RIVERS STATE UNIVERSITY, PORT HARCOURT.

ADOPTION OF AGRICULTURAL TECHNOLOGIES BY FARMERS: A RURAL SOCIOLOGY AND DEVELOPMENT PERSPECTIVE

AN INAUGURAL LECTURE

BY

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B.Sc. (Agricultural Production) RSUST, M.Sc. (Agricultural Extension) RSUST
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Professor of Rural Sociology and Development

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DEDICATION

This inaugural lecture is dedicated to the loving memory of my late brother, Mr. Rowland Owhondah Nlerum who offered me the support that empowered my early journey into academics.

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The Vice Chancellor
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Registrar and other Principal Officers of the University
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Distinguished Professors and Members of Senate
Deans and Directors of Faculties and Institutes
Heads of Department
Academic and Non-Academic Staff
My Community Members, Church Members, Family Members and
Great Students and Alumni of Rivers State University
Staff and Students of Rivers State College of Health Science and
Management Technology
Royal Fathers
Gentlemen of the Press
Ladies and Gentlemen.

1.0 PREAMBLE

It is a thing of joy today to stand before this honourable audience to deliver this inaugural lecture of this great University. Before I proceed, let me with humility put on record that I am by the grace of God the first person in Oro-Owo my Community of Rumueme Kingdom in Rives State to be admitted into the University to do a degree programme in the year 1980. As it pleased the Almighty God, I am also the first in the Community to be a University Lecturer and first to be promoted to the rank of a Professor.

The Department of agricultural Extension and Rural Development was created out of the Department of Agricultural and Applied Economics/Extension of this University in 2016 as a separate Department. I am happy to record that I am the first lecturer in this new Department to be accessed and promoted as its first Professor on the 18th of December, 2019. By this promotion I have become the third Professor in the field of Agricultural Extension and the first in Rural Sociology and Development option in this University. The first and second Professors in the field of Agricultural Extension who were promoted in the former Department of Agricultural Economics/Extension who also provided mentorship for me to rise to this rank were Professor George Nwimene Emah in the year 2008 and Professor Benjamin Iheanyichukwu Isife in the year 2016. This inaugural lecture is the second in the field of Agricultural Extension after the first one which was presented by Professor George Emah on the 26th of September, 2018. Let me use this time to briefly explain who a Professor is.

A professor is someone who has been promoted to the highest academic rank usually on the basis of his or her scholarly achievements (University of Leeds, 2020). Professorship is not a qualification, but an academic staff grade of the most senior level. A Professor is an expert in

his or her field of study (Gabriel, 2016) and a teacher of the highest grade. Professors are national and international figures and are often leaders in their fields of study locally, nationally and globally.

The best Professors according to Herman (2011) are known for the manifestation of these characteristics among others.

They:- take interest in the students, understanding the generation

- listens and respects the students,
- advise and mentor the students,
- encourage students to own a lifelong learning quality, like themselves,
- treat students as a people and not numbers by being approachable and patient,
- know their material and also how to teach them well,
- are defined in terms of quality of research work and
- are involved in community services in and outside the university.

Brief on Inaugural Lecture

Inaugural lecture is an educational talk usually carried out by a new Professor to let people know the academic and research activities he or she has carried out over the years and what his or her future research interest will be focused. Inaugural lecture time is an occasion of significance in a Professor's career at the University. Professors are usually required to give their inaugural lectures within 12 months of their appointment (Sunshine Booksellers, 2020). Inaugural lecture is a ceremonial occasion. Academic robe is worn by the Professor who is presenting the lecture and other Professors of the University.

Some benefits of Professorial inaugural lecture as indicated by University of Bristol (2020) include, but not limited to the following:

- the new Professor celebrate an important personal milestone with family, friends, colleagues, students and the general public,
- it is an opportunity for the University to recognize and showcase the academic achievements of its own staff,
- colleagues both (past and present) within the Faculty and more broadly the University can hear about researches that are going on around the University and
- it represents an essential component of the University's public events, by helping to create a wider awareness of the latest developments in agriculture, science, engineering, arts and humanities, medicine, law and social sciences, education, etc.

it is the desire to fulfill the content of this brief on inaugural lecture in the side of the presenter and especially the University that this inaugural lecture programme is carried out.

2.0 **INTRODUCTION**

Vice Chancellor Sir, thank you for the opportunity to present the number 68 inaugural lecture which is titled "Adoption of agricultural technologies by farmers: A rural sociology and development perspective". A brief overview of the lecture is captured in this introductory section. The title of the lecture was conceptualize from the fact that agricultural research stations in Nigeria have developed and are still developing productive agricultural technologies that improves the output of farmers. Many of these technologies are there in the shelves and data banks of the research stations wasting away.

The farmers themselves are unable to get at these technologies because they are not aware that they do exist. The rural sociology and rural development practitioners, being agricultural extension workers themselves, whose role is to introduce the technologies to the farmers are few to serve the need of farmers in terms of awareness creation through information dissemination and education. It is this scenario, that led to the caption of the title of this inaugural lecture.

It is important at this juncture however to clarify that rural sociology and development is one of the options in the field of agricultural extension. Other options existing in the field of study of agricultural extension are extension administration, extension communication, rural sociology and extension, extension education, community and rural development, etc. Rural Sociology and Development is considered a more versatile option as it is one of the fields of study in Sociology which is in the social science discipline and that of agricultural extension which is in agricultural discipline.

The versatility of this discipline was seen earlier by one of the fathers of the then Department of Agricultural and Applied Economics/Extension of this University, Professor Eloke Chukuigwe whom I consulted for counsel when I was choosing the area to specialize at the beginning of my Doctorial study. He particularly counseled me to go for rural sociology and development among the fields of study in agricultural extension because that option will make me become a versatile person. I have seen this to be true because I can function in the fields of agricultural extension in the faculty of agriculture and sociology in the faculty of social science, where rural sociology is one of the major options.

This inaugural lecture will cover conceptual clarifications on rural sociology, history of rural sociology, role of rural sociology and development practitioner in agricultural production, rural development and its objectives. Others are importance of the rural area in socio-economic development of Nigeria, agricultural extension and my research contributions.

3.0 CONCEPTUAL CLARIFICATIONS

3.1 Sociology as Field of Study

Sociology is defined as the study of human activities and human organizations (Sanderson, 1988). Auguste Comte (1798-1857), a French Philosopher is regarded today as the father of modern day sociology. It was Comte who gave sociology its name in 1837 when he coined the term sociology from two words, namely, "Socio" a Latin word meaning "Society" and "Logy" a Greek word meaning Science. Etymologically, joining these two words together, Auguste Comte defined sociology as the scientific study of the society. Sociology is one of the social sciences. Other social science main disciplines are economics, political science, psychology and anthropology. The scope of sociology however is said to be broader than the other social sciences because the element of sociology exist in all other fields of the social science disciplines because human group activities exist in them all. The branches or fields of specialization in sociology are many and include rural sociology, urban sociology, military sociology, political sociology, medical sociology, industrial sociology, sociology of education, sociology of law, sociology of religion, criminology, gerontology, women and gender studies, etc. Rural sociology is my own area of research interest in the field of sociology.

3.2 Rural Sociology Concept

Rural Sociology is an advanced or scientific study of human social relationship in groups in the rural society. Rural sociology is the branch of sociology and agricultural extension which studies the agencies and systems through which positive changes are achieved in rural communities (Olayide, 1981). Rural sociology deals with the scientific study of social change and strategies by which productive and positive changes are brought about in the rural areas (Nlerum et al 2018). The pivot of rural sociology is to study and understand about relationships which exist between humans when they are in group settings in the rural area. Examples of such rural group setting are the crop farming group, livestock farming group, fish farming group, farmers co-operative, women-in-agriculture group, youth farmers, male farmers and several other groups which are found within the rural environment which are agricultural and non-agricultural in nature. Apart from the rural based groups as listed, rural sociology also studies other human groups from outside the rural area which bring development initiatives to the rural people. Examples of these groups include all Governmental Agencies, Non-Governmental Organisations (NGOs), and Private individuals within and outside the country.

3.3 Brief History of Rural Sociology

Rural Sociology originated in the United State of America in the year 1912. This was when the government of Africa thought it wise that the lives of people living in the rural area should be made better like their counterparts who dwell in the cities or urban areas. It was at this time that concerted efforts were concentrated by the American government to make life more meaningful to the rural people to dwell in and by so doing reduce their interest in migration to urban areas to seek for better life and thereby reduce city congestion with its associated social problems.

Few years following the origin of rural sociology, the American Rural sociological Society was inaugurated with the aim of documenting the research studies which were carried out in rural areas for development purpose. Apart from this, the society also co-ordinated all the activities of the American government which had to do with the development of the rural communities. The activities of the American Rural Sociological Society highly influenced the expansion of rural sociological studies in the other parts of the world.

The study of rural sociology in Nigeria started in 1966 when it was taught as a course in the University of Ibadan in the Department of Agricultural Economics and Extension (Jiboowo, 2000). When the department of Agricultural Extension was created in the University of Ibadan in 1968 the teaching of Rural Sociology was transferred to the new department from the Department of Agricultural Economics. It was from the University of Ibadan that the study of Rural Sociology spread to other Universities which named their own Department as Agricultural Extension and Rural Sociology like University of Ife and Ahmadu Bello University. In Nigeria, the study of rural sociology got significantly developed in the year 1984. This was when the Nigerian Rural Sociological Association now known as Rural Sociological Association of Nigeria (RUSAN) was established in its first annual conference at the University of Ife, Ile-Ife.

Rural sociological activities in Nigeria became expanded and publicized with the journal of the Association. Today the study of rural sociology which is although relatively new as a discipline has spread to several Federal Universities, State Universities, Private Universities, Research Institutes, Colleges of Agriculture, Polytechnics (Fasoranti, 2011) and Colleges of Health Science and Technology. Rural sociology today is offered as a course of study in the Faculties of Social Science and Agriculture leading to the award of diploma, bachelor's, master's and doctorate certificates either by itself or in combination with other relevant disciplines.

3.4 **Relationship between Rural Sociology and Agricultural Extension**

The activities of rural sociology and that of agricultural extension are closely related (Katach Udated) and more or less interwoven with each other. This is because much of the functions of the both fields of discipline are concentrated in the rural society. The relationship between them includes but not limited to the following.

i) Rural sociology is an advanced or scientific study of human social relationship in groups in the rural society, while agricultural extension is a non-formal educational programme for farmers who form more of the rural human groups on which rural sociological studies are based.

ii) Rural sociology studies the attitude and behaviours of rural people for improvement, while agricultural extension is interested in the delivery of educational information to rural people which brings about improvement in the knowledge, skill and attitude of the rural people which rural sociology is concerned about.

iii) Rural sociology studies the problems, needs and interests of the rural people (society), while agricultural extension assist farmers who form the bulk of the rural

people to determine their problems, needs and interest and develop educational programmes to satisfy these problems, needs and interests of farmers.

iv) Rural sociology analyses rural social relationship within and between people in groups, organisations and leaderships in rural areas, while agricultural extension makes use of the knowledge obtained from the analyses of rural groups, organisations and leadership for achievement of agricultural development objectives of the rural dwellers and others.

v) Rural sociology studies social situations to obtain social facts about the rural society, while agricultural extension makes use of such social data to harness and mobilize extension programmes for farmers.

vi) Rural sociology investigates the problems arising from the rural social institution, that is, the family, political, economic, educational and religious systems of the rural society, while the agricultural extension also studies the rural social institutions with the view of determining their functions in achieving the development objectives of extension among farmers.

vii) Rural sociology is concerned with human relationships among people who are concerned with agricultural and non-agricultural occupations in rural societies, while agricultural extension is more concerned with the study of human relationships among people who are involved in the agricultural sub-sectors such as crop farmers, livestock farmers, fish farmers, agro-processors, marketers and consumers of farm products and natural resources conservators (Ekuman Kama, 2011). While the scope of rural sociology in terms of occupational relationship covers agricultural and non-agricultural sectors, that of agricultural extension is limited to the agricultural sub-sector.

viii) Rural sociology and agricultural extension conduct their activities majorly in the rural environment with the use of similar research methods involving farmers who are the primary inhabitants of the rural environment, especially in developing countries like Nigeria.

ix) Several rural sociological concepts provide the foundation on which agricultural extension analyses are based. Some of the rural sociological concepts on which agricultural extension analyses are based include culture, social change, social group, social values, norms, adoption-diffusion process, group dynamics, etc.

x) Both rural sociology and agricultural extension are akin to community and rural development through agriculture which is the major economy of most rural dwellers.

Vice Chancellor Sir, it is evident from the fore-going that the concerns and interests of rural sociology and agricultural extension are intertwined and overlap (Ekuman Kama, 2011) because both fields of study concentrate efforts on the rural dwellers of which the farming groups are their primary beneficiary. The next conceptual interest of this lecture is to ascertain the roles of the rural sociology and rural development practitioner in agriculture.

3.5 **Roles of the Rural Sociology and Rural Development Practitioners in Adoption of Agricultural Technologies.**

Vice Chancellor Sir, the roles of the rural sociology and rural development practitioners in the adoption of agricultural technologies can not be over emphasized. The roles are therefore enumerated as contained in study of Nlerum and Agorom (2018) as below.

i) They help to understand and appreciate the problems of farmers with a view of intervening with development programmes like agricultural innovations which enhances the farmers' production and income.

ii) They help to provide grass-root information to development agencies which are interested in the welfare of farmers and also to return a feedback to the development agencies from the farmers. This is achieved through the agricultural/extension feedback mechanism.

iii) Extension Agents who are in direct and constant contact with the farmers are equipped with sociological knowledge for enhanced performance in the adoption of agricultural production value-chain. Some of the sociological knowledge include community leadership development, culture, the social system, social norm, etc.

iv) Farmers are assisted in understanding of themselves, their environment and their roles in the society. This is done with the aim of motivating them to continue with their farming occupation and to participate fully in the development initiates around them.

v) Farmers are assisted to identify the benefits, powers and forces of group action and are therefore encouraged to form cooperative societies for mutual support and input mobilization.

vi) Farmers are also made to understand the conditions that bring about positive change and transformation in agriculture and are encouraged to be part of the positive change by adoption of technologies and the contact farmer mechanism.

vii) Rural farmers are made to see the need to concentrate effort in their agricultural enterprises and distance themselves from the lure of migration to cities to seek for white collar jobs which are inadequate.

viii) Rural sociology and rural development practitioners seek to advocate for the rural environment to be more desirable at all times for rural dwellers of which farmers are more by interfacing and collaborating with the appropriate Governmental, and Non-Governmental Agencies to bring about relevant community development facilities of potable water, good road network, communication facilities, electricity, schools, recreation centres, markets, health care centres, improved farm inputs and credits.

The focus of rural sociology and rural development practitioners is the rural area. The question now is how do we describe the rural area in Nigeria?

4.0 **RURAL AREA**

4.1 Rural Area in Nigeria

The rural area in Nigeria represents a given geographical local environment which can not be rightly described as semi-urban or urban, where life is simple and close to nature (Nlerum and Okidim, 2014). The modern society recognizes two geographical locations as opposite sites for human habitate, namely, the rurality and the city (Nlerum and Doutimifi, 2018). Those who inhabit the rurality are said to dwell in the rural area, while those who inhabit the urban and semi-urban areas are said to inhabit the cities.

In Nigeria and Africa, 70% of the population inhabit the rural area (Ekong, 2011, Nlerum and Jacob, 2013), while 30% of the population inhabit the sub-urban and urban areas of the country. Eighty percent (80%) of the rural dwellers in Nigeria are primarily engaged in one form of agriculture or another as their means of livelihood (Nwankpa, 2017).

Common features of rural areas, especially in Nigeria and other parts of Africa as shown by Ayichi (1995) are general poverty, low income and investment of the people, underutilized or unutilized natural resources, rapidly increasing population, under and disguised employment, use of traditional tools and technologies, high level of ignorance due to poor educational opportunities, inadequate social and physical infrastructure, etc. Beside these, the main occupation of the people is agriculture or agriculturally related, which is done with simple farm tools.

Vice Chancellor Sir, the existence of these setback features in the rural areas has made the profession of rural sociology and development relevant.

Rural areas in Nigeria are identifiable with some characteristics which are explained as the next unit of this lecture.

4.2 **Characteristics of Rural Areas in Nigeria.**

Sociologically, rural areas in Nigeria in comparison with the urban areas exhibit the following and similar characteristics.

i) Their settlement pattern is dispersed or isolated, while in urban areas the settlement pattern is nucleated or compact (Girigiri, 2000).
ii) Kinship structure is very strong in rural than in urban areas.
iii) Social rank is traditionally confired on people in the rural areas, while in urban areas social rank is achieved by personal efforts.
iv) Social organizations in rural areas are mainly informal in nature and marked with face-to-face relationships. In urban areas social organizations are mainly formal in nature.
v) Occupation of rural people is mainly agricultural or agro-related, while diversity of occupations is the case with urban areas.

vi) There is high land area to human population in rural area (Fasina 2005) than in urban area.
vii) Major income of rural people is from agriculture, while urban area has diverse means of income and livelihood.
viii) Standard of living in rural area is low.
ix) Rural areas are near to natural environments than urban areas.
x) In rural areas, the culture is homogenous, but in urban areas, the culture is heterogeneous with different cultural practices.
xi) In terms of social differentiation, in rural areas, there is little or no division of labour as almost every family is known to be producing the same or similar kinds of goods and services. In urban areas, high level of division of labour exists in occupation and means of livelihood of the people, etc.

4.3 **Importance of Rural Areas in the Socio-economic Development of Nigeria.**

Vice Chancellor Sir, irrespective of the fact that the rural areas when compared with the urban areas are disadvantaged in terms of physical features and characteristics, their importance in the socio-economic development of Nigeria can not be over emphasized. Some of the importance of rural areas in Nigeria in line with Ekong (2003) are that they:

i. remain the food and feed baskets for man and animals, accounting for over 80% of the world's food (Arsenault (2014),
ii. provide raw materials and fibre for our industries,
iii. provide foreign exchange for the country in terms of crude oil, gases, agricultural products, by rites, coal, tin, gold, etc,
iv. provide labour for our industries which are located in both the rural and urban areas,
v. provide human resources which are required to run the various social and economic sectors of the nation because every worker in Nigeria belong to one rural area or another,
vi. protect our cultural heritage and
vii. confer right of citizenship to all Nigerians.

As a Professor of Rural Sociology and Rural Development, let me in this lecture take a little time out to explain a few basic concepts in rural development as I have already done in Rural Sociology. This is because the improvement of lives of people in the rural area is brought about by the process of rural development.

5.0 **RURAL DEVELOPMENT**

5.1 **Conceptual Explanation of Rural Development and Sustainable Rural Development**

Rural development is a multi-dimensional process by which a group of people or a society harnesses, mobilizes and utilizes available human and material resources for the purpose of transforming the socio-economic and physical environment of the rural people

(Obasi 2010, Nlerum and Ogu 2014). Rural development involves the process of improvement of the geographical areas which are domiciled by aggregation of rural families (Eze, 2005, Nlerum, 2012) by the enhancement of human resources and necessary infrastructural facilities to bring about social, economic and physical wellbeing of the rural people. Jibowo (2000) succinctly referred to rural development as a socially, economically, politically, educationally, orderly and materially desirable condition with the purpose of improving the quality of life of the rural population.

The overall objective of rural development is to alter the behavior complex of a larger population of rural people in such a way that they will acquire the necessary knowledge, skill and attitude that would enable them become more productive and grow individually and collectively to a better standard of living, while contributing fully to national progress and development. Rural development involves the implementation of programmes that empowers rural people in the area of agricultural production, health care, education, home management, housing, electrification, employment, potable water supply, co-operative formation, etc.

Rural development activities need to be sustainable. Sustainable rural development is that development activity that meets the need of the present generation without compromising the ability of the future generation from meeting their own needs. In order to enhance sustainability, a development practitioner encourages current beneficiaries of development projects to satisfy their needs as much as possible, while making conscious efforts to preserve the project and its surrounding environment to last long enough to continue to satisfy the need of future and unborn members of the rural society. Full participation of the rural people themselves in decision-making about project activities is *sine qua non* in the realization of the objectives of sustainable rural development and rural development practitioners are aware of this fact.

5.2 **Objectives of Rural Development**

The major objectives of rural development which the Rural Development Practitioners from time to time seek to realize in the rural environment include, as seen in the study of Obasi (2010).

i) **Agricultural Development**: This is done in the area of technology development, technology dissemination, provision of improved inputs at the right time and quantity, provision of credit, availability of extension workers, storage facilities, processing and marketing of agricultural products and improved family nutrition.

   The development of the agricultural production capacity of rural people is key in rural development since agriculture generate employment and income and it is a means of reducing poverty among the rural dwellers in Nigeria.

ii) **Infrastructural Development**: Improvement in the physical nature of the rural environment is another area of emphasis in rural development which is of interest to the rural sociology and rural development practitioner. The facilities of interest here include

the provision of good rural roads, transportation facilities, effective communication, potable water supply, electricity supply, educational facilities, upgrading of health care facilities, etc.

iii) **Industrialization**: Location of industries in the rural area is another objective of rural development. Industrialization increases empowerment and economic activities in the rural divide. Rural-urban migration is also reduced by industrializing the rural area. Oil palm processing, cotton, beverage, wool, oil and gas, groundnut, rice mill industries are some examples of industries which are springboard for rural development in Nigeria.

iv) **Human Resources Development:** By the provision of educational opportunities to rural people, rural development equip rural people (youths, men, women and children) for modern and decent life, new skills, means of livelihood and increase participation in social, economic and political consciousness. Human resources development improves the manpower base of the rural communities.

v) **Provision of Health Facilities:** Rural development seeks to provide facilities for affordable health services to the rural people. This is done through efforts which are geared towards the equipment of primary and secondary health care services which are located close to the people.

The summary of the above specific objectives is that, rural development seek to enhance equity in income distribution, productive employment and empowerment, food production and food security and basic infrastructure of the rural people.

5.3 Framework for Rural Development

By framework for rural development, we mean the structure of those activities which give shape to the process of rural development. There are components in the process of rural development which must be targeted to ensure that impressive impact has been achieved in the rural development process. For rural development process to achieve its goal of poverty reduction among the rural populace a simultaneous or a near simultaneous effort should be made in the incoperation of the various units of the rural development framework as indicated by Eboh, (1995).

a) **Human Development:** This contains such activities as job training, leadership training, research activities, youth activities, health services, food and nutrition, skill empowerment, formation of rural groups, etc.

b) **Institutional Development:** Incoperated in this framework are:

   i) Economic activities; have such structures as agricultural development, business, industrial matters, materials and equipment, markets, credit, loans and grants.

   ii) Educational activities; have such indices as formal education, non-formal education and informed education.

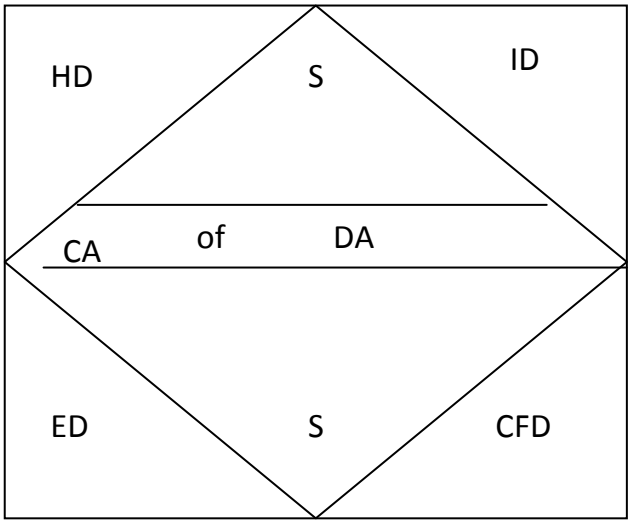
   iii) Political activities; covers leadership, security, democracy, resource allocation, etc.

   iv) Religious activities; covers all religious matters

   v) Family activities; covers parenting and family support.

c) **Environmental Development:** This includes such activities like environmental protection, conservation, community beautification, population control, environmental sanitation, recreation, agro-forest, etc.

d) **Community Facilities Development:** In this framework, the areas of concentration are provision of housing, electricity, potable water, communication, roads, school buildings, churches, public buildings, etc.



KEY

HD – Human Development

ID – Institutional Development

ED – Environmental Development

CFD – Community Facilities Development

CA – Co-ordinating Agencies

DA – Development Activities

S - Stakeholders

Figure 1: Diagrammatic sketch of framework of Rural Development showing the components of the rural development process.

5.4 **Process of Rural Development**

The actual process of rural development is successfully grouped into four major steps; namely: knowing the community, planning the programme, implementing the programme and monitoring and evaluating the programme (Eze, 2005).

5.4.1 Step 1: **Knowing the Community**

Knowing the community comprises the process of penetration, studying the community for need identification and the determination of goal and objectives. Penetration is the process of making the first and initial contact with the community by the rural development practitioner. It is done by a visit or contact with the traditional opinion and political leaders of the rural community which has been earmarked for development. The purpose of penetration is to declare the practitioner's personality, mission and donor of the development activity.

Studying the community is the process of knowing how the community is structured for the aim of understanding of what will work in the area. Areas of interests by the practitioner in this process are demographic features, population distribution, social institution (family, education, political, economic and religious activities), community facilities (housing, road, water supply, electricity, town halls, health care centres), culture, etc.

Need identification aspect of knowing the community is the process by which the development practitioner collects, collate and prioritizes the needs and interests of the target community. Determination of goal and objectives is the next process in knowing the community. The goal defines the expectation of a programme or project, while the objectives determines "what, where, when, why, whom and how" of the programme. Generally the objectives of a programme states clearly what the target community stands to benefit by participating in the programme's activities. Objectives in development programme must be specific, explicit, achievable and measurable.

Knowing the community by the development practitioner involves the process of data collection which can be achieved through the use of questionnaire, participant observation, interview schedule, secondary data, diagnostic survey, brainstorming, etc.

5.4.2 Step 2: **Planning the Programme**

The planning stage is the next after knowing the community. Planning the programme is the process of determining what is to be achieved by the programme after a given period of time. This is usually before the programme is practically implemented. The plan contains the day-to-day activities of the programme that is from its inception to its end. The plan contains such information as the programme's duration, beneficiaries (target group), stake-holders, counterpart contribution (if any), funding, personnel and their job schedules, targets to achieve at a particular time, monitoring and supervision, progress report writing and presentation, evaluation, etc.

A planning committee is needful in the planning stage. Statutory members of the committee are the stakeholders to the programme which are the consultants, donors, target group (community people), personnel of the programme, etc.

5.4.3 Step 3: **Implementing the Programme**

Implementation stage in the process of rural development is the time in which the planned programme on paper is taken to the field for action and execution. Adherence to the provisions of the planned document is a core requirement for a successful programme implementation. Provision of enough facilities, inputs, funding at the right time is important in the implementation stage of the programme.

Programme implementation is carried out with the workplan. The workplan is a description of the essential activities in the development process. Workplan also contain officers and units responsible for certain responsibilities, the time frame to begin and conclude each activity of the plan.

5.4.4 Step 4: **Monitoring and Evaluating the Programme**

Monitoring is the process by which a feedback on a programme after a given period of time is made by the implementers, executors and managers of the programme. The essence of

monitoring is to supervise the project to ensure that the activities are carried out as contained in the plan. Monitoring also ensures that the programme is performing as it is expected, giving the period under consideration. Monitoring prepares the programme for evaluation which follows after it.

Evaluation is a scientific method of measuring if the project has delivered on its set down objective after a given period of time. Evaluation provides answers to the following questions: has the original problem been solved? What new problems have immerged? Where are the people now" and What next should be done? The answers to these questions provide baseline information for future action to the management of the programme.

It is important to note that participation of the target group, that is the community people or recipients, or beneficiaries of the project is of immense importance in the various stages in the process of rural development.

5.5 Approaches to Rural Development

Approaches to rural development means the channels or the routes through which rural development activities are disseminated to the target group (rural community people). Uwakah (2005) listed rural development approaches in Nigeria to include: agricultural extension, adult education, co-operative society formation, home economics, health care services, community facilities provision (road, water, housing, etc) and skill acquisition for youths.

5.6 Relationship between Rural Sociology and Rural Development.

i. **Better Understanding of the Community:** Rural sociology provides knowledge which brings about a better understanding of how the rural communities function to the Extension Change Agent (Alfred, 2011), the rural development worker. Rural sociology teaches about leadership, norms, culture, social relationships, social institution, etc. to the Extension Change Agents. The change agent then makes use of the sociological knowledge so obtained to galvanise the communities to participate in rural development efforts.

ii. **Diffusion and Adoption of Innovations**: Rural sociology plays a major role in the analyses of the process of diffusion and adoption of rural development innovations to the development worker (Extension Agents). The knowledge of how rural development initiative moves from the process of awareness, interest, evaluation, trial and adoption is important in the process of dissemination of development projects to rural dwellers.

iii. **Family Decision:** Rural sociology equips rural development workers with knowledge of who takes certain family decisions between men and women. With this knowledge, the development worker (Extension Officer) is able to know who to contact between a husband and his wife in a family in the introduction of certain development initiatives or technologies.

iv. **Cultural Compatibility of Innovations**: Rural Sociology provides development workers with the knowledge of how compatible an intended development initiative will be with the culture of the rural people. With this knowledge the rural development worker is able to know even from the beginning which community will be receptive or not to a given development programme.

v. **Knowledge of Migration:** Migration is a rural sociological concept which prepares development worker with knowledge of how and why able-bodied young men and women leave their rural communities to the urban centres, majorly in the search of white collar jobs which currently are not easy to come by. These migrants leave the farms in the hands of older people whose productivity is very low. Rural sociology emphasises the need to make lives better for rural dwellers in order to retain more youths in the rural communities for enhanced agricultural development, output and economic growth of the nation. This emphasy to make life meaningful for rural people which rural sociology promote agrees with the objective of rural development.

6.0 AGRICULTURAL EXTENSION

6.1 Agricultural Extension Concept

6.1.1 Origin of Extension Education.

The word extension is obtained from two Latin words namely: "Tensio" meaning stretching and "Ex" meaning out. Joining the two words together extension therefore means "stretching out". Extension education therefore in this sense means stretching out of learning information to other people. The term extension education was first used in the year 1873 by the father of extension education called James Staurt, a Fellow of the Trinity College of Cambridge University, United Kingdom.

Extension education began when the University of Cambridge realized that the much knowledge which were generated within the University need to be "stretched out" to the people (communities) surrounding the University who may be in need of the knowledge to improve their livelihood activities. The University from this process began to disseminate productive knowledge to host communities of the university in an out-reach and community service exercise. Host community members who could not have the opportunity of being students in the University were thus given the chance to benefit from the much knowledge which were generated in the citadel of learning through the process of extension education.

6.1.2 Meaning of Agricultural Extension Education.

In view of the earlier explanation of what extension is, agricultural extension education is explained as a non-formal and an out-of-school educational system for training and influencing farmers and their families to adopt improved practices from the research stations (educational institutions) in agricultural production (Nlerum and Akpanji, 2015).

Agricultural extension does not end with teaching farmers to adopt improved practices, but it is also concerned with the process of assisting farmers to change their overall outlook to the point where they are receptive to and on their own start looking for the means of upgrading their knowledge, skill and attitude that will result into improvement of their farm enterprise and the home situation such as environment, health, leadership, etc.

6.2 **Principles and Philosophies of Agricultural Extension Education.**

6.2.1 **Principles of Agricultural Extension**

In order for agricultural extension service to succeed in the process of information dissemination to farmers, it needs to be guided by some set of principles. The principles provide the ethics for extension practitioners in their effort to assist their clientels or target groups or farmers.

An extension principle therefore is defined as the truth, guideline and law upon which the service of extension is based. Following this understanding, the principles of agricultural extension includes, but not limited to the following:

i) Extension begins from where the people are. This means that extension practitioners do take note of the present knowledge, skill, attitude, and competency of the people, it is set to service. It is only when the capacity of the farmer is known that effective impartation can be made by the extension agents. Knowing where the people are can be obtained through:
   a) face-to-face contact between the Agent and the people;
   b) use of survey to determine the present social status of the people in the area in terms of culture, belief, available material recourses, educational levels, experience, age, sex, etc.

ii) Extension focuses on the felt need and interest of the people. In terms of programme simulation, planning and implementation, extension focuses on the need and interest of the people. Meeting the need of the farmers is a driving force and priority of extension practitioners. The use of the top-down approach as opposed to the bottom-up approach to the planning of extension activities is better in the effective determination of needs and interests of the target group for an extension outfit (outreach).

iii) Extension Programmes must be sustainable. Sustainability of an act is the process or the state of being maintained to last reasonably long enough to serve its purpose. This principle of extension means that the package which extension is extending to the farmers should be the one that would last enough to be able to service the need of the present farmers and other generation of farmers that would need the package later.

A sustainable extension delivery service is that which is able to meet the need of the present farmers without compromising the ability of future farmers to meet their

own need. Agricultural extension technologies which are sustainable would require to be: less expensive, with easily and available inputs, practicable, profitable, practicable in a small scale, affordable, replicable and of a higher relative advantage over the one it is supposed to replace. Moreover, it should conform to the indigenous knowledge scheme of the people.

iv) Extension programme is participatory in approach. The participation of the rural people, clientels or target groups is central in a successful extension programme. This is important because farmers show more commitment in extension programmes in which they are part of the decision-making, planning, implementation, monitoring and evaluation.

v) Extension makes use of local leaders. In order for extension service to reach as many farmers as possible in a given location over a given period of time, the use of local leaders is important. The local leadership serves as contact farmers through whom the Extension Agent is able to reach out to other farmers in a particular location.

vi) Extension makes use of trained personnel (professionalism) as practitioners. In order to qualify to be engaged as a professional in extension, the person should possess a minimum of National Diploma in any field of agriculture or a National Certificate of Education (NCE) in agricultural education. However, the most appropriate minimum qualification for a person to become a specialist in the field of extension is first degree in agricultural extension, agricultural economics/extension, agricultural education and agricultural journalism. Failure to use specialists to practice extension, tantamounts to the use of quacks as practitioners.

vii) Extension believes in the use of variety of teaching methods in the education of farmers. The output of extension service is maximized when a combination of variety of teaching methods are used to deliver technical messages to farmers by the Agent. Teaching methods which are available to extension teachers are demonstration, lecture, discussion, use of mass media, etc.

viii) Use of constant evaluation. Extension believes in constant supervision, monitoring and evaluation of its personnel and field activities. The major aim for this follow-up is to ensure that the objective of the extension programme is achieved as specified in the plan over a given period of time.

ix) Subject matter of extension work is definite and specific. In view of the fact that the farmer is a busy person, it is required that extension workers should be definite, specific and straight to the point when on an educational mission to farmers.

6.2.2 **Philosophies of Agricultural Extension Education**

Philosophy is the fundamental principle on which the practice of extension is based. It is the philosophy of extension that makes it different from the practice of other fields of study. Extension philosophies include the following:

i) Helping farmers to help themselves rather than just doing things for them.

ii) Encourage voluntary participation of farmers in extension activities and avoiding the use of force or coercion. This means that democratic approach is used in extension education.

iii) Extension is based on the hypothesis that rural people are capable, intelligent and willing to accept change for good.

iv) Extension help farmers to identify and find solutions to their farm and family problems at their own cost.

6.3 **Objectives of Agricultural Extension.**

Some selected objectives of agricultural extension education are to:

i) increase agricultural production of farmers through the dissemination of appropriate technical messages which improve farmers' production, knowledge, skill and attitude,

ii) improve the knowledge of farmers in home making, health care and family life,

iii) encourage youth participation in agriculture and rural welfare activities,

iv) encourage social development including cooperative formation,

v) promote the creative use of natural resources to improve community life, health, education and rural living and

vi) promote community development effort of the people.

6.4 **Process of Agricultural Extension**

In order to carry out a successful agricultural extension programe, seven basic processes are involved. They are diagnosis, feedback system, message transfer, linkage, training, monitoring and evaluation (Asiabaka, 2002).

i) **Diagnosis**.

This is the process whereby extension workers make an analysis of the felt needs and interests of the clientel or target group, that is the farmer, before the process of preparing an extension plan. This stage involves the studying and understanding the target group's social and economic background, culture, leadership pattern, population, etc. Diagnosis is the first stage in the extension process.

ii) **Feedback System.**

Once extension has been able to diagnose the problems surrounding the need and interest of the target group, the next activity is to deliver the problem through a feedback process to the research institution for appropriate solutions. The response of the research station is also through the feedback mechanism delivered to farmers. This feedback mechanism satisfy the two-way communication channel between the research station and farmers. Feedback is the second stage of the extension process.

iii) **Message Transfer.**

When the research station has provided solutions based on the interest of farmers which earlier has been diagnosed. Extension passes the information as a message to

the farmers through the Extension Agent who is in direct touch with farmers. Extension messages come in the form of creation of awareness, skill development, attitude development in teaching at the field or home of farmers or by the use of mass media channels. Message transfer is the third stage of the extension process.

iv) **Linkage System.**

Linkage System account for the process during which the extension worker links the target group to sources of input supply which are required for the implemenation of the message which has been disseminated to the target group. Although it is not the duty of extension to provide farmers with inputs which they may need to adopt the message, it is however, the responsibility of extension to direct farmers or provide information on the sources of input supply such as farm tools, seeds, fertilizers, fingerlings, animal feeds, planting materials, day old chicks, processing and storage equipment. The linkage system is the fourth stage of the process of extension.

v) **Training**.

Successful extension programmes require training and retraining of extension staff to be up-to-date with current trend as may be demanded by their job. In-house training, out-of-programme training and in-service training are required at this point to tackle the skill gap which may arise on-the-job from time to time. Training is the fifth stage of the extension process.

vi) **Monitoring**.

Monitoring is majorly a management tool which is used in following-up the day-to-day progress which is made by extension. Results of monitoring are useful in ensuring that planned projects are working as planned. Observed deviation from the plan is corrected during monitoring.

Supervision by the Extension Agents on farmers, supervision of the Extension Agent by senior extension workers and the Subject Matter Specialists are all forms of monitoring. Monitoring also provides information with which the extension worker sends as a feedback to the research station as per the effectiveness of a recommended production technology. The sixth stage in the process of extension is monitoring.

vii) **Evaluation**.

This is the last (seventh) stage in the agricultural extension education process. Evaluation is the process whereby extension is able to determine if its objective has been achieved after a given period of time. Often, evaluation is carried out by external bodies or persons apart from those that implemented the extension programme. Evaluation is important to determine if the programme was a success or not. Lessons which are learnt from evaluation are also beneficial to the programme implementation team.

6.5 **Fields of Study in Agricultural Extension.**

Some fields of specialization in agricultural extension in Nigeria and other parts of the world are:

i) Agricultural Extension Administration.
ii) Agricultural Extension Communication.
iii) Rural Sociology.
iv) Rural sociology and Development.
v) Rural Sociology and Agricultural Extension
vi) Agricultural Extension and Rural Development.
vii) Community and Rural Development.
viii) General Extension.
ix) Agricultural Extension Education.
x) Agricultural Journalism.

6.6 **Agricultural Technology**

Agricultural technology is the application of scientific techniques which satisfies human needs and desires in the control of the production, yield, preservation and processing of agricultural products (Nlerum, 2013). Today, world security issues are tied to the level of technology in agriculture (Ogunrinde, 2006). Food security status of any nation is to a large extent tied to the level and type of agricultural technologies which are developed and available to the farmers.

In Nigeria, the over twenty-two agricultural research institutes have played host to several agricultural technologies which have enhanced discoveries and inventions which have resulted to improvement in the production of crops, agro-forestries, livestocks and fisheries. The ultimate test of success of any agricultural technology generation and transfer system is the extent of technology adoption by the clients, which in this case are the farmers.

In view of the foregoing, it is needful to state that agricultural research efforts in themselves are valueless in a development context if they are not extended to the farmers who are their end users for adoption. It is on the basis of this assertion that the title of this inaugural lecture "Adoption of agricultural technologies by farmers: A rural sociology and development perspective" has become very important.

6.7 **Agricultural Technologies of Rivers State Agricultural Development Programme (ADP).**

Attempt is made in this section of the lecture to enumerate some agricultural technologies of the Rivers State Agricultural Development Programme (ADP) which have been made available to farmers in the South-South agricultural zone of Nigeria. Farmers were encouraged to adopt the technologies in order to enhance their farm production and income so as to be able to tackle the scorge of poverty among the farm families. These ADP agricultural technologies are grouped under the headings: Crop, agro-forestry, livestock, fishery and agro-processing (Women-in-Agriculture) (Apapa, 2020).

i) Crop production technologies: some of the selected agricultural crop technologies are: fertilizer application, planting of crops in rows, cowpea, cassava/maize/egwusi

or telfaira intercrop, yam minisett/maize followed by cowpea production, plantain/banana cultivation, pineapple cultivation, introduction of improved cassava varieties - TM30572, TMS 30555, etc, plantain/cocoyam intercrop, dry season vegetable and maize production, cassava/maize/cocoyam intercrop, cassava/maize/sweet potato intercrop, cowpea cultivation, etc.

ii) **Agro-Forestry Production Technologies**

Some of the selected agro-forestry technologies are: introduction of agro-forest crops, snail rearing, bee keeping, establishment of *Gnetuum africanuum* (Ogbono), Okazi cultivation, etc.

iii) **Livestock Production Technologies.**

Selected livestock technologies in this section include: confinement of sheep and goat, swine production, poultry production, rabbit rearing, rearing of grass cutter (nchi), etc.

iv) **Fisheries Production Technologies.**

Selected agricultural technologies in fisheries include homestead fishpond construction and management, maintenance of fishing gears (example nets), control of turbidity in ponds, fingerling production, fish stocking density, etc.

v) **Agro-Processing Technologies (Women-in-Agriculture)**

Selected technologies in this section being mainly for women-in-agriculture are: soya bean processing into milk, processing of cassava into adourless fufu flour and mash, storage of maize in cribs, cocoyam and plantain chip production, processing of cassava into doughnut, vegetable processing and utilization, etc.

6.8 Adoption Concept

6.8.1 Meaning of Adoption in Extension

Adoption of agricultural technology is the process of putting into practice an accepted agricultural innovation or agricultural production package by the farmer. Adoption is a farmer's decision for continual practice of a science-based agricultural production technology (Fliegel 1984). The main objective of agricultural extension communication is to provide a firm knowledge on which action for adoption could be based by the farmer.

Adopters are categorized in terms of their earliness or lateness in taking decision for or against farm technologies. The categories according to Rogers (1983), Asiabaka (2002) are innovators, early adopters, early majority, late majority and laggards. The first group of farmers to adopt new technologies in any locality are referred to as innovators. These are usually few and representing 2.5% of the farming population.

Innovators are relatively often made up of farmers who are young, educated and good in risk taking (venturesome). The second group is known as early adopters and represents 13.5% of the farming population. They serve as role models to other farmers (Asiabaka, 2002). As the new technology continues to spread, the third group of farmers to adopt it are referred

to as the early majority. This group accounts for 34% of the farming population. The late majority is the fourth group of adopters. They make up 34% also of the farming population.

Laggard is the fifth and last group of adopters and represents 16% of the farming population. This group adopt technologies only when every interested farmer has adopted. They adopt when the technology has become belated when other farmers are opting for newer technologies. Majority of farmers in this group are less educated and older in age (Asiabaka, 2002).

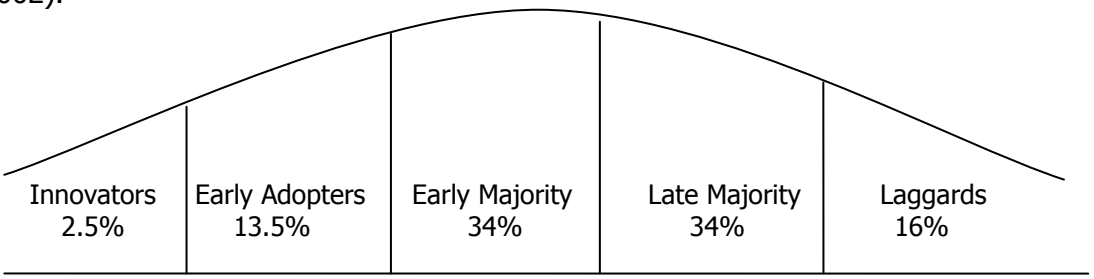


Figure 2: **Adopter Categories of Agricultural Technologies. Adapted from Rogers (1983).**

6.8.2 Importance of Technology Adoption in Agriculture

a) Remarkable agricultural productivity is achieved by farmers in Nigeria, United States of America, Hawaii, Japan, India, Pakistan (Ojoko, 1994), etc.
b) Decision-making capacity of farmers is enhanced as they gain competency in managerial skills to operate in a commercial based economy (Williams 1984).
c) Farming is made more lucrative with increase productivity and income.
since the cultivation of less portion of land yield more for the farm family (Nlerum 2007).

6.8.3 Some Factors influencing Adoption of Technologies by Farmers.

Several studies by researchers have shown some factors which influenced adoption of technologies by farmers. These factors include:

a) The presence of the Extension Agent acts as a catalyst which stimulates and motivates the farmers to adopt farm technologies (Agumagu, 1996).
b) Educational level of the farmer is important because a higher educational level of the farmer is known to be associated with higher adoption rate (Emah, 1990).
c) Use of contact farmers as shown in the works of Benor and Baxter (1984) is another factor.
d) Properties of the technology itself remains crucial in its adoption by farmers. The properties include the technology's relative advantage over the farmers' practice, compatibility with the environment, triability in a small scale, input availability, less complexity and visibility of result (Iwueke, 1994, Nlerum, 2007).

6.9 **Stages of the Adoption Process.**

Awareness: This is the first time the farmer is made to know about an agricultural technology. This may be through a personal contact with the extension worker, mass media (print or electronic) or other farmers.

Interest: This is the stage in which the farmer develops desire to know more about the technology he has just become aware of or informed about or introduced to. The farmer begins to make inquiry on how to know more about the technology either through the extension worker, fellow farmers or the mass media.

Evaluation: At this stage the farmer starts to ask himself questions about the newly introduced technology which he has indicated his interest. Questions which go on in the mind of the farmer at this stage are, how will the application of the technology affect his farm business? What are the benefits of the new technology over his current traditional practice? Is it practicable in a small plot or space? Are the inputs to practice it locally available and at a minimal cost? Will the output (harvest) be better than his normal practice? etc. The farmer now goes to the next stage if he is able to mentally convince himself that the new technology will enhance the socio-economic needs of his farm family.

Trial: A successful evaluation of the new technology leads to the trial stage in which the farmer takes the decision to try it in a small portion of his farm. The major aim of trying it in a small portion is to make comparism between the harvest from the small trial plot and farmer's adjacent equal plot size. The other reason for a small plot trial is to minimize risk on the part of the farmer if the new technology fails. If the harvest from the trial plot is better than the harvest from the farmer's adjacent equal plot size, then the farmer now moves on to the next stage which is adoption.

Adoption: This is the stage where the farmer is convinced from the outcome of the harvest in the trial stage that the new technology is beneficial to his need and therefore will add more value to him socio-economically and therefore decides to accept it as his method of farming. Sometimes, farmers may adopt all the various components of the technology, known as the complete adoption or may wish to adopt some components of the technology, known as partial adoption (Nlerum and Agumagu, 2008). Adoption of agricultural technologies (innovations) by farmers is an essential prerequisite for economic prosperity, particularly in less developed countries.

7.0 **MY RESEARCH CONTRIBUTIONS TO KNOWLEDGE**

Vice Chancellor Sir, distinguished ladies and gentle men, the field of agricultural extension is very broad and extends to the area of rural sociology and rural development (Nwachukwu, 2014). In view of this fact, it is not possible to effectively study how to extend agricultural technologies to farmers without studying the sociology and development efforts (human group activities) of the people. It is on the basis of this fact that my research focus in

agricultural extension is on rural sociology and rural development. It is not possible to discuss all my research contributions to knowledge of over 60 research publications in both local and international journals and conferences in this lecture. However, for the purpose of this inaugural lecture, I shall limit my research contributions to knowledge to adoption of agricultural technologies by farmers which is the end-desire of the agricultural extension experts (the rural sociology and development practitioners). Given this fact therefore, my efforts shall be concentrated in adoption of agricultural technologies in: (i) crop, (ii) livestock, (iii) fishery, (iv) agro-processing and (v) others.

7.1 **Adoption of Agricultural Technologies in Crop Production.**

7.1.1 **Prediction of Adoption of Yam Minisett Technology Among Yam Farmers in Rivers State, Nigeria.**

Yam minisett technology is an agricultural production technology designed to multiply seed yams for planting in the next planting season (Otoo, et al, 1987) with seed yams of about 25 grammes to produce bigger yam tubers for family consumption and the market. This scientific technology was used to tackle the perennial scarcity of seed yams often encountered by yam farmers in Nigeria at the beginning of each yam farming season. The yam minisett technology consists of the following eight activities: cutting of clean and healthy mother seed yams of 500 – 1000 grammes into minisetts of about 25 grames, treatment of minisetts with minisett dust or slurry of woodash, planting at a geometry of (25 x 100) centimeters, planting when rainfall is steady (between May and June), weeding three times before harvesting, application of N.P.K. fertilizer at 400 – 500 kilogrammes per hectare, vine staking soon after sprouting with pyramid or trellis and harvesting when the leaves are dried and falling.

Yam farmers as used in this study is referred to all farmers who cultivated yams either as a sole or a mixed crop. These yam farmers have sustained Nigeria as the highest producer of yam in the world (Onwueme and Sinha, 1991). Given the problem of sourcing for seed yams encountered by yam farmers yearly, the research problem of the study was to determine if the adoption of yam minisett technology by yam farmers in Rivers State could be predicted based on the farmers' socio-economic attributes of age, contact with Extension Agents, education, farm income, farm size and yam farming experience.

The objectives of the study were to identify the variables that determined adoption among the yam farmers and to identify the variable that exercised the strongest predictive power on the adoption of yam minisett technology among yam farmers.

Multi-stage cluster, purposive and random sampling techniques were used in the selection of 252 yam farmers in Rivers State. Data were elicited with copies of the interview schedule and questionnaire and analysed with the descriptive statistics of mean and percentage. Inferential statistics with the step-wise multiple regression analysis at 0.05 level of significance was used to test the hypothesis of the study. Adoption constituted the dependent

variable, while the farmers socio-economic attributes constituted the independent variables of the study.

The result in Table 1 showed that the best predictor of adoption among yam farmers in Rivers State was contact with the Extension Agents with R^2 value of 0.3364, indicating that this attribute alone accounted for about 33.64% of the variability in the adoption behavior of the yam farmers (Nlerum 2009). The second best predictor was educational level with R^2 value of 0.2240 explaining about 22.40% of the variability in the adoption behavior of the yam farmers. The third was net farm income with R^2 value of 0.1805, which explained about 18.05% of the variability in the adoption behavior. The last was farm size with R^2 value of 0.1317 which explained about 13.17% of the variability in the adoption behaivour of the yam farmers. The joint effort of these four significant socio-economic attributes of the yam farmers which had significant relationship with their adoption level had an R^2 value of 0.8926 and therefore explain about 89.26% of the variability in the adoption behavior of the yam farmers in Rivers State.

Table 1: Result of Step-wise Regression Analysis showing Predictors of Adoption of Yam Minisett Technology among Yam Farmers in Rivers State.

Variables	PE(b)	SE	F-Value	Partiat R^2	Mode R^2	Significance
Intercept (a)	137.572	42.6704	9.75	-	-	*
Extension Contact (X^1)	2.0457	0.4320	24.66	0.3364	0.3364	*
Educational Level (X^2)	1.02345	0.2667	15.64	0.2449	0.5804	*
Yam Income (X^3)	1.41234	0.3156	11.40	0.1805	0.7609	*
Farm Size (X^4)	1.6512	0.5661	4.06	0.1317	0.8926	*

R^2 = 0.8926, PE(b) = Parameter Estimate (beta), SE = Standard Error * Significant (P<0.05)

Source: Field Survey (2002).

Vice Chancellor Sir, the result of this study has shown clearly that the best predictor of the variability in the adoption behavior of yam farmers in Rivers State was contact with the Extension Agents, that is, the rural sociology and development practitioners. The study of Davis, *et al* (2019) showed that the number of these Extension Agents in Nigeria is grossly insufficient with the ratio of between one Extension Agent to 5,000 and 10,000 farmers (1:5,000 and 1:10,000) instead of the World Bank Standard of 1:800 (World Bank 1988). The study of Emah, (2018) in Rivers State has also shown a poor Extension-farmers ratio in the state.

The perspective of the rural sociology and development practitioners following the result of this study is that the gap between extension workers and farmers in Nigeria is very wide and therefore need to be brought closer to the world bank standard.

7.1.2 **Adoption of Production Recommendations of Cassava/Maize/ Egwusi-Melon Intercropping System by Green River Project Farmers in Niger Delta, Nigeria.**

This study analysed the adoption of the crop production technology of cassava/Maize/Egwusi-Melon intercropping system by the Green River Project Farmers in the Niger Delta region of Nigeria. The National Root Crop Research Institute, Umudike, Abia State, Nigeria developed this technology for effective crop mixture involving cassava, maize and egwusi –melon for optimum and sustainable yield per unit area of the farm. Inclusion of egwusi-melon in the intercropping system was needed to control weeds and as well as aid in soil moisture retention, thereby aiding leaf water status and yield. Intercropping is beneficial in increasing crop yield and land use efficiency (Amanullah et al, 2006). Intercropping is also beneficial in sharing farm labour cost, increasing the efficiency of the use of land, water, sola radiation and reducing security risk of crop failure often associated with monoculture.

It was the desire to reap the various benefits of intercropping system over monoculture that the research problem of the study was conceptualise to determine the rate at which farmers in the study area have adopted this intercropping technology. Data for the study were elicited with a multi-stage randomly administered questionnaire from 270 respondents from Bayelsa, Imo and Rivers States. Percentage, Analysis of Variance and Mean Separation were used for data analyses.

Table 2: Percentage (%) Application of Cassava/Maize/Egusi-Melon Intercropping System by Farmers of Green River Project in Niger Delta Region of Nigeria.

Production Recommendations	Bayelsa State (n=90)	Imo State (n=90)	Rivers State (n=90)	Pooled value (Niger Delta) (n=270)
Planting in well-drained flood free soil	77.8	72.2	76.7	75.6
Planting of improved varieties of crops	93.3	84.4	91.1	88.9
Planting of healthy cassava stems, maize and egusi seeds	92.2	85.6	94.4	90.7
Intercropping egusi into the crop mixture	81.1	68.9	85.6	78.5
Planting cassava cuttings at 45^{o} slanting position	83.3	66.7	86.7	81.1
Planting at (1x1) metres for cassava and maize.	84.8	66.7	80.0	77.0
Planting crops in rows	82.2	74.4	86.7	81.1
keeping farm weed free	77.8	76.7	78.9	77.8
Application of N.P.K. fertilizers at 8 bags per hectare	53.3	63.3	53.3	56.7
Harvesting at 3-4months for maize and 8-12 months for cassava	73.3	63.3	74.4	70.4
Percentage (%) mean level of application	79.86	72.22	80.78	77.56

Source: Field Survey, (2009). Multiple responses were used.

Results in Table 2 indicated a mean adoption rate of 77.56% by Green River Project Farmers in the Niger Delta region of Nigeria (Nlerum et al, 2011). However, adoption rate was highest in Rivers State with 80.78%, followed by Bayelsa State with 79.86% and lastly by Imo State with 72.22%. The result of the test of hypothesis showed that significant variation in adoption existed with Rivers and Bayelsa States than with Imo State. Further studies in the region indicated that one of the main constraints to adoption of the Green River Project farmers was insufficient contacts with the Project Extension Officers with 55.56% (Nlerum, *et al,* 2012). This result agreed with that of Nlerum and Wobuoma (2012) where poor access to the Project's Field Officers accounted for 68.30% of the constraints to Fadama III participants among rural families of Rivers State, Nigeria.

7.2 **Adoption of Agricultural Technologies in Livestock Production**

7.2.1 **Adoption of Livestock Farming for Employment Generation in Etche Local Government Area of Rivers State.**

Out of the Nigerian youth population of 80 million, representing 60% of the total population, 64 million of them are unemployed, while 1.6 million of those working are underemployed (Ajufo, 2013). Youth unemployment is an unwanted social trend and its effects on the affected youths are geared towards crime (Ome-Egeonu, 2014).

In order to tackle youth unemployment in Nigeria, adoption of livestock farming is a ready skill to exploit especially now that the government is laying more emphasis on job creation through massive support for small and medium scale enterprises. It has been shown that the livestock sector is increasingly being organized and has employed at least 1.3 million people globally and has directly supported the livelihood of 600 million poor small holder farmers in the developing world (Thornton, 2010).

Livestocks are domesticated animals raised in an agricultural setting to produce commodities such as food, fibre and raise income. Examples of livestocks are cattle, goat, sheep, pig, cat, camel, donkey, dog, horse, rabbit, water buffalo and poultry (Roland-Holst, 2007). Livestock farming holds substantial potential for rural poverty alleviation and employment generation, especially among the youths. Socio-economically the livestock sector is useful because it generates continuous stream of income, employment, reduces seasonality in livelihood patterns, provide draught power, provide organic manure for the crop sector, hide and skin, bones, blood for compounding of feeds, fibre for industries, environmental conservation, etc. It supplements income from crop production and other sources and absorbs income shock due to crop failure. Livestock farming is a key contributor to national development (Ojiako and Olayede, 2008).

Research problem of the study was based on the fact that the ever increasing population of Nigeria which is estimated to reach 402 million people in the year 2050 (Bamiyi, 2013) will breed more unemployed youths. In view of this fact, a survey of livestock farming as

a source of employment to the growing youth population in Nigeria has become paramount (Nlerum & Owen, 2015). The research question which was conceptualized to address the research problem was, which type of livestock farming will be mored advantageous in dealing with youth unemployment in the study area? The objective of the study therefore determined the types of livestocks grown and problems faced by livestock farmers in the study area. Random sampling technique was used in collecting data from 60 livestock farmers with the aid of the interview schedule and structured questionnaire. Data were analysed with percentage and mean, while the test of hypothesis was with the Analysis of Variance (ANOVA) of the F-Statistics.

Results in Table 3 shows that poultry with 65.00% was the major type of livestock farming adopted by farmers in Etche Local Government Area of Rivers State (Nlerum and Owen, 2015).

Table 3: Types of Livestock Production Adopted by Farmers in Etche Local Government Area of Rivers State.

Livestock production	Frequency (n=60)	Percentage %
Rabbitry	-	-
Piggery	17	28.33
Goatry	19	31.70
Poultry	39	65.00
Sheep	2	3.33
Cattle	-	-

Source: Field Survey, (2010). Multiple responses were allowed.

The result implied that investment in poultry farming will result into better means of employment generation than other types of livestock farming in the area. Goatry was the next with 31.70%, meaning that it would be the next to poultry in employment generation in the study area.

Table 4: Problems to Adoption of Livestock Farming in Etche Local Government Area of Rivers State.

problems	Frequency (n=60)	Percentage %
Insufficient Extension Agents.	42	70.00
Insufficient Skills from Extension Agents.	22	36.67
Inadequate Credit for expansion	40	66.67
Poor market outlet for sale of products.	51	85.00
Poor co-operative formation.	31	51.67
Insufficient veterinary services	58	96.67
Livestock pests and diseases.	58	96.67

Source: Field Survey, (2010). Multiple responses were allowed.

Table 4 has shown that the major problems to the adoption of livestock farming in Etche Local Government Area were insufficient veterinary services and pests and diseases with 96.67% each. Also important to note was that insufficient Extension Agents (Rural Sociology and Development Practitioners) constituted as much problem to adoption of livestock farming as indicated by as much as 70.00% of the respondents.

Vice Chancellor Sir, from this result insufficiency in extension workers has continued to show as a setback to adoption of agricultural technologies. The perspective of the rural sociology and development practitioner is that in order for investment in livestock farming to lead to the desired generation of employment opportunities for youths, provision has to be made to address the problems of insufficient extension workers, insufficient veterinary doctors and provision of drugs against livestock pests and diseases in the study area.

7.3 **Adoption of Agricultural Technology in Fish Production**

7.3.1 **Use of Fishpond Recommendations in the Rural Niger Delta of Nigeria.**

Fish production through capture fisheries from inland water bodies in Nigeria is faced with the problem of over exploitation, while yields are almost stagnant (Bankole et al, 2003). The solution to this problem lies in fish culture which could give reprieve to the artisanal capture fisheries subsector (Jamu and Ayinla, 2003). Although Nigeria is a developing fish nation, with a coastline area of 853 kilometers (Food and Agricultural Organisation, 2005) and has a strong fish culture supported by natural catch fishes throughout the year with a total production of 1,157,234 metric tons (Federal Republic of Nigeria, 2006), a huge supply – demand gap for fisheries product still exist in the country (Agbebi, 2010). As demand for fish is

increasing, the supply of fish from Nigerian waters is being threatened by increasing oil pollution, unsustainable fishing practice and proliferation of water hyacinth (Agbebi, 2010).

A potentially viable means of satisfying this reported case of supply-demand gap in fish produced from the wide, apart from importation is by aquaculture, which is the rearing of fish in ponds. Aquaculture accounted for as low as 43,950 tons of fish, which represented 3.8% of the total fish production in the country in 2004 (Federal Republic of Nigeria, 2006). The desire to improve the aquacultural status of Nigeria and the need to enhance the economic and protein needs of its rural host communities led the Green River Project (GRP) of the Nigerian Agip Oil Company Limited to emphasize the concentration of effort on the agricultural technology of construction and management of fishponds for the purpose of fish rearing (culture) by its beneficiaries in the Niger Delta region of Nigeria.

The research problem of this study was to determine the extent to which rural beneficiaries of GRP have used the fishpond construction and management technology in their aquacultural practices for enhanced fish production and poverty reduction. The research question of the study was, to what extent has the GRP farmers adopted the fishpond construction and management practices in their farming enterprises? The objective of the study therefore determined the extent of adoption of fishpond production recommendations in the rural Niger Delta of Nigeria.

Data for the study were collected with the use of the questionnaire and interview schedule through random sampling method. The sample size was 270 respondents out of the direct beneficiaries of 2,700 farmers of the Green River Project (GRP) in Bayelsa, Imo and Rivers States. Methods used for the analysis of the data were percentage, mean, analysis of variance (ANOVA) and mean separation.

Results of the study showed that there as a high mean rate (73.78%) of adoption of the agricultural technology of fishpond construction and management among beneficiaries of Green River Project in Niger Delta region of Nigeria as shown in Table 5 (Nlerum *et al* 2011).

Table 5: Percentage Adoption of Fishpond Construction and Management Recommendations by Green River Project Beneficiaries in Niger Delta Region of Nigeria.

Recommendations	Percentages (%)			
	Bayelsa State (n=90)	Imo State (n=90)	Rivers State (n=90)	Pooled value (Niger Delta) (n=270)
Selection of site that supports constant supply of water	83.3	55.6	82.2	73.7
Construction of economic pond size	78.9	57.8	77.8	71.5
Fertilizer application in pond with N.P.K. to boost micro flora growth	81.1	63.3	80.0	74.8
Application of lime to reduce pond water acidity	78.9	64.4	77.8	73.7
Stocking ponds with fingerlings from certified sources like Green River Project	80.0	57.8	78.9	72.2
Interstocking catfish with tilapia	97.8	65.6	67.8	77.0
Allowing fingerlings to swim out on their own from fingerling containers	71.1	66.7	71.1	69.6
Feeding fish with recommended fish feeds two times per day	80.0	65.6	78.9	74.8
Maintenance of adequate oxygen circulation in pond	80.0	68.9	78.9	75.9
Harvesting fishpond regularly to prevent overcrowding, cannibalism, and extra cost of feeding	78.9	66.7	77.8	74.4
Maintain good water quality control	78.9	633.3	80.0	75.2
Protect ponds from predators	78.9	61.1	77.8	72.6
Percentage mean level of Adoption	80.93	63.07	77.42	73.78

Source: field Survey, (2019). Multiple responses were allowed.

Further results indicated that the highest (80.93%) rate of adoption was among Bayelsa State beneficiaries. Rivers State came second with 77.42% rate of adoption, while Imo State was last with 63.07% rate of adoption.

The most adopted recommendation by beneficiaries of the Project with 77% was interstocking of catfish with tilapia. Maintenance of adequate oxygen circulation in ponds with 75.9% was the second most adopted recommendation. The third most adopted recommendation with 75.2% was maintenance of good water quality control.

Table 6: Summary of Analysis of Variance (ANOVA) showing Variation in Adoption Rate for Bayelsa, Imo and Rivers States.

Source of Variation	SS	Df	MS	F-ratio	P-value	F-critical
ROWS (recommendations)	0.05	11	0.04	3.42	0.006	2.26
Columns (States)	1.43	2	0.72	569.82	0.000	3.44
Errors	0.03	22	0.00			
Total	1.51	35				

Source: Field Survey, (2009). SS = Sum of Squares; df = degree of freedom; MS = mean square; P = probability, P = 0.05

Results in Table 6 shows that significant variation exited in the adoption of fishpond recommendations by the rural beneficiaries of Green River Project among the three studied states of Niger Delta region because F-ratio of 569.82 was greater than F-critical of 3.44 at the P-value of 0.000, given the alpha level of 0.05. We therefore rejected the null hypothesis which states that there is no significant variation in adoption of fishpond recommendations among the three states of Niger Delta of Nigeria.

Table 7: Summary of Mean Separation showing States' Variation in Rate of Adoption of Recommendations of Fishpond Construction and Management in Niger Delta Region of Nigeria.

States	Means
Bayelsa	0.793^{a}
Imo	0.362^{b}
Rivers	0.792^{a}

Source: Field Survey, (2009). Note: Mean within the column with different superscript varied significantly following least significant difference at P=0.05 levels.

The summary of the mean separation results in Table 7 shows that rural beneficiaries of the Project in Bayelsa and Rivers States varied significantly with those of Imo State in the adoption of fishpond construction and management technology recommendations. Given this result, adoption was more effective in Bayelsa and Rivers States than in Imo State.

The study recommends a more and intensive agricultural campaign in Imo State to bring its own rate of adoption to be at par with Bayelsa and Rivers States. This recommendation justifies the role of the agricultural extension worker (rural sociology and development practitioner) in the adoption of agricultural technologies among the rural fish farming groups in

Niger Delta Region of Nigeria. The recommendation accounts for the perspective of the rural sociology and development practitioners on the studied technology in the Niger Delta region.

7.4 **Other Forms of Adoption of Technologies.**

7.4.1 **Access of Rural Women to Agricultural Information in Eleme Area of Rivers State, Nigeria.**

Rural women are those women who inhabit the geographical location which is not semi-urban or urban in nature, where life is simple and close to nature as opposed to those women who inhabit the urban area or cities (Nlerum, *et al* 2015). The primary occupation and major means of livelihood and income for rural women, especially in Rivers State is agriculture or its related secondary activities.

Rural women are involved in almost all phases of food production (Ugboh, 2006) and undertake as high as 86.87%, 87% and 62% respectively of planting, weeding and harvesting in Nigeria (Korie, 2007). Apart from yam production, rural women cultivated more okra, melon, maize, pumpkin, cocoyam and cassava, than men in Owerri agricultural zone of Imo State (Okwusi and Aboh, 2007). Irrespective of the fact that rural women more than men take the lead in agricultural activities making up 60% - 80% of the farm labour force, it is ironic to note that their contributions in agriculture and rural development activities are seldomly noticed (Ogunlela and Mukhtar 2009).

Given these contributions in agricultural production, rural women deserve better recognition, but this is not so as Ugboh (2006) observed that planners and implementers of agricultural programmes have failed to direct needed farm inputs to women. It is on the basis of this predicament of women-in-agriculture that the research problem of this study was derived, to find out if rural women in Eleme area of Rivers State have enough access to agricultural information which has the capacity of enhancing agricultural productivity of rural farmers. The research question for the study was, what is the rate of access to agricultural information by rural women in the study area? In order to tackle the research question, the objectives of the study determined the rate of access of rural women to agricultural information, ascertained their sources of information and identified the constraints to information access experienced by rural women in the area.

Random sampling technique was used in selecting a sample size of 100 farm women in the area. Data for the study were randomly collected with an interview schedule from Agbonchia, Aleto, Alesa and Alode. Descriptive statistics was used for data analysis as shown in Table 8.

Results in Table 8 shows that only 40% of rural farm women in Eleme area had access to agricultural information, while as much as 60% of them were unreached (Nlerum *et al,* 2012).

Table 8: Percentage Distribution of Rural Women According to Access to Agricultural Information in Eleme Area of Rivers State.

Options	Frequency (n=100)	Percentage (%)
Had access	40	40.00
Had no access	60	60.00
Total	100	100.00

Source: Field Survey, (2019).

This result implies that a good proportion of these rural women were shut out of the benefits of improved agricultural technologies which are globally known to enhance agricultural productivities of farmers. This result agrees with the conclusion of the study of Rivara and Corning (1990) that women lacked access to and are bypassed by extension workers. The consequential effect of this result is consistent low farm yields and food insecurity among these rural farm women in the study area.

Table 9: Sources of Agricultural Information to Rural Women in Eleme Area of Rivers State.

Sources of Information	Frequency (n=40)	Percentage (%)
Friends and family members	17	42.50
Fellow farmers	14	35.00
Extension agents	9	22.50
Print media (news paper, magazine, etc)	0	0
Audio-visual media (radio, television, computer)	0	0
Total	40	100.00

Source: Field Survey, (2019).

The major source of agricultural information to rural farm women in Eleme area of Rivers State, Nigeria were friends and family members with 42.50% (Table 9). The next source of agricultural information was fellow farmers with 35.00%. This was followed by Agricultural Extension Agents with 22.50%. The print and audio-visual media were not utilized as sources of agricultural information by these women. The poor utilization of the agricultural Extension Agents (Rural Sociology and Development Practitioners) is traceble to the insufficiency of agricultural Extension Agents in Rivers State as shown in Table 10 of this study.

Table 10: Constraints of Rural Farm Women to Access of Agricultural Information in Eleme Area of Rivers State, Nigeria.

Constraints	Frequency (n=100)	Percentage (%)
Unavailability of Extension Agents	70	70.00
Lack of right to land	2	2.00
Insufficient funds	15	15.00
Complexity of agricultural information	13	13.00
Total	100	100.00

Source: Field Survey (2019).

Unavailability of Extension Agents was the major (70%) constraint of access to agricultural information by rural farm women in Eleme area of Rivers State, as shown in Table 10. This result agreed with earlier and later studies by Nlerum and Okonkwo (2008) and Nlerum and Kue (2015) that poor extension contact was one of the main obstacles to adoption of farm technologies among farmers in Khana and Gokana Communities in Rivers State, Nigeria. Insufficient funds and complexity of agricultural information accounted for lesser constraints of 15% and 13% respectively.

The fact that unavailability of Extension Agents constituted the major constraint to access of agricultural information by these rural farm women, echos the reason for consistent poor farm productivity in the area.

Vice Chancellor Sir, based on the result of this study, the perspective of rural sociology and development is that for farmers in Eleme area to have more access to agricultural information in order to increase their farm productivity, there is the need to engage enough rural sociology and development practitioners (Extension Agents) to play their role of information dissemination for higher adoption of agricultural technologies.

7.4.2 **Flood Adaptation Strategies by Rural Farmers in Abua/Odual Local Government Area of Rivers State, Nigeria.**

In Nigeria, one of the commonest environmental hazards threatening food security is flood (Amusat and Amusat 2013). Flooding of farms is the abundance of water which overflow on farmlands or the earth's surface, which the soil is no longer able to absorb the water content (Falkenmark, 2007). For Geoscience Australia (undated), flooding is a general and temporary condition of partial or complete inundation of normally dry land area from overflow of inland or tidal waters from the unusual and rapid accumulation or runoff of surface waters from any

source. Causes of flooding of farm are from both the natural and human sources (Etuonovbe 2011). Natural causes of flood on farms are from heavy or torrential rains or rain storm, ocean storms and tidal waves, usually along the coast. Human causes of flooding are from burst water main pipes, dam burst, levee failure and dam spills.

Flooding has destroyed the farmers' food crops, cash crops, degraded agricultural lands, caused leaching of soil nutrients and resulted in the erosion of the rich top soils. As indicated by 88.03% of respondents, flood was the major climate problem of crops (Ajokporise 2011). Flooding also affects fish farms leading to escape of fishes in ponds. Farm animals are also exposed to cold and many have died as a result of flood effects. The farmer himself is unable to carry out effective farming activities in flood affected farms. The end result of flood on farmers are food insecurity, hunger and huge economic losses. In order to minimize or overcome the negative effects of flooding on farmers, adaptation strategies to reduce the effect of climate change has become necessary.

Some adaptation strategies adopted to overcome the negative effects of flooding on farms are planting of crops in well drained flood-free soils, pre-flood cultivation, planting after receding of flood, zero tillage farming system, construction of drainage channels, planting of flood resistant crop varieties (crop diversification), planting of cover crops and the use of flood forecasting practices. Others are exchange of assistance with other farmers, value addition by processing of yields, practice of intercropping, off crop production, engagement of non-farm activities and crop rotation. Abua/Odua Local Government Area is affected by serious flooding of farms in an annual basis.

The research problem of this study therefore was to know if farmers in the study area are adapting to strategies which minimizes the effects of flooding in their farming activities. This is to mitigate the menace of flood often encountered in an annual basis by farmers in the area. The research question was, what were the flood adaptation strategies used by farmers in Abua/Odual Local Government Area of Rivers State, Nigeria. The study hypothesis was that there is no significant relationship between personal characteristics of flood affected farmers and their flood adaptation level.

Simple random sampling method was used to select 120 farmers from the registered farmers, as recorded by the Federal Ministry of Agriculture in Rivers State at the 2012 flash flood survey. Data were collected by the use of the interview schedule which was distributed at the communities of Ogbema and Otari in Abua clan and Emelogo and Ogboloma representing Odual clan. From each of the sampled community, 20 farmers were randomly selected to make the sample size of 120 respondents. Data were analysed by the use of percentage and mean. The multiple regression analysis was used in the test of hypothesis of the study.

Results in Table 11 shows that the major flood adaptation strategies employed by the farmers with 100% response each were planting in well-drained flood-free soils, pre-flood cultivation and construction of drainage channels.

Table 11: Flood Adaptation Strategies Adopted by Farmers in Abua/Odual Local Government Area of Rivers State.

Strategies (n=120)	Percentage (%)
Planting in well-drained flood-free soils	100.00
Pre-flood cultivation	100.00
Planting after re ceding of flood	94.17
Zero tillage farming system	91.67
Construction of drainage channels	100.00
Planting of flood resistant crop varieties (Crop diversification)	-
Planting of cover crops	-
Use of flood forecasting practices	56.67
Exchange assistance from other farmers	93.33
Value addition by processing of yields	75.00
Practice of inter-cropping system	83.33
Patronage of farm insurance scheme	1.67
Diversification to off-crop production (like livestock)	-
Engagement in non-farm activities	41,67
Use of crop rotation	90.83
Means of flood adaptation strategy (adaptation capacity)	61.94

Source: Field Survey, (2015). Multiple responses were used.

These results were followed by planting after receding of the flood (94.17%) and exchange of assistance from other farmers with 93.33%. Further results of the study however shows that inadequate extension information on flood adaptation strategies, was the primary setback to the farmers' adoption of more flood adaptation strategies in the area.

Generally, the mean flood adaptation strategy (flood adaptation capacity) of the farmers which was 61.94% shows that farmers in Abua/Odual Local Government Area have a flood adaptation strategy which is above the average capacity. The study therefore showed that farmers in the study area reasonably adopted flood adaptation strategies in their farming activities. The perspective of the rural sociology and development practitioners from the result of this study is that, despite the fact that farmers in this study area have reasonably adopted flood adaptation strategies in their farming, the presence of more extension workers will bring about better rate of adaptation.

8.0 **CONCLUSION**

Vice Chancellor Sir, this inaugural lecture has shown that the perspective of Rural Sociology and Development is that the role of the Extension worker (Rural Sociology and Development Practitioner) remains pivotal in the adoption of agricultural technologies by farmers. Some of the roles of extension workers as indicated in the lecture include to: understand and appreciate the problems of farmers, provide information on the felt needs and interests of farmers for rural development agencies, assist farmers to understand themselves and the important roles they play in the advancement of the society, make farmers see the need to stay focus and concentrate effort in the farm enterprises, etc.

The lecture has also shown that the perspective of rural sociology and development as a branch of agricultural extension especially in the adoption of agricultural technologies, is that the number of extension personnel available to address the needs of farmers is insufficient as the current Extension Agent to farmers ratio in Nigeria is too wide and therefore very poor. Insufficient Extension Agents was also a limiting factor in adoption rate of livestock farmers, access of rural women to agricultural information, flood adaptation strategies of farmers, etc. Other constraints limiting farmers from adoption of agricultural technologies as revealed in this inaugural lecture were insufficient veterinary services, livestock pests and diseases, poor market outlet for sale of farm products, inadequate credit for expansion and poor formation of co-operative societies.

The best predictor of the adoption behavior of farmers as shown in this lecture was contact with Extension Agents (Rural Sociology and Development Practitioners). This finding has made the role of these professionals indispensible for farmers and the agricultural sector. The fact that extension work force in the country is insufficient calls for urgent attention.

Vice Chancellor Sir, the perspective of the rural sociology and development practitioners in the adoption of agricultural technologies is that farmers need more and more guidance at the various stages of the agricultural business, from production, processing, marketing and even to consumption. The need for the provision of technical guidance has made the role of the Extension Agents indispensible to farmers in the adoption of agricultural technologies in Nigeria.

9.0 **RECOMMENDATIONS**

Vice Chancellor Sir, as the usual norm, I will like to bring this inaugural lecture to an end with these recommendations.

i) Employment of more extension workers by the government and Non-Governmental Agencies is important. Employment of these professionals will assist to provide more information on improved production technologies for the adoption needs of farmers. Adoption of improved technologies brings about increase in agricultural output for improved income and poverty reduction among farmers and the wider society.

ii) Availability of more veterinary officers and drugs for livestocks. Engagement of veterinary doctors at the Local Government Areas is important to address the problem of pests and diseases constraining livestock farmers from adoption of agricultural technologies.

iii) Enhanced market outlet for the sale of farm products resulting from the enhanced farm output emanating from increased harvest of the farmers due to adoption of agricultural technologies is necessary. Enhanced market outlet for farm products of rural farmers can be achieved by improving rural road network for easy transportation to better markets, bulk purchase by the government agencies and value-chain addition in the form of food processing to promote the shelve life of agricultural products for better financial returns to the primary farm producers. The services provided by the Rural Sociology and Development Practitioners will receive more patronage if farmers find enough market outlets for the sale of their farm products.

iv) Provision of more credits for expansion by farmers can not be over emphasised. Adoption of agricultural technologies as disseminated by the extension workers come with more financial responsibilities on the part of farmers. Farmers need more funds to purchase farm inputs, equipment and even land as requirements to adopt technologies for the expansion of their farm enterprices. Provision of credits to farmers at low interest rate will be useful in meeting this need.

v) Farmers are required to form themselves into co-operatives. The formation of farmers' co-operative make the role of the Rural Sociology and Rural Development Practitioners more effective in the dissemination of agricultural technologies. This is because communicating to farmers in groups, yield more and faster results than the individual contact in terms of information dissemination for adoption of agricultural technologies. Co-operative formation also on the part of the farmers make it easier for farmers to team up resources together to purchase farm inputs and attract attention of the government and other development agencies.

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