicate the T&V extension model in all the states.

Training and Visit as a Management System

The Training and Visit system is a hierarchically organised and time-bound method of managing extension services. It is designed to deliver selected, timely and feasible technologies to farmers on a strict fortnightly periodicity. The system encourages strong linkages with agricultural research institutions, places great emphasis on a professional approach to extension and requires an exclusive devotion to extension work. In principle, all activities related to the physical handling of inputs and credit applications are avoided. Extension agents are supposed to liaise with input supply agencies and to advise farmers on sources of inputs and credit. Extension workers at all levels are expected to spend most of their time in the field and to participate in regular localised training sessions designed to inform them of current recommendations and give them opportunity to report back on farmers' problems.

Although there is no national policy on extension for the Agricultural Transformation Agenda, key informants at the Ministry of Agriculture have alluded to the Agricultural Extension Transformation Agenda as the document guiding extension and advisory services. They are however quick to point out that there was no framework at the beginning of the ATA for extension and advisory services until much later. The Agricultural Extension Transformation Agenda recommends the adoption of Farmer Field School. It states thus:

It is therefore important to institutionalize, strengthen, and take the farmer field school (FFS) approach that has already been initiated in Nigeria, to the next level in order to meet the current serious challenges of inadequate staffing and funding of the extension services in Nigeria. The NPFS/FAO commenced the implementation of the Farmer Field School (FFS) Extension approach in 2007 and we have noticed significant changes in extension delivery and impact in the participating States. Unfortunately

however, the successes could not be sustained and scaled up for lack of funds. The effectiveness and efficiency of the approach for farmer empowerment and productivity improvement were clearly proven.

The Farmer Field School (FFS) extension system is a unique participatory extension approach that offers an alternative to traditional extension approaches. While the traditional approaches and the World Bank-promoted Training & Visit (T&V) system view the farmers as passive recipients of information and provide supply-driven extension services, the FFS on the other hand, is a “learning process where farmers are gradually presented with new technologies, new ideas, new situations, and new ways of responding to problems. The knowledge acquired during the learning process builds on existing knowledge, enabling farmers to adapt existing technologies to become more productive, more profitable, and more responsive to changing conditions, or to adopt new technologies” Hughes and Venema, 2005.

This study aligns with the need to put the farmer first in agricultural research but very importantly, it looks beyond communicating with farmers in the research process to communicating with diverse multiple actors across the agricultural value chain because only by forging interactions among diverse views can socially-informed research and development processes be forged. The research is steeped in the constructivist evaluation based on the premise that the world has multiple, socially-constructed realities.

CHAPTER 3

RESEARCH METHODOLOGY

3.0 Introduction

This study was conducted in order to assess communications in agricultural research and innovation processes using the National Agricultural Extension and Research Liaison Services (NAERLS), Zaria as case study. To be able to gather the necessary data, the researcher utilized the descriptive method, using quantitative approach. Herein, the chosen respondents were randomly selected from two of the selected NAERLS adopted villages of Nassarawan-Buhari and Sakadadi.

The credibility of findings and conclusions extensively depend on the quality of the research design, data collection, data management, and data analysis. This chapter is dedicated to the description of the methods and procedures done in order to obtain the data, how it was analyzed, interpreted, and how the conclusion was arrived at. This section is to justify the means in which the study was obtained and it helped in giving it purpose and strength. All these helped in the processing of the data and the formulation of conclusions.

3.1 Study Area

The study is conducted in two of the NAERLS adopted villages of Nassarawan-Buhari and SakaDadi in Giwa and Sabon-Gari Local Government Areas of Kaduna State respectively. Agriculture forms the principal means of livelihood for more than 75% of the working population in both villages. Livestock keeping is a common activity in most households in the area, ranging from poultry, cattle, goats and sheep.

The villagers are mainly Hausa/Fulani, living in traditional polygamous family settings. There is also the presence of other minority ethnic groups in both villages.

The National Agricultural Research Project (NARP) under the World Bank assisted programme in 1996, introduced the Adopted Villages concept to the National Agricultural Research Institutes (NARIs), of which the National Agricultural Extension and Research Liaison Services (NAERLS) is part of (ARCN2011). The Agricultural Research Council of Nigeria (ARCN), following the collapse of the NARP, requested the NARIs to revive the adopted village, culminating into the take-off of the adopted village project in 2009.

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, fisheries. The Institute claims to adopt the multidisciplinary approach to problem solving.

3.2 Sampling

Data for the study were collected by interview and questionnaire schedule from a total of 148 respondents out of 200 using unstructured questionnaire in Nassarawan-Buhari in Giwa Local Government Area and Sakadadi in SabonGari Local Government Areas, which are the two NAERLS adopted villages purposively selected for the study. Interviews is also conducted with selected principal officers of NAERLS which include, the director of the institute; Mallam Ismaila Ilu, the public relations officer; Ismail Olawale and desk officer for the selected adopted villages Murtala Galadima. To complement the primary data, additional data were collected from secondary sources,

such as the official reports from NAERLS and Federal Department of Extension, Federal Ministry of Agriculture and Rural Development. Information collected are on frequency of contact with extension agents, the various interventions introduced by the project to the beneficiaries, income levels and assets generated as a result of their involvement in the project.

3.3 Research Instruments for Data Collection

Focus Group Discussions (FDGs)

A focus group is a form of qualitative research in which a group of people are asked about their perceptions, opinions, beliefs, and attitudes towards a product, service, concept, advertisement, idea, or packaging. Questions are asked in an interactive group setting where participants are free to talk with other group members. It is an instrument or survey method to collect the views of users of an innovation. It can be applied to properly understand the motivations behind certain attitudes of a group or community. Group discussion produces data and insights that would be less accessible without interaction found in a group setting.

This study therefore took the above into consideration by engaging farmers and other stakeholders within the case communities of Nasarawan-Buhari and SakaDadi in focus group discussion so as to have an in-depth knowledge of the communities in relation to their interaction with NAERLS and the outcome.

Questionnaire

A questionnaire is a set of systematically structured questions used by a researcher to get needed information from respondents. Questionnaires have been termed differently, including surveys, schedules, indexes/indicators, profiles, studies,

tests, checklists, scales, inventories, forms, inter alia. They are; any written instruments that present respondents with a series of questions or statements to which they are to react either by writing out their answers or selecting from among existing answers. The questionnaire may be self-administered, posted or presented in an interview format. A questionnaire may include check lists, attitude scales, projective techniques, rating scales and a variety of other research methods. As an important research instrument and a tool for data collection, a questionnaire has its main function as measurement. This study therefore adopts the unstructured questionnaire approach in soliciting information from the case communities, principal and desk officers at NAERLS as well as selected stakeholders.

Interviews

In this study, the researcher used the interview technique to generate data. The purpose of the interview is to explore the views, experiences, beliefs and/or motivations of individuals on specific matters (e.g. factors that influence their attendance at the dentist). Qualitative methods, such as interviews, are believed to provide a 'deeper' understanding of social phenomena than would be obtained from purely quantitative methods, such as questionnaires. Interviews are, therefore, most appropriate where little is already known about the study phenomenon or where detailed insights are required from individual participants. They are also particularly appropriate for exploring sensitive topics, where participants may not want to talk about such issues in a group environment.

When designing an interview schedule it is imperative to ask questions that are likely to yield as much information about the study phenomenon as possible and also be able to address the aims and objectives of the research. In a qualitative interview,

good questions should be open-ended (i.e., require more than a yes/no answer), neutral, sensitive and understandable. It is usually best to start with questions that participants can answer easily and then proceed to more difficult or sensitive topics, this can help put respondents at ease, build up confidence and rapport and often generates rich data that subsequently develops the interview further.

Internet and Library

More and more students are turning to the Internet when doing research for their assignments, and more and more instructors are requiring such research when setting topics. However, research on the Net is very different from traditional library research, and the differences can cause problems. The Net is a tremendous resource, but it must be used carefully and critically while the printed resources you find in the Library have almost always been thoroughly evaluated by experts before they are published. This process of "peer review" is the difference between, for example, an article in Times magazine and one in a journal such as the University of Toronto Quarterly. Furthermore, when books and other materials come into the University library system, they are painstakingly and systematically catalogued and cross-referenced using procedures followed by research libraries the world over. This process is the basis for the way materials are organized in the Library, and it makes possible the various search functions of the Web catalogue. In recognition of the resource materials available in library's, this research work obtained materials from the Sir Kashim Ibrahim library, NAERLS library and the library of Jomokenyata University Nairobi Kenya. A selection of materials was also sourced from the private library of Prof. J.Z. Okwori.

There are a great many solid academic resources available on the Net, including hundreds of on-line journals and sites set up by universities and scholarly or scientific

organizations. The University of Toronto Library's Electronic Resources page, google books, google scholar, Sage publications Online, Acedemia.edu are some of such academic sources utilised in this study.

3.4 Guides for Analysis

Data collected from respondents were analysed, using descriptive and z-test statistics. Descriptive data analysis is clearly the collection of various data reports and describing them in understandable terms. It includes graphs, tables, figures, charts and such other tools that are normally used for data analysis, but also includes the definition and summary of these raw data while Z-test on the other hand compares sample and population means to determine if there is a significant difference. It requires a simple random sample from a population with a Normal distribution and where the mean is known.

CHAPTER 4

CASE PRESENTATION AND ANALYSIS

4.0 Introduction

This chapter is for the presentation of the findings and analysis derived from the data collected. A total of 148 responses were received from the targeted 200 potential respondents. At the outset, it provides a brief history of NAERLS and the rationale behind the creation of adopted village system and the demographic details of respondents, data presentation, analysis, interpretation and discussion of findings.

The Adopted Village Project

In addressing the problem of widespread rural poverty, the National Agricultural Research Project (NARP) under the World Bank assisted program in 1996, introduced the Adopted Villages concept to the National Agricultural Research Institutes (NARIs) of which NAERLS is a member. The Agricultural Research Council of Nigeria (ARC/N), following the collapse of the NARP, requested the NARIs to revive the adopted village, culminating into the take-off of the adopted village project in 2009. The scheme was initiated to facilitate the trial of new research findings by scientists under the farmers' environmental conditions with the added advantages of involving the farmers in the trials either as observers, in the case of researcher managed, or executors in the case of farmer managed trials.

The involvement of farmers will in turn speed up the rate of adoption of such technologies by neighboring farmers, as the trial will also serve as demonstration plot. Also, technologies generated in the Institute are taken to the adopted villages for dissemination to farm families in the adopted villages. There are a total of 40 NAERLS

adopted villages some of which include, Nassarawan-Buhari, Sakadadi, Tudun-Iya, Bassawa, Mai-Wasa, Biye, Dan Sarki, Mai Gamo amongst others but this research is only limited Nassarawan-Buhari and Sakadadi In Giwa and SabonGari Local Government Areas of Kaduna state respectively.

NAERLS has been working in the above villages for over five years and a lot of agricultural research and communication of innovation efforts have been conducted. The researcher is therefore interested in what has been done so far and the nature of communications methods used and the level of involvement of the farmers within the communities in the process and the extent of acceptance or otherwise of the innovations that were introduced to them.

4.2 Data Presentation, Analysis and Interpretation

This study was undertaken in Nassarawan-Buhari and Sakadadi in Giwa and SabonGari Local Government Areas of Kaduna state respectively. These communities are two adopted villages purposively selected for this study. Methods of data collection are through interview and questionnaire schedule from 148 respondents out of the 200 sent out.

The questionnaires were administered and collected by the researcher and the responses were tabulated under the following sub-headings:

- A. Demographic Data
- B. Research Question Analysis
- C. Major Findings
- D. Discussion of Findings.

A. Table 4.1 Distribution of Respondents by sex

Variable (Sex)	Frequency	Percentages
Males	95	64%
Females	53	36%
Total	148	100%

Source: Field Survey 2013 from Nassarawan-Buhari and Sakadadi

Table 4.1 above indicates that **95** of the respondents representing **64%** were males while **53** of the respondents representing **36%** were females. Majority of the respondents therefore, were male farmers and heads of households.

Research Question Analysis

Research Question 1: To what extent are farmers involved in agricultural research and innovation processes in Nassarawan-Buhari and Sakadadi?

Table 4.2: The extent of Farmers involvement in research and innovation process

Description	Strongly Agree	Agree	Disagree	Strongly disagree	X
Farmers are involved in agricultural research and innovation from the initial stages	0	30	50	68	3.2
Farmers are only involved when innovations are being tested/introduced	90	20	28	10	1.7
Farmers are not involved at all in the process	10	18	50	70	3.2
We are involved in the entire process of agricultural research and innovation	10	15	58	65	3.2
Overall Mean					2.8

Source: Field Survey 2013 from Nassarawan-Buhari and Sakadadi

The above table contains the three items used to answer question 1 of the research. It emerged that farmers are not properly involved in the research and innovation process from the initial stages even in the adopted villages. It also emerges that farmers are involved at the point of field trials, which dispels the possibility of the non-participation of farmers in the agricultural research and innovation process. From the above, it is not a question of a lack of participation but rather, the level of participation. As seen here, it is consultative type of participation with emphasis on consultation and gathering of information from the farmers and also influencing their decisions. The agricultural researchers and extension agents define both problems and solutions and may modify these in the light of the farmers responses.

The mean score of the items is = 2.8 and is greater than the cut-off point of 2.5, hence, implying that the involvement of farmers is limited to consultation. These findings indicate that the farmer is treated as a recipient of technology rather than a partaker in the process. When farmers are involved from the beginning there are no assumptions as to what their needs are; the needs are put into perspective in whatever innovation agricultural researchers would eventually come out with. To shave a man's head, the man has to be available with the head and also contribute by way of giving directives on how the head should be shaved.

This should also apply in agricultural research and extension. Farmers who need innovations and end users should be part of the process. This would hasten the innovation process and avoid situations where innovations are introduced to farming communities but rejected because they do not satisfy the needs and aspirations of the farmers. Supporting this finding is the claim by the farmers during informal interview session that they have had to reject a milling machine that NAERLS had brought to test because though it was more efficient, it required more energy to operate. If the research

leading up to the design of the milling machine had involved the farmers it would have come out earlier during the research process that the farmers were not only concerned about efficiency but also effectiveness.

The farmers as end users of an innovation are intelligent enough and knowledgeable about their endeavors to know what works for them and what would not work. Regardless of the level of diffusion of an innovation, once it does not bring desired value to the farmer, he or she would not adopt. The farmers' intelligence could be appreciated at two critical parts of the research chain depending on the researcher and methodology adopted. The first is at the inception of the research; the researcher could acknowledge the farmers' intelligence and work with them from the beginning. The second is for the researcher to be all knowing and ignore the role of the farmer in the research process. At the end when the researcher expects the farmers to adopt his brilliant innovation, farmers intelligence comes to the fore in rejecting the innovation and its application. Therefore it is not about the end, but also about the processes leading to the end.

Research Question 2: What communication tools are employed by the NAERLS and its agents to communicate to farmers in the adopted villages?

Table 4.3: On the issue of communication tools employed by NAERLS to reach out to farmers.

Description	Strongly Agree	Agree	Disagree	Strongly disagree	X
NAERLS extension agents use training and Visit(T&V) model with farmers	98	40	5	5	3.6
NAERLS employs mass media channels to transmit innovations and research outcomes to the farmers	20	30	70	28	2.3
NAERLS reaches out to farmers through ICT, demonstrations and exhibitions	89	46	10	3	3.5

NAERLS uses folkloric media such as story-telling, folktales, songs/music, folk drama poetry and other cultural practices of the farmers	5	5	18	120	3.7
Overall Mean					3.2

Source: Field Survey 2013 from Nassarawan-Buhari and Sakadadi

The above table contains the four items used to answer question 2 of the research. The mean score of the items = 3.2 is greater than the cut-off point of 2.5, hence, it is agreed that NAERLS uses communication strategies or methods that are vertical and top down to reach out to farmers. Mass media, ICT, demonstrations and exhibitions, though they are good, they have inherent limitations which accounts for a short fall in the participation of local farmers in the research and innovation process. Folkloric media which are perhaps accessible to the farmer are not given proper and large attention as a tool to communicate research and innovation outcomes. Folkloric media, when used participatorily may enhance acceptance and usability of agricultural innovations.

Research Question 3: Why is farmers' participation crucial to agricultural research and innovation process in the adopted villages?

Table 4.4: There is the need to identify all the stakeholders critical to the success of agriculture

Description	Strongly Agree	Agree	Disagree	Strongly disagree	X
Farmers alone have all the information they require at their disposal	8	20	70	50	1.9
Farmers need to engage with other stakeholders and actors for effective result	68	60	10	10	3.3
Farming is a lot more complex now than it used to be and farmer's indigenous knowledge needs to be factored into the Agricultural innovation and research process	70	68	5	5	3.4

There is the need to identify all the stakeholders critical to the success of agriculture	70	68	5	5	3.4
Overall Mean					3.0

Source: Field Survey 2013 from Nassarawan-Buhari and Sakadadi

With a mean of 3.0, greater than the cut off mark of 2.5, the question above shows that farmers alone do not hold the key to successful agricultural research and innovation. There is the need for multi stakeholder engagement with the agricultural sector with a view to identifying the challenges along the value chain and proffering solutions drawing from the contributions of all. Furthermore, extension agents and researchers must encourage the concept of co-design in carrying out any agricultural innovation intervention. The indigenous knowledge and wisdom of farmers and key stakeholders across the entire value chain must be taken into account as this will bring about the technologies that will address the challenges that confront them.

Question 4: To what extent is the top – bottom approach to technology transfer still relevant and beneficial to the research and innovation process in the adopted villages?

Description	Strongly Agree	Agree	Disagree	Strongly disagree	X
Farmers will learn more reading from already designed books and guidelines	15	23	70	40	2.08
Farmers learn and adopt a lot of innovations through the radio, television, ICT and newspapers	20	30	50	48	2.1
Farmers exchange ideas and learn more when engaging with their fellow farmers and other stakeholders	78	40	15	15	3.2
Exhibitions, demonstrations and teaching by extension workers are adequate to the needs of farmers	8	10	100	30	2.0
Overall Mean					2.3

Source: Field Survey 2013 from Nassarawan-Buhari and Sakadadi

This question presents a mean of 2.3 less than 2.5 indicating that the top down approach to communicating technology is not effective. The supply-driven and top-down system, promoting agricultural messages that had been designed and developed by research scientists, with limited input from the technology users do not influence the farmers as much as community generated messages and approaches would. Farmers learn better under participatory atmosphere and have the high tendency of adopting innovations when given the opportunity to share their views and make inputs into the research and innovation process. Diffusion of information which is principally a top-down approach and seem the most comfortable method in use by NAERLS pose lot of resistance and are greeted with little or no compliance by farmers owing to lack of their voice in the incubation process of agricultural innovations.

Discussions of Findings

From the outcome above, it is obvious that the participation of farmers in the research, innovation and dissemination process is critical to agricultural development. In an interview with the NAERLS Public Relations Officer, it was revealed that “NAERLS as it is currently structured relies heavily and operates the Top Down approach as a strategy in communicating information and innovations to its farmers because it is government and donor funded. There is no national policy on extension to guide our operations although we are making efforts to find a middle ground so as to make our interaction with the farmers in the adopted villages more participatory”- Ismail Olawale

From the quotation above, it is not just enough as is the case of NAERLS to engage with farmers at the dissemination stage. Engagement and dialogue with all stakeholders must be part and parcel of the whole innovation process from conception

to dissemination. The participation of farmers, farmer organizations, and other relevant stakeholders is indeed no doubt necessary to achieving an effective agricultural research and extension agenda. In as much as the emphasis is on farmers, it should be noted that they do not constitute the entirety of the value chain in the agricultural sector; as such their participation alone is not enough to stimulate agricultural development in Nigeria. The emphasis on food security and production issues by agricultural research institutes though very important shows that not enough is been done in research and innovation to stimulate agricultural growth and economic development.

It is the position of this study that research and innovation process should look at the entire value chain from production to consumption if it is to contribute to increasing not only food security but income growth and sustainability for smallholder farmers. Such a value chain approach will require building strong partnerships with farmer groups, extension workers, agri-business, input providers, credit services and policy makers at all levels. By addressing bottlenecks in the whole value chain and working in partnership with various groups, research can achieve greater success.

There is the need therefore to replace the narrow scientific disciplinary approach, which tends to address either livestock or crop or soil or another problem in isolation. The success of research is judged by the socio-economic benefits accrued by the farmer from the adoption of new practices/policies and not solely on indices of increased production.

This brings to the fore the need to adopt the innovation systems concept which embraces not only the science suppliers but the totality and interaction of actors involved in innovation. It extends beyond the creation of knowledge to encompass the

factors affecting demand for and use of knowledge in novel and useful ways. The agricultural innovation systems (AIS) approach also focuses on enabling and constraining factors for innovation other than knowledge, such as physical infrastructure and social infrastructure, including institutions such as informal norms, values, attitudes and practices, and formal rules embedded in legislation and policy (Hall et al., 2006; Klein Woolthuis et al., 2005).

Judging from the findings of this study, NAERLS has the Mass Media Information, Education and Communication and Training and Visit (T&V) as its main methods for communicating agricultural innovation to its farmers. These are methods that have been called to question because of the inherent gaps for example, the significant challenges facing the T&V system includes; poor linkages between research and extension, reduced frequency of regular training of extension staff and/or failure to hold such training(s), higher ratio of farmers -to- extension agent, increased use of mass media as a complimentary channel for technology diffusion along with the T&V effort and, high cost of implementing the system among other challenges. Mass media as a tool leaves more to be desired as most of the farmers to whom the information is meant can neither read nor write in English or their native tongue thereby rendering these information and education pamphlets, posters and banners irrelevant.

Farming is much more diverse than in the past and is often combined with other activities. New knowledge is generated by farmers, researchers (basic and applied) and private companies. The old linear model of technology transfer (from scientists to the users) is therefore outdated and should be replaced by an interactive model of networking systems, which integrate knowledge production, advice, education and adoption. It therefore suffice that the NAERLS needs to go beyond its current level of activity which is largely focused on information dissemination on innovative

technologies to galvanizing the broad stakeholder base so as to entrench the culture of participation among stakeholders in the agricultural innovation process. It is important for NAERLS to consider alternative forms of communication for easy adoption of agricultural research and innovation.

Consensus is growing that new ways of conducting agricultural research are needed. To date, the operational implications of these changes and strategies for making them efficient, effective, and sustainable have been discussed very little. Lessons on strengthening the connectivity between agricultural research and other innovation system actors are viewed through the lens of three types of economies - agriculture-based, transformation and urbanized economies which dovetails into two strategies investing in “demand articulation” mechanisms to better identify the needs of different user groups and designing “organizational interfaces” that help transform research into real goods and services. There is a case for both market and nonmarket approaches to improving demand articulation and organizational interfaces. They include investment in formal mechanisms that provide stakeholder input to research organizations, more participatory mechanisms that bring researchers and farmers together to solve problems, innovation platforms that address larger, more complex challenges with diverse actors, commercialization programs that move research into the marketplace, and financing mechanisms that encourage collaborative research. Careful adaptation to the specific innovation contexts, strategies, and mechanisms is prerequisite for success.

Agricultural research needs to be examined within the broader analytical framework of an innovation system, which means recognizing that innovation in agricultural development must not occur in collaboration with agricultural research organizations alone. The essence is to make public research organizations more

responsive, dynamic, and competitive within this new landscape in agricultural development. To reach this goal, public research organizations will have to increase their relevance, their capacity to respond to a changing landscape, and their ability to produce goods and services that can be put to use in a socially or economically productive manner.

These statements are not a call for paying less attention to the quality of scientific inquiry and expertise in agriculture. They are rather a call for greater interaction between researchers and other knowledge producers and users to maximize the quality of agricultural science and its impacts on society and the economy at large. Increased interaction means that public research organizations will continue to play a role in developing country agriculture but that their role must change. The key to this change will be flexible institutional arrangements that encourage dynamic, rapid responses to changing circumstances from public research organizations.

As mentioned earlier, for NAERLS in particular and the Nigerian agricultural research community in general to succeed in its desire to see to the adoption of innovative agricultural technologies, it is the position of this study that a more strategic system grounded in participation must be adopted. This strategic system should be in line with the principles of co-design approach which seeks better articulation between the supply of research (from researchers) and demand for research (from users). Researchers engage systematically with a heterogeneous set of actors, which may include farmers, input suppliers, traders, processors, researchers, NGOs, and government officials in the interactive, adaptive, and flexible process of developing innovations. The core principles of co-design include joint planning, implementation, and decision making related to all activities that foster innovation; close coordination

among stakeholders at all strategic and operational levels; combining scientific, other technical, local knowledge and other resources.

It is often used when problems are complex and challenging. Examples include the shared management of agricultural land held in common or complex issues of land tenure in Nigeria; the period of adjustment to new policies or market operations; the development of shared understanding of problems and their solutions, when there is potential to do so; and problems for which previously designed solutions or scientific and technical knowledge are not available. Given the issues of scale involved in such a large group of actors and their numerous concerns, co-design relies on at least some of the concerned stakeholders to have the experience and skills to facilitate, coordinate, and negotiate multi-stakeholder efforts.

Co-design aims at achieving better communication between research supply and user-driven demand for problem-solving. It implies that researchers engage systematically with multiple stakeholders in the iterative, adaptive, flexible, and nonlinear process of communication leading to the development of innovations.

The core principles of co-design include:

- Joint planning (inclusive of rural small holder farmers), implementation, and decision making related to activities aimed at fostering innovation and
- Close coordination among stakeholders at the strategic and operational levels, combining scientific, technical, and local knowledge and other resources.

Co-design may be implemented at any scale, depending on the nature of the problem, the innovation being developed, and the types of stakeholders involved. Investing in co-design approaches implies covering the costs of communicative

functions which include coordination, facilitation, and collective action inherent to working collaboratively at all stages of the process.

Innovations usually result from a process of networking and interactive learning among a heterogeneous set of actors, which may include farmers, input suppliers, traders, processors, researchers, NGOs, and government officials. Although many research organizations and researchers in developing countries like Nigeria have some experience in research collaboration with other public sector professionals and farmers (often within the framework of competitive research grants), they generally lack the more wide ranging exposure, related skills, and attitudes to engage effectively in collaborative research with more diverse public and private stakeholders. A major challenge of researchers in Nigeria remains their inability to effectively engage with the small holder farmers who remain very critical in the equation. The near refusal to adopt the bottom up approach in communicating research innovation makes the total adoption of agricultural innovation a challenge.

This refusal can be traced to the perceived technical superiority and ego of the researchers who feel the farmers and other stakeholders are illiterates and have little or no value to the process. Individual researchers and research systems need to change and expand the scope of their research, methodologies, and core skills. A major advantage of this system is that it takes into consideration the perspective and perceptions of each stakeholder, which is shared, understood, and recognized by others as legitimate with a view to bringing about suitable solutions collectively identified. Diverse diagnostic methods can be used to achieve an accurate collective representation of the situation; they usually involve developing some sort of a conceptual model (or simplified representation) of the problem, as proposed in the ARDI method (Actors, Resources, Dynamics, Interaction) described in Etienne (2005).

In characterizing stakeholders, the key is to understand the actual motivation and goals of each stakeholder, its history and trajectory, its strengths and weaknesses, its socio-economic interest, past and current interactions with other stakeholders. Specific methods and tools have been developed to elicit this understanding, such as stakeholder mapping or the analysis of socio-technical networks.

Negotiations are involved around identifying and agreeing on the roles and functions of each stakeholder and on the resources that each must commit or find. Negotiations need to come up with effective mechanisms for managing the co-design process during implementation at the strategic/governance and operational levels, such as steering and implementation committees. At the strategic level, goals and objectives need to be reassessed dynamically and adjustments made periodically to refocus the collective energies and to solve any tensions or conflicts, which frequently arise during multiple stakeholder dialogues. At the operational level, a key concern is effective implementation and dealing successfully with technical, logistical, and financial issues.

By way of conclusion, it is pertinent to say that there are several benefits to be derived from participatory approach to agricultural research and innovation process. These benefits include but not limited to the following areas:

- More suitable and diverse innovations that are more appropriate, easier to adopt, and developed more rapidly than innovations generated through conventional approaches.
- Involved stakeholders, whose individual and collective capacities for action, research, and problem-solving (agency) are strengthened. If attention has been duly paid to the weakest stakeholders, their technical, social, and at times political endeavors may be empowered.

- Institutions develop better routines and capacities to implement their respective missions and goals, owing to their involvement in the process.
- New institutional arrangements allowing better coordination and synergies among stakeholders.
- A virtuous, sustainable circle through which, at the end of the process, the various stakeholders are more willing and able to keep innovating as needs or opportunities arise. This brings about a greater capacity for stakeholders particularly the small holder farmers to take their destiny into their own hands.

For research, experience and skills in applying co-design approaches can result in several additional benefits, such as a greater ability to work in an interdisciplinary fashion and to think systemically. The approach helps to renew and open the research agenda and to reduce the typical divide between research and societal needs.

This study advocates for a change in the societal function of extension from its reactionary nature of awaiting innovation or research to disseminate to end users, to being more proactive: serving as the platform for innovation. From the fore going, it is apt to state that extension should not just be a component of agricultural innovation rather it should be a cross cutting element across the innovation chain.

CHAPTER 5

SUMMARY, RECOMMENDATION AND CONCLUSION

5.0 Introduction

This chapter provides the summary of the research; generate conclusions and recommendations based on the analysis of the results of the study on communication in Agricultural Research and Innovation: A case study of the National Agricultural Extension and Research Liaison Services, NAERLS, Zaria.

The primary respondents of the study were composed of 148 farmers and stakeholders located in Nasarawan-Buhari and SakaDadi, two of the NAERLS adopted villages selected for this research work. The quantitative and qualitative method were applied by the researcher. The research also designed questionnaires as the primary instruments of gathering data. Preliminary research and unstructured interviews were also conducted to further increase their understanding about the subject matter. For effective analysis and interpretation of data, the researchers used descriptive and z-test statistical tools, Percentage Distribution, Ranking, Weighted Mean.

5.1 Summary

The overriding purpose of this study was clearly articulated. The challenge of effective communication in agricultural research and innovation was brought to fore. The non-adoption of agricultural innovation by rural farmers and families can be explained by the inappropriateness to their special needs.

As its statement of problem, this study stressed the fact that many years of research efforts have resulted in thousands of technologies, but with a poor adoption rate. The inadequate participation of farmers in the design of most of these technologies

and the poor communication approaches adopted by extension agents have contributed to this development. Despite the unsatisfactory outcome of various initiatives in this regard by government agencies and research institutions such as NAERLS and the federal department of extension they still consider a continued diffusion of innovation in agricultural practices as the best bet. This strategy remains basically top-down in approach. Specifically, this study endeavoured to explore the perceived communications practices in use by the National Agricultural Extension and Research Liaison Services (NAERLS) Zaria to deploy the end product of agricultural research and innovation using two out of its adopted villages as a case study.

The study therefore established that regardless of the sophistication of any technology, its use or adoption is dependent upon the participation of all key stakeholders including farmers in the product development phase. To realize the aim of the study, a set of objectives and research questions were drawn. The scope of this study is limited to the communication analysis of agricultural research and innovation in Nigeria with particular reference to NAERLS operations.

Chapter 2 of this study is the literature review. It is a critical analysis of published body of knowledge around the subject matter. It explores the shift in thinking about communication for development that has revolved around a core difference between the meaning of communication: as a simple transfer of information or as a social process through which meaning is created and codified. These contrasting ways of conceiving of the meaning of communication have created two main branches of communication for development that can be differentiated by their core beliefs about the roots of development problems. On the one hand, behaviour change communication generally focuses on the lack of information and the need for individual behavior

changes while participatory or empowerment communication points to the need to change collective social processes and society wide power imbalances

This research work goes further to discuss various communication theories such as constructivism, sustainability and Empowerment communications as well as models and functions of communication. It also discussed, Participation in Agriculture, Typologies of Participation, Criticism of Participation and various communication models such as Research, Development and Diffusion Model, Framing Systems Research and Extension Model and the Farmer-First and Last Model.

Chapter three of this study is research methodology. It gives a clear indication of how the work was packaged and the methodology adopted in generating data for the research work. This chapter indicates the study area, the sampling techniques, research instruments such as, focus group discussions, internet and library, interviews and questionnaires, It also provides information on guide for analysis that is, the instrument used in analysing data collected from the research field.

Chapter four, which is the case study chapter, presents a general background knowledge of NAERLS and the Adopted villages chosen for this study and goes further to explain data generated, the analysis of the data and interpretation thereof.

5.2 Key Findings

Communication - the sharing of ideas and information - forms a large part of the extension agent's job. By passing on ideas, advice and information, he/she hopes to influence the decisions of farmers. NAERLS has predominantly adopted the mass media, ICT, audio-visual aids as its main methods of communicating with farmers in

the adopted villages, which invariably means the farmer remains a passive receiver of information as noted earlier.

Mass media are those channels of communication which can expose large numbers of people to the same information at the same time. They include media which convey information by sound (radio, audio cassettes); moving pictures (television, film, video); and print (posters, newspapers, leaflets). The attraction of mass media to extension services is the high speed and low cost with which information can be communicated to people over a wide area. Although the cost of producing and transmitting a radio programme may seem high, when that cost is divided between the millions of people who may hear the programme, it is in fact a very cheap way of providing information. The cost of an hour's radio broadcast per farmer who listens can be less than one-hundredth of the cost of an hour's contact with an extension agent. However, mass media cannot do all the jobs of an extension agent. They cannot offer personal advice and support, teach practical skills, or answer questions immediately.

There are, however, a number of limitations to the use of Mass media such as radio in extension work. Batteries are expensive and often difficult to obtain in rural areas, and there may be few repair facilities for radio sets that break down. From the listener's point of view, radio is an inflexible medium: a programme is transmitted at a specific time of day and if a farmer does not switch on the radio in time, there is no further opportunity to hear it. There is no record of the message. A farmer cannot stop the programme and go back to a point that was not quite understood or heard properly, and after the broadcast there is nothing to remind the farmer of the information heard.

Printed media can combine words, pictures and diagrams to convey accurate and clear information. Their great advantage is that they can be looked at for as long as the viewer wishes, and can be referred to again and again. This makes them ideal as permanent reminders of extension messages. However, they are only useful in areas where a reasonable proportion of the population can read. Which again begs the question; what is the percentage of literate farmers within the adopted villages?

One other key finding of this study is the near absence of folklore in the communications approach adopted by NAERLS. Traditional forms of entertainment using communal outlets such as drama, poetry, storytelling which takes into account the cultural practices of the people remains a potent tool which has not been adequately explored by NAERLS.

In conclusion, this study revealed that the adopted village project has improved the extension-rural household linkages, enhanced knowledge and information capacity of respondents and by extension increased their income but with a clear indication that farmers are not adequately consulted in the agricultural research and Innovation process. Farmers are not effectively involved in the research and innovation process right from conception. Participation of resource poor farmers in the communication, decision making, research and innovation processes leave much to be desired. This accounts for the high level of resistance to innovation and lack of compliance with or non-adoption of innovations coming their way from agricultural researchers.

5.3 Recommendations

In view of the above findings, the study recommends that the NAERLS should intensify efforts and build on the weaknesses identified in its use of Mass media to carry out research into farmers' existing knowledge, attitudes, practices, and problems

concerning farming topics, and for mass media messages to be pretested. This means that a preliminary version of the message is given to a small number of farmers so that, if they have any difficulties interpreting it, revisions can be made before the final version is prepared and broadcast.

It should employ the use of audio cassettes or compact disc where information can be recorded on cassettes in a studio, where many copies can then be made for distribution to farmers who will listen and have the opportunity to playback. This can be recorded in as many dialects as possible.

This research work strongly advocates the institutionalization by NAERLS of cultural forms of communication for extension work. These include folk Songs, local poetry and drama. These strategies should be utilized in a participatory way to illustrate the benefits inherent in the technology or innovation for easy adoption and build the capacity of the farmers thereon. They should be used to cater for local situations and response from the audience. No modern technology is required and these media are especially useful where literacy levels are low. By involving local people in preparing the plot of a play, extension agents can stimulate the process of problem analysis, which is a fundamental part of the educational aspect of extension and this will facilitate the adoption of modern agricultural research and innovation.

In light of the above, this study further recommends the following:

1. That NAERLS should as a matter of urgency engage the Ahmadu Bello University Zaria via the Department of Theatre and Performing Arts to develop a communication strategy that will utilize traditional forms of education, communication and entertainment such as drama, poetry, storytelling etc to engage farmers in the design and dissemination of innovations. By using

farmers to illustrate the benefits of a technology or prepare the plot of a play, it can stimulate the process of problem analysis.

2. It is also the position of this study that NAERLS should change its reactionary approach of waiting for innovation to disseminate but serve as a platform for innovation where all relevant stakeholders across the value chain will converge bearing in mind the Principles of Co-design that allows for participation and ownership in the long run.
3. The government of Nigeria through the Federal Ministry of Agriculture and Rural Development to make available a National Policy Document on Extension and recommends a more participatory approach to agricultural technology development and dissemination if the nation is serious about the issues of food security and the improvement in the well-being of farmers.

Finally, all relevant key stakeholders should be mainstreamed in the agricultural research and communication of innovation processes by NAERLS and other agricultural development agencies. This will not only enhance the smooth and willing adoption of innovations that are introduced to the farmers but will also build their capacity to contribute effectively to research, communication and agricultural development in Nigeria.

5.4 Conclusion

In conclusion, For NAERLS in particular and the Nigerian agricultural systems in general together with its international partners to achieve its goal of advancing agricultural practices through adoption of modern agricultural science innovations, a more strategic system grounded in participation, that takes into account the expectations and concerns of all stakeholders (especially the farmers) across the entire value chain must be put in place and institutionalized.

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APPENDIX 1
QUESTIONNAIRE

QUESTIONNAIRE FOR FARMERS IN ADOPTED VILLAGES

Research Questionnaire

Dear Sir/ Madam/

The researcher is a student in the Department of Theatre and Performing Arts, Ahmadu Bello University, Zaria of Nigeria, conducting a research on Communication in Agricultural Research and Innovation process: a case study of National Agricultural Extension and Research Liaison Services (NAERLS), Zaria

Kindly assist in filling- in the questionnaire with necessary information as such information will be held CONFIDENTIAL and strictly used only for the purpose of this research.

I will appreciate your sincere and candid response to all the questions in the questionnaire.

Thank you

Abu Umaru Joseph

SECTION A: Personal data of respondents (Please tick as appropriate)

1) Gender: Male Female

2) Age: 20-25 25-30 30-35 and above

1. For how long have you been a resident of this community?
2. Are you a farmer?
3. If yes, what are the crops you produce?
4. Are you aware of an organization called NAERLS?
5. If yes, What Do you know about them?
6. Have you benefitted from any of the agricultural innovations they have introduced to your community?
7. If yes, were you aware of the innovation before it was introduced to you?
8. Where you satisfied with the outcome?

9. Amongst all the new agricultural innovations introduced, what was your level of involvement in its development?
10. What communication tools and strategies are employed by the NAERLS and its agents to communicate to farmers?
11. Are you satisfied with it?
12. To what extent are farmers involved in agricultural research and innovation processes?
13. To what extent is farmers' participation critical in agricultural research and innovation?

APPENDIX 2

Letter to NAERLS Director

1 September 2014

The Director
National Agricultural Extension Research Liaison Services (NAERLS),
Ahmadu Bello University,
Zaria

Dear Sir/ Madam

Request to Administer Questionnaires to NAERLS Staff

I wish to seek your approval to administer questionnaires to staff of your institute as part of my research on the topic: Communication Strategies in Agricultural Research and Innovation Processes; a case study of The National Agricultural Extension and Research Liaison Services (NAERLS).

My name is Umaru Abu, a post graduate student of the Centre of Excellence in Development Communication, department of Theatre and Performing Arts, Ahmadu Bello University, Zaria.

Please find attached to this letter, copies of the questionnaire for your perusal.

Thanks in advance for your kind approval

Yours Sincerely



Umaru Abu

APPENDIX 3

QUESTIONNAIRE FOR NAERLS STAFF

Research Questionnaire

Dear Sir/ Madam

The researcher is a student in the Department of Theatre and Performing Arts, Ahmadu Bello University, Zaria, Nigeria, conducting a research on Communication in Agricultural Research and Innovation process: a case study of National Agricultural Extension and Research Liaison Services (NAERLS), Zaria

Kindly assist in filling- in the questionnaire with necessary information as such information will be held CONFIDENTIAL and strictly used only for the purpose of this research.

I will appreciate your sincere and candid response to all the questions in the questionnaire.

Thank you

Abu Umaru Joseph

SECTION A: Personal data of respondents (Please tick as appropriate)

1) **Gender:** Male Female

2) **Age:** 20-25 25-30 30-35 and above

1. Does NAERLS have an operational or working communication strategy?

(a) Yes [] (b) No []

(a) If yes; when and how was it designed?

(b) If no, why?

2. How does NAERL’s communication strategy mainstream local farmers and relevant partners in planning, implementation and evaluation of agricultural production research?-----

3. Are farmers involved in the design of NAERLS communication plan?
(a) Yes [] (b) No []
4. Do NAERLS donors or funding partners determine the communications approach used to disseminate agricultural research innovations outcomes?
(a) Yes [] (b) No []
5. Which specific role do the farmers play in the entire agricultural research process?

APPENDIX 4

LIST OF INTERVIEWEES

1. Interview with Alhaji Murtala Galadima, a staff with the Zaria Zonal office of the National Agricultural Extension and Research Liaison Services (NAERLS), 3rd July, 2014.
2. Interview with the Director, National Agricultural Extension and Research Liaison Services (NAERLS)Zaria on 3rd July, 2014
3. Interview with Ismaila Olawale, Public Relations Officer, National Agricultural Extension and Research Liaison Services (NAERLS) Zaria, 13th August 2014.