ENHANCING COMMUNICATION OF INNOVATIONS FOR AGRICULTURAL DEVELOPMENT IN GHANA A CASE STUDY OF AGRICULTURE IN THE BUILSA DISTRICT

BY

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DEDICATION

This Report is dedicated to my Mother, Salamatu Bakari, my wife, Haw Ibrahim, and my children, Ayuba Ibrahim, Sahadatu Ibrahim, Khadijatu-Kubura Ibrahim, Sherif Ibrahim, Fatia Ibrahim and Saphia Ibrahim all of whom have to endure financial stress during the period of the course.

DECLARATION

I, Ibrahim Al-hassan, author of this study do hereby declare that the work presented in this thesis entitled.

"ENHANCING COMMUNICATION OF INNOVATIONS FOR AGRICULTURAL DEVELOPMENT IN GHANA: A CASE STUDY OF AGRICULTURE IN THE BUILSA DISTRICT".

was done entirely by me in the Mphil in Development Studies, University for Development Studies, Tamale. This work has never been presented in whole or in part for any other degree of the University or elsewhere. Due recognition has been given to cited works.

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Abstract

In Ghana, since the introduction of extension service as an agency for modernizing agriculture through bringing innovations generated by research, the process of bringing these innovations to farmers has for many years taken the form of Transfer of Technology (T.O.T). (Ramirez, 1997:3) The Transfer of Technology approach is a simple linear process which involves the Extension agent picking the new idea generated through research and communicating it directly to the farmer. The farmer in this process is expected to adopt and operationalise this new idea in his farming business.

It is the contention of this study that research and Extension has not been able to produce an impact in modernizing agriculture and increasing the productivity of small scale farmers, particularly in resource- poor farming regions because the Transfer of Technology (TOT) approach adopted by extension and practised over the years is ineffective. The approach is ineffective because it is alienating and non-participatory. It is a linear process, from research to extension to farmer (research – Extension – Farmer). This approach therefore alienates the researcher and those engaged in marketing agricultural inputs and out puts in the process of communicating innovations to farmers. The communication is only between the extension agent and the farmer. Even in this process the farmer is only a passive recipient of innovations. The process of T.O.T cannot therefore be considered to be fully participatory.

It is this non-participatory nature of the process of T.O.T. that has largely contributed to making research and extension ineffective in modernizing and transforming agriculture despite several years of research and extension activities in Ghana.

It is the conviction of this study that if extension re-orients itself and factor in the researcher, the farmer and marketing agents of agricultural inputs and out puts in the process of innovation communication and change its present mode of linear Transfer of innovations to that of facilitating an all embracing process of innovation communication in a participatory framework and within the diversities and knowledge systems of farmers then giants steps would be made towards agricultural modernization and national development.

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However, any pit falls in this Report are entirely my own.

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CHAPTER ONE

INTRODUCTORY BACKGROUND

1.0. Introduction:

The standard of living is low for the majority of people in developing countries. Absolute poverty results in severe human suffering among the population of these countries. Such a situation tend to constrain economic growth and is therefore socially, politically and economically unacceptable in the long run. (Mac Namara, 1985:54)

Improvement in the living standard of the poor in developing countries through the effective communication of innovations in agriculture is therefore one of the most important task facing the governments of these countries and indeed the whole of humanity. (Mac Namara, 1985:54)

Agriculture and food play a very important role in carrying out this task. This is because the agricultural sector provides or has provided, the basis for economic development in the majority of developing countries. However most of the poverty in these countries is found in the agricultural sector itself, leading to insufficient food production. The consequent hunger and malnutrition largely account for the wide spread suffering, both within and out-side agriculture (Mac Namara, 1985:54) world bank Report.

Attempts to meet the basic needs of the poor in developing countries must focus heavily on agriculture.

In this regard, strategies must be found to make agriculture in developing countries more productive. Agriculture is a system problem. It will not perform effectively unless a whole range of interdependent and interrelated conditions are satisfied. The problems of the acute shortage of foreign exchange in developing countries, adverse weather conditions together with limited human and material resources do no allow developing countries to act simultaneously on several fronts at once. It is therefore imperative to identify each component in the system in order that the limited resources can be used to attain maximum level of satisfaction. (World Bank Report, 1985)

Mosher, (1966:50-57) in his book "Getting agriculture Moving" outlined ten major factors for agriculture development.

These include:

- Innovation (New Technology)
- Extension Service
- Market
- Supplies
- Transport
- Incentive
- Production Credits
- Group Action.
- Land Development (Infrastructure)
- Agricultural Planning.

Arthur Mosher designated the first six factors as ESSENTIALS.

According to Mosher (1966:75) farmers would undoubtedly respond favourably to increase agricultural output if these six factors are adequately provided on a sustained basis. The remaining four factors are what he termed accelerators.

According to Mosher, the accelerators only help to epitomise the impact of the essential factors. Growth in agricultural productivity can only be achieved whenever and wherever all the essentials are present. They are different from the accelerators on the grounds that each of them is important and indispensable. However to achieve a faster rate of agricultural development each of the accelerators can be of great help.

One way of increasing agricultural production is to bring more land under food crops through clearing of forests and savanna grasslands and expanding the acreage under food crops to meet the needs of a fast growing population.

However, this approach to increasing food production is not sustainable because of its attendant problems of environmental degradation and desertification.

Also the competition from industry, human settlements, forest and wild game reserves, protection of water sheds and the need to maintain general ecological balance for land imply that there are no more vast uncleared lands lying idle to be brought under agricultural production.

This therefore imply that increased food production to meet the needs of the ever growing population in developing countries must come from land already in production. This means land already in production must be made to produce more than they are currently producing. In short increased productivity per unit area of land and per farmer in combination with harvesting from nature in non agricultural lands, for instance harvesting of honey and wild life and producing crops, livestock and poultry that are unique for an area for example the production of guinea fowl and shea-nut which are unique to only the Guinea- Savana regions should be the only way now available to increase agricultural food production.

The key factor therefore to agricultural productivity is in short, better improved agricultural technology supported by effective price policy regime for agricultural produce which would facilitate the general growth of the economy.

This has not been the case for the agricultural sector in developing countries because the reach countries of the north continue to subsidize their farmers and agricultural exports which enables their products to more competitive in the international agricultural commodity market.

Technology implies innovations. Innovation can be defined as productivity and income raising change in one of the interrelationships of the farm as a system. (Mosher, 1966:70)

The innovations are one of three categories:

a. Improved seed/food or breeding stock, and agricultural chemicals or new farming practices.

b. Constraint removers. New equipment that permit expansion of the enterprise such as selected mechanization (tractor) to overcome time constraint between land preparation and sowing.

c. Switching from limited casual subsistence production to improved expanded cash-market oriented production.

1.1. Characteristics of Technology

It has been shown through practical experience that any technological package should possess the following features – profitability, complexity and congruity and divisibility. (Toborn, 1971:81)

However, for farmers in Sandema simplicity of technology will more realistic and useful to them as majority is them are predominantly illiterate. Simplicity for this study is taken to mean, how easily the change can be incorporated into the management routine of the farmer without requiring additional costs in therms of labour time and imputs.

In planning his farming enterprise the farmer's key criterion is the measure of profitability associated with the new technology. It indicates the market benefits accruing to the economy and the farmer. It is measured by the incremental, not the total value of the marketed outputs realised from the change. Clearly an increase in market output may be qualified by other national, regional and district objectives, which might equally well be built into the planning structures. Adoption is a complex phenomenon and entails among others, the acceptability and systematic adjustment to the complexity of the techniques (Collinson, 1971:72)

Acceptability measures the possible areas of disturbance to the farmer's existing mode of production consequent on the introduction of the new techniques. Acceptability measurement is based on the cost of any change measured by the loss of utilities derived from other products satisfied by the resource allocation required to follow the change (Collinson, 1971:59)

Complexity measures the amount of disturbance the change creates in the management routine of the farmer, for instance, the degree of orientation he must make in his usual sequence of field operations over the season. It is ascertained by committing the number of days shifted in each planning time period between crops (Collinson, 1971:73)

Improved agricultural technology can therefore strengthen a country's capacity to produce food, improving the nutrition and general economic well-being of low income people. It can also stimulate economic growth in rural areas, help to curb the environmental degradation

caused by population pressures, unsound farming practices, over-grazing and deforestation. Agricultural research institutions are generating new knowledge in the form of new seeds, stocks and new farming practices at a rapid rate, which it might seem tempting for developing countries just to adopt the research results of the developed nations, the reality is that most new agricultural technology can be adopted. However, it must be adapted to local conditions. For this, local research stations are required, for the research stations to bring about innovations they need strong support from national policy-makers to devise strategies which will maintain effective linkage with clients (extension services and farmers)

1.2. Background:

1.2.1. The Agriculture situation in Ghana

In Ghana today, agriculture is seen to be the single most important production sector that has the capacity and impetus to propel economic growth and structural transformation in order to maximize the benefits of economic growth (GPRS II, 2006 – 2009).

The emphasis on agriculture-led growth strategy is predicated on a number of factors.
First, agriculture is the highest contributor to GDP and provides employment for over 60 percent of the population. Consequently growth in the sector will impact directly on the growth of the economy as well as employment. Conversely, the economy cannot make over all progress unless the mass of small-scale food producers can achieve significant improvement in their productivity through increased investment and changes in technologies/ innovations. (GPRS II, 2006 - 2009).

Secondly, the bulk of the poor, especially women, are engaged in agriculture – food crops, livestock and fisheries. Therefore accelerated development in agriculture will have direct benefit on poverty reduction in the villages and help to slow-down the rural –urban drift.

Thirdly, increased productivity in agriculture will ensure food security and contribute immensely to health and well being of the population.

Forth, modernised agriculture based on participatory generation and communication of innovations will prepare the grounds for structural transformation between Agriculture and industry. The demands of the markets for agricultural produce in whose production Ghana has comparative advantage entail the achievement of additional steps: the concurrence of volume

and quality, packaging and conservation, marketing and delivery. Only through this can Ghana's farmers realise higher incomes from both local and foreign sources.

Fifly, while the rural areas can be expected to lose population share to urban areas as part of long-range perspective of economic growth, a pressing social problem of Ghana today is the acute shortage of employment opportunities for the youth. Given the pervasive shortage of capital the quickest route to the solution of the problem that cannot wait is to absorb a maximum number of these in higher productivity and higher income farming pursuits.

Thus, in the next few years the growth of the economy is planned to be led by the agricultural sector, which will provide the necessary in puts for a vibrant Agro-processing industrial sector in the medium to long term. The security of Ghana's domestic food supply is itself yet to be attained. But in addition, the areas of Ghana's comparative advantage in agricultural production should be enhanced and transformed into competitive advantage in the sub-region and more distant markets. (GPRS II, 2006 - 2009)

For agriculture to lead growth in the short to long term, the economy must diversify into other crops for the export markets including mangoes, papaya, pineapples, cashew nuts and vegetables.

The recent spurt in Ghana's cocoa production, arising in part from the rapid adoption of improved technologies and innovations by the farmers, illustrates the developmental potential of the Ghanaian farm entrepreneurs, their land and workers. (GPRS II, 2006 – 2009).

If equal attention is given to the non-traditional export crops by incorporating appropriate technologies through participatory technology development, and communications then tremendous steps would be made in the diversification of Ghana's agriculture, its competitiveness and capacity to absorb shocks.

1.2.2. Weaknesses and Threats to an Agricultural led Strategy

A number of factors limit optimal production in agriculture, especially production of crops, livestock and fisheries, agriculture as a whole will always be dependent on natural conditions.

Rainfall is unreliable with regard to on set, duration, intensity and amount, and can disrupt food crop production,. The failure of development policy over decades is that Ghana has not implemented accessible and easily affordable technologies/ innovations to overcome these deficits (GPRS II, 2006 – 2009). Ghana is not in the sahel zone. There is no short of rain volume even in the direct savanna for abundant and secure food production year after year. What is lacking is a systematic policy to conserve and utilize ample rainfall in all parts of the country. Some efforts in this direction have been frustrated by the choice of inappropriate technologies / innovations. The example from Burkina Faso shows that simpler and cheaper technologies or innovations for the harvesting and use of our rain water endowments could yield Ghana immense benefits in agricultural productivity and poverty reduction.

Additional risks in an agricultural base strategy include bush fires, post harvest losses and uncertainties storage, transportation and marketing problems. An equally important constraint is the dearth of affordable credit in agriculture (GPRS II, 2006 - 2009).

Food crop still do not have adequate marketing and financial support. For the producers, this makes crop farming a high risk enterprise and in a vicious circular relationships, it also makes a high-risk field for its traders and bankers. (GPRS II, 2006 - 2009).

Strenuous intervention from government, NGOs, farmer co-operatives banks and other farmer support groups is the only way to break the cycle and attenuate the risks on both sides so that the private sector moves in our present development paradigm can successfully perform their roles in moving Ghana's agriculture forward.

Variability in the natural conditions also adversely affect the livestock and fisheries sub-sectors in ways similar to that of crop farming (GPRS II, 2006 - 2009).

Under the GPRS II many interventions have to be carried out at public expense to over come the disabilities that hinders growth.

Consequently in order to achieve accelerated growth in Ghana's agriculture, a number of key interventions will have to be initiated to support agricultural productivity. These include strategic research, and development activities, appropriate financing for the sector, value

addition and improved marketing, efficient organization of production and enhanced capacities of producers.

In the area of crop production in particular, the following measures are earmarked to be pursued.

- Ensure women's access to the control over land and agricultural inputs, including extension services.
- Promote and support large scale farming and nucleus out- grower schemes for the production of targeted/ selected crops.
- Enhance the productivity of small scale farmers by securing their access to extension, storage, price stability, credit, markets and land.
- Women small holders producers of food crops will be given needed impetus to improve their livelihood and assisted to benefit from the potential positive effects of linkages between agriculture, industry and exports.
- Develop and use improved seed/planting material.
- Intensify research – extension farmer linkages to ensure that technologies / innovations are developed and communicated appropriately to meet world –wide market demands.
- Promote and support the use of weights and measures as well as grades and standards in the marketing of commodities so as to enhance commercial efficiency.
- Strengthen farmer- based organizations with full participation of women farmers, to enhance access to credit and other services. The emasculation of Ghana cooperative movement which had previously attained a pre-eminent position in cocoa marketing and the national savings.
- Improve storage/ warehousing and distribution networks, including refrigerated transport system and cold storage facilities at part.
- Improve rural infrastructure network, particularly rail-road linkages.
- Promote the culture of community based irrigation in order to move agriculture from reliance on the vagaries of the weather to a more scientifically managed system of assuring water.
- Improve data collection, collation, analysis and dissemination of results within the industry.

Additionally a number of technical constraints to agricultural development exist. These include:

- Low crop yield and out put due to low soil fertility and over dependency on rainfall.
- Unsustainable agricultural practices including low exploitation of water for irrigation purposes.
- Low productivity and low disease- resistant breads of livestock.
- High incidence of livestock diseases and poor disease surveillance systems.
- Inappropriate Husbandry practices
- Inadequate infrastructure for aquaculture and low levels of fish production from existing water bodies
- Limited value addition and high post harvest losses.
- Limited access to marketing centres due to poor conditions of the road network.

The contemporary situation of the agriculture sector as comprehensively presented in the Ghana Poverty Reduction Strategy II posits a clear conviction that it is the most important production sector that has the capacity, impetus and potential to propel growth and structural transformation to maximise the benefits of economic growth.

This to a large extent can only be realised if the sector continuous to enjoy sustainable and demand driven prospects of modernization based on participatory technology development and communication of harmonised proven innovations which meets the varied interests of stakeholders, so that individually and collectively they can reap the full benefits of their investment in the agricultural enterprise.

1.3. The Problem Situation.

In Ghana, since the introduction of extension service as an agency for modernizing agriculture through bringing innovations generated by research, the process of bringing these innovations to farmers has for many years taken the form of Transfer of Technology (T.O.T). (Ramirez, 1997:3) The Transfer of Technology approach is a simple linear process which involves the Extension agent picking the new idea generated through research and communicating it directly to the farmer. The farmer in this process is expected to adopt and operationalise this new idea in his farming business.

It is the contention of this study that research and Extension has not been able to produce an impact in modernizing agriculture and increasing the productivity of small scale farmers, particularly in resource- poor farming regions because the Transfer of Technology (TOT) approach adopted by extension and practised over the years is ineffective. The approach is ineffective because it is alienating and non-participatory. It is a linear process, from research to extension to farmer (research – Extension – Farmer). This approach therefore alienates the researcher and those engaged in marketing agricultural inputs and out puts in the process of communicating innovations to farmers. The communication is only between the extension agent and the farmer. Even in this process the farmer is only a passive recipient of innovations. The process of T.O.T cannot therefore be considered to be fully participatory.

It is this non-participatory nature of the process of T.O.T. that has largely contributed to making research and extension ineffective in modernizing and transforming agriculture despite several years of research and extension activities in Ghana.

It is the conviction of this study that if extension re-orients itself and factor in the researcher, the farmer and marketing agents of agricultural inputs and out puts in the process of innovation communication and change its present mode of linear Transfer of innovations to that of facilitating an all embracing process of innovation communication in a participatory framework and within the diversities and knowledge systems of farmers then giants steps would be made towards agricultural modernization and national development.

In terms of agricultural development, the different stakeholders can together be perceived as a social organization and it is their joint action which enhances or limits the development and communication of innovation (Engel, 1994).

The traditional Transfer of Technology (TOT) model is being eclipsed by newer models which acknowledge the over lapping of researchers, outreach workers, farmers, inputs suppliers and marketing agents (Christoplus and Nitsch, 1993). Rather than focus on the technology itself the new approach recognises that information and knowledge provides common denominator among farmers, extension workers and researchers (Christoplus and Nitsch, 1993). Hence, the problem that this research intends to investigate is the ineffective communication of innovations for poverty reduction in the Builsa District of Ghana.

1.4. THE RESEARCH QUESTIONS

1.4.1. Main Research Question

The main question posed by this study is "How can Agriculture be modernised through participatory communication of innovations" such that productivity could be increased in a sustainable manner and in so doing reduce poverty?

1.4.2. Sub-Research Questions

a. What are the current strategies of innovation communication in the Builsa District.

b. What are the strengths and weaknesses of these strategies.

c. What factors influence innovation communication in the Builsa District.

d. How does gender differentiation affect innovation communication.

e. How can the varied interests of stakeholders involved in innovation communication be harmonised to achieve increase in sustainable productivity and consequently poverty reduction.

1.5. OBJECTIVES OF THE RESEARCH

1.5.1. Main Objective of the Research

The general objective of this study is to develop and analyse information on how innovation communication can be enhanced for increase in productivity of small-scale agriculture in the Builsa District.

1.5.2. Sub - objectives:

(a) To identify the various innovation communication channels and techniques, their adequacy and appropriateness.

(b) To enquire into the communication mechanisms in order to determine their effectiveness in the study area.

(c) To identify the major factors which influence innovation communication among farmers in the Builsa District.

(d) To offer recommendations for the solution of problems that affect innovation communication for increase and productivity.

1.6. The Scope of the Research

In order to be able to streamline and realign Rural peoples knowledge in the management of innovation communication with them and make it available for use in agricultural development, a clear focus is necessary. I have decided for a combination of methods. A decision is made for the actor- oriented approach as an analytical tool (Long, 1984; 1989; 1990: Long and Van de Ploeg, 1988, 1989) and the fields of study, I have decided to apply are:

- The knowledge processes involved in the organization of small farmer agriculture with reference to the communication of improved techniques, land use systems, labour use systems and gender roles would be addressed.

- Individual and communal processes in the management of innovation communication would be analysed in their dynamic forms.

- Knowledge and social networks such as the directors of extension organisations, extension officers, farmers, researchers, marketing agents and input suppliers would also be investigated.

- It is necessary to find out farmers views about the driving forces that operate within this linkage relationships.

- The relevance of social group interaction and institutional factors on innovation communication, transformation and exchange (Check land, 1985) would be considered in this study.

1.7. Relevance of The Research

Agricultural development policy makers have made very little use of Rural peoples knowledge in innovation communication for the promotion of productivity increases of small farmers. However, there is enough evidence to show that small farmers are a rich sources of knowledge and other resource base vital for planning (Adongo, 1980; Richards, 1985, 1986; Gubbles, 1988; Millar, 1990, 1992).

It has always been the policy drive of successive governments to find answers to decreasing food production, how to feed the growing population and how to generate surpluses for export (Adams, 1990; IFAD Report, 1990; GPRS II, 2006 - 2009).

It is my hope that the results of this study will provide some indicators for harnessing Participatory Technology Development and Communication of Innovations in agricultural development programmes.

The efficient use of scarce government resources demands making appropriate policies and action programmes that are participatory and bottom-up in nature (Chambers, 1983, 1990).

Such policies would guide the role of donor agencies, NGOs and other interventionist once government has mapped out its line of action. It is therefore of paramount importance to try to influence policy with this study.

The deficiencies of research and extension to respond adequately to farmers' needs is illustrated by Box (1986, 1988, 1989). He attributes this to the "Social distance" that exists between these institutions and the farmer. He argues that this distance increases when research and extension procedures are implemented without adequate regards to cultivators' knowledge. The awareness does not exist within these institutions that farmers are researchers and extensionists as well. Rhoades (1984) Rhoades and Bebbington (1988), Rhoades and Booth (1990) and Millar (1992) have all documented small farmer experimentations, showing that they combine formal rationality of science and what Nitsch (1992) refers to as "adaptive rationality" of their own. I am of the opinion that it is significant to understand these aspects of knowledge processes before any meaningful study can be undertaken if social errors are to be avoided.

It is within this framework of optimalising the performance of farmer related institutions that the relevance of this study is addressed.

CHAPTER TWO

LITERATURE REVIEW

2.0. INTRODUCTION

In a presidential address to the Economic History Association, Richard Easterlin asked "Why isn't the whole world developed"? He observed that development had spread from Northern and Western Europe and then on to some regions of recent settlement, but it had stopped short of being diffused to most of the world. Why was it not transmitted?. Easterlin stated that "development" is a function of the rate of technological/innovational change-the introduction of new production techniques/innovations. (Meier, 1995:62)

The transfer of technological change, according to Easterlin is an educational process. Thus the spread of development depends on the growth of science and the diffusion of modern education, which in turn depends on an incentive structure and new political conditions and ideological forces (Meier, 1995). Technology is often identified with the hardware of production-knowledge about machines and processes. In this study a much broader definition is adopted, extending to all the skills, knowledge and procedures for making, using and doing useful things (Meier, 1995: 368). Technology thus include methods used in non-marketed activities as well as marketed ones. It includes the nature and specification of what is produced-the product design-as well as how it is produced. It encompasses managerial and marketing techniques, banking and law, for example-as well as to manufacturing and agriculture. A complete description of the technology in use in a country would include the organization of productive units in terms of scale and ownership. This wider definition is of importance since there are relationships between the hardware and soft-ware-between for example mechanical processes and managerial techniques and infrastructural services-which both determine the choice made in both sphere.

2.1. Clarification of concepts

In reviewing the literature concerning this study, the following concepts would need clarification.

- Development communication.
- Participation

- Extension
- The actor- oriented Approach
- The small-scale farmer
- The Tertiary level Actors
- Networks, Interfaces and Linkage Mechanisms.
- Agriculture knowledge and Information System (AKIS)
- Rural Peoples Knowledge (RPK)
- Cosmovision Analysis

2.2. Development Communication

I will begin my introduction to the issue of development communication by quoting the following statement made by Martin Luther King- a Veteran writer and advocate for peoples' participation in their development affairs.

> "We fear because we do not know.
> We do not know, because we do not understand.
> We do not understand, because we are not informed.
> We are not informed, because we do not communicate.
> We do not communicate, because we are separated"
> Martin Luther King. (Gladkikh, 1998:1)

In the above quoted statement, Martin Luther King seeks to create our awareness that in the majority of cases where interventions, in whatever form they may take, be they new organizational designs, new technological innovations, behavioural and attitudinal changes and whether they are internal or external and intended to bring about positive and desired improvements and changes in peoples' welfare, the stakeholders in the change process – the inventor or initiator of the change ideas ie the Researchers, those trained or involved in the transmission of the new ideas to the Beneficiaries, ie Extension and Development Workers and finally those intended to benefit from the new intervention, ie the Target Beneficiary population are separated in terms of social status, knowledge systems, cultural orientation, space and ideology.

In this regard all the stakeholders involved in the change process, ie the Researchers, Development Workers and the Target Beneficiaries all entertain some level of fear of each other.

These fears come about because they do not know each others background and orientation. Because of their lack of each others background and orientation, they tend not to understand one another.

All the stakeholders do not understand each other's socio-economic, political, cultural structures, processes and organizational backgrounds because they are not informed. This lack of information about each others makes it difficult for them to communicate effectively simply because they are separated in space, cultural and ideological orientation, knowledge systems as well as social –economic and political statues.

Judging from the above analysis of Martin Luther King's quotation, it is clear that "No National consensus or individual change can take place without dialogue – within groups of people with homogeneous needs, between groups of people with different needs, and between the public and planners (e.g government agencies, private voluntary organizations) claiming to meet those needs (Gladkikh, 1998:1). This implies horizontal communication within and between groups in which people are organized, vertical, bottom – up people – to –people planner information flows on needs, priorities and preferred modes of meeting them and top-down planner –to-people information flows in response to community information they receive.

Information flows in three ways in a never-ending spiral. The dialogue at each loop or circle of spiral may sometimes lead to communication, i.e. a sharing of meanings, and sometimes it may not. But the spiral shaped system must keep information flowing constantly if national development is to be broad-based and self-sustaining" Mody (1991)

In the above quote and in his book, Designing Messages for Development Communication, Mody(1991) clearly describes the important role communications plays in supporting the mass mobilization goals of grassroots organizations, governments, non-profit groups and international agencies in the countries of the North and South.

The role of development communications within these various organizations is to present ideas or innovations in a way that an audience will understand, accept and act upon. It involves putting together the actual words and images that are needed to support the various programmes and activities of an organization and which help it to achieve its vision and mission.

Whether it is educating people about AIDS, new innovations in agriculture, health, water and sanitation or encouraging them to work co-operatively, the communication of ideas does not take place automatically Gladkikh (1998). It needs to be carefully planned to be effective. Unfortunately, many development programmes, for example, the workers Brigade programme in the 1960s, the Regional Development programmes in the 1970s, the Regional Agricultural Development programmes in the Mid to late 70s and the structural Adjustment programmes in the Mid 1980s and late 90s and of course the latest Heavily indebted poor counties programme, the New partnership for African Development (NEPAD) and the Millennium challenge Account programme of the United States of America, which are mostly donor driven are conceived without a serious communication component. A special case in a development programme in Ghana, where communication was given importance was the Upper Regional Agricultural Development Programme (URADED) in which an Institute of Field communication and Agricultural Training (IFCAT) was established under the programme. Unfortunately, the Institute could not be sustained and collapsed after the donor support for the programme expired.

The literature reveals many well-intentioned and other wise carefully planned programmes, which fail because of the poor selection and design of communication tools, tools which may not meet the information needs of people, or may be presented in a way which offends the local sensibilities of the people-costly errors which waste time and human resources.

In the past, just as the process of development was seen primarily as the provision of goods and services to the people, so was development communication conceived as a simple, one way flow of information, from the "experts" to the masses.

In this study an alternative approach which stresses the importance of real communication or dialogue between all those involved in development programming - planners, professionals and the public (beneficiary groups) will be examined. It presents a systematic approach to planning

effective communication strategies, which involves the participation of people at all stages in the planning for development processes. The theoretical content is drawn from various disciplines, Sociology, Psychology, Agriculture, behavioural Sciences, organisational Management, adult education, public relations and communication theory itself.

2.3. WHAT IS DEVELOPMENT COMMUNICATION

Development communication is based on the premise that an organisation's programmes can only be successful if people both inside and outside the organisation understand and accept the ideas and innovations being proposed. The goal is to create a climate of acceptance, not through manipulation, but_through an understanding of people's motivations, awareness, hopes, fears, needs and preference, and by providing information and opportunities for feedback which will enhance the communications process and achieve the desired results (Gladkikh, 1998).

Housein (1988:2) defines development communications as "the creation and implementation of a communication strategy to support a specific development project so as to increase the likelihood that project goals are achieved". To this end, the Food and Agriculture Organisation (FAO) has developed principles to guide development communicators in their work.

2.4. FAO Guidelines For Development Communication Support

In June 1987, FAO organised an expert consultation on Development support communication (DSC) to analyse the state of the art, identify directions for the future and formalise the FAO approach to communication for rural development. The following principles continue to be valid regardless of changes in development paradigms:

- Development communication is a social process designed to seek a common understanding or consensus among all the the participants of a development initiative, and leading to joint action. The media are useful tools to help bring about this process, but their use should not be seen as an end in itself.

- Development communication must take into account the perspectives of rural people. A good communicator must first and above all know how to listen. Time must be taken to consult with intended actors, and to learn from them.

- Social change, social engineering and education take time. The duration of DSC components in development projects or of communication projects themselves must be sufficiently long to obtain sustainable results, demonstrate their impact and create an institutional base.
- Successful development communication calls for a well-defined strategy, systematic planning and rigorous management.
- A systematic use of communication also requires a holistic approach covering the many aspects of life in rural areas.
- Communication for development must be incorporated in the planning stage of development programmes and not tacked on at the last moment as an afterthought.
- Broad based, integrated communication strategy, using all possible channels in an orchestrated fashion will give better results than relying on one medium only. (Gladkikh, 1998:2)

Development communications in organisations takes many different forms. It may mean using information materials designed to support development programmes, training people how to create their own educational materials and to communicate their own message; maintaining good information flow within an organisation or maintaining good relations with donors, the media and the general public. Depending on the size of the organisation, these roles may be the responsibility of one person such as a community worker, or team of people with communications responsibilities such as a team of specialised agricultural extension staff involved in an integrated communication of proven innovations that must be practised simultaneously (Gladikh, 1998).

2.5. PURPOSE OF DEVELOPMENT COMMUNICATIONS

According to (Gladkikh, 1998:3) development communication has six main functions within organisations.

- To inform: to define, explain, show new techniques, increase knowledge.
- To educate: to change awareness, deepen understanding and analysis, teaches new skills.

- To persuade: to convince, to change attitudes, beliefs, values, ask for commitment.
- To motivate: to encourage people to act upon new or old attitudes and values.
- To inspire: to strengthen a commitment to old beliefs, values, or to create a commitment to new ones.
- To promote: to heighten awareness of an organisation, its goals, programmes, foster good relations.

Depending on the situation an organisation's purpose may involve one or several of the above.

2.6. COMMUNICATION MODELS

Just as the theory and practice of development has changed over the years, so has the theory and practice of communications, particularly how it is used in development. Several models of the communication process have emerged. Each has its advantages and disadvantages and varies substantially in the level and quality of power and participation encouraged in the intended receiver(s) of the message.

Three models will be considered in this study. All three are used by organisations to communicate with their various audiences.

2.6.1. One – Way Communication Model

Sender ⟶ Message ⟶ Receiver

Source: Gladkikh (1998:3)

This linear model involves the one-way dissemination of information usually to promote a person, place, product, service, technique programme etc. This is commonly used in advertising, the message is designed to persuade the receiver to take action prescribed by the sender.

There is no input from the receiver. The motivation of the sender may be for personal gain (money, attention, prestige, votes etc), or it may be to provide information which the sender considers is for the "Public Good".

Posters, for example, displaced in public places usually try to send "messages" to people who belong to their target audiences. Typically, messages are instructions such as "plant more trees, use manure for soil fertility promotion or use a condom". They do not seek to promote dialogue, but rather to convey clear, definite messages about which there is no discussion.

Decisions about the content of the message is made by people outside the local communities in which it is to be seen, heard or used. The people who are the targets for such messages are simply supposed to accept them without questions and to modify their behaviour accordingly.

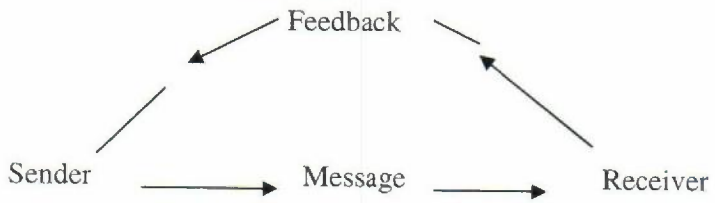
The people involved in developing these materials tend to be associated with relatively large and powerful organizations, such as governments, the media, advertising and international agencies, who some would say disseminate the propaganda of the powerful". Posters are typically designed by affluent, educated urban experts with little understanding of the rural poor. As a result, the posters usually contain little of local relevance or meaning.

The one-way model is best used by development organizations when the message is simple and needs to be communicated quickly, for example, the date and time of the next public meeting.

One caution is that, it may be quicker but with no opportunity for feed back or dialogue to clear up misunderstanding, it can be less effective. In any communication, meaning lies in the mind of the receiver, who actually controls what and how much is communicated.

As the message becomes more complex, two-way communication becomes essential.

2.6.2. Two-Way Communication Model



Source: Gladkikh (1998:4)

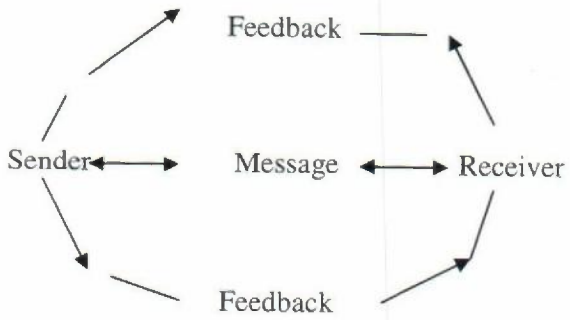
The addition of feedback in this model allows the sender to find out how the message is being received through activities such as pre-testing and monitoring so that it can be modified and adapted to better suit the receiver's needs.

The sender, however, still controls the process and can affect the quality and quantity of the feedback provided through the type of questions chosen and they way they are asked. The sender can also choose to ignore some or all of the feedback provided.

In the third model, the two-way model of communication has been adapted to get away from the idea of manipulation by the sender. Feedback does not have the same meaning it does in the previous model since it is members of the community (the "receivers") who are preparing the message in the first place.

In the Participating Communications Model, the organizations encourages people to think and act for themselves, to become effective "Senders" not just "receivers" of information and / or benefits. This include training people to create and send their own messages and enabling them to network and initiate their own dialogue with others. To create social change that is sustainable and democratic, there needs to be a space for all voices to be heard and for every one to get the information they need to make wise choices about their futures. Development organizations can contribute to this process by creating opportunities for this dialogue and by actively listening to the messages disadvantaged people send to us about their needs.

2.6.3. Participatory Communications Model



Source: Gladkikh (1998:5)

It is this participatory communications model that this study is advocating for as a tool for enhancing participatory development and communication of proven innovations and technologies for agricultural development which the Ghana Poverty Reduction Strategy II (GPRS II) has targeted for rural development based on modernised agriculture.

2.7. A TYPOLOGY OF DEVELOPMENT COMMUNICATION

Development Communication can be put into a number of categories based either on the senders or receivers point of view. (Gladkikh, 1998:119)

Development Support Communication

This refers to communication efforts that are designed to complement and support specific development efforts in the developing countries.

The message originate outside the control of the community or target group and are delivered through government or international development institutions and non-governmental organizations. Examples here could include agricultural extension materials, radio literacy broadcasts, health education posters, village dramas containing development messages etc. (Gladkikh, 1998:119)

Horizontal Communication

This type of development communication describes people – to –people communication independent of the structures of mass communication or agency/ government control. Typical examples include mail, telephone and more recently electronic mail using the Internet and World Wide Web. (Gladkikh, 1998:119)

Participatory Communication

This involves putting Community Members at the Centre of development communication activities by helping them communicate more effectively with the outside world, and more importantly with themselves. Participatory communication uses various media to stimulate people to become aware of their own situation and to mobilize them into action. (Gladkikh, 1998:119)

Reflective Communication

This refers to attempts by primarily developed countries and agencies to portray the development efforts carried out in the less developed countries to their audiences in their countries. This type of communication is usually used to raise funds and/ or promote the organization. (Gladkikh, 1998:119)

2.8. HISTORICAL OVER VIEW AND EXPERIENCES WITH COMMUNICATING INNOVATIONS

2.8.1. Introduction

The experiences with communication of innovations for purposes of this study would be reviewed at three levels. These are, the Global level, the African level and the Country level-Ghana.

2.8.2. The Global Level

At the global level, innovation communication, usually take the form of transfer of technology through technical assistance programmes/agreements. Under such programmes, the recipient country enters into agreement with the Donor country, which provide the technical know how, through the supply and installation of technical equipments, their operation, maintenance, management and training.

Over time, the relevant technical skills that are to be provided under the agreement are passed onto the recipient country's technical personnel engaged in the programme.

This form of innovation communication does not take into consideration indigenous skills and knowledge that have a bearing on the programme.

It is a simple process, from the expert to the beneficiary; usually referred to as "take it or leave it" approach (Lele, 1995).

The global level communication of innovation also take the form of procurement of new inputs for the enhancement of productivity from countries that have made gains from the use of such inputs, usually from developed countries. The use of fertilizers, agro-chemicals, new fishing gears and equipments in agriculture, the replacement of less efficient equipment with the latest

state of the art technology in manufacturing industries, mining and commerce as well as the application of new managerial skills and models in management of organizations and production concerns are some of the examples of this type of innovation communication at the global level. (Development Co-operation Report, 1986:123 – 148)

Here again, the recipient countries, mostly developing countries are at the receiving end and mostly are not involved in the processes leading to the development of these technologies. The technologies are therefore alien to them as they are not products of their cultural milieu.

To buttress this point, the following statement by a farming specialist at a conference organised in washington DC from 23rd to 25th August, 1992 by the Japanese backed Sasakawa African Association and the Global 2000 Organization of Ex-Us President Jimmy Carter is relevant. (Sasa Kawa African Association and Global 2000 organization conference Report, 1992:15)

" The Technologies that sparked Asias Green Revolution in the 1960s and 1970s can successfully be exported to Africa". (Conference Report, 1992:15)

Of course, exporting here entails, communicating the innovations that sparked off the Green Revolution to farmers in Africa.

The question to ask is, how were the innovations communicated. The answer to this question is that, the innovations were communicated using the one-way communication model, from the expert to the farmers and the farmers can choose to adopt or not adopt the new innovations that were transmitted to them.

Although much work, remains to be done, many improved crop varieties have been developed by national and international agricultural research organizations for sub-Saharan Africa. Compared with most traditional varieties, today's new cereal crop variety are vastly more efficient in grain production and carry higher levels of genetic resistance to diseases, insects and pests as well as tolerant of drought conditions.

Unfortunately, few returns are accruing to farmers from these investment in plant breeding research.

In maize for example, although 60 percent of the total developing countries' area is planted with improved genotypes (mostly hybrids) only about 25 percent of sub-saharan maize area is planted with improved materials (Checkland, 1985:51).

In Africa today, the problem of increasing agricultural productivity through the application of improved techniques is not that improved techniques are not being made available to farmers, neither is it that the techniques transmitted to farmers are inappropriate to the production needs of the farmers, but the fact is that high production cost and poor marketing conditions makes Africa's agriculture less competitive in the face of developed countries' subsidized agriculture.

The achievement of modernised agriculture in Africa has been retarded by various factors. Because many African farmers operate on the fringe of the commercial agricultural sector and consume most of their harvest on the farm, the purchases of improved variety is more difficult. Until many small-scale farmers can participate fully in commercial agriculture as well as in the development and communication of demand driven technologies agricultural development will be stalled.

The global level communication of innovation is usually and mostly funded by multi-national donor agencies such as the World Bank, the International Monetary Fund and the United Nation Agencies----Food and Agricultural Organisation (FAO), World Health Organisation (WHO), United Nations Development Programme (UNDP), United Nations Children's Fund (UNICEF)etc.

Innovation communication at this level is usually done through large scale technical schemes, requiring heavy outlay of capital investment. Examples of such schemes include, the construction of the Akosombo Dame in Ghana to generate Hydro-Electric power for industrial development, the construction of the Aswan High Dam to generate hydro electric power and large scale irrigation farming in Egypt, the Gizera Irrigation scheme in the Sudan between the Blue and White Niles for the promotion of all year round irrigation farming for increased agricultural production of export crops and food crops. (Development Co-operation Report, 1986:148-154)

The establishment of substitution industries to produce basic consumer items in most countries of the developing world are also examples of global level communication of innovations.

The global level communication of innovations has resulted in the establishments, of high-tech industrial establishments, schemes, projects and programmes dotted in many parts of developing countries, for example Volta Aluminium Company (VALCO) in Ghana.

Most of these industrial establishment, schemes and programmes depend on spare parts and technical components for their operation and maintenance.

These parts have to continue to be imported and constitute huge drains on the economies of these countries.

The effect of this is that, most of such projects, schemes and industrial establishment in many parts of Africa and other developing countries have collapsed, or are closed down, whilst others have been sold out.

Taking Ghana as an example most of the substitution industries that were established in the 1960s and 70s, e.g the Ghana Industrial Hold corporation (GIHOC), the ceramic factories, the canaries and the large scale agricultural programmes all collapsed because of funding problems, lack of spare parts and basic technical personnel to sustain the operation, maintenance, re-engineering, up-grading, up-dating and modernizing such establishments and schemes as and when necessary to cope-up with changes in developments at the international and national level. Again these are problems associated with end users because they do not have socio-cultural inputs and backgrounds to the development of such high-tech innovation.

Global level communication of innovations has not therefore succeeded in propping up sustainable development in many developing countries, including Ghana. This is invariably so because in most cases outmoded and obsolete technologies and equipments are transferred to developing countries without adapting them to the socio-cultural and environmental conditions of these countries.

2.8.3. Experiences Of Innovation Communication In Africa.

The African continent, being pronominally made up of developing countries depends heavily on the technical know-how of the developed countries to meet its developmental needs in

Education, Health, Agriculture, Water and sanitation and indeed virtually all sectors of the continent's space economy.

Innovation communication at the continent's level take the form of transfer of Technology (TOT) usually from the developed countries to the countries of Africa through technical-co-operation programmes. These technical co-operation arrangements are usually entered into at the bi-lateral or multi-lateral levels with governments, bilateral and multi-lateral agencies such as the World Bank, UN agencies, the IMF and individual donor countries. (Development Co-operation Report, 1983:139-148)

Under such arrangements, technical equipments, tools and schemes are provided and installed by the donor agency in the specific African country. Technical personnel of the donor country are usually brought to operate the schemes as well as train the technical personnel of the recipient country in Africa. Overtime the technical skills to be provided under the agreement are passed onto the technical personnel of the recipient country engaged in the scheme. (Development Co-operation Report, 1983:139-141)

As already exemplified, many hydroelectric schemes, irrigation projects, new innovations in health, education, agriculture and water and sanitation abounds in African. (Development Co-operation Report, 1983:156-189)

These innovations are communicated in a very simple way, from the expert to the beneficiary using the one-way model of innovation communication.

This approach to innovation communication has resulted in the dotting up of many development projects, industrial concerns, manufacturing, processing and mining firms in the 1960s and 70s. Today most of such firms have collapsed because they continue to rely on imported spares, which are not easy to come by.

At the African continental level, the Transfer of technology (TOT) approach to communicating innovations to the continent has not succeed in building the continent's capacity for self-driven sustainable development.

The technologies that are communicated are in most cases alien to the continent's indigenous culture. The technologies in most cases also become obsolete before they are transferred to the countries of African.

2.8.4. Experiences Of Innovation Communication In Ghana

In Ghana, innovation communication whether in Agriculture, Education, Health, Water and sanitation and in community development is carried out through established governmental organisations, non-governmental organisations, civil society and various trade and professional associations. (Case study Report on Water and Health Education Project in Northern Ghana, CIDA, 1982)

These organisations usually have field workers who are normally in contact with beneficiary communities and from whom new innovations are communicated to communities. Emerging new innovations are usually passed onto the field workers through formal training in established educational institutions, through training workshops, seminars, conferences and sensitization exercises.

Having been imbued with the new innovations, the field workers then passes them to the beneficiaries through discussion meetings, community durbars and through direct person to person contact with individual beneficiaries.

The experience at the country level is that innovation communication also take the form of transfer of technology, from the expert extension worker to the beneficiary community members.

In Agriculture, health, education and water and sanitation for examples, innovations are passed on to communities without their participation. It is assumed that they have nothing to offer but to receive productive new techniques from the experts, which would assist improve their productivity for improved conditions of living.

After many years of innovation communication in this way, the desired qualitative changes have not been realised. In the agricultural sector for example, the small-scale farmer, appear not to be affected by extension services because their production methods, systems and productivity has remained stagnant and in most cases declining. They are not making use of

the new ideas being communicated by the extension service Department of the Ministry of Food and Agriculture.

In the area of health, new health practices continue to be passed down to communities by community health workers and yet the desired changes required in health status are not be realised. So are water and sanitation and other aspects socio-economic development.

It is the failure of the traditional transfer of technology approach to innovation communication that called the approach to question from about the late 70s on wards and shifted emphasis to the then emerging paradigm of participatory approaches in innovation development and communication. (Deborah and Kaimowitz, 1989)

2.9. PARTICIPATION

2.9.1. Introduction

Since this study is looking at how participatory communication of innovations can be enhanced to promote agricultural development, particularly small-scale agriculture, it is important to provide a brief on the concept of participation.

2.9.2 What is Participation

Participation means different things to different people. Definitions of participation therefore abound (Cohen and Uphoff 1997; Korten 1980; Paul 1987; and Ghai and Hewit de Alacantara 1990). All of them include in some measure the notions of contributing, influencing, sharing, or redistributing power and of control, resources, benefits, knowledge, and skills to be gained through beneficiary involvement in decision making. There is also much debate among practitioners and in the literature about whether participation is a means or an end, or both (World Bank 1992; Picciotto 1992).

For the purpose of this study I define participation as a voluntary process by which people, including the disadvantaged (in income, gender, ethnicity or education) influence or control the decisions that affect them. The essence of participation is exercising voice and choice (Narayan, 1995)

This conception does not assume that there is an ideal level of participation to be achieved. The most effective form of participation varies, but over the long run sustainability will depend on minimizing transaction costs in horizontal and vertical interactions.

Participation is viewed as a means to defined ends, not as an end in itself; the goal therefore is to optimise participation to achieve the desired goals, not simply to maximize participation.

The desired goal in innovation communication include achieving improved and shared understanding and utilization of proven ideas, techniques, practices and developing the human, organizational and management (Narayan, 1995).

2.9.3 Levels of Participation

Participation according to Paul (1987) is a multidimensional, dynamic process, which takes varying forms and changes over time, based on interest and need. Paul (1987) usefully distinguishes among levels of participation, all four of which may coexist in a project. The first two categories present ways to exercise influence; the other two offer ways to exercise control. The levels comprise information sharing, consultation, decision making and initiating action.

2.9.4. Information Sharing

Innovation communicators may share information with clients to facilitate collective or individual action. The information flow is one-way, from experts or agencies to target beneficiaries or communities. Although it reflect a low level of intensity information sharing can positively make impacts by enlarging clients understanding of specific issues regarding new ideas or innovations.

2.9.5. Consultation

When communicators not only inform clients but also seek their opinions on key issues a two-way flow of information develops.

This two-way flow presents some opportunities for clients to give a feedback to development workers who can then use the information about preferences, desires, and tastes to develop designs and policies that achieve a better fit between agency programmes and beneficiary demands.

Examples of consultation include methods that tap indigenous knowledge and organizational forms, such as socio-economic surveys, beneficiary assessments and willingness-to-pay studies (Deeper, 1995:8).

2.9.6. Decision Making

Information sharing and consultation generally do not lead to increased local or beneficiary capacity or empowerment of local people and institutions, although they can lead to more effective programmes.

Client involvement in decision making, however, exclusively or jointly with external agency, is a much more intense level of participation which often promotes capacity building. Decision – making may be about policy objectives, project design, implementation or maintenance and different actors may by involved at different stages of the project, thus the decision to participate in a project may be made by the community, and the choice of technology may be made jointly, after the costs and benefits of the various innovation options have been explained by the agency and understood by the community/ beneficiary group.

2.9.7. Initiating Action

Initiating action, within parameters defined by agencies, represents a higher level of participation that surpasses involvement in the decision-making process. Self-initiated actions are a clear sign of empowerment. Once clients are empowered they are more likely to be proactive, to take initiative, and to display confidence for undertaking other actions to solve problems beyond those defined by the agency.

This level of participation is qualitatively different from that achieved when clients merely carry out assigned tasks.

2.9.8. Why Advocate For Participation In Innovation Communication

Participation engenders financial, social, ownership and psychological costs as well as benefits. Clients or beneficiaries are likely to participate when their benefits out weight their costs, just as agencies are likely to foster beneficiary participation when the benefits of doing so outstrip the costs to the agency (Narajan, 1995). According to Narajan (1995) knowledge about the costs and benefits of participation remains limited. However, he maintains that little guidance

about budget allocations appropriate to induce participation is available to those planning large-scale projects.

Nevertheless, (Narayan 1995:9) indicates that from an agency perspective people's participation (as an input or an independent variable) can contribute to the achievement of four main objectives in development, which of course include development communication. These are

I. Efficiency
II. Effectiveness
III. Empowerment
IV. Equity

2.9.9. Efficiency

Efficiency measures the relationship between a given output and its cost and inputs. Because participatory decision-making allows more timely beneficiary inputs, as well as synchronization of agency and client inputs, it may well lead to greater efficiency. Discussion, consultation and information sharing often produce greater consensus about goals and means and more clarity about roles, authority, and ownership than would otherwise be possible. Consensus and clarity in turn reduces conflicts and delays, resulting in smoother implementation and lower overall costs.

For example, proper identification of innovation needs, appropriate communication medium and channels would ensure timely communication of innovations and promote their acceptance and practice.

2.9.10. Effectiveness

Project effectiveness is the degree to which stated project objectives are achieved (Narayan, 1995). Client involvement, direct or indirect, may result in a better match between what users want and what an agency or project offers. Innovation communication for example is considered effective if it increases access to current best innovative practices that are accepted and put into practice by clients to increase their productive capacity and welfare.

Effective innovation communication projects produce economic (time savings) and environmental benefits, among others (Narajan, 1989; Jaganathan, 1992).

Clients can facilitate effective communication of innovations in several ways and at different stages. They may contribute to redefinition of objectives, better communication design, redesign, selection of communication channels, resource mobilization and implementation. Beneficiary ownership and control of innovation projects are also often seen as essential elements to effective innovation communication.

2.9.11. Empowerment

Empowerment is essentially a political concept that means more equitable sharing (or, redistribution) of power and resources with those who previously lack power. Any activity that leads to increased access and control over resources and to acquisition of new skills and confidence, so that people are enabled to initiate action on their own behalf and acquire leadership, is an empowering activity. This is where innovation communication plays an important role as it provide new skills, ideas, knowledge and best practices that empowers people to take control of their own development initiatives. The central argument for participation processes is that involvement in decision-making lets people exercise choice and voice more broadly in their lives, as well as in the more immediate context of development programmes that benefit them. Empowerment is thus, about the capacity building of individuals and the organizations that support them. (Narayan, 1995)

2.9.12. Equity

According to Narayan, the major purpose of any development oriented initiative is a more equitable distribution of the benefits that accrues from it. It is well established that development gains tend to be "captured" by those already better off (Narayan, 1995:10). The primary goal of innovation communication is to reach those people who are less endowed and with very little or no access to those innovative practices that are required to increase their productivily so that they can increase their share of the benefits of development. When included in the pursuit of this bread goal, beneficiary participation – which promotes transparency and accountability – may lead to less capture by the elites and to more equitable access to the benefits of development in general.

2.9.13. Who Participates

Participation occurs at global, national, sub-national, community and household levels. The primary focus of this study is on the participation of beneficiaries, those who are meant to

benefit from the change brought about by development workers through innovation communication processes. The characteristics of these beneficiaries (individuals and groups) are important because they influence the type of participation that occurs.

The most important characteristics that bring people together to take action is commonality of interest (Narayan, 1995:11). This is the glue that binds people who may otherwise not have much in common in terms of geography, wealth, power, leadership, degree of organization, social cohesion, ethnicity, income, gender, or education.

Commonality of interest may supersede other distinctions, including the entity or "community" (or village or other administrative label of convenience). Thus, when innovation communication service is not differentiated, and alternative sources are practically nonexistent (as in resource – poor arid farming regions), the rich or elite are as much affected as the poor by the lack of sufficient water or rainfall to meet the requirements of crop and animal production needs. Although men may be interested in an improved water supply for watering cattle and women may want the water for domestic uses for example, their common need for water can bring them to work together to negotiate for change with service providers.

Some important client characteristics that influence participation are gender (women, as the primary managers of domestic water, are more affected by, and therefore more interested in, improved water supplies); income (the poor have less ability to pay for innovations, but their need is greater because they often live the farthest from the sources of innovation services; education (the assumption is that the more educated the group of people, the more easily they understand the issues and the more willing they are to take action); knowledge and skills (when people have some understanding of innovation issues and financial management skills, they can more easily manage and contribute to re-in-force improved systems of innovations); and social cohesion and organization (trust, loyalty, and reciprocity are important in undertaking collective action, achieving consensus about objectives and rules, and in effectively managing conflicts.

Also consistently cited in the literature as important in effecting participation are leadership qualities and the presence of leaders. The presence of local leaders is important in initiating change, and leadership qualities among beneficiaries are important in bringing about and sustaining change on a large scale.

2.9.14. How Do People Participate

Evidence from the literature shows that outside agencies and organizers can induce collective action when an issue deals with a common interest of community groups. This process of organizing the poor so that their voices are heard is a role that many NGOs have played effectively in addressing a variety of needs (Narayan, 1995), from employment and water to marketing and housing (examples include Agakhan support programme in Pakistan, BRAC and Graineen Bank in Bangladesh, Amul in India, WALI and Dian Desa in Indonesia, and KWAHO in Kenya).

Increasingly, the literature also shows that many of the roles currently being fulfilled by public sector agencies can be more effectively and efficiently carried out by the private sector.

In Ghana for example, the establishment of the "Extension Development Fund" is designed to identify well organized private sector agencies involved in extension work, such as the Presby Agriculture Project in Sandema, and provide them with necessary financial support as part of effort to privatise extension service in the long term process of innovation communication for agricultural development.

The formation of Farmer Based Organizations (FBOs), Water Users Association at Irrigation project areas and Community Based Livestock Extension Development Agents are part of measure to increase beneficiary participation in innovation communication service delivery for increase productivity and agricultural development.

Various aspects of service delivery can be contracted out, for instance, limiting the public sector role to regulating, fostering competition and monitoring performance (Triche, 1990). While it is clear that many NGOs can induce collective action, financial resources (including external assistance) are channelled primarily through government agencies. They central questions, therefore, are these: can government agencies induce collective action on a large scale?. If so, under what conditions and with what mechanisms?. The challenge to government agencies is to re-structure their policies, institutions, and organizational forms so that public agencies are accountable for their performance and have the incentive to respond flexibly and quickly to peoples demand, either directly or through involvement of the private sector, including NGOs.

2.10. PARTICIPATORY TECHNOLOGY DEVELOPMENT (P.T.D)

2.10.1. Introduction:

Having provided a review of the concept of participation, our next concern is to provide a review of the practical operationalization of participatory Technology Development and communication.

Millar and Apusiga, (2004:9) defined Participatory Technology Development (P.T.D) as follows.

"Participatory Technology Development (P.T.D) is simply a process of encouraging the active involvement of rural men and women in the development of practical and appropriate technologies and or other options for use.

In this process, according to Millar and Apusiga, farmers together with others study the existing situation, make analysis and define priority problems, on which basis they experiment locally with a variety of technological options. These options they indicate are based on ideals and experiences derived from both indigenous knowledge and formal science.

Millar and Apusiga (2004) also assert that over the years, experience has shown that neither indigenous knowledge forms nor formal science is adequate in addressing the problem of under development. They point out that each has its own benefits and challenges.

Learning from this understanding according to Millar and Apusiga, PTD practitioners find it worthy in drawing from the best of traditional science (indigenous knowledge) and formal science. They point out that practice over the years proves that the fusion of elements of the two results in the appropriate use of science to develop technologies that actually work.

The PTD approach according to Millar and Apusiga is participatory to the extent that it involves various stakeholders including communities in the process of finding solutions to their own problems. Its is premised on belief that local problems are better solved using local knowledge and techniques, which can then be informed by benefits of formal science.

The approach is also technological to the extent that it results in the generation of innovative ways of addressing problems identified within the locality. Innovations are arrived at after careful consideration of the issues or problem, effective diagnosis and the innovation designed to address the solution.

It is this design element, according to Millar and Apusiga that gives P.T.D its technological character. It is also a development approach because it is a process that facilitates change in the being. It enables people to move from lower state of being to a higher state of being, one that enhances the livelihoods of beneficiaries (Millar and Apusiga, 2004:10)

2.10.2. Activities Under Participatory Technology Development

The operationalization of the PTD process involve a number of activities to be undertaken. Practically there are six phases/steps in the P.T.D process in which rural people are invited to participate actively.

According to Millar and Apusiga, experience in using P.T.D for over ten years, shows that the steps which are often projected in a logical sequence, are iterative and as such, start is not necessarily at step one.

A community may move from step 1 straight to step 4 (Trying out) as a result of the new awareness created through initial entry discussions.

For purposes of this study, the sequence as outlined by Millar and Apusiga (2004) is retained as a guide.

The steps are as follows:

Step 1: Getting started or community Entry
Step: 2: Looking for things to Try or Diagnosis
Step: 3: Organizing for the Development Action or Action planning.
Step: 4: Trying out or Implementation
Step: 5: Sharing the Results (includes Monitoring and Evaluation)
Step 6: Sustaining the results/scaling – up/phasing out.

2.11. EXTENSION

There is an ongoing debate as to whether extension is an essential factor of agricultural development or it is only an accelerator. Mosher (1966) classifies it as an accelerator. However, in Ghana's situation we consider extension services as an essential factor necessary to get proven innovations transmitted to predominantly non-literate small-scale food crop farmers.

Checkland (1985:27) sees extension as an educational process consisting of:

- Informing farmers about the potential innovation
- Selling to them individually or groups the idea of trying the new concept.
- Training them in necessary skills.

Too much research has been wasted, at least from the point of view of producing greater farm yields because knowledge are pushed ahead on only a simple front. If for example a new crop variety is being developed, the research plan must provide for studies of all other inputs needed, (cultural practices, marketing, extension, supply incentives etc) for this new variety actually to be put to productive use. Thus research will be necessary on each of the many factors that influence productivity.

Priorities will necessarily be according to the problems of each region, the kind of constraint that will be met will differ from one region to another. The innovation process is divided into three interconnected systems. (Checkland, 1985:45).

- The client system representing the farmers as the market for innovation.
- The generating system, which is producing the technology and therefore directing the type of change available and,
- The linkage system communicating the available improvement between the generators and the clients. The last two systems are presented by research and extension.

It is against this background that various agricultural research stations in the country were established in the 1940s and 50s. (Borte-Doku, 1978:58). Their purpose were:

- To investigate local farming methods
- To devise improved systems of farming adapted to the local environment.

- To demonstrate the benefits which can be derived from the introduction of new crops, improved varieties and superior techniques.
- To serve as a base for extension work and as centres for training young farmers.

Research to generate new techniques of farming would not be complete and would not be worthwhile unless the new techniques so generated can be brought to the knowledge of farmers. This we said can be done through the process of extension services. The importance of extension to the whole process of modernizing agriculture and therefore raising its productivity particularly with reference to developing countries was forcefully stated by W. Arthur Louis, when he made the following observation.

"As for priority, expenditure on bringing new knowledge to peasant farmers is probably the most productive investment which can be made in any of the poorer agricultural economies. For, raising the productivity of the soil is in most places the surest and quickest way now available for increasing the national income substantially" (Louis, 1972:45)

In a recent workshop, organised for selected agricultural extension workers in sub-Saharan Africa which was held in Accra from 18th to 24th January, 1993 participants suggested that, government's of sub-Saharan Africa should provide adequate and timely funding to Agricultural Extension and Research Services for sustained productivity in the sector. Addressing the summary session of the workshop, Mr. Edward Jaycox, Vice President of the World Bank, Africa Region had this to say:

"Success in agricultural productivity which will lead to economic growth is a must not only for Africa but for the whole world". (Workshop report 1993:48)

In another conference, organised in Washington DC from 23rd to 25th August, 1992 by the Japanese backed Sasakawa Africa Association and the Global 2000 organization of ex-US President Jimmy Carter, a farming specialist addressing the conference on the policy problems holding back the continents agricultural potential made the following observation:

"The technologies that sparked Asia's green revolution in the 1960s and 1970s can be successfully exported to Africa". (Conference Report, 1992:56).

"Linking agricultural research and production activities to promote modernised agriculture remains a major institutional challenge facing policy makers concerned with reversing Ghana's current tragic decline in human welfare and arresting the unprecendent environmental degradation being wrecked upon the country. In 1970, Ghana's area under forest cover was approximately 108743.52sqkm, by 1982, it had declined to about 105247.77sqkm.

In Ghana today, the problem of increasing agricultural productivity through the application of improved agricultural techniques is not that, improved techniques are not being made available to farmers, neither is it that the techniques transmitted to farmers are inappropriate to the production needs of the farmers, but the fact is that farmers are slow in responding to the application of new agricultural techniques.

The achievement of modernised agriculture in Ghana has been retarded by various factors. Because many Ghanaian farmers operate on the fringe of the commercial agricultural sector and consume most of their harvest on the farm, the purchase of improved varieties is more difficult. Until more small-scale farmers can participate fully in commercial agriculture, agricultural modernization will be stymied.

Soil fertility and lack of physical and or economic access to improved technologies have also seriously hampered agriculture modernization. Until this pressing yield constraint is relaxed, agricultural modernization will be held in check because the yield advantages of improved technologies is largely eroded when they are grown in impoverished soils under poor crop management.

Commenting on the need to improve agricultural productivity through improved agricultural techniques Professor Adebayo Adedji, Executive Director of African Centre for Development and Strategic Studies has this to say: (Adebayor,1992:74) Report of the Conference of African Ministers of Agriculture, Nairobi.

"In addition to technological change from new seeds, increased irrigation and improved research, a producer price support policy must also be put in place for such crops as maize, sorghum, wheat, millet, rice, yams and potato. Price support policies for such carefully selected food commodities will generate enough incentive and income to food producers to

enable them apply new production techniques and by raising agricultural productivity will stimulate capital investment. If ever Africa is serious and determined to bring about poverty alleviation and pursue a human centred development strategy which will also launch a process of socio-economic transformation, a policy of producer price support is an imperative necessity". (Adebayor,1992) in an address of African Ministers of Agriculture in Nairobi.

The above statement clearly echoes the fact that present price policies for the agricultural sector does not make it attractive and profitable for small-scale farmers to adopt improved techniques that will ensure agricultural modernization.

The policy environment within which the agricultural sector operates can therefore critically affect its capability to utilize improved technologies and increase productivity thereby fulfilling a necessary condition for agricultural modernization and socio-economic development. Agricultural extension and research must therefore be seen only as one part in a wider programme of agricultural modernization which include such other things as roads, agricultural credit, water supplies, efficient marketing, land reform and the development of new industries to process surplus production.

This study operate from the point of view that there are multiple sources of innovation and information within a given farming system. In addition to the formal research institutions, input suppliers, traders and private individuals all demand and supply information.

Farmers capacity to control their environment is the result of the resources at their disposal; among these, knowledge and skills are key components. In order to understand a farming system, it is just as important to understand the communication networks as it is to understand its environmental situation or changes in its market place (Raminez, 1997).

Farmers and Farmer groups are stake holders in a rural community, just as much as municipal authorities, public servants, private for profit and non-profit organizations, salesmen, traders, bankers, researchers, women's group, private entrepreneurs, religious bodies etc. These stake holders interact constantly seeking to negotiate and create opportunities to fulfil their needs and pursue their interests. In these negotiations information is exchanged on prices, market opportunities, technology and practices, policy changes and politics. Much of the information

travels freely, but some may also come at a price. These seemingly invisible patterns of communication and information exchange constitute an integral part of a farming system.

In deed, some argue that they constitute part of a broader system, an agricultural knowledge and information system (Roling 1988). In terms of agricultural development, the different stakeholders can together be perceived as a social organization; and it is their joint action which enhances or limits the development of innovation (Engel, 1994).

The traditional Transfer of Technology (TOT) Model is being eclipsed by newer Models which acknowledge the overlapping of researchers, outreach workers and farmers (Christoplus and Nitsch, 1993). Rather than focus on the technology itself, the new approach recognises that information and knowledge provides common denominator among farmers, extension workers and researchers.

The Agricultural knowledge and information system model describes the two-way flow of information and knowledge among research, extension organizations and farmers. In this sense the Agricultural knowledge and information system (AKIS) goes against the existing linear information dissemination systems which were developed in most national agricultural research systems under the Transfer of Technology Model (Ramirez, 1997).

The best extension systems in the world develop where farmers are organised and able to lobby for the technical assistance which they consider priorital (Roling, 1988). It is the demand capacity of farmers that dictate the quality and effectiveness of the extension support. The opposite process, whereby extension systems conceivably strengthen farmers' production systems through technology, is more a myth of the TOT model than an observable reality.

In the AKIS perspective, the two-way exchange of information is crucial for effective communication of relevant technology. As a consequence, the role of extension has been reformulated from a one-way TOT persuasive channel into a two-way channel for requests and answers which facilitates the learning process of farmers, extension staff and researchers.

From the point of view of the AKIS, and of participatory research, the facilitator can be described as a broker of information demands and supplies. The model is aimed at supporting

decision making, problem solving and innovation in a given country's agriculture (Rolling, 1990).

It is from this point of view that diversity has attracted the attention of agricultural scientist quite considerably. Recent studies in the developed countries are beginning to highlight the fact that, the so called homogeneity in the advanced agriculture is after all, not that homogenous. Van de Pleog (1990) exhaustively illustrates the issue of differentiation in his article on heterogeneity and farming styles of Dutch farmers. Engel (1991) refers to it in discussing the issue of multiplicity of actors, diversity in sources and types of information and the need for integration. Nitsch (1991) posits the same issues from the point of view of adaptive rationalities of farmers.

Researchers in developing countries have been confronted by heterogeneity of small farmers much earlier than their counterparts in developed countries. Collinson (1995,1987) chambers (1983) and Richards (1986,1988) have made the diversities in small farmer agriculture in the third world their focus. In Ghana, the development in this field are quite recent (Annor-FremPong, 1988; Millar, 1990,1992).

Following the recognition of diversity and multiplicity of actors in a given farming system, it has become apparently clear that innovation communication can best be viewed, understood and improved from an actor perspective.

This forms the basis for the conceptual framework and methodologies of this study backed by the choice for an actor oriented approach as an analytical tool.

2.12. THE ACTOR-ORIENTED APPROACH

The Actor –oriented approach is an analytical tool for exploring the sequence of relationships, inter-relationships and linkages that permeates all stakeholders involved in any human enterprise, be it in agriculture, industry, banking, finance or field of study. (Long, 1988)

Since this study seeks to understand how innovations developed by research is communicated to small farmers by the extension service in the Builsa District, one definition adopted by the study is that the small farmer is the primary level and the tertiary level is the state, formal

institutions and their relationship with farmers (Government officials and NGOS) involved in the extension enterprise in the District.

2.12.1. The Small-Scale Farmer

The small-scale farmer, who is the primary level actor is understood in this study as operationally described by Millar (1992).

In Northern Ghana, as described by Millar, the land holdings of the average small farmer (a nucleus family of a man, his wife and say 4 children who live within an extended family system of between 2 and 20 nucleus families) is on average 5 hectares of which 3 hectares on the average is under cultivation at any one time. He / she practices mixed farming (ie keeping cattle, sheep, goats and poultry along side crop production) and spreads his risk by adopting mixed cropping (combining cereals with legumes, root tubers and vegetables).

Small scale farmers or peasants are also perceived as social actors, who are knowledgeable and 'capable' who, attempt to solve problems, learn how to intervene in the flow of social events around them, monitor actions continuously, observing how others react to their behaviour and taking note of various contingent circumstances stances (Long 1988)

2.12.2. The Tertiary Level Actors

This level of actors constitute the state, the formal institutions (Government Departments and agencies) and Non-Governmental Organizations involved in the Business of Agriculture at the National, regional and District level and their relationship with the farmers.

The role of the state and policy as a power base and power relations between the state and actors is illustrated in Long (1984;1988;1989). Long further showed how the state attempts to manage development and how farmers strategise within this arena of limited opportunities, creating spaces to realise their own agendas.

In discussing the role, relationships and interactions of stakeholders involved in innovation communication, this study also takes cognisance of the concept of "Human Agency", which means "recognizing that, individuals, whether they are peasants, land lords or bureaucrats, attempt to come to grips with the changing world around them and that they do this both

cognitively on the basis of existing cultural categories and ideologies, and organizationally in the way they interact with other individuals and groups". (Long, 1983:3)

This paradigm of human agency form the genesis of actor oriented analysis of social processes (Leeuwis et al 1990). The tools it applies are under pinned by certain basic concepts which for purposes of this study have been selectively discussed below:

2.12.3. Networks, Interfaces and Linkage Mechanisms

In their quest for knowledge generation, exchange and utilization, farmers creates relationship with each other and the world around them. These established relationships produces what is referred to as "knowledge Networks" (Havelock, 1986).

Engel (1991:53) defines a knowledge network as "..... a number of individuals that share knowledge and exchange information concerning a specific field of interest or knowledge domain and these network may exist within organizations or across organizations and institutions". He makes a distinction between formal knowledge networks and informal knowledge networks. The former represents the institutionalised network made up of researchers, extensionists and policy makers. Farmers are part of this network for as much as they are interacting with other key actors.

This ensures continuities in knowledge networks that would be treated by this study. However, discontinuities of such linkage relationship (Box, 1986, 1988, 1989) is a common feature that would be addressed by this study. This process breaks down formal structures and creates informal structures and linkages constructed by farmers themselves.

This is particularly relevant in the study area where formal structures for the supply of farm inputs (fertilizers, weedicides, pesticides, improved seeds etc) broke down following government's withdrawal of subsidies on farm inputs in the mid – 1980s; giving rise to the emergence of informal network and structures for supply of inputs to farmers. Also formal structures established by NGOs implementing interventions breakdown when the NGOs move out after the intervention programme is completed.

In the case of Northern Ghana, Millar, (1992), indicate that it is very difficult to separate the knowledge networks of small farmers from their social networks. He pointed out a 'direct' and an 'indirect environment', through which social relationships influence knowledge networks.

It is also indicated that, in the case of Northern Ghana informal networks (with fellow farmers and actors of the formal networks) would appear to be more important than formal networks because the formal institutions do not deliver reliable Services. Networks are not static but dynamic/ fluid relationships that keep changing in composition, determined by which choice or choices of action are made by actors (Millar, 1992).

In her discussion of the life worlds of actors, Villarreal (1990) alludes to a similar phenomenon. She asserts that the life worlds of an actor extends to that of his kin, his friends, neighbours and peers. This transcends into the issue of power, of multi-strand networks and orientation for whatever linkage relationship they enter into. Actors cannot afford to be isolated in their social actions as a result of their quest for knowledge.

2.12.4. Interfaces

A social interface is described as the "Critical point of contact, intersection or linkage between different social systems, fields or levels of social order or where structural discontinuities, based on differences of normative values and social interests are most likely found" (Long, 1984; 1989). The idea of boundaries and interfaces being areas of encounter of actors and "Windows" to components of the system is well elaborated.

Millar, (1992:54), argues that the view by Long, (1990) that interfaces are windows will make meaning if the addition is made that these windows are without "Shutters". He maintains that interventions introduces shutters, as a result of their inherent biases and subjectivities. Millar, further points out that most researchers and extensionists walk into communities with "Shutters on" and try to actualise the interface (sometimes with farmers) in the researchers' own way. By doing this, the interface become a different type of window – with "shutters on".

This, (Haverkort and Millar, 1992) explains why farmers 'Cosmo-visions are ignored by interventionists. This according to (Haverkort and Millar, 1992) results in interventionist imposing arbitrary boundaries on actors, components or systems which in many situations

make dynamic systems static. This they note is a major reason that account for the failure of most interventions.

Else where, Villareal (1990) argues that boundaries should be delimited by the people themselves, in their own language and from their own perspectives, since the boundaries themselves constitutes objects of study.

It is also noted that an indigenous Agricultural knowledge and information system (IAKIS), has its own internal dynamics and properties, which gives rise to certain attributes that characterise that particular IAKIS, making it different from other IAKIS (Millar, 1992). This observation serves as a useful guide for of this study – a combination of farmers' attributes and as an actor, the researchers own.

2.12.5. Linkage mechanisms

Operational devices that actualise interfaces constitutes linkage mechanisms and they allow separate parts of the system to become an integrated whole (Long and Van de Ploeg (1988, 1989). They further clarify this by making reference to the idea of multiple realities which relates closely to Van de Ploeg (1990) dialectics on heterogeneity as a major concept to understand what farmers do and how they operate their enterprise. He observed that different combination of resources give rise to different farming styles. Similar perceptions about heterogeneity are also discussed by Engel (1991) in his discourse on Multiplicity and diversity within the AKIS.

According to Roling (1988a), linkage mechanism could involve concrete procedures, regular events, any device, channel or other arrangement that could bridge the gap between components of the system. This he notes would allow communication between and amongst actors and should serve the function of knowledge transformation rather than just information transfer. Functional links are seen as activities which aim at forming a bridge between research and technology transfer with the performance of the systems as an objective. The different sub-systems that are involved in the linkages need to be co-ordinated in deferent ways because of the different linkage mechanisms and power positions (Roling, 1992; Roling and Engel, 1999)

As this study has the objective of coming out with indicators for donor, policy and institutional interventions at the farmer level, linkage mechanism deserve critical attention in the Builsa District. It is my intention then to understudy the linkage mechanisms within the Agricultural knowledge and information system (AKIS) and within the indigenous Agricultural knowledge and information system (AKIS) in the District

2.13. AGRICULTURAL KNOWLEDGE AND INFORMATION SYSTEM

This study will conduct a thorough assessment and evaluation of the state of Agricultural Knowledge and Information System (AKIS) in the District. This is necessary to establish the state of awareness of the primary level actors (small farmers) about the various innovation that are being communicated to them by the extension service in the District.

The Agricultural knowledge and information system is defined by Roling and Seegers (1991:74) as "the articulated set of actors, networks and/ or organizations, which potentially work synergically to support knowledge processes in agriculture, so as to improve the goodness of fit between knowledge and environment, and/ or control provided through technology use".

The definition provided by Roling and Seegers Serves as a useful reference point for this study because it provides the basis for the identification of the various actors, networks, organizations and individuals that are articulating knowledge processes in agriculture in the District. This will enable the study assess and evaluate the extent to which these actors are co-ordinating their activities for the benefit of the small farmer.

2.14. RURAL PEOPLES' KNOWLEDGE (R.P.K)

The idea of Rural peoples' knowledge posits that the small farmer is a social being who is not just a passive recipient of innovations but an active participant who possess information, knowledge, skills and attitudes, internalize them and strategise in his dealing, with various local actors as well as with external persons and institutions (Roling, 1988, 1991)

Rural Peoples' knowledge is conceived as that which emerged from the interaction amongst individuals and between individuals and their environment, resulting in a product which has been formed and transformed by society itself (Chambers, 1983, 1990). This knowledge which is socially constructed is therefore culturally specific and has its distinct characteristics which

may be similar to, or different from other construct. It is to be noted that R.P.K is in a dynamic relationship with its environment and is in constant evolution over time.

Participatory processes with the farmers will be utilised to incorporate RPK into the study (Jiggins and Roling, 1982; Ashby, 1986, 1987; Chambers and Jiggins, 1987).

Efforts by Non-Governmental organizations to incorporate RPK in their interventions have been documented by Gubbles (1988) and Forrington and Biggs (1990).
For many years, various valuable experiences of small farmer experimentation existed with very little recognition given to them.

The works of Rhoades (1984) among Peruvian small farmers on potato cultivation, Box (1986, 1988, 1989) on cassava and rice in the Dominican Republic, Millar (1990) on traditional yam storage in Ghana, Kassague et. al. (1990) on Skills and techniques among small farmers in the area of soil and water management in Mali and Toure (1990) on farmers adaptation to changes in the environment within the livestock sector in Mali, all constitutes living testimonies to the value and experiences of Rural peoples' knowledge. If these had not been consciously unearthed, they would have been lost to extension and research.

Writing on Africa Indigenous Agricultural Revolutions, Richards (1988) argues that successful rural development which depends on inventive self-reliance, will enable small farmers to make changes which are potentially of benefit to them in particular, and to society in general.

This argument to a large extent seems to be a reasonable starting point for re-orienting the efforts of policy makers and interventionist in their bid to modernise small-scale agriculture. This, it is observed will allow for a change in the power relationships between the intervener and the farmer through schemes that would enable the farmer to dictate the pace, if not influence the rules.

2.15. COSMOVISION ANALYSIS

The concept of cosmovision as a tool of analysis of social reality was first brought to light by PRATEC, a Peruvian NGO (in Haverkort et. al., 1991).

The notion of cosmovision emanates from a culture that perceives the world holistically, thereby integrating the world with the cosmos.

Human society is seen to be part of nature and humans must work in conformity with the dictates of nature. Man is perceived to belong to nature and not nature belonging to man. In other words man is part of nature and not nature part of man. In this frame of mind society does not stand in opposition to nature as is the case in the western world view where man is considered the conqueror of natural forces, man in the cosmovision world view must rather work and communicate with nature. Human relationship with nature is viewed to be dynamic and not static and involves a process of on-going domestication and transformation of the environment which must not be recklessly exploited, abused or flouted with impunity. Nature is perceived to be provider of nourishment and the primary goal of human existence. It provides the abode for the dead and the ancestors.

It is this belief embedded in the cosmovision concept that establishes the assumed interrelationship between spirituality, nature and mankind.

The role of super powers, the natural processes that take place and the relationship between man and nature are clearly described. It makes explicit the philosophical and scientific basis for which interventions in nature take place. (Haverkort and Millar, 1992). Embedded in the Cosmovision Concept is the belief that there is no one Cosmovision but as many as perception and beliefs of the cosmic world differ.

The cosmovision paradigm identifies a hierarchy of Devine beings, spiritual beings especially ancestors.

The existence of these hierarchies give rise to several rituals in which elders, priests and soothsayers play prominent roles and prescribe the way problem-solving can take place. This, to a large extent determine how people go about knowledge and technology development. In this regard the RPK and the cosmovision embedded in them dictates how society is organizing itself and how effectively it is achieving its goods (Millar, 1992).

In the Builsa District ancestral worship is practised and permeates the social fabric of the majority of small farmers.

My review of the experiences of innovation communication indicate that the one-way model of innovation communication has dominated global, sub-global and national level communication of innovations and that this pattern of innovation communication has resulted in the dotting up of high level capital intensive technical infrastructural projects in many developing countries, including Africa and other less developed areas in Asia, the Pacific and the Caribbean that have not worked and that have made these countries even poorer.

The general out come of this dominant mode of innovation communication is that, it enables the developed countries to export their obsolete technical equipments and know-how to the developing countries, makes them technically dependent on the developed countries, which invariably contributes to making their development process unsustainable. This is necessarily so because their technical progress is not culturally grown and they tend to be at the tail end of global technical progress.

The dominant one-way model of global innovation communication is likened to the dominant scientific method of knowing and knowledge generation, which even though there are other forms of knowing and knowledge generation has sub-due all others and relegated them to the background.

The inadequacy of the Transfer of Technology model in sustaining technical progress in the developing countries gave rise to a paradigm shift to participatory approaches during the past three to four decades.

The approach, which is still evolving is aimed at beneficiary involvement in the design, development and communication of appropriate technologies that suits and meets their technical capabilities and needs to promote sustained technical progress for sustainable development.

CHAPTER THREE

METHODOLOGY

3.0. INTRODUCTION

Methodology in social science research is the appropriate research techniques or strategies and methods or logical framework to be used in the investigation and the choice of the appropriate technique and methods is one of the most difficult problems that faces social science research. The reason for this lies in the nature of social science research phenomena, which have to do with extremely unstable human conditions in different environments. This has given rise as to whether to use qualitative or quantitative techniques in social science investigation, and invariably which strategy to adopt---case studies, histories, experimentation, ethnography, surveys, archival analysis (Bacho, 2001) as well as which research technique to be used in data collection, data analysis and reporting. This chapter will consist of where the study would be conducted and how it will be done.

In the conduct of this study efforts would be made to involve community participation in the data and information gathering process. In this regard an actor-oriented perspective would be employed in the conduct of the study.

A number of research approaches that allow staked holder participation at all levels in the conduct of the study will therefore be employed. Rapid Appraisal of Agricultural knowledge systems (RAAKS) a methodology pioneered by Engel and Salomon (1994) provide a concrete starting point and an operational method with steps to follow. RAAKS is best described as a management tool for understanding an agricultural knowledge system in a participatory manner.

Participatory Technology Development approach, a methodology that has gained wide acceptance for involving stakeholders (farmers) participation in the design and development of appropriate technologies (Millar and Apusiga, 2004) would also be employed in the conduct of the study. Other research methods, such as direct interview of stake holders, documentary review and appropriate participatory Rural Appraisal tools will be utilised in the study.

3.1. Profile of Builsa District

1. Location: Builsa District is one of six District in the Upper East Region of Ghana. It lies between latitudes 10^0 20' North and 10^0 15' North and longitudes 1^0 05' West and 1^0 35' West.

Area: The District has an area of 2,220sq.km, has the largest land area in the region representing 25.1% of the Upper East Region. The District is predominantly rural. It is bounded to the North and the East by the Kassena Nankana District, to the South by the West Mamprusi District, and to the West by the Sisala District.

3.1.1. Physical Characteristics

Underlain with gentle slopes ranging from 150m to 200m with outcrops of granitic rocks

Drained by major tributaries of the White Volta, namely Sisili, Kulpawn, Tono, Asibalik and Belikpien. The drainage is generally high but streams are mostly seasonal.

The high drainage density with the low-lying terrain makes most places flooded in the rainy season.

Tropical Savanna climate with mean monthly temperatures ranging between 21.9 and 43.1C. These rise up to 45C in March.

Starts in April, builds up to a peak in August – September and stops in Mid October. The District effectively has 5 months of rain and 7 months of dry season. It is considered a water deficient district, which is inadequate for agriculture. It ranges between 850mm and 1,150mm p.a. with irregular dry spells in June or July.

Characterized by Savannah wood land consisting of dispersed short perennial grasses, associated with short shrubs and herbs interspersed with deciduous, drought and fire resistant trees of economic importance such as baobab, acacia, shea tree and dawadawa.

The dominant rock types found in the district are granite (70%). Alluvial sand stones with recent and old alluvial deposits and old river terrace (19%), Birimian rocks (5% or 11,905 ha) and Voltain shale (5% or 10,980 ha)

The whole district has about 15 different soil associations each made up of one or more soil series. The common soil types are those developed from the granite rocks. These form half of the northern half of the district covering not less than 70% of the land area. These soils are gravely and concretionary, not very good for arable farming. The alluvial soil are in the mid to southern parts of the district and are considered to be the best agricultural soils. These are suitable for both land and mechanized cultivation of rice, millet, sorghum, maize and legumes.

3.1.1.2. Natural Resource Potentials

The district is endowed with rich natural resources, mineral deposits like gold, chromate, rutile, jasper, chalk, lime and varied clay types are reported in the mid to the southern parts of the district most of the soil associations in the district are found to have large quantities of clay deposits, which can be exploited for the making of pottery, ceramics, paint, brick and tiles etc. The Northern part of the district stretching from Chuchuliga to Bachonsa and Kadema to Zamsa have outcrops of granitic rocks suitable for quarrying for stone, for road construction and building. Other forms of resource potentials include Dams/ Dugouts used for dry season irrigation farming and livestock watering.

The District has reserves covering 35689hectares which among other things serve as habitats for wild life and as tourist attraction spots.

3.1.1.3 Constraints Of the Physical Environment

These include:

Land degradation and desertification (through tree felling, bush burning, inappropriate use of fertilizers, chemicals, tillage methods), seasonal water shortages arising from the long dry season, poor road network, recurrent natural disasters such as heavy rains, strong wind storms, floods, army worm infestation, drought etc.

3.1.1.4 Demography

The District population growth has been as follows:

1984 ------- 66,357

2000 ------- 75,375 with annual growth rate of 0.8%

Population density is 34 persons per square kilometre in 2000 compared to a regional average of 104 persons per square kilometre. The District is considered sparsely populated.

Age -------- Sex Distribution
0-14years ----- 43.95%
15-49years ----- 23% (include women in fertile age group)
50-64years ----- 50.85%
Over 65years ----- 5.2%
Dependency ratio is 49.15%

The District has 155 communities with no settlement having more than 5,000 people, Major settlements are Sandema, Fumbisi, Wiaga and Chuchuliga.

The number of households as at (2000 census) is 14,636 with an average household size of 5.15 persons.

The District is homogeneous, mostly Builsa forming 83% of the population. Other minority tribes are Kantosi, Mamprusi, Sissala, Nankani and Moshie all together make up 17%.

The dominant religion is the traditional African religion, 46.41% followed by Christianity, 28.32% and Moslem, 22.54%.

The main festival of the Builsa is the Feok, usually celebrated in December to commemorate the defeat of Babatu and his notorious slave rainders. The Festival also marks and gives thanks to the ancestors for the year's harvest.

The District has a high poverty incidence with average annual household expenditure of ¢1,793,000 compared with the national Average of ¢4,244,000. 79% of the district population have average welfare or per capital income of ¢562,700 per annum as at 1999 income levels. (2000 Population and Housing Census)

This shows that 9 out of every 10 people in the district are poor.

Manifestations of the poverty index in the district are:

- Hunger
- Malnutrition (underweight, stunted growth
- Ill health
- High mortality rates
- Low life expectancy
- High crime wave
- Excessive child abuse, drinking, streetism
- Commercial sex
- Loss of personal integrity

3.1.1. 5. Socio-Economic Characteristics

Poorly developed economic infrastructure, inadequate postal services, non functional telecommunications and frequent breakdowns of many exchange equipment indicate the infrastructure situation of the district.

Two main markets, Fumbisi and Sandema and five (5) minor ones exist in the District. These are all beset with problems such as inadequate stores, stalls, sheds, warehouses, sanitary facilities and drainage systems.

Road network is poorly developed with 146km length of roads. 81km of this is primary or artery road, from Chuchuliga to Yagba. The remaining 65km is feeder road linking settlements; to a large extent, inter settlement communication is by foot-path.

Agriculture constitutes the main economic activity, employing 68% of the district's labour force. Total cultivable areas are 37,000 hectares. The people are predominantly small holders growing a wide range of rainfed food crops including sorghum, millet, groundnuts, rice, beans, potato and vegetables. Farmers are also engaged in livestock and poultry production of various species. The methods of cultivation are hand and hoe, animal traction and tractor but the hand and hoe is the predominant method. Several decades of continuous cropping combined with such land degradation activities such as bush fires, indiscriminate tree felling, use of inappropriate land tillage methods, fertilizers and chemicals have resulted in serious loss in nutrient content of the soil.

Crop yields are therefore generally very low (about 1.5T/Ha for maize, 2.0T/Ha for sorghum and millet. These coupled with high post harvest losses of about 30% of gross output makes food security situation in the district very critical. Under MOFA/LACOSREP/AgSSIP and other NGOs several interventions are currently being put in place to address the problem of low output levels and high post harvest losses.

These include:

- Helping farmers to improve the quality of their farm produce through planting of improved crop varieties, application of effective production management techniques.
- Provision of performance-oriented extension services with focus of closely supervised and targeted delivery that make up for short falls in staffing.
- Development and multiplication of new improved varieties of seed and planting materials of selected crops, including maize, rice, sorghum, millet, sweet potatoes and varieties of vegetables.

Livestock and fisheries productions are also low, though these have massive potentials for expansion and improved productivity. Efforts being made to increase output in these areas are:

- Introduction/use of improved breeds of fingerlings
- Production/conservation and use of quality animal feed especially during the dry season
- Adoption of improved animal and fish husbandry and management and health practices
- Prevention and control of animal pests and diseases
- Construction of ponds, pens and cages.

3.1.1.6 Proposed Priority Actions

- Provision of small scale irrigation schemes for dry season farming
- Provision of portable water and sanitation facilities in all communities
- Generation of non-farming employment
- Improved access to education and health facilities.

- Gender mainstreaming and gender equity

3.1.1.7 Labour Participation in Economic Activities

Reference 2000 population census indicate the following:
Age 0 – 70 years ---------- 58,939
Of this, 35,194 (59.7%) are economically active
Of the 35,194 only 23,446 can work for pay
Of the 23,446, 4,365 are either sick, on leave, displaced or temporally while 7,383 of the economically active group are unemployed.

40.3% of the 7 years age group and above are not economically active.

3.2. METHODOLOGICAL FRAME WORK

From the employment of an actor perspective, primary level actors would be given the opportunity to identify their sources of innovation in their production system. Similar to Van de Ploeg (1990) farming styles studies, farmers would be grouped or categorised to form the starting point for more detailed investigation. The choice is therefore made for an actor oriented approach as an analytical tool (Long, 1984, 1989, 1990; Long and Van de Ploeg, 1988, 1989).

A number of research approaches have been suggested for investigating the elements, strengths and weaknesses of an agricultural knowledge and information system at local, regional and national levels (Garforth, 1993; Roling, 1990; Brunold and Scheuermeier, 1996). However, they tend to remain researcher controlled and allow limited participation by the different stakeholders, thereby limiting the full operationalization of the model. Rapid Appraisal of Agricultural Knowledge System (RAAKS), a methodology pioneered by Engel and Salomon (1994) provide a concrete starting point and an operational method with stages to follow. RAAKS is best described as a management tool for understanding an agricultural knowledge system in a participatory manner.

Following the growing trends in participatory analysis, this study intend to explore network analysis from the user/ actor perspective that is mapping the Agricultural knowledge and information system from the farmer level up. This process would be made more visual and, therefore, accessible to farmers by using PRA techniques based on Long, (19984), (1989,1990), Long and Van de Ploeg, (1988, 1989)Actor Oriented Approach.

This approach would allow the researcher, the field workers (Extension staff) and rural communities (farmers) to jointly identify the networks of information exchange, bringing these actors together in a closer learning and planning process.

The approach will follow three stages:

- Mapping of actors and linkages
- Analysis of linkage performance
- Action Plan to modify roles and improve linkages.

3.2.1 Stage 1: Mapping of Actors and Linkages

The various activities which will be followed during this stage include the following; (Ramirez, 1993:5)

➔ Identification of farmer group and presentation to farmer group of the research goals.

- Farmer group draws community map highlighting major production systems, enterprises, infrastructure and tenure.
- Ranking of major enterprises.
- History of innovation – description of major changes for each enterprise in the last 10 to 15 years and the identification of the actor responsible for each major change.
- Drawing of linkage map for each linkage. The farmer group verifies each actor/ linkage drawn.
- Verification and discussion with farmers on the basis of the linkage map.
- Following up the leads identified from the farm level and interview trades men, input suppliers, private and public technology transfer workers and District Assembly Officials.

3.2.2. Stage II: Analysis of Linkage Performance

While the linkage map illustrates the linkages among the most important actors, it says very little about the relative performance or importance of the linkages. (Ramirez, 1997:9)

A further stage is required in order to identify the key linkages and to understand why and how they perform. This analysis helps to propose improvements in the roles and relationships among actors identified in the last stage.

The analysis of linkage performance will be based on the following criteria.

- Actors' awareness of other actors' functions in the linkage.
- Relevance of other actors services.
- Timeliness of other actors' services, if information inputs is programmed to coincide with the availability of other inputs, then the service is timely.
- Accessibility to other actors' services; If an extension worker is able to visit farmers regularly, this can enhance the relevance and timeliness of the service.
- Communication Media through which linkage is mediated.
- Linkage control over the initiation and management of a linkage.

When farmers have demand capacity over the services in their area, the other criteria listed here can be better ensured.

The criteria chosen in stage II is to serve as qualitative criteria by which to define new and desirable functions and linkages among actors. The criteria is also meant to provide a framework that would give meaning to the field level findings and on the basis of this to articulate improved roles and linkages.

3.2.3. Stage III: The Action Plan to Modify Roles and Improve Linkages

At this stage the relevant tools or windows from the RAAKS would be borrowed for action and intervention planning based on the following. ((Ramirez, 1997:10).

- Knowledge management analysis: what can be done and by whom to fulfil the objectives.
- Actor potential analysis: who has the mandate/ means to cooperate in effectuating the changes deemed necessary for successful performance of the system. How can solutions be negotiated among key actors.
- Intervention planning: who is going to do what? (Engel and Solomon, 1994).

As this study is basically concerned with Participatory Technology Development and Communication, the PTD steps will also be followed where appropriate as a methodology for eliciting community participation in the data and information gathering concerning innovation flows and exchange in the study area.

3.2.4. STEP ONE: GETTING STARTED OR COMMUNITY ENTRY

This step in the P.T.D. process enable the researcher, development worker or interventionist to prepare him/herself adequately so that he/she would enter the community without offending community/local sensibilities or breaking traditional protocols. This calls for self meditations, appraisal and reflections as part of the preparation, so that one can work with humility, respect and empathy (Millar and Apusiga, 2004:11).

These values are important to open the researcher or development worker up to respect indigenous world views, knowledge, structures and systems.
Once this is done the step entails conducting the following activities.

(a) Conduct of proper community entry based on existing traditional protocols such as asking the linguist to guide you, sending drinks/cola to the chief, respecting the time scheduled, the order of communication and of seating or as may be specified from culture.

(b) Going through the cultural embedding processes of the people such as taking part in ceremonies and festivals, sharing in various performances (also sooth saying), and also attending the markets and funerals.

(c) Conducting a reconnaissance survey in the community using PRA Tools such as embarking on community and Transect walks, engaging in community mapping and participant observations. This is intended to provide you first hand perceptions about the broader issues that the researcher may be interested in later.

(d) Studying the existing information system and net work of the area.

(e) Building on a relationship of confidence with local networks of farmers.

(f) Building, a relationship of confidence and co-operation with the community.

(g) Understanding the social and cultural positions of the people.

(h) Negotiating with community members about possible ways of working toward a mutual goal.

(i) Learn about the motivation of farmers for action.

If the above activities are thoroughly carried out they will provide useful information and results for undertaking the next group activities.

For the conduct of the above interrelated group of activities, the following PRA tools are useful for eliciting the involvement of various categories of stakeholders (Millar and Apusigah, 2004:12)

- Participant observation
- Open discussion
- Discourse and conversational analysis
- Discussion meeting with groups
- Community Walks
- Community Mapping
- Critical area engagements (Markets, festivals, funerals)

The literature also indicate that the researcher or development worker can identify indigenous forms and others he/she may create as additional PRA tools to complement the above stated ones.

The information that is necessary to collect during this phase of the PTD process include the following.

- The living conditions of different socio-economic groups in the community and cultural values.
- The needs of the community, and especially those of the poor.
- The way the community solves its problems e.g does it use traditional methods and or involves assistance of outside organizations.
- Social patherns in the community-who talks to whom and why
- The community power structure- who are leaders and opinion makers.
- Informal or formal organizations of men and women in the community (both mixed and separate)
- Community Regulatory mechanisms (authority and control)
- Issues of advocacy, rights, equity, access and control.
- Links between the community and supply of services and who controls them.

3.2.5. STEP TWO: LOOKING FOR THINGS TO TRY OR DIAGNOSIS

In this step of the P.T.D process, the researcher, development worker or interventionist begins from within and then go without. The idea is that communities themselves have things to try or are already trying things and governmental organizations and Non-governmental organizations might have things to try too. Also research and other institutions could also be a valuable source of things to try before one could possibly think of going external.

At this phase of the P.T.D process, the following activities are to be undertaken to follow those of step one.

- Identify the indigenous knowledge in the community relevant to main problems noted from step one.
- Identify in formal knowledge relevant to the main problems.
- Get beneficiary reasons (criteria/indicators) for wanting to undertake this main problem and not others.
- Conduct a participatory diagnosis by making a joint analysis of existing situations, natural Resource systems and identifying main problems.
- Re-construct existing indigenous management structures and systems
- Identify constraints to the performance of these structures and systems
- Screen and select topics for further consideration and development.
- Agree (decide) with beneficiaries on what things to develop (test/experiment).
- Identify the persons who are interested in testing (experimenting).
- Note the local resources that can be used in the process of testing (experimenting).

If these activities are well carried out, the various options to test will emerge from which organizing for the selected development actions(s) can start.

In organizing or planning for the testing of the selected development option, the following activities that need to be carried out cover the following.

- Identifying indigenous structures of power and authority – the chiefs, Tindaana/spiritual leader, Assemblyman, Magazia, Magazia's assistant, the Machina/youth leader
- Identifying indigenous technical knowledge on natural resources management and processes of learning/knowing-land/farmland, grazing land, degraded land, settlement area etc), forest reserve (Government reserve where different types of trees and grasses can be found, community woodlot and private plantations), water Bodies (Rivers, streams, ponds, dugouts, dams and wells. Most of those may be silted or polluted.), Woodland (where very little or no farming is carried out. The trees, grasses, medicinal plants, wild fruits, rafters etc can no more be found easily, and when found, very far away from the settlement), Wildlife (many wildlife species can no more be seen), Sacred Groves/Traditional protected lands – with many people not believing much in taboos etc. they have either encroached or not cared for these groves.
- Identify relevant formal knowledge (levels of resources and their uses.
- Getting farmers' own criteria of status of natural resources.
- Identifying issues on the rights of disadvantage groups regarding access, control and ownership as well as other equity concerns.
- Identifying other organizations working in similar fields.
- Identifying possible service providers, stakeholders, and possible strategic allies.
- Screening and selecting alternative options for improvements which will lead to optimal use.

To promote community/beneficiary participation in the identification and selection of development options the following PRA tools can be applied.

a. Focus group interviews
b. Problems tree Diagnosis
c. Community maps
d. Form maps
e. Ranking
f. Flow diagrams
g. Transect walk
h. Drawing of resource maps out of community maps
i. Community Institutional mapping

3.2.6. STEP THREE: ORGANIZING FOR DEVELOPMENT ACTION OR ACTION PLANNING

This step of the PTD process requires a high degree of concern and sensitivity to equity issues and it is important that gender, generational and any other marginality (eg settlers, strangers, ability) issues are integrated in the process of designing actions.

Activities that are required to be carried out with the community and other stakeholders in this phase of the PTD process include the following:

- Organization of community forum to re/discuss the things that have emerged for action during the second step of the process (Looking for thins to Try step (step Two).
- Discuss with communities to agree on the mode of action (individual, group, family, according to source of livelihoods, or entire community)

- Let the community make the choice whether as mobilising for a development activity, the testing of an innovation or designing of an experiment.
- In situations where individuals are representing the community, the community should be facilitated to select ambassadors to represent their interests and regularly account to them.

When the action interest groups/individuals have been found, there is the need then to focus on these groups for more detailed planning.

The actions to be carried out with the action interest groups include the following:

- The re-selection of groups/individuals who have opted for the test (experiment).
- Identifying (note) the ways of testing (experiment of the farmers.
- Discussing alternative ways with them.
- Agreeing with the farmers to modify how to carry out the test, if need be using the best tools/practices and what is possible from both local and external knowledge.
- Designing and planning the tests (experiments)
- Agreeing on the roles and responsibilities for each one, this requires getting commitment from each one.
- Identifying the resources that would be used and who will provide which one.
- Agreeing with the communities on what indicators to measure and how to go about measuring them (those of the community and the researcher/ interventionist)
- Agree on what to follow up and when, and possibly what to measure.
- Agree also on the possible things to be learnt from the tests (experiments).

The outcome of this third phase of the PTD process is an agreed-upon plan, which indicate what will be tested, how and by whom. The outcome will also include measuring tools and main learning points to follow.

In the literature, the main PRA tools that are listed to be most useful in this phase of the PTD process are as follows.

a. Various discussions
b. Role plays, Games and Exercises
c. Pie charts and Histograms
d. Wealth Ranking
e. Demonstrations and simulations
f. Various flow diagrams
g. (Problems) Tree Analysis

3.2.7. STEP FOUR: TRYING OUT OR IMPLEMENTATION

This phase in the PTD process is the time for the implementation of the various options agreed on in step 3. This involve the actual implementation of the actions, options or path ways identified and selected by the rural people. The phase includes the monitoring and evaluation of the results supervised by the community institutional structures using community based systems.

Under this fourth step of the PTD process, the following actions should be carried out.

a. Re-discussion of the designs of step 3 and the various actions with the actors. This is necessary to include new emerging issues or deletion of activities that are found not to be relevant or important.
b. Organization of logistics and other resources
c. Holding regular meetings to discuss progress.
d. Holding field days and exchange visits
e. Visiting and supporting the activities of the rural people in their fields of action.
f. Checking the results of each activity together with the farmers and others.
g. Observing and monitoring what happens.

The literature on PTD recommends the following PRA tools for this fourth phase.

a. Various forms of discussion
b. Cropping calendar and seasonal calendars
c. Pie charts and Histograms
d. Flow charts
e. Impact Diagrams
f. Solution (Tree Analysis
g. Demonstrations and simulations
h. Participant observation.

From the available literature on the PTD process, it is evident that the underlisted PRA skills and competencies would be developed at this phase of the process.

a. Leadership skill development
b. Experimental skills development
c. Group Development
d. Linkage development
e. Structure for processing in formation
f. Spontaneous sharing arrangements
g. Self-monitoring and Evaluation
h. Skills and systems for accountability
i. Demonstration skills.

3.2.8. STEP FIVE: SHARING THE RESULTS (INCLUDING MONITORING AND EVALUATION

From the available literature on the PTD process, it is noted that even though this action is listed as step 5, it should be born in mind that sharing, for rural people, starts much earlier, most especially during implementation. It is noted in the literature that rural people discuss their starter-actions with neighbours, at markets and funerals, and in the evenings when they are resting.

Apart from informal sharing, the following activities need to be carried out with the communities.

a. Holding of field workshops regularly to discuss the protocols.
b. Inviting outsiders to come and see what is happening.
c. Organising regular fora for the experimenting group/individuals to give account to the whole community.
d. Providing regularly organised opportunities for the marginalized groups to show-case their action.

e. Organizing visits to secondary sites
f. Holding farmer-to-farmer training meetings
g. Reviewing inputs against outputs.
h. Check efficiencies and Effectiveness
i. Monitoring with the view to replan
j. Communication of results with local and scientific networks to scrutinise and interpret them, and to encourage others to test and adapt the results for their circumstance.
k. Identifying and encouraging the participation of other community-based extension systems
l. Identifying and encouraging the involvement of various other service providers.
m. Bringing up visual aids developed and related ones for discussion.

For this fifth phase of the PTD process, the available literature provide the following PRA tools for the operationalization of the phase.

a. Various forms of discussion
b. Various Trend Analysis
c. Matrix scorings and Rankings.
d. Impact Diagramme.
e. Discussion of various maps
f. Role plays
g. Drama, puppetry, songs
h. Posters and other audio-visuals.
i. Critical Arena Discussions (markets, funeral, festivals)

In the Literature, the following exercises are also listed as helpful in the sharing of result.

a. Keeping of monitoring Records and documentation of processes
b. Publicising results and findings using symbols and other indigenous forms.
c. Organising evaluation and planning workshops and inviting key persons from other communities to participate.
d. Looking back at the indicators and criteria
e. Organising excursions and cross-visits with community intuitions

3.2.9. STEP SIX: SUSTAINING THE PROCESS/UP-SCALING/PHASING-OUT

This sixth and last phase of the PTD process is necessary to promote the sustainability of the process, provide the enabling environment for replication of the process by many more community members, usually referred to as up-scaling the process as well as provide the opportunity for the researcher/intervenist/community worker to phase out (plug in-plug out concept).

In the Literature, even though it is clear that sustainability issue start much earlier in the PTD process, the sixth phase constitute the critical step of being sensitive on sustainability of the process. The available literature also indicate that, this is the phase that is useful to find out whether there are spin-offs of actions that have not received the direct attention of the researcher/interventionist /community worker.

The literature also point out that experience from working with rural people has shown that there could be parallel experimenting or testing going on by people far removed from the focus

sample of action once the interventionist has gone through elaborate process of engagement. These could be people who were not in the initial phases and yet who copy from participants. They also could be people who were there at the beginning but decided not to be part of the experimenting group and yet have gone out of their way to do some testing of the on-going actions on their own. The literature indicate that these are an interesting, informative, and a creative group that should be consciously found out, for because, almost invariably, they exist in rural community-based actions and contribute differently to on-going processes. They also provide an opportunity for essential learning about farmer-to farmer learning and cross-sharing.

The activities of the sixth phase are listed in the available literature as follows:

a. Organization of shows to highlight results
b. Continuation with holding of field workshops
c. Continuation with organization of visits to secondary sites (cross visit to other places
d. Conducting extensive public relations with audio-visuals produced
e. Focusing on the farmer-to farmer training meetings (also indigenous forms)
f. Publicising results with local and scientific networks to scrutinize and inter prêt them and to encourage others to test and adopt the results for their circumstances.
g. Identifying and involving community-based extension systems, other service providers and potential Donors.

For the sixth phase, the Literature on the PTD process reveal that the following issues should be focused on:

a. Creating favourable conditions for on-going experimentation, adoption of options by others, and further natural resources improvement and management.
b. Moving beyond monitoring and evaluation to assessing impact.
c. Working on net working and collaborative arrangements with community institutions.
d. Consolidating roles and responsibilities of community institutions.
e. Entrenching sustainability issues (also gender and environmental sustainability.
f. Responding to issues of equity and rights.
g. Dealing with policy and advocacy issues.

The PRA tools that are recommended in the literature for the sixth phase of the P.T.D. process is listed as follows.

a. Various forms of discussion
b. Discussion of the various maps
c. Various Tread Analysis
d. Matrix scorings and Rankings
e. Impact Diagrams
f. Role plays
g. Drama, puppetry and songs
h. Posters and audio-visuals.

3.3. CONCLUSION

In concluding my review of the Participatory Technology Development (P.T.D.) process, I would wish to point out some practical difficulties, which the available literature reveal with the practical application of the model.

- Each tool needs detailed preparation by the users
- Formulating the probing in such a way as to use multiple tools is difficult.
- Rural people expect something "a regard" the lack of which makes participation difficult
- Rural people are not used to sharing ideas in the open hence use of what tools to "open them up" is difficult to guess.
- It is initially difficult to get faith/trust from rural people in the process
- It is difficult to find the same set of motivation for all rural people
- Getting people to document things formally is a big challenge, especially when non-literates are involved.
- The tendency in facilitation is to resort to lecture and to lead. How to avoid this is difficult.
- It is difficult during the first time to manage the participatory processes successfully.
- In the process of using PRA tools it is sometime difficult to separate problems from solutions.
- How to re-arrange a drawing and yet not distort the information is not easy
- Who draws the flows and other diagrams and maps? (preferably the rural people themselves). How to give guidance and refrain from doing it yourself is not easy.
- How to be creative and know what tool to use and when is a skill.
- How to identify and use relevant indigenous tools is not easy
- How to be sensitive to marginalized groups all the time is difficult
- To always remember that rural peoples have their unique way of functioning, doing things and interpreting the world that might be completely different from our ways is quite a challenge.

Source: Millar and Apusiga, (2004:26)

Another form of data collection I intend to use is the direct interview method. For this type, Semi-Structured and structured interview would be used. I intend to rely more on open ended questions but also closed questions which are, converging in nature and detailed in probing "phased assertion" (Bernard, 1988) would be used. The interviewing method is chosen because of the desire to probe deeper into farmers knowledge processes and into aspects of rural peoples knowledge relating to innovation.

Document Review: I will review official records at the District office of the Ministry of Food and Agriculture (MOFA) and the Presby Agric Station in Sandema all of whom are involved in innovation communication in the District.

3.4. Detailed Data Analysis

The earlier three stages of the RAAKS process have data analysis built in them. Hence this section will follow the procedure suggested by Merriam (1988). The raw data will be organised by arranging the narratives, field notes and documents chronologically based on the phases of the RAAKS process.

The first level of analysis will involve narrative description of the findings of the three stages of the P.R.A. processes.

The second level of analysis will entail developing criteria that helps interprete the data.

The data from the direct interview method will be analysed by frequency distribution techniques or any other suitable statistical analysis method. It is envisaged that data analysis would be done on a daily and weekly bases. The final analysis will consist of a summary of the daily and weekly analysis.

3.4.1. Daily Analysis

At each stage, I intend to adapt de Vries (1990; 64) style of recollecting the day's "text", consisting of conversations, interviews, small events recorded in my field note book and try to connect the bits and pieces with previous bits and pieces if any. This will enable me create a mental picture, cross check this picture with informants the next day and also identify research issues for subsequent development.

3.4.2. Weekly Analysis

In furtherance with the re-construction of actors linkages and performance, I intend to identify some common characteristics that would result from comparisons of situations and results. The necessity of each case would be verified with informants and the outcome would be used to determine whether they form a basis for further investigation as case studies or not. This would help clarify features which define specific issues. Findings would be verified with informants in discussions.

The analysis of case studies would be based on making logical connections between a number of variables with the actors through detailed and purposeful scrutiny. They would also be analysed through constant validity checks for actors own consistencies and inconsistencies (Yin, 1984).

3.4.3. Final Analysis

This would be made up of daily, weekly and all other earlier analysis. In addition to this, more other thorough and rigorous analysis would be pursued to enable proper writing-up of findings.

To enhance trust in the results, I intend to use the following strategies.

- Triangulation – use of multiple sources or multiple methods (documents, interview, participants observation/ field visits) to cross-check the findings.
- Check interpretations with individuals interviewed or observed.
- Staying on-site over the research period.
- Clarify my own biasis.
- Ask peers to comment on emerging findings.
- Describe in detail how the study was conducted and how the findings were derived from the data (Merriam, 1988).

The Research Process

I propose starting the field work with the community mapping exercises followed by the interviews and finally document review.

PROPOSED TIME TABLE FOR FIELD WORK

Months	2006			2007		
Activities	Jan.	Feb.	March	Jan.	Feb.	March
1. Mapping of Actors and linkages						
2. Analysis				— — — — — — — —		
3. Action plan to modify roles and improve linkages				— — — — — — — — —		
4. Interview	— — — — — — — — — — — —					
5. Interview						
6. Interview				— — — — — — —		
7. Data analysis	— — — — — — — — — — — — —					

It is expected that between January and March 2007 Community maps depicting actors involved in innovation communication would be prepared. Between April and June, 2007, maps depicting linkage performance would be prepared. Action plans to modify the roles and improve linkages would be under taken in July, 2007.

Direct interview of actors (farmers, extension workers, input suppliers, traders etc would be conducted in three phases. Phase one will last from January to March, 2007. Phase two will take place from April to June 2007 and phase three, will be done in July, 2007.

In fact data analysis is a process that would take place throughout the period of the research at all the stages that data is gathered.

The time table for the field work is designed to coincide with the long dry period when farmers are virtually free and would have time to participate in the mapping exercises together with the researcher and the extension officers.

The timetable as it stands now is tentative and as it becomes necessary it will be revised to accommodate any changes and eventualities that many arise.

CHAPTER FOUR

FINDINGS AND DISCUSIONS

4.0. INTRODUCTION

In order to develop and analyse information on how innovation communication can be enhanced for increased productivity of small-scale agriculture in the study area, a survey was conducted to collect information about extension workers and farmers' activities.

Also a community mapping exercise of actors and linkages, analysis of linkage performance and an action plan to modify roles and improve linkages was under taken with a farmer group in the study area.

In all 16 extension workers and 120 farmers were covered.

The extension workers are from the Department of Agriculture in the District made up of 10 and the Presbyterian Agriculture Station in Sandema who were 6 in number.

The farmers were selected from the 3 Agricultural zones in the District. 40 farmers, made up of 20 men and 20 women were chosen from each zone.

Data on the strategies of innovation communication, communication medium, gender differentiation in innovation communication, experiences in innovation communication, factors that influence innovation communication, problems that affect innovation communication and also data on the age and sex distribution of extension workers and farmers were collected through structured interviews, Focus Group Discussion, Community Fora and direct discussions with extension workers, farmers, directors and managers of extension organisations in the Builsa District.

This chapter is devoted to the analysis of data gathered from the survey.

The analysis of the data is made around the sub-objectives of the research in the following order:

- Adequacy and appropriateness of innovation communication strategies.
- Problems that affect innovation communication.
- Effectiveness of communication strategies.

- Factors influencing innovation communication: Gender perspectives.
- Role of stake holders in innovation communication.

4.1. ADEQUACY AND APPROPRIATENESS OF INNOVATION COMMUNICATION STRATEGIES

4.1.1 Age and Sex Distribution of Extension workers and Farmers Interviewed

4.1.1a Age characteristics of extension workers

Out of the 16 extension workers interviewed 15 of them, representing 95% were males and the remaining one representing 5% was a female.

The majority of extension workers were in the age group of 41-50 years for the male extension workers whilst the only female extension worker under the employment of the Presby Agricultural station fell within the age group of 21-30 years.

TABLE 4.1.1a :**Age characteristics of extension workers**

AGE GROUP	MALE		FEMALE	
	Number of Extension workers	% of total	Number of Extension workers	% of total
21-30 years	5	31.25	1	6.25
31-40	Nil	-	Nil	-
41-50	10	62.5	Nil	-
Above 50	Nil	-	Nil	-
Total	15	93.75	1	6.25
Source: Survey Data.				

The dominance of men over women among the extension workers interviewed is a reflection of the relatively negligible number of women engaged in formal innovation communication in the area compared with men. By extension, this is even so in the other areas of human and social development where innovation communication is a crucial factor in fostering attitudinal changes for the promotion of rapid development. In water and sanitation, in community development, in health and in all forms of information, communication and education activities required for communication of innovations to beneficiaries, men are in the majority. Women constitute the largest proportion of our population, hence their minimal role in innovation

communication is unacceptable. The basis of development is the creation and communication of new innovations in all fields of human endeavour. (Meier, 1995 : 62). Hence we need more women at the forefront of innovation communication to serve as role models in bringing new ideas or innovations to the majority of women in our communities.

Another important factor revealed by the data is that majority of extension workers in the area are within the middle age bracket of 41-50 years, displaying clearly that many of the extension workers are aging, which may have the effect of reducing their effectiveness in communicating innovations to farmers.

The 6 young extension workers all happen to be employees of the Presbyterian Agricultural station in Sandema. The aging majority are employees of the Department of Agriculture. Information gathered from the District Director of Agriculture indicates that young extension workers are not recruited by government because of the increasing wage bill of the sector. This information was revealed during a Focus Group Discussion of the adequacy and appropriateness of innovation communication strategies by a Focus Group of Extension workers drawn from the Department of Agriculture and the Presbyterian Agriculture station.

4.1.1b. Age characteristics of farmers

In this study, a total of 120 farmers as earlier indicated were covered in the survey. The 120 farmers were selected from the three Agricultural zones of the district.

40 farmers, made up of 20 males and 20 females were selected from each zone.

We now present below the age characteristics of the farmers covered in the survey.

Table 4.1.1b: Age characteristics of Farmers

AGE GROUP	MALE		FEMALE	
	Number of Farmers	% of total	Number of farmers	% of total
21 – 30	4	3.3	Nil	0
31 – 40	6	5	10	8.3
41 – 50	15	12.5	30	25
51 – 60	20	16.6	15	12.5
Above 60	15	12.5	5	4.20
Total	60	100%	60	100%

Source: Survey Data

From Table 4.1.1b it is evident that for both male and female farmers covered in the survey, majority fell within the age brackets of 41-50 and 51-60 years. Out of the sixty male farmers covered in the survey, 15 of them, representing 12.5 percent of all farmers covered in the survey fell in the age group of 41-50 years.
20 of them representing 16.6 percent were in the age group of 51-60 years.

In the case of the 60 female farmers covered in the survey, 30 of them, representing 50% of female farmers interviewed and 25% of the 120 farmers covered in the survey, fell in the age group of 41-50 years. 15 of the female farmers interviewed, representing 12.5% of all farmers covered in the survey were in the age group of 51-60 years, whilst 5 of the female farmers, representing 4.2% of the farmers covered in the survey were above 60 years.

From the survey, it is clear that, out of the 60 male farmers interviewed, 50 of them, representing 83.3% of the male farmers and 41-6 percent of all farmers covered in the survey were in the age bracket of 41-60 years and above.
In the same vane, out of the 60 female farmers interviewed, 50 of them, representing 83.3% of the female farmers and 41.6% of all farmers covered in the survey were also in the age bracket of 41-60 years and above. This is amazing, but what this reveal is that, in the Builsa District, farming is predominantly undertaken by men and women who are in the middle and over aged group. This may have implications for productivity. This is so because it is this age group that most often resist change and are not willing to try new innovations. Innovation communication targeted at this group may therefore not make the expected impact.
The most active farming age groups of 21-30 and 31-40 years, who are versatile, have youthful exuberances and who would have been more willing to experiment with new innovations rather find farming unattractive. Only a few of them take-up farming.

From the survey, it is clear that, out of the sixty male farmers interviewed, only 10 of them were in the age bracket of 21-40 years. They represent only 8.3% of all farmers covered in the survey. This equally applies to the female farmers, where only 8.3% of all farmers covered in the survey were females.

4.1.2. Current strategies of innovation communication in the study area

From information gathered in the field through questionnaire interview and Focus Group discussion of extension workers on strategies of innovation communication in the study area, the following strategies were identified.

I. Practical field demonstration
II. Focus Group discussion
III. Community fora
IV. Meetings with Farmer Groups
V. Adaptive Trials
VI. Farm visits to farmers

Six main strategies are therefore commonly used in communicating innovations to farmers in the area by extension workers.

Table 4.1.2a. **Innovation Communication Strategies used by Extension Workers**

No.	Type of Strategy	Number of Extension Workers using the strategy	Percentage	Remarks
1.	Practical Field demonstration	10	47.6	The number of respondents on type of strategies exceed the number of extension workers interviewed because individual extension workers identified more than one strategy in communicating innovation to farmers. This equally apply to the percentage calculation because the total exceeds 100% as the extension staff identified more than one strategy.
2.	Focus Group discussion	7	33.3	
3.	Community For a	6	28.5	
4.	Meeting with farmer groups	2	9.5	
5.	Adaptive Trials	2	9.5	
6	Farm field visits	15	71.4	

Source, survey/Field data.

From Table 4.1.2a. it is clear that the most commonly used strategy for communicating innovations to farmers in the study area is "farm field visits" to individual farmers, where the extension staff and the farmer have one to one contact. From its face value, this strategy would seem to be very effective in communicating innovations to farmers.

However the effectiveness of this strategy is greatly minimised by the large number of farmers and distances that the extension staff has to cover.

The average extension/farmer ratio in the area is 1:3400. On the average extension workers commute a distance of 50Kms to reach their farmers. In the course of the year, the extension worker is able to cover less that one third of the farmers under them as clearly reported by the extension staff themselves (source, field information) during a Focus Group Discussion of a group of Farmers and Extension Workers.

The next most important strategy for communicating innovations in the area is "Practical Field Demonstration where 10 extension workers or 47% of the extension workers in the area use the strategy.

According to the extension workers, this strategy is practical and visual in nature, because the farmers see and feel the activities directly. According to them, it could have been the most effective strategy if farmers could devote time to participate in the demonstration activities when invited to do so. They indicate however during the interviews that most farmers when invited to participate in demonstration training activities are not able to do so because of other social, cultural and economic engagements which thus make the strategy less effective in communicating innovations to farmers because many farmers miss practical demonstration activities.

Focus Group Discussion and Community Fora are also commonly used strategies for communicating innovations to farmers. Approximately 33% use Focus Group Discussion and 28% use community Fora.

The extension staff however complain that in the case of Focus Group discussion, it is always difficult to identify expert leaders from among farmers to lead the discussions. This they indicate make the use of the strategy frequently very difficult. They point out that one has to

meticulously identify expert farmer leaders discuss with them and convince them to accept to lead such discussions. This difficulty they indicate is the main weakness in the use of the strategy. The strength of the strategy they point out is that, where expert farmer leaders are obtained and the discussion successfully conducted then the ideas and innovations are effectively communicated and understood by the group of farmers who participate in the discussion.

As regard community fora, the extension staff point out that the strategy is effective in mobilising large numbers of farmers to group at a point for interaction between them and farmers. However they indicate that controlling the large number of people pose a big challenge. Noise control, disruptions and disturbances are factors that they indicate make the strategy less effective as a tool for innovation communication.

From Table 4.1.2a, meetings with farmers and adaptive trials are the least strategies used for innovation communication in the study area. Only two (2) or 9.5 percent respectively of extension staff use the strategies. The extension staff clearly indicated that they find it difficult organising meetings of farmers because farmers expect provision of some kind of motivation, monetary or other wise to attract them to attend such meetings. This, they indicate they are unable to provide

In the case of adaptive trials, they point out that they do not have the necessary logistics and facilities to effectively use the strategy as a tool for communicating innovations to farmers.

As with extension workers, the farmers who were covered in the survey were also required to identify current strategies of innovation communication used by extension workers.
Table 26 below, indicate the results of the survey on current strategies of innovation communication identified by the farmers.

Table 4.1.2b: Strategies of Innovation Communication identified by Farmers.

No.	Type of Strategy	No. of farmers identifying it	Percentage
1.	Bringing farmers together for a brain storming exercise with them.	0	0
2.	Practical field demonstration on demonstration farms	40	33.3
3.	Organizing farmers to visit other farmers who are successful to learn from their experience.	10	8.3
4.	Organizing training workshops and seminars	0	0
5.	Visiting farmers in groups and passing on relevant information to them.	20	16.6
6.	Visiting farmers individually on their farms or at their homes to pass on new ideas to them.	50	41.6

Source: Survey Data.

From Table 4.1.2b, it is clear that from the point of view of farmers, extension workers in the area use four main strategies for communicating innovations to them.

From the survey, 61.6 % of farmers interviewed identified "farm and home visits as the major strategy used by extension workers for communicating innovations. Forty farmers, representing 33.3 %of all the farmers interviewed identified " practical field demonstration on demonstration farms" as another strategy used by extension workers for communicating innovations to them.

20 farmers, representing, 16.6 % of farmers covered in the survey identified "visiting farmers in groups and passing relevant ideas to them" as another strategy used by extension workers in passing on innovations to them." "Visiting successful farmers in groups to learn from their experience" was identified by 10 farmers, representing 8.3 % of the farmers covered in the survey as one of the strategies extension workers use in communicating innovations to them.

When the farmers were asked "why extension workers rely so much on individual farm and home visits in communicating innovations to them, majority of them explained that" "individual farm and home visit strategy" is quite effective in passing on innovations to them. This they said is because the extension staff give full attention and listen effectively to them. They indicated however that the weakness of the strategy is that, only a few farmers are visited in the course of the year and most farmers have to rely on other farmers to learn new ideas".

In the case of practical field demonstration on demonstration farms, the farmers said, the strategy is visual and so effective in bringing about understanding of the effectiveness of new ideas. However, they said, because of other social responsibilities which occupy them, they are not in some cases able to go for the practical demonstration. They see this as the major weakness of the strategy because the strategy involve sacrifice of time for other activities to go for demonstration learning.

As regards "visiting farmers in groups, the farmers said, it is good as it affords opportunities for farmers to interact collectively with extension agents. They indicated however that, the weakness of the strategy is that, it is sometimes difficult to control the group, if it is large.

A lot of noise and disturbances they said is associated with the strategy. From the study, the strategies identified by the farmers, their strengths and weaknesses collaborates very well with those of the extension agents and this to a large extent seem to give credence to the results of the study.

From the finding and discussions on the adequacy and appropriateness of innovation communication strategies used by extension workers, a preliminary conclusion can be drawn that, innovation communication is still heavily dependent on the visit and Training strategy which by and large is non-participatory. From our literature review, it is noted that, it is the non-participatory nature of the Transfer of Technology approach that has rendered extension service in effective in transforming and modernizing agriculture. This explains why innovation communication in the Builsa district is ineffective because the communication strategies are inadequate and in appropriate as they still rely on the transfer of Technology (T.O.T) approach.

4.2 PROBLEMS THAT AFFECT INNOVATION COMMUNICATION IN THE STUDY AREA

4.2.1 Problems of Innovation Communication Strategies

Extension workers use a variety of strategies in communicating innovations to farmers.

These strategies have their own associated problems that may serve as a limitation to effective communication of innovations.

To enhance innovation communication would therefore require elimination of the problems associated with the strategies. Even if they cannot be completely eliminated, steps could be taken to minimise them.

In recognition of this, one thing this study sought to do was to find out from farmers, the problems they find associated with the innovation communication strategies used by extension workers. The farmers were simply required to indicate the problems.

The results of the study on the problems farmers find associated with the strategies of innovation communication used by extension workers are summarised in table 4.2.1 below.

Table 4.2.1 Problems identified by farmers

NO.	Identified problem	No. of farmers identifying the problem	Percentage
1.	The strategies are non-participatory	19	16
2.	The strategies make the extension worker the embodiment of all knowledge of innovations	74	61
3.	The strategies basically aim at transferring new ideas to farmers without factoring farmers own knowledge and experiences	27	23

Source: survey data

From table 4.2.1, it is evident that, the 120 farmers covered in the survey identified three problems which they find associated with the innovation communication strategies extension workers use. These problems they identified are as follows:

1. That the strategies are non-participatory
2. That the strategies make the extension worker the embodiment of all knowledge of innovations.
3. That the strategies basically aim at transferring new ideas to farmers without factoring farmers own indigenous knowledge and experiences.

74 farmers, representing 61 % of the farmers covered in the survey, indicated that the strategies "Make the extension workers the embodiment of all knowledge of innovations".

This they said make the extension workers feel that they know everything about farming and as such are not most often prepared to listen to farmers own ideas (Ramirez, 1997:3).

27 farmers, representing 23 % of farmers covered in the study also indicated that, one problem associated with the strategies is that, they aim basically at transferring new ideas to farmers without factoring farmers own knowledge and experiences. This, the farmers said put them at the receiving end of new ideas and so they are made to appear as if they lack any idea about farming. This re-emphasises the non-participatory nature of innovation communication in the area.

Another problem the farmers pointed out as associated with the innovation communication strategies extension workers use is that the strategies are non-participatory. Innovations, they said are passed on to them in a dictatorial manner, "take it or leave it" approach (Christoplus, and Nitsch, 1993).

This problem was identified by 19 farmers, who represent 16 % of the farmers covered in the survey.

According to the farmers, innovation communication strategies need to be participatory enough to allow the indigenous knowledge and experiences of farmers to be acknowledged during the process of innovation communication (Ramirez, 1997).

4.2.2. Visit and training strategy of innovation communication

"Visit and Training " has over the years been the main strategy for innovation communication to farmers in the Builsa district. Majority of extension staff rely on farm field and home visits to farmers in communicating innovations to them. Most development workers explain that the strategy is effective because there is one to one and direct face to face contact between the farmer and the extension worker.

This, they say allow for free interaction, discussions, listening and exchange of views .

If the above assertion is true, it is expected that given the many years of extension activities in the district using the strategy, then maximum impact could have been achieved in enhancing innovation communication in the district.

However, things seem not to be so as far as innovation communication in the district is concerned, giving rise to the thinking that the visit and training strategy has over the years not made the desired impact in innovation communication in the district.

In recognition of this, one thing this study sought to do was to find out from farmers, if they agree that the visit and training strategy mainly used by extension workers has not made adequate impact over the years.

The results of the survey on the impact of the visit and training strategy is summarised in Table 4.2.3 below.

Table 4.2.3 **Farmers assessment of the impact of the visit and Training strategy**

No	Issue	No. of farmers responding to the issue		Percentage	
		Yes	No	Yes	No
1.	Do you Agree that the visit and Training strategy has not made adequate impact	80	40	67	33.7

Source: survey Data

From the results shown in Table 4.2.3, it is clear that majority of the farmers covered in the survey, numbering 80 and representing 67 % of the farmers interviewed agreed that the visit and Training strategy has indeed not made adequate impact in communicating innovations to farmers. Asked why they think it has not made adequate impact, the farmers said, the strategy is good and effective as it provide avenues for direct face to face contact with development workers but the problem with the strategy is that, its coverage of farmers is limited.

Using the strategy, development workers are able to cover only a limited number of farmers. Many farmers are left out.

The strategy also make demand for a large number of extension workers to be employed if many more farmers are to be reached.

Unfortunately, for the whole district there are only 23 extension workers. Fifteen of them are employees of the Ministry of Food and Agriculture and the rest of the 8 are employees of the Presbyterian Agricultural Project in Sandema.

40 farmers, representing 33% of farmers covered in the survey however indicated that the strategy has made adequate impact in communicating innovations to farmers.

Asked to give reasons for their assertion, the farmers said, even though the coverage of farmers is limited with the strategy, it is quite effective in communicating innovations to farmers, who in turn are able to pass on the ideas communicated to them to other farmers who are not reached by the extension workers. They argue that farmer to farmer communication of innovation is a common phenomena in the Builsa district and this explains why they agree that the strategy has made impact in communicating innovations to farmers.

From the findings and discussions of the problems that affect innovation communication in the study area, it can be concluded that, the reliance on the visit and Training strategy, which is non-participatory and aim basically at transferring innovations constitute the major problem that affect innovation communication in the area.

4.3 EFFECTIVENESS OF COMMUNICATION STRATEGIES

4.3.1 Medium of Innovation Communication in the Study Area

One factor that can enhance or reduce the effectiveness of innovation communication is the medium of communication. In communicating innovations to farmers, two main communication media can be used. These are, verbal and written communication.

The survey on the medium of communicating innovations to farmers by extension workers reveal the following results.

Table 4.3.1. **Medium of innovation communication**

No.	Medium of Communication	Number of Extension workers	Percentage
1.	Verbal	16	100
2.	Written	0	0
3.	Communicating Directly	10	62.5
4.	Communicating through an interpreter	6	37.5

Source: Survey Data.

From the survey on the medium of communicating innovations to farmers as displayed from the results in Table 4.3.1, it is clear that all the sixteen extension workers interviewed use verbal communication in communicating innovations to farmers. None of the extension workers interviewed use written mode of communicating innovations to farmers. This revelation is not surprising because majority of farmers in the area are illiterates and cannot read and write. This explains why all the extension staff have to rely on verbal mode of communicating innovations to farmers.

The study on communication medium however reveal that even though 100 percent of extension staff use verbal communication, 62.5% of them, representing 10 extension staff communicate directly in the local dialect to farmers, whilst 37.5% representing 6 extension staff communicate through interpreters, because they do not understand and speak the Buli language.

Communication through interpreters has the tendency of reducing the effectiveness of ideas and messages being communicated because of the risk of misinterpretation. As many as 37.5% of extensions staff therefore face the risk of their messages being misrepresented which is a major weakness of innovation communication through interpreters.

4.3.2. Farmers communication medium

Just as extension workers were required to indicate the medium of communication they use in passing on innovation to farmers, farmers who were covered in the study were also required to state the medium of communication they use in communicating with the extension workers. In communicating with extension workers, the farmers could do so either verbally or by written communication.

The survey on the medium of communication farmers use in dealing with the extension workers reveal the following results.

Table 4.3.2: Farmers' Medium of Communication

No.	Medium of Communication	Number of farmers using it	Percentage
1.	Verbal	120	100
2.	Written	0	0
3.	Communicating directly	63	52.5
4.	Communicating through an interpreter	37	30.8

Source: Survey Data.

From the survey on the medium of communication farmers use in communicating with extension staff, it is evident from the results shown in Table 4.3.2 that all the 120 farmers covered in the survey said in dealing with extension workers they use verbal communication.

Written communication does not feature as a medium of communication between farmers and extension workers in the study area. From Table 4.3.2, no farmer indicated written communication as a form of communication between them and extension workers. This collaborates with extension workers, when they also indicated that because of the high illiteracy level among farmers in the area they do not use written communication as a means of passing on innovation to farmers.

On the issue of communicating directly with extension workers or through an interpreter, 63 farmers, representing 52.5% of farmers covered in the survey said they communicate directly.

37 farmers, representing 47.5% of the farmers covered in the survey however said they communicate through interpreters, because their extension workers do not understand their local dialect (Buli)

As already noted earlier, communicating through interpreters has its own weaknesses because of the tendency of interpreters to misrepresent information they are required to pass on.

Since as much as 47.5% of farmers in the area communicate with extension workers through interpreters, one can clearly conjecture that there are problems associated with innovation communication in the area.

4.3.3 Communication ability and experience of extension workers

One important factor that can contribute to enhancing innovation communication is experience and the possession of good communication skills.

The more experienced and skilful an extension workers is in communicating, the more efficient he will be in delivering innovation messages to farmers.

Hence, one thing this study sought to do was to ask farmers to rate the communication ability and experience of their extension workers.

The farmers were just required to rate the communication ability and experience of their extension workers in terms of whether they are satisfactory, good, very good, poor or very poor.

The results of the survey on the communication ability and experience of extension workers as rated by farmers is summarised in table 4.3.3. below.

Table 4.3.3: Communication ability of extension workers

No.	Rate	No. of farmers scoring the rate	Percentage
1.	Satisfactory	51	42.5
2.	Good	44	36.6
3.	Very good	21	17.5
4.	Poor	4	3.4
5.	Very poor	0	0

Source: survey Data:

From table 4.3.3, it is evident that the majority of farmers, numbering 51 and representing 42.5% rated the communication ability and experience of their extension workers as satisfactory.

44 farmers, representing 36.6% of the farmers covered in the survey rated the communication ability and experience of their extension staff as good whilst 21 farmers, representing 17.5% of the farmers interviewed rated the communication ability and experience of their extension staff as very good.

3.4% of the farmers interviewed, numbering 4 however rated the communication ability and experience of their extension workers as poor.

On the whole, the study has shown that the communication ability and experience of extension workers in the Builsa District ranges from satisfactory to very good among the majority of the extension workers in the district. Based on this finding, one can say that the potential exist in the Builsa District for enhanced communication of innovation to farmers.

4.3.4. Joint learning of innovations

From the survey on the strategies of communicating innovations in the study area, it became clear that approximately 93.7% or 15 out of the 16 extension workers interviewed depend on field farm visits to farmers as the major tool for innovation communication even though they complement this with other strategies of innovation communication.

Joint learning of innovations among farmers, which often from the survey take the farm of practical field demonstration, focus group discussion, community fora and organised meeting of farmers with extension staff are little emphasised. The extension workers interviewed indicate that joint approaches to learning of innovations are difficult to organize and have heavy demand on time, resources and energy. This explains why even though majority of them indicate that they try to encourage joint learning of innovations, in practice, the approach is little used.

One way of promoting sharing of experiences among farmers is "participatory learning of innovations". Participatory approaches to learning brings farmers and extension staff and even researchers together in a joint learning situation (Christoplus and Nitsch, 1993). This provides opportunity for sharing of experiences among farmers, extension workers and researchers.

Like the extension workers the study also sought to find our from farmers whether or not extension workers encourage joint or participatory learning of innovations. The farmers were simply required to indicate "Yes" or "No".

The results of the survey on participatory learning of innovations is as shown in Table 4.3.4.

Table 4.3.4. Participatory Learning of Innovations

No.	Issue	No of farmers responding to it		Percentage		Remarks
		Yes	No	Yes	No	
1	Extension workers encourage participatory learning of innovations.	40	60	33.3	66.7	This question was asked in a reverse order to test the consistency of the responses to the questions.
2.	Extension workers do not encourage participatory learning of innovations.	60	40	66.7	33.3	

Source: Survey Data.

From Table 4.3.4, it is evident that extension staff to a large extent do not encourage joint learning of innovations. 66.7% representing 60 of the farmers covered in the survey indicated

that extension staff do not encourage joint learning of innovations. 40 farmers, representing 33.3% however said extension staff encourage joint or participatory learning of innovations.

The outcome of the study on participatory learning of innovations from farmers collaborates well with similar study from extension workers. From the analysis of data gathered from extension workers on the issue of participatory learning of innovations, majority of the extension workers indicated that even though they are aware of the tremendous advantages of participatory learning of innovations, they do not emphasise the approach in communicating innovations to farmers because of the difficulties of the approach in terms of organization, time, resources and energy.

4.3.5. Feed back on experiences of innovations communicated

One way of improving communication of innovations to farmers is receiving appropriate response or feed back of the experiences the farmers have learnt of the innovations communicated to them as they practice these innovations in their farming activities. These feed back would enable the extension staff and researchers alike to re-appraise these innovations with a view to improving them and make them more applicable to the practical realities of the farmers.

The survey on farmers feed back of the experiences of innovations communicated to them by extension or development workers reveal the following information:

1. The total number of extension staff who indicated that they received a feedback on the experiences of innovations they communicate to farmers is 14 or 87.5% of extension staff interviewed
2. The total number who indicated that they do not receive a feed back is 2 or 12.5% of extension workers interviewed.

According to the extension workers, the feedback they receive from farmers are reported at the weekly meetings of extension staff with the District Director of Agriculture and other senior staff of the district Agricultural Development Unit (DADU).

This, they indicate are incorporated into the quarterly Report of the Department to the Regional Agricultural Development Unit (RADU). What happens to their feed back at the Regional and national level they say, they do not know.

Feed back from farmers on their experiences with innovations passed on to them is required for purposes of reviewing and refining the innovations to make them more appropriate to the needs of farmers.

Hence one thing the study sought to do was to find out from farmers whether or not they provide feed back on their experiences with innovations communicated to them. The farmers were simply required to indicate "Yes" or "No" on the issue of provision of feed back on innovations passed onto them by extension workers.

The results of the study on the issue of provision of feedback by farmers of their experiences with innovations communicated to them is as displayed in table 4.3.5 below.

Table 4.3.5. Feedback on innovations

No.	Issue	No of farmers responding to it		Percentage		Remarks
		Yes	No	Yes	No	
1	Feedback on innovations is provided by farmers	100	20	83.3	16.7	This question was asked in a reverse order to test the consistency of farmers to the responses.
2	Farmers do not provide feedback on innovations	20	100	16.7	83.3	

Source: Survey Data.

The results of the survey as shown in Table 4.3.5, indicate that majority of farmers provide feedback of their experiences with the innovations communicated to them. 100 farmers out of the 120 farmers covered in the survey, said the provide feedback on innovations passed on to them. They represent 83.3% of the farmers covered in the survey. Only 20 farmers, representing 16.7% of the farmers covered in the survey, said they do not send feedback on innovations communicated to them.

The results of the study agrees very well with those of the extension workers where they said they receive feedback on innovations they communicate to farmers which they in turn report during their regular weekly meetings with their District Directors and Managers.

4.3.6. Sources of innovations to farmers in the study area

In the practice of their farming business, farmers, like all others engaged in other forms of production, seek to improve their businesses through the application of new and more efficient innovations. Innovations to farmers can be derived from a variety of sources such as extension workers, marketing agents, input suppliers and from other farmers just to mention a few.

The impact that innovation communication makes in modernizing and improving the efficiency of farmers to a large extent will depend on the sustainability of the sources of the innovations. Hence one area of interest to this study was to determine the main sources of innovations to farmers in the study area, since this will help the study access the strength and weaknesses of innovation communication in the area.

From the survey conducted among extension workers, Table 4.3.6 below reveal the main sources of innovations to farmers in the study area.

Table 4.3.6. Main sources of innovation to farmers as reported by extension workers in the area.

No.	Innovation source	Number of respondents	Percentage
1	Extension workers	13	81.25
2.	Marketing Agents	--	--
3.	Input suppliers	6	37.5
4.	Other farmers	16	100

Source: Survey Data.

From the survey, it is clear that farmer to farmer communication is the main source of innovations to farmers in the Builsa District. All the sixteen extension workers interviewed indicated that farmers constitute the main source of innovations to other farmers. This imply that farmers interactions with each other provides the main avenue for innovation communication in the study area.

Extension or development workers are the next most important source of innovation to farmers in the area. This is so because 81.25% of the Extension workers interviewed indicate that they are the second most important source of innovation to framers. Input supplies, according to the extension workers are also a good source of innovation supply to farmers and in the Builsa District, the survey indicate that they represent 37.5% of the sources of innovation Communication to farmers.

From the above information as revealed by the survey on the main sources of innovation to farmers, it is clear that any programme to improve or enhance innovation communication to farmers in the Builsa District should place emphasis on creating avenues for increased farmer to farmer interaction.

4.3.7. Innovation sources identified by farmers

Farmers, like all others engaged in other forms of production always seek to improve their productivity through the application of new and more efficient innovations. Farmers derive innovations from a variety of sources and the more friendly, reliable and sustainable the source the better for the farmer. In this regard, it is important that farmers know the variety of sources of innovation available to them, so that they can tap and take full advantage of the various sources of innovation to their credit.

From the survey conducted on the issue of farmers' knowledge of the sources of innovation which they could readily identify, Table 4.3.7 summarises the results of the study.

Table 4.3.7: Main Sources of Innovation Identified by Farmers

No	Innovation source	Number of farmers identifying it	Percentage
1	Extension workers	40	33.3
2.	Marketing Agents	5	4.2
3.	Input suppliers	5	4.2
4.	Other farmers	70	58.3

Source: Survey Data

From the results of the study in Table 4.3.7., it is evident that majority of the farmers covered in survey identified other farmers as the major source of innovation to them. 70 of the farmers interviewed, representing 58.3% of all the farmers covered in the study identified other farmers as a source of innovation available to them. 40 farmers, representing 33.3% of the farmers covered in the survey identified extension agents as another major source of innovation to them. Five farmers identified marketing agents as a source of innovations. Another five farmers also identified input suppliers as a source of innovation to them. Together, marketing agents and input suppliers represent 8.4% of the source of innovation to farmers.

From the results of the study, it has become evident that farmer to farmer communication of innovation constitute the main source of innovation to farmers. Majority of farmers in the district rely on other farmers for new ideas in their farming business. The results collaborates well with those of the extension workers who also identified other farmers as the major source of innovation to farmers in the Builsa District.

This study has already revealed that extension workers are able to cover only a few of their farmers in their operational areas in the course of communicating innovations. The few farmers who are covered then become the source of innovations to their colleagues who are not covered by extension workers. This explains why other farmers become the major source of innovation to farmers in the study area.

Building farmers capacity should therefore be the most reliable approach towards enhancing innovation communication in the area.

4.3.8 . Improving Innovation communication strategies

4.3.8a Ways/strategies suggested by extension workers

Extension workers have over the years played a pivotal role in getting innovations produced through research and development communicated to farmers in the study area. In doing this, they apply different strategies they have studied in schools and colleges, workshops, brainstorming exercises, seminars and communication programmes they may have participated in.

In applying these strategies practically in the field, they certainly would gather experiences about their strengths, weaknesses and short-comings. Given the practical realities about the

short-comings of these strategies through experience, they through innovative designs may find ways of improving the effectiveness of the strategies in communicating innovations to farmers.

Hence, one thing this study sought to do was to find out from extension workers what suggestions they may have to make towards improving the communication of innovations to farmers.

From the study, the interview of extension workers on what ways or strategies they can suggest for improving the communication of innovations to and among farmers, the facts as indicated in Table 4.3.8a was obtained.

Table 4.3.8a. Ways / strategies suggested by extensions workers

No	Ways/ strategies	Number of Extension Workers Suggesting it
1.	Excursion/ Field days/ Trips	10
2.	Practical field demonstrations	9
3.	Co-ordination of efforts by extension and research organizations for innovation communications targeted at farmer groups rather than individual contact of farmers	14
4	Respecting farmer views	13
5.	Films shows/ public fora	5
6.	Use of local radio station	10
7.	Capacity building for extension workers in communication skills	14
8.	Provision of adequate logistics for extension workers	16
9.	Blending research and development innovations with indigenous knowledge	16

Source: Survey Data.

From Table 4.3.8a, it is clear that the extension staff made a number of suggestions for improving communication of innovations to farmers. Key among these suggestions are;

1. Provision of adequate logistics for extension staff. In fact all the 16 extension staff interviewed suggested it.

2. Blending of research and development innovations with indigenous knowledge was also suggested by all the sixtension extension staff interviewed.

3. In fact capacity building for extension staff in communication skills and the co-ordination of efforts of extension and research organizations was also suggested by fourteen out of the sixtension extension staff interviewed respectively.

4. Respecting farmers views was suggested by 13 out of the 16 extension workers interviewed.

5. Excursion/ Field / trips, practical field demonstrations, use of the local radio and film shows/ public fora were all suggested as important communication strategies for getting innovations to farmers.

In fact from the study four strategies for improving communication of innovations to farmers in the study area emerge clearly and any programme for enhancing innovation communication in the study area must take these key strategies seriously and put them at the fore front, if any success for getting innovations to farmers is to be achieved in the study area.

4.3.8b Ways/strategies suggested by Farmers

The strategies used for communicating innovations to farmers have always been determined by extension agents. Development workers decide what type of strategy to use in passing on innovations to farmers without recourse to its appropriateness to the farmers. In a mutual learning situation the views of all participants on the techniques to be used for Communicating ideas is necessary to enlist the support and interest of all the participants.

Taking cognisance of this, one thing this study sought to do was to ask farmers to suggest ways (strategies) for improving innovation communication to and among farmers.

The results of the study on suggested ways by farmers for improving innovation communication is summarised in Table 4.3.8b.

Table 4.3.8b: Ways/Strategies suggested by farmers

No.	Ways/strategies	No. of farmers suggesting it	Percentage
1.	Respecting farmers views	30	25
2.	Blending research and development innovations with indigenous knowledge	20	16.6
3.	Use of local Radio station	10	8.3
4.	Training of local farming experts in innovation communication skills	40	33.3
5.	Recruiting more extension agents to improve the extension agent – farmer ratio	10	8.3
6.	Increasing the extension agent – farmer contact period	10	8.3

Source: Survey Data.

From Table 4.3.8b, it is evident that majority of the farmers covered in the study, numbering 40 and representing 33.3% of those interviewed suggested "training of local farming experts in innovation communication skills as a way of improving innovation communication in the area. From my discussion with them, they indicated that the local farming experts command respect among farmers, farmers listen to them and take their advise. According to the farmers, if they are identified and trained in relevant communication skills, they could be of great assistance in enhancing innovation communication to many farmers.

30 farmers, representing 25% of those covered in the survey suggested respecting farmers views" as another strategy for improving innovation communication in the area. "Blending research and development innovations with indigenous knowledge" was another strategy suggested by 20 farmers, representing 16.6% of the farmers covered in the survey for improving innovation communication in the study area.

Other strategies suggested by the farmers covered in the study include the following

1. Use of the local radio station. This was suggested by 10 farmers, who represent 8.3% of the farmers interviewed.

2. Recruiting more extension agents to improve on the extension agent – farmer ratio. This was also suggested by 10 farmers, representing another 8.3 percent of the farmers interviewed.

3. "Increasing the extension agent- farmer contact period" was suggested by 10 farmers, who also represent 8.3% of the farmers covered in the survey.

According to the farmers, if some of the ways they have suggested can be implemented, particularly, the training of the local farming experts, it will go a long way in enhancing innovation communication in the study area as a whole.

4.3.9. Commitment of extension workers

One major factor that can greatly enhance communication of innovations is commitment of extension workers to their duty of communicating innovations to farmers. Commitment is a factor that has the potential of overcoming logistical problems, financial inadequacy and other factors that negatively affect innovation communication. Irrespective of the level of skill training in communication, availability of logistics, financial motivation and other reward incentives, where there is no commitment all these other complementary factors will make no effect in improving innovation communication.

On account of this, the issue of commitment on the of extension staff to their duty was investigated by this study.

The study sought to find out the level of commitment of extension workers to their duty.

The study on the level of commitment of extension staff to their duty of innovation communication reveal the facts and information contained in Table 4.3.9. below.

Table 4.3.9: **Commitment of extension staff to their duty**

No.	Level of Commitment	Number of Extension staff who indicated it	Percentage
1.	High commitment	5	31.25
2.	Low commitment	6	37.5
3.	Very high commitment	5	31.25
4.	Very low commitment	0	0
5.	No commitment at all	0	0
	TOTAL	16	100

Source: Survey Data

The study on the level of commitment of extension workers in the study area to their onerous duty of getting innovations communicated to farmers reveal a balance of feeling of commitment among the development workers. The largest number of the extension workers, representing 37.5% of the total number of extension workers interviewed indicated that they have low commitment to their duty. On the other hand 5 of the extension workers, representing 31.25% and another five of them also representing 31.25% responded that they have high and very high commitment respectively.

If we put the high and very high commitment workers together, then it becomes clear that the majority of the extension workers representing a combined total of ten out of the sixteen extension workers covered in the survey is committed to their task of getting innovations communicated to farmers.

In actual fact, the 6 extension staff who responded that they have low commitment to their duty all happen to come from the Presbyterian Agricultural station based in Sandema. A close discussion with them indicated that their salary level is very low as compared to the salaries of Ministry of Food and Agricultural extension staff. They are much younger and have not been in service for more than five years. They are there fore far more junior to their colleagues with the Ministry of Food and Agricultural.

Of the five ministry of Food and Agricultural workers who indicate that they have very high commitment to their task, my further discussion with them revealed that they are the most

senior among the ten staff from MOFA who were covered in the survey and so they tend to have more access to resources in terms of fuel, logistics, respect and are more often selected to attend workshops, seminars and training courses. They appear to be better motivated and it is not surprising that they responded that they have very high commitment to their task.

The reasons provided by the 10 extension staff who indicated that they have high and very high commitment to their task include the following.

1. Job satisfaction
2. Regular promotion
3. Respect from farmers for their views.
4. Full participation by farmers in discussions.
5. Cordial relationship with the farmers
6. Recognition and awards during annual Farmers Day celebration.
7. Love for the job.

The six extension staff who responded that they have low commitment to their task also gave the following reasons.

1. Lack of job satisfaction
2. Inadequate provision of logistics for their work
3. Low salary levels
4. No regular promotion on their part.

4.3.10. Regular upgrading and skill training of extension workers in the study area

Since the field of innovation communication is dynamic and therefore require continues upgrading and skill training of extension workers, one thing this study sought to do was to find out how regular the knowledge, skills and attitudes of the these staff are being upgraded or enhanced to improve their skills and professional competency.

Investigations on skill upgrading and training reveal the following realities on the ground.

On the issue of the regularity of skill upgrading and training of extension workers in the area, the Table 4.3.10 below provide information on the responses given by the extension staff who were covered in the survey

Table 4.3.10. **Regularity of skill upgrading and training of extension staff in the study area.**

No	Issue	Number of Extension staff Responding to it	Percentage
1.	At regular Intervals	12	75
2.	At very irregular Intervals	4	25
3.	Cannot remember the last time I participated in any training course	0	0
	Total	16	100

Source survey data.

From the survey, it became clear that 12 of the extension workers interviewed, representing, 75% of all extension staff covered in the survey, indicated that they are given regular skill upgrading and training to continue to improve their capacity in innovation communication.

Four of the extension workers, representing 25% of all those covered in the survey, however reported that skill upgrading and training for them is very irregular.

My interaction and discussion with the District Director of Agriculture on skill upgrading and training for his extension staff indicated that the Department holds weekly training sessions and meeting for extension staff at which meetings they are briefed on the new developments on emerging policies on innovation communication.

This information by the District Director of Agriculture actually confirm the response provided by the majority of the extension staff that they receive regular skill upgrading and training to improve their capacity in carrying out their tasks.

4.3.11. Length of period of service of extension staff

Experience indeed is one of the important factors in determining the effectiveness and efficiency of innovation communication by extension staff. The more experienced the staff, the more efficient and effective he will be in communicating innovations to farmers.

Experience in the majority of cases will be determined by the length of service of the staff.

Hence, one thing this study sought to do was to determine the length of service of extension staff in the area as a measure of their level of experience.

Table 4.3.11 below display the length of service and therefore the level of experience of extension staff in the area in communicating innovations to farmers.

Table 4.3.11: Length of service and experience of extension staff in the area.

No	Length of service	Number of staff	Percentage
1.	0-5 years	7	43.75
2.	6-10 years	2	12.5
3.	11-15 years	0	0
4.	16-20 years	1	6.25
5.	21-25 years	0	0
6.	26-30	6	37.5
7.	31-35 years	0	0
8.	36-40 years	0	0
9.	Above 40 years	0	0

Source: survey Data

From our study it is clear that the majority of extension staff in the Builsa district have a working experience of between 0-5 years. These are made up of seven workers representing 43.75% of the extension staff covered in the survey.

Six of the staff representing 37.5% of those covered in the survey have a working experience of 26-30 years.

One staff has one year working experience whilst another has two years experience.

It is clear from this study that as far as experience in innovation communication in the study area is concerned, the situation is not so good as majority of the staff, totally 10 out of the 16 covered in the survey have low working experience and therefore may not be effective in communicating innovations to farmers for several reasons.

These may include impatient on the part of these young men to listen to farmers, display of youthful exuberances and arrogance which invariably will negatively affect innovation communication.

From the findings and discussions on the effectiveness of communication strategies, it can be concluded that the potential exist in the study area for enhance communication of innovations.

4.4. FACTORS INFLUENCING INNOVATION COMMUNICATION: GENDER PERSPECTIVES

4.4.1. What Makes Farmers Want To Access New Innovations In Their Farming Enterprise

One way of enhancing innovation communication is information on what influence farmers to want to access new innovations in their farming business. This will enable the innovation communicator to take cognisance of such influential factors when designing and packaging the kind of innovations to communicate to farmers.

It is with this understanding that this study sought to find out from farmers what factors influence them in their bid to access new innovations. The farmers were simply required to indicate what makes them want to access new innovation in their farming enterprise.

The results of the survey on factors that influence farmers to want to access new innovations is summarised in Table 4.4.1 below.

Table 4.4.1: **Factors that influence Farmers to want to access new innovations.**

No.	Factor	No. of farmers indicating it
1.	Yield potential of the innovation	120
2.	Interest in the new idea	72
3.	Market and financial prospects associated with the idea	52
4.	Prestige and recognition among fellow farmers	84
5.	The social and economic responsibility associated with the new innovation	12

Source: Survey Data.

From the results of the survey on factors that influence farmers to want to access new innovations, it is clear that the yield potential of an innovation is a very influential factor that induce farmers to want to access new innovations.

All the 120 farmers, representing 100% of the farmers covered in the survey indicated it as a factor that induce them to want to accept an innovation.

The next most important influential factor that induce farmers to want to access a new innovation as indicated by the farmers covered in the survey is "the prestige and recognition a farmer enjoys among colleague farmers by accessing a new innovation. 84 farmers, representing 70% of the farmers covered in the survey indicated it as important factor that influence them.

72 farmers, representing 60% of the farmers covered in the survey indicated "interest in the new idea" as another important factor that induce them to want to access a new innovation.

52 farmers, representing 43% of the farmers covered in the survey said the "market and financial prospects" associated with an innovation is an important factor that influence them to want to access a new innovation. Only 12 farmers, representing 10% of the farmers covered in the survey identified "the social and economic responsibility associated with a new innovation as a factor that induce them to want to access the innovation.

From the survey on factors that influence farmers to want to access a new innovation it is evident that any programme geared towards enhancing innovation communication must take cognisance and include in the communication package such factors as the yield potential of the innovation, the prestige and recognition farmers enjoy from colleagues by accessing the innovation, the interest farmers have in the new innovation and the market and financial prospects associated with the innovation among others.

4.4.2. Gender and Innovation Communication in the Study Area

Increasingly more and more women are involved in small scale agriculture either on a full time basis or on part-time basis.

In the Builsa District, there are many women farmers groups which the Department of co-operatives has assisted to form or formed voluntarily by groups of interested women. The Department of Agriculture has also assisted in forming many farmers groups, some single sex groups and other mixed sex groups. All these groups are targets for communicating innovations to.

Traditionally farming is seen as a preserve for men and so extension in most situations do not target women for innovation communication. However with the increasing role of women in farming, it is important and more so of greater significance to poverty reduction if innovations required to increase small scale agricultural productivity and other areas of social welfare that contribute to improving standards of living of the poor and vulnerable are increasingly targeted at and made available to women.

In this regard, one issue that this study aimed at investigating was "how gender differentiation affects innovation communication in the study area".

The survey on gender differentiation and innovation communication revealed the facts and information contained in Table 4.4.2a below:

Table 4.4.2a.: **Gender and Innovation Communication**

No	Issue	Number Of Extension Staff Responding Yes	Number Of Extension Staff Responding No
	Do you see gender differentiation affecting innovation communication in the Builsa District.	11	5

Source: survey Data

From Table 4.4.2a, the responses gathered from the study indicate that 11 out of the 16 extension staff interviewed agree that gender differentiation affect innovation communication to farmers in the Builsa District. A close and detailed discussion with the extension workers reveal that information flow on improved and efficient innovations favour men more than women. However 5 of the extension workers disagreed to the assertion that gender differentiation affect innovation communication in the Builsa District. These group of extension workers emphasise that more and more women now take advantage of new innovations because they turn out for innovation meetings, work in groups, access credits and so are able to adopt improved innovations in their farming activities. On the whole however the reality revealed by this study indicate that innovation flow favour men more than women.

The reasons that majority of the extension staff have given for their assertion that gender differentiation in innovation communication is skewed in favour of men are summarised in Table 4.4.2b below

Table 4.4.2b. **Reasons given for innovation communication favouring men**

No.	Reasons	Number Of Extension Staff Giving It	Percentage
1.	Women lack information on innovations.	8	50
2.	Inferiority complex on the part of women farmers.	10	62.5
3.	Low participation of women in decision-making	12	75
4.	Men's dominance in land ownership	14	87.5
5.	Because of women's pr-occupation with house hold chores	14	87.5
6.	Discrimination against women	8	50
7.	Inequity in household resource distribution and control between men and women	16	100
8.	Lack of women's involvement in leadership position	15	93.75
9.	Relegation of women's education to the background	7	43.5
10.	Unequal distribution of gender roles and responsibilities	12	75
11.	Women considered as properties of men	6	37.5
12.	Women do not actively participate in innovation activities and programmes	10	62.5
13.	Women deprived of land ownership	14	87.5

Source: Survey data.

From the summary of reasons given for gender differentiation in innovation communication which is skewed in favour of men, it is clear that "inequity in household resource distribution and control" is given as an overriding reason for gender differentiation in innovation communication. Infact all the sixteen extension workers interviewed gave it as a reason for gender differentiation in innovation communication. This finding is re-enforced by a unanimous agreement among participants during a community for a at Yisobsa that unequal

access to the use and control of household resources gives advantage to men over women in the application of new innovations in their farming business. The community for a was organised by the researcher to provide opportunity for farmers to discuss freely gender issues in innovation communication in the Builsa District.

Other reasons such as, lack of women's involvement in decision-making, men's dominance in land ownership, women's pre-occupation with household chores, low participation of women in decision-making, unequal distribution of gender roles and responsibilities which places much burden on women and deprivation of women in land ownership are some of the reasons given to explain gender differentiation in innovation communication in the Builsa District.

The percentage of extension staff giving these reasons during the interviews range between 50 and 93.75%.

4.4.3 Women's participation in innovation communication activities and programmes

In the Builsa District, like most parts of Ghana, men are generally perceived to be mainly farmers. On the surface, this perception makes the general believe among people that women are not farmers and are limited to only helping their husbands on their farms.

However, with farming becoming more and more commercialised and therefore an important source of income the emerging reality is that, more and more women are becoming full time farmers. With their increasing involvement in farming, it is essential that messages on improved innovations are targeted at and communicated to them to increase their productivity, raise their income levels and reduce poverty and deprivation among them.

Hence one issue that this study investigated was to find out whether the general perception that only men are seen as farmers in the Builsa District negatively affect women's participation in innovation communication programmes despite their increasing involvement as full time farming practitioners.

From the interviews conducted on this issue among extension staff and farmers the results and findings are show in Table 4.4.3a and 4.4.3b below.

Table 4.4.3a: **Extension workers response to the perception**

No	Issue	Yes	No	Remarks
		Number of Extension staff responding to it.	Number of Extension staff responding	
1.	Popular perception that only men are farmers negatively affect women's participation in innovation communication programmes and activities	7	9	This question was asked in a reverse order to test the consistency of the respondents to the questions
2.	The popular perception that only men are farmers does not negatively affect women's participation in innovation communication programmes and activities	9	7	-do

Source: survey Data.

From the survey, it has emerged that majority of the extension workers interviewed have indicated that, the popular perception that only men are farmers does not negatively affect women's participation in innovation communication programmes and activities. Indeed 9 out of the 16 extension staff interviewed have indicated that the perception does not affect women's involvement in innovation programmes and activities, whilst 7 have indicated that the perception negatively affect women's participation in innovation programmes and activities.

A close view of the respondents, 9 indicating that the perception doest not negatively affect women's participation in innovation programmes, whilst 7 have indicated, it negatively affect them reveal that one cannot understate the importance of the perception in affecting women's participation in innovation programmes. Since tradition dies hard, and considering the near balance of the responses one can confidently say that this age-old traditional perception still holds sway in the Builsa district and therefore still some how affect women's complete

involvement in innovation communication activities and programmes. If this is the situation then one can predict that majority of women in the Builsa District still rely on outmoded traditional practices in their farming activities, which certainly affect their productivity levels

Table 4.4.3b: Farmers response to the perception

No.	Issue	Number Of Farmers Responding To The Issue		Percentage	
		Yes	No	Yes	No
	The traditional perception that only men are farmers affect women's participation in innovation communication programmes in the Builsa District.	74	46	62	38

Source: survey Data.

From the results of the study in table 4.4.3b, it is evidently clear that majority of the farmers covered in the study have responded that the traditional perception that only men are farmers affect women's participation in innovation communication programmes. 74 farmers, representing 62% of the farmers interview have indicated that the perception affect women's participation in innovation programmes. When the farmers were asked to give reasons why they think the perception affect women's participation, the listed the following reasons.

- That in most cases women are not invited to participate in innovation programmes because they are not seen to be farmers.

- That in situations where women are even invited to take part in innovation programmes they find it difficult to do so because they are bogged down by household chores.

- That in most cases where the women farmers are married, their husbands do not permit them to participate in innovation training programmes.

- That, the timing of most innovation communication programmes are not suitable to women farmers because of their multiple household chores.

- That exhaustion as a result of heavy work prevents women from full participation in innovation communication activities.

From the results of the study in table 4.4.3b, it is also observed that 46 farmers representing 38% of the farmers covered in the survey have responded that the perception does not affect women's participation in innovation training programmes. When these farmers were asked to list reasons why they said the perception does not affect women, the provided the following reasons.

- That in recent times, too much attention is given to women farmers by innovation communication organizations.

- That most development workers now carry out their innovation communication programmes in the communities where women are able to find time to participate.

- That a lot of women farmers and women in general have access to credit facilities and so are able to hire the services of labour to assist them in their household chores. This enables them to have time to participate in innovation programmes.

- That of late there are a lot of women organizations at the national, regional, district and community level that provide a loud voice for women to take advantage of existing social and economic entitlements in their societies. This enables them to fully participate in all social and developmental activities in their communities.

From the study on the traditional perception that only men are farmers, one important finding that has emerged is that whilst majority of extension workers have indicated that the perception does not affect women's participation in innovation communication programmes, majority of farmers have indicated that the perception affect women's participation in innovation communication programmes.

4.4.4. Sources of innovation to women farmers in the Builsa District

4.4.4a. Sources Identify by Extension Workers

Increasingly more and more women have become involved in farming as an occupation and source of income. With the domineering role of men in farming and the perception that only men are farmers, innovations are targeted at them at the expense of the women farmers.

Hence, one issue this study sought to investigate was the source of innovation to women farmers in the Builsa District.

From the study, the main source of innovations to Women farmers as identify by extension workers is displayed in Table 4.4.4a below.

Table 4.4.4a: **Sources of Innovation to women Farmers.**

No.	Innovation Source	Number Of Extension Staff Identifying It As Source To Women Farmers	Percentage	Remarks
1.	Extension workers	10	62.5	Some of the extension staff identified more
2.	Men farmers	4	25	Than one source of innovation to women
3.	Other women farmers	8	50	Farmer. This explain
4.	Input suppliers	0	0	Why the total number identifying the sources
5.	Traders in Agricultural products	1	6.25	Exceeds the number of extension staff interviewed
	Total	23		

Source: Survey Data.

From Table 4.4.4a, it is clear that extension workers and other women farmers have been identified as the major source of innovation to women farmers respectively, these two sources represent 62.5 and 50% respectively of the total number of extension workers interviewed on what they see as the source of innovation to women farmers in the Builsa District.
Men farmers represent 25% of the source of innovations to women farmers, whilst input suppliers and traders in agricultural products do not in the main constitute sources of innovations to women farmers in the area.

This study has therefore revealed that any programme designed to improve the flow of innovations to women farmers as measure to improve their productively should target extension workers and leading women farmers in the area.

4.4.4b. Sources identified by farmers

Like the extension workers farmers were also asked to identify the sources of innovation to women farmers.

The survey on the main source of innovation to women farmers as identified by farmers covered in the survey is summarised in table 4.4.4b

Table 4.4.4b: **Main source of innovation to women farmers.**

No.	Innovation Source	No. of farmers indicating it	Percentage
1.	Extension workers	120	100
2.	Men farmers	72	60
3.	Other women farmers	64	53
4.	Input suppliers	24	20
5.	Traders in Agricultural products	4	3

Source: survey Data.

The results of the study on sources of innovation to women farmers as shown in table 4.4.4b indicate all the 120 farmers covered in the survey said extension workers constitute the main source of innovation to women farmers. 72 farmers, representing 60% of farmers covered in the survey said men farmers constitute the main source of innovation to women farmers. 64 farmers, who represent 53% of farmers covered in the survey see other women farmers as constituting the main source of innovations to them.

24 farmers representing 20% of farmers covered in the survey identified input suppliers as a source of innovation to women farmers. Only 3% of the farmers covered in the survey identified traders in agricultural products as a source of innovation to women farmers.

From the study, it has emerged that Extension workers, men farmers and other women farmers constitute the main sources of innovation to women farmers from the perspective of farmers covered in the survey.

4.4.5 Women's multiple roles and participation in innovation training programmes

Women farmers, like all other women involved in other activities of life have multiple roles, first as domestic managers and secondly as farmers. The tendency is that these multiple roles affect their participation in innovation training programmes, which are crucial in passing on to them new practices required for increasing their productivity.

4.4.5a Extension worker response

One issue that this study therefore investigated was whether extension workers agree that the multiple role of women farmers as domestic managers and as farmers affect their participation in innovation training programmes.

The study sought to find out from extension workers whether the multiple role of women farmers affect their participation in innovation programmes they organize for farmers.
Table 4.4.5a below displays the results of this investigation.

Table 4.4.5a Extension workers response

No	Issue	Yes	No	Remarks
1	Women multiple roles affect their participation in innovation training programmes	9	7	This question was asked in the reverse order to test the consistency of the respondents in their response to the questions.
2.	Women's multiple roles does not affect in their participation in innovation training programmes.	7	9	This question was asked in the reverse order to test the consistency of the respondents in their response to the questions.

Source: survey data.

The results contained in Table 4.4.5a above shows that, the majority of the extension workers interviewed have indicated that women's multiple roles as farmers and domestic managers affect their participation in innovation training programmes.

Nine out of sixteen extension staff interviewed said women's multiple roles affect their participation in innovation training programmes, whilst 7 have said their multiple roles does not affect their participation in innovation programmes.

From my close discussion with the District Director of Agriculture and the manage of the Presbyterian Agricultural station in Sandema, they have both indicated that whilst increasing number of women attend and participate in innovation training sessions, majority are still unable to do so because they are bogged down by domestic and household chores. The majority response to the issues is therefore confirmed by the heads of the leading extension organizations in the district.

Like the extension workers, farmers were also required as part of the study to indicate whether or not the multiple roles of women as farmers and domestic managers have effect on their participation in innovation training programmes.

The results of the study in relation to the above is summarised in Table 4.4.5b below.

Table 4.4.5b.: **Response of farmers to the issue of whether or not women's multiple roles affect their participation in innovation communication programmes**

No	Issue	Yes	No
1.	Women's multiple roles affect their participation in innovation communication programmes.	35	85

Source: Survey Data

From Table 4.4.5b., it is clear that majority of farmers have indicated that women's multiple roles as farmers and domestic managers does not affect their participation in innovation communication programmes. This assertion was made by 85 farmers who represent 71% of the farmers covered in the survey. 35 farmers, representing 29% of the farmers covered in the survey however said women's multiple roles affect their participation in innovation communication programmes.

The farmers' response to the issue of women's multiple roles is completely at variance with the response of the extension workers. Whilst majority of extension workers indicated that women's multiple roles affect their participation in innovation programmes, majority of farmers said it does not affect them.

When the farmers who indicated that women's multiple roles affect their participation in innovation communication programmes were asked to enumerate the effects of the multiples roles on their participation, the farmers enumerated the following effects.

1. The multiple roles makes them exhausted.
2. They are unable to find time to participate in innovation training programmes
3. They experience low levels of productivity in their farming activities.
4. They are unable to find time to try out new practices.
5. Their ideas and voices are not heard.

4.4.6 Effects of women's multiples roles

Another thing this study sought to find out was the effect of women's multiple roles on their participation in innovation communication programmes. During investigations from extension staff, what they thought were the effects of women's multiple roles on their participation in innovation programmes, is summarised in Table 4.4.6a.below.

Table 4.4.6a.: Women's multiple Roles and participation in innovation programmes

No	Effect	Number Of Extension Staff Identifying It	Percentage	Remarks
1	They are unable to find sufficient time to try out new practices	8	50	
2	The become tired before attending training programmes	10	62.5	
3	Their ideas and voices are not heard	5	31.25	
4	They experience low levels of productivity	16	100	
5	Lateness for training programmes/meetings	9	56.25	The number of extension staff identifying the effects are more than the number interviewed because some of them identified more than one effect and have to be counted for each effect identified.
6	Low turn out of women for training programmes	7	43.75	
7	They are unable to find time to participate in training sessions	5	31.25	
8.	Because they come to training sessions exhausted they are unable to participate actively in training sessions			

Source: Survey:

From table 4.4.6a above it is clear that many of the extension staff identified, lateness, low turn out for training sessions, exhaustion, lack of time, tiredness and low productivity as the main

effects caused by women's multiples roles in their participation in innovation training programmes.

All the extension staff interviewed have indicated that one effect of women's multiple roles is that they experience low productivity in their farming activity. 62.5% said one effect is that, they became tired and exhausted before going for innovation training programmes. 56.25% identified lateness as one effect of their multiple roles in their participation in training sessions.

In fact, 7 extension staff, representing 43.75% of those interviewed identified low turn out for training programmes as one effect of women's multiples roles affecting their participation in innovation programmes. 31.25%, representing 5 extension workers said, one effect of women's multiple roles is that their ideas and voice are not heard.

4.4.7. Strategies/ ways to enhance women's participation in innovation communication activities

4.4.7a Strategies/Ways suggested by Extension Workers

With the increasing rate at which women take-up farming as an occupation and income earning venture, it is important that strategies and ways are found to enhance their participation in innovation communication activities.

This will enable them learn and apply the most innovative practices for increasing their productivity, increased income and eventually poverty reduction which will contribute to improved conditions of living.

In line with this issue, one thing this study targeted at doing was to investigate and identify ways or strategies for enhancing women's effective participation in innovation training programmes or activities.

The extension staff interviewed on the above issue were required to suggest ways for enhancing women's participation in innovation training activities. The results of this study is summarised in Table 4.4.8a below.

Table 4.4.7a. **Suggested Ways by Extension Workers**

No.	Ways/Strategies Suggested	Number of Extension Staff Suggesting it.	Percentage
1.	Motivation	3	18.75
2.	Provision of credit	4	25
3.	Group Formation	5	31.25
4.	Consultation with women farmers in scheduling innovation training activities	2	12.5
5.	Designing different training programmes for women farmers	2	12.5
6.	Women should have free access to and ownership of land	1	6.25
7.	Increasing female enrolment and participation in education to higher levels	1	6.25

Source: Survey Data

The study on ways of enhancing women's participation in innovation programmes revealed that motivation of women, provision of credit to women, forming women into groups, consultation with women in scheduling training programme dates and time, designing training programmes that accommodate women's multiple roles, women having free access and ownership of land and encouraging women education to higher levels were suggested by the sixteen extension workers, who were interviewed on the issue. The largest number of the extension workers numbering 5 and representing 31.5%t of the extension workers covered in the interview suggested group formation of women as the most viable way for enhancing women participation in innovation programmes.

Provision of credit and motivation was suggested by 25 and 18.75% respectively of the extension staff interviewed as important means of improving women's participation in innovation activities. 12.5% of those interviewed suggested, consultation with women farmers in scheduling innovation training activities and designing training programmes that accommodate the multiple roles of women. Free access to and ownership of land and encouraging female education to higher levels were suggested by 6.25% respectively of all the

extension staff interviewed as necessary for enhancing women's effective involvement in innovation programmes and activities.

Like the extension workers farmers were also ask to suggest ways for enhancing women's participation in innovation communication programmes.

The results of the study on ways farmers can suggest for enhancing women's participation in innovation programmes are summarised in Table 4.4.7b below.

Table 4.4.7b: Ways Suggested by Farmers

No	Suggested Way	No. of Farmers Making the Suggestion	Percentage
1.	Consultation with women in scheduling innovation training programmes	30	25
2.	Providing credit facilities for women to invest in new innovation	50	42
3.	Designing different training programmes for women	20	17
4.	Women to be given free access to the ownership of land	10	8
5.	Reducing women's multiple roles	10	8

Source: Survey Data.

From table 4.4.7b., it is seen that the farmers covered in the survey made five suggestions for enhancing women's participation in innovation communication programmes in the district. The suggestions they have made are similar to those made by the extension workers.

From the study, 50 farmers, representing 42% of the farmers covered in the survey suggested that, one way of enhancing women's participation in innovation programmes is to provide credit facilities for them. This, they said will support them to invest in new innovations. 30 of the farmers covered in the survey, representing 25% suggested that women should be consulted with when scheduling innovation training programmes. This, they said will enable the women to suggest time and dates that will be convenient to them.

Designing different training programmes for women was another suggestion made by the farmers covered in the survey. This suggestion was made by 20 farmers who represent 17% of the farmers interviewed.

Free access to the ownership of land by women and reducing women's multiple roles were other suggestions made by the farmers. 10 farmers respectively representing 8% respectively of the farmers covered in the survey made those suggestions.

4.4.8. Traditional perceptions of women and Investment in land Development

In the Builsa District, the traditional perception is that women do not own land. Even though this perception prevails, more and more women continue to take up farming as an occupation and income-earning activity.

With the increasing participation of women in farming, it is important that they are accorded the status of landowners so that they can devote time, energy and resources in the acquisition of relevant knowledge and innovations necessary for the development of land on which they practice their farming activities. They will be more willing to do so if they are perceived as the real owners of the land.

However, given the prevailing traditional perception that they do not own land, there will be no incentive for them to do so.

This perception therefore may have the tendency of negatively affecting women in their participation in knowledge and innovation acquisition activities and it is important to examine the impact of this perception on women's participation in innovation acquisition programmes. Hence one thing this study sought to investigate is whether, given this perception that women do not own land, it will be worth while for them to invest their time, energy and resources in knowledge and innovation acquisition activities for the development of land they do not ultimately own.

The extension workers and farmers interviewed on this perception were required to indicate whether it was worth while for women to invest their time and resources in knowledge and innovation acquisition activities.

The results of the study is summarised in Table 4.4.8a and 4.4.8b below.

Table 4.4.8a **Extension Workers response on worthiness of women's investment in knowledge and innovation training programmes for land development**

No.	Issue	No. of Extension Workers Saying it	Percentage
1.	Worth while for women to invest in knowledge and innovation activities	10	62.5
2.	Not worth while for women to invest in knowledge and innovation activities	5	31.25

Source: Survey Data.

From Table 4.4.8a, it is clear that majority of the extension staff interviewed representing 62.5% have indicated that notwithstanding the perception that women in the study area do not own land, it is still worth while that they invest their time, energy and resources in knowledge and innovation training programmes.

On the other hand 31.25% of the extension staff interviewed said it is not worth for women to invest their time, energy and resources in innovation training activities.

The study identified the following reasons why majority of the extension staff interviewed indicated that it is worth while for women farmers to invest in knowledge and innovation training programmes.

1. That women could engage in long term lease of land
2. That the perception is only in principle or normative but in reality women have access to and really own land.
3. That with the changing perception and value of land itself, land can be purchased by anybody including women.

Like the extension workers, Farmers, as part of the study were required to indicate whether with the prevailing traditional perception that women do not own land, it was prudent for them to invest their time, energy and resources in knowledge and innovation acquisition activities for land development.

The results of the survey on whether or not it was prudent for women to invest in new innovations for the development of land they do not own is summarised in Table 4.4.8b below.

Table 4.4.8b: **Farmers responses to the worthiness of women's investment in land development**

No.	Issue	Number of Farmers Responding		Percentage	
		Yes	No	Yes	No
	With the traditional perception that women do not own land, is it prudent for them to invest in knowledge and innovation activities for land development.	66	54	55	45

Source: Survey Data.

From the results in Table 4.4.9, it is evident that majority of farmers numbering 66 and representing 55% of farmers covered in the interview indicated that irrespective of the perception that women do not own land, it was still prudent for them to invest in knowledge and innovation acquisition activities for land development. Asked why they thought it was prudent, the farmers gave the following reasons.

I. That women could engage in the long term lease of land.

II. That the perception is only in principle or normative but in reality women have access to and really own land.

III. That with the changing perception and value of land itself land can be purchased by any body including women.

However 54 of the farmers, representing 45% of farmers covered in the survey indicated that, it was not prudent for women to invest in the development of land they are perceived not to own.

From the findings and discussions of the factors that influence innovation communications for the point of view of their gender perspectives, it can concluded that, generally speaking, there is a strong gender bias in favour of men when it comes to communicating innovations to farmers in the district.

4.5. ROLE OF STAKEHOLDERS IN INNOVATION COMMUNICATION

4.5.1. Collaboration Among Actors In The Innovation Communication Field

The innovation Communication industry in the Builsa District like any other district in Ghana is made up of different actors who use different approaches, strategies, techniques, systems and procedures in communicating innovations to farmers.

The farmers in a particular Community in the district therefore find themselves sometimes confronted by these different innovation communication organizations with different packages of innovation communication kits.

Sometimes these different innovation actors are not even aware of the presence of other actors working in the same community with similar objectives, missions and purposes of working towards improving the productivity of these farmers.

This lack of awareness of the presence of other actors does not make it possible for these different actors to collaborate, pull energies and resources together for the purposes of enhancing their communication of innovations to these farmers.

The awareness of other actors in the innovation communication field is therefore very important for purposes of collaboration among actors. Hence one thing this study sought to do was to find out about actors awareness of other actors in the field of innovation communication in the district.

The extension workers and farmers who were interviewed were required to indicate their awareness of other innovation communication organizations, agents and individuals in the district.

The findings of the study is summarised in Table 4.5.1 below

Table 4.5.1: **Actors awareness of other actors**

No	Issue	No. of Extension Workers and Farmers	Percentage	Remarks
1.	Aware of other extension actors in the District	136	100	All the 136 extension workers and farmers interviewed indicated that they were aware of other actors in the District
2.	Not aware of other extension actors in the District	0	0	--

Source: Survey Data.

From Table 4.5.1 above, it is seen that the findings of the study is clear as far as the issue of "other actors awareness of other actors" is concerned. All the extension workers and farmers who were covered in the study did indicate that they were aware of the presence of other actors in the district. This overwhelming awareness is a strong potential factor for inducing collaboration among these actors.

4.5.2. Actors in the innovation communication industry in the Builsa District

From our study on "actors awareness of other actors" it was found out that actors were aware of the presence of other actors.

When the extension workers and farmers were asked to list other actors whose presence they were aware of, the following were listed as actors in the innovation communication field in the Builsa District.

1. Presbyterian Agricultural Station
2. Farmer Based Service

3. Department of Agriculture of the Ministry of Food and Agriculture
4. Adventist Development and Relief Agency (ADRA)
5. Input suppliers
6. Department of Co-operatives
7. Vuum Trees (an environmental Community Based Organization (CBO)
8. Techno Serve
9. Forestry Service
10. District Assembly
11. Ghana Health Service
12. Department of Social Welfare and Community Development
13. Foundation for Integrated and Strategies Development (FISTRAD) – An NGO Based in the District
14. Department of Education
15. Ghana Health Service

4.5.3. Co-ordination of innovation communication activities

Since there are several actors in the innovation communication field, one surest way of enhancing innovation communication is the collaboration and co-ordination of the programmes and activities of these different actors. This will promote the sharing of ideas, pulling of resources, time and energy to bring about efficiency, avoid duplication of efforts and streamline activities of the different actors in a manner that will promote unity of purpose to enhance and achieve maximum impact in innovation communication in the study area. Collaboration and co-ordination of the activities of the different actors is therefore crucial to the enhancement of innovation communication in the study area.

Hence one issue this study sought to investigate was whether or not in the process of communicating innovations to farmers these extension agents collaborate their activities.

The extension agents who were covered in the interviews were required to indicate whether they co-ordinate their activities with other actors whose presence they were aware of.

The results of this investigation is summarised in Table 4.5.4a. below.

Table 4.5.3a. Co-ordination of innovation communication activities

No	Issue	No. of Extension Agents	Percentage	Remarks
1.	Co-ordinate innovation communication activities with other actors	12	75	12 of the extension agents interviewed, representing 75% indicated that they co-ordinate their activities with other actors
2	Do not co-ordinate innovation communication activities with other actors	3	25	25% representing 3 of the agents interviewed said they do not co-ordinate their activities with other actors

Source: Survey Data

From the study we find that there is a high level of co-ordination among actors in the innovation communication field in the Builsa District. 75% of extension agents interviewed have responded that they co-ordinate their activities with other actors. Only three of the extension agents interviewed, representing 25% said, they do not co-ordinate their activities with the other actors they were aware of.

Given this high level of co-ordination among extension agents the potential exists for enhanced innovation communication in the district.

Since co-ordination takes different forms and approaches, the study also sought to find out how the extension agents co-ordinate their activities. This is necessary in order to determine the effectiveness of the co-ordination. The extension agents interviewed were required to indicate how they co-ordinate their activities with other actors.

Table 4.5.3b below provides a summary of the results of how extension agents in the study area co-ordinate their activities with other actors in the area.

Table 4.5.3b: **Forms/ approaches of co-ordination used by extension agents**

No	Type / Form/ Approach of Co-ordination	No. of Extension Agents Using it	Percentage	Remarks
1.	Through organised co-ordination fora by the extension organizations in the district.	10	62.5	The total number of respondents on types of co-ordination approach used exceeds the total number interviewed because one respondent indicated that he uses more than one approach.
2.	Through group discussion among individual extension workers at their zonal level	4	25	
3.	Extension workers of the different extension organizations having individual face to face contact discussions at the sub-district level.	3	18.75	

Source: Survey Data.

From Table 4.5.3b, it is evident that majority of the extension agents interviewed get their activities co-ordinated through organised co-ordination fora, which the various extension organization in the district collectively organise.

In fact, this finding collaborates well with the real situation on the ground. At the District level, the Department of Agriculture periodically organizes stakeholder fora to which all extension organizations in the district are invited to participate. These periodic stakeholder fora, provides opportunities for the co-ordination of extension activities.

The study on the issue of co-ordination also indicate that 25% of the extension agents interviewed do co-ordination through group discussions among individual extension agents at

their zonal level, whilst 18.75% of the extension agents interviewed do individual face to face contact discussion at the sub-district level.

On the whole the study clearly points out that, there are efforts among extension agents and organizations to co-ordinate their activities at the zonal, sub-district and district levels.

4.5.4. Complementarity of the activities of extension organizations in the Builsa District.

In the Builsa District the innovation communication industry is made up of several organizations all of whom communicate innovations to farmers with the view to improving their productivity and therefore standard of living. These different organizations use different approaches, strategies, techniques, systems and procedures in communicating innovations to farmers.

The farmers in any particular community in the district most often find themselves confronted by these different organizations with different innovation communication packages that sometimes leave the farmers confused with no clear-cut direction to follow or practice to implement. To bring about enhanced communication of innovations, the activities of these organizations should aim at complementing one another. Hence one thing this study sought to do was to find out from farmers whether or not the activities of the various extension organizations in the district complement one another.

The results of the study on the complementarity of the activities of the various extension organizations is summarised in table 4.5.4 below.

Table 4.5.4.: **Complementarity of the activities of Extension Organizations in the Builsa District**

No.	Issue	No. of farmers Responding to the issue		Percentage	
		Compliment	Duplicate	Compliment	Duplicate
1.	Activities of Extension Organizations compliment one another or duplicate each other	89	31	74	26

Source: Survey Data.

Table 4.5.4 shows the results of our study on the complementarity of the activities of extension organizations in the district.

From the study, it is clear that majority of the farmers covered in the survey have indicated that the activities of extension organizations in the district compliment one another. 89 farmers covered in the survey responded that the activities of extension organizations compliment one another.
31 farmers however, representing 26% of the farmers interviewed during the survey have indicated that the activities of extension organization in the district duplicates each other. Given the results of the study on the issue of complementarity of the activities of extension organizations, the potential exist in the district for a shared and unified responsibility among the extension organizations in the process of communicating innovations to farmers.

This potential if properly managed can lead to enhanced communication of innovations in the district.

4.5.5. Ensuring the relevance of other actors services

Farming, like any other enterprise depends on a wide range of services that have to be provided by different actors spread across the district, region and the country at large. The services of these different actors, such as input suppliers, marketing agents, warehousing agents, transporters, the security agents, municipal and public office functionaries have to be co-ordinated and made relevant to the farmer if he/ she has to take full advantage of the benefits of innovations being communicated to them by extension agents. This is necessarily so because the reaping of the full benefits of any innovation depends on the relevance and timely intervention of the services of the different actors. In this regard, the extension agent has a role to play in ensuring that the services of other actors in the innovation communication field is made timely and relevant to the farmer.

Hence one thing this study sought to find out was how extension agents can ensure the relevance of other actors services to the farmer, since they do not control these other actors.

The results of the study on this issue is summarised in Table 4.5.5 below

Table 4.5.5.: **Strategies used by Extension Agents to Promote the Relevance of other Actors' Services to Farmers**

No	Type / Form/ Approach of Co-ordination	No. of Extension Agents Using it	Percentage
1.	Through stakeholders meetings / reviews/ discussion	5	31.25
2	Through timely advise to farmers on when to access the services of other actors	4	25
3.	Through creation of awareness of other actors services	3	18.75
4.	Linking farmers to other actors	4	25

Source: Survey Data.

From Table 4.5.5, it is made clear that 31.25% of extension agents responded that they ensure the relevance of other actors services to farmers through stakeholders meetings, reviews and discussions. According to the extension agents, during such meetings, reviews and discussions the relevance of the other actors services and how to access them are exposed to the farmers.

25% of the extension agents interviewed said they try to promote the relevance of other actors services through timely advise to the farmers on when to access them. Another 25% said they do so through linking farmers to the other actors by means of visits to the other actors. Awareness creation about other actors services during community fora is a strategy used by 18.75% of the extension agents interviewed. In general the study clearly shows that extension agents uses difference strategies to promote the relevance of other actors services to farmers.

4.5.6. Timeliness of other Actors Services to Farmers in the Study Area

The timely availability of other actors services at a time when they will be most need is a necessary condition for reaping the full benefits of innovations that are communicated and applied by farmers.

Hence one issue this study sought to inquire into was the timely availability of the services of other actors to farmers.

The study sought to find out from extension agents the timeliness of other actors services such as input suppliers, marketing agents and transporters, to mention a few to farmers in the area.

The extension agents were required to indicate whether other actors services are supplied on a good timely bases or poor timely supply of the services of other actors.

The results on the issue of timeliness of other actors services to farmers is summarised in Table 4.5.6. below;

Table 4.5.6a.: Timeliness of Other Actors Services

No	Issue	No. of Extension Agents Responding to it	Percentage
1.	Good timely supply of other actors services	7	43.7
2.	Poor timing in the supply of other actors services	7	43.7

Source Survey Data.

From Table 4.5.6a., it is apparent that whilst 43.7% of the extension agents indicated that other actors services are supplied on a timely basis, another 43.7% says that other actors services are not supplied on a timely bases.

Two extension agents did not respond to the issue of timeliness of other actors services.

From the study, it is clear that extension staff in the study area are divided on the issue of timeliness of other actors services to farmers. Whilst half of the respondents says other actors services are not available on a timely basis the other half says they are supplied on a timely basis. This sharp divide among the extension staff on the issue of timeliness of other actors services can be explained by geographical differences in the supply of other actors services. Whilst extension agents working in more urbanised and easily accessible locations in the district see farmers having easy access to other actors services their counterparts in typical rural and inaccessible locations see farmers not getting easy access to the services of other actors.

Generally, the study has revealed that farmers living in more urbanised and accessible areas have easy access to the services of other actors whilst those living in inaccessible and typical rural areas do not have easy access to the services of other actors.

In recognition of this, one thing this study sought to do was to find out from farmers whether or not the services of input suppliers are available to them on a timely basis. The farmers were simply required to indicate "Yes" if the services are available to them on a timely basis and "No" if the services are not made available to them on a timely basis.

The results of the study on the issue of timely availability of the services of input suppliers is summarised in table 4.5.6b. below:

Table 4.5.6b.: Farmers Responses to the issue of timely availability of the services of input suppliers.

No.	Issue	No. of farmers responding to the issue		Percentage	
		Yes	No	Yes	No
1.	Services of input suppliers available on a timely basis.	68	52	57	43

Source: Survey Data.

From Table 4.5.6b, the results of the study on the issue of timely availability of the services of input suppliers shows that majority of the farmers numbering 68 and representing 57%t of the farmers covered in the survey have indicated that they have timely availability of the services of input suppliers. 52 farmers, representing 43%t of the farmers covered in the survey however said the services of input suppliers are not available on a timely basis. In fact my close discussion with the farmers on this issue of timely availability of the services of input suppliers revealed that farmers in and around urban and semi-urban areas have easy and timely access to the services of input suppliers, whilst farmers in typical rural locations and hard to reach areas of the district do not have easy and therefore timely access to the services of input suppliers. From this

understanding, it can be noted that majority of the farmers who responded that the services of input suppliers is timely live and farm in and around urban and semi-urban areas of the district, whilst majority of those who said the services of input suppliers is not timely live and farm in typical rural and hard to reach locations in the district.

Another factor which affects the timely availability of the services of input suppliers is that, the service of input suppliers is a purely privatised business and so its availability is largely driven by the profit element.

The transport cost in moving input to difficult and hard to reach locations is so high that, it greatly reduces the profit as a disincentive for input suppliers to move inputs to typical rural locations in the district.

4.5.7. Joint fora of stakeholders involved in innovation communication in the Builsa District

One way of enhancing or bringing about improvements in the activities of any field of human endeavour, be it in industry, commerce, agriculture, mining or fishing, to mention a few is "periodic meeting of stakeholders in that field of endeavour. This certainly affords opportunities for stakeholders in the endeavour to review their activities, share ideas, experiences, identify strengths and weaknesses and be in a position to determine where the endeavour currently stand in relation to other endeavours in the community, district, regional and even in the international context.

Having determined where the endeavour stand in relation to others, the stakeholders will then be able to develop and adopt common strategies with a view to bringing about short, medium to long term improvements in the performance of the endeavour.

It is on account of this understanding that this study has made it a point to inquire into whether extension agents and organizations involved in innovation communication as a field of endeavour in the Builsa District periodically organise joint meeting or fora of stakeholders. The extension agents were simply required to indicate whether they do so or not and if the do how regularly it is done.

The results of the study on the issue of periodic joint meeting or fora of stakeholders involved in innovation communication in the Builsa District is summarised in Table 4.5.8a. below.

Table 4.5.7a: Organization of Joint Meeting or Fora of Stakeholders.

No	Issue	No. of Extension Responding to it	Percentage
1.	Joint stakeholder meetings are organised	13	81.25
2.	Joint stakeholder meetings are not organised	3	18.75

Source: Survey Data

From the results shown in Table 4.5.8a., it is evident that majority of the extension agents representing 81.25% of those interviewed have indicated that joint stakeholder meetings or fora are held for those involved in innovation communication in the Builsa District. Only three of the extension agents interviewed representing 18.75% have said that joint stakeholder meetings are not held. My close examination with this three agents and my inspection of attendance list of agents who attend joint stakeholder meetings whenever they are invited to such meetings has shown that the three always absent themselves from such meetings. It was not therefore a surprise that the three have responded that joint stakeholder meetings are not held.

Given the finding of the study that meeting of stakeholders involved in innovation communication are organised periodically in the Builsa District, then the potential exist for enhanced communication of innovations in the district.

This finding collaborates very well with my discussions with the District Director of Agriculture, the Manager of the Presby Agricultural Station in Sandema and some Heads of Government Departments and NGOs involved in innovation communication in the Builsa District when they said through the joint stakeholders meetings, they have been able to resolve several differences among them, which has enable them to avoid entering the same communities or dealing with the same farmers as far as innovation communication was concerned.

According to them, they have been able to avoid duplication of efforts and saved time and resources for other things.

As to the regularity of the organization of the joint stakeholder meetings, the finding of the study is as shown in Table 4.5.7b below.

Table 4.5.7b: **Regularity of Organization of Joint Stakeholder Meetings**

No	Periodic Interval	No. of Extension Agents Responding to it	Percentage
1.	Once a year	6	37.5
2.	Twice a year	5	31.25
3.	Three times a year	0	0
4.	Once in a quarter	0	0

Source: Survey Data

From Table 4.5.7b, the results of the study indicate that six of the extension agents interviewed representing 37.5% said joint stakeholders meeting is organised once a year in their areas of operations.

Five of them representing 31.25% have indicated that stakeholder meetings are held twice a year in their operational areas. Two of the extension agents did not respond to the issue of joint stakeholder meetings, whilst three of them said they do not organise joint stakeholder meetings in their areas of operations. For this three agents, it was observed that they fail to attend joint stakeholder meetings held at the district level by their organizations and therefore not surprising that they do not organise such meetings at their level of operation.

Like the extension workers the study also sought to find out from farmers whether they have had any experience of participating in a joint forum of stakeholders involved in the innovation communication field. The farmers were simply required to indicate "Yes" if they have had any such experience and "No" if they have not had any such experience before.

The results of this finding is summarised in table 4.5.7c below:

Table 4.5.7c: Responses of Farmers to experience of participating in joint fora of stakeholders involved in innovation communication in the Builsa District.

No.	Issue	No. of farmers responding to the issue		Percentage	
		Yes	No	Yes	No
1.	Experience of participating in a joint forum of stakeholders involved in innovation communication.	86	34	72	28

Source: Survey Data.

From table 45.7c, it is evident that majority of farmers covered in the survey on the issue of experience of participation in joint fora of stakeholders involved in the innovation communication field, numbering 86 and representing 72% of the farmers have responded that they have had experience of participating in a joint forum of stakeholders. 34 farmers, representing 28% of the farmers covered in the study however said, they have never had any experience of participating in any joint forum of stakeholders.

Since from this study, it has come out that majority of farmers have ever participated in a joint forum of stakeholders, the implication is that periodically such fora are held. It is not therefore surprising that, majority of farmers in this study have also indicated that activities of extension organizations involved in innovation communication in the district compliment one another. It is this periodic organization of joint meetings of stakeholders, that enables them to discuss their programmes, know one another's activities and therefore avoid duplication of efforts. Given this scenario, the potential exist in the district for enhancing the communication of innovation to farmers.

4.5.8. Harmonizing the Activities of Stakeholders

In the field of innovation communication, there are many actors whose activities impact on one another. The activities of extension agents, farmers, input suppliers, transporters, marketing agents, researchers and a host of others impact on each other.

Even though these actors' activities affect each other, they operate differently and at different levels with varying interests that, they in most cases may not be aware of the extent to which their activities impact either negatively or positively on the activities of others in the field.

To avoid the negative impact of actors on other actors, it is important that the activities of these stakeholders are harmonised in such a manner that they complement one another, so that innovation communication can be enhanced in the district.

It is on account of this understanding that this study undertook to find out from extension agents, who based on their experiences in the field, what suggestions they have for harmonizing the activities of stakeholders involved in innovation communication in the Builsa District.
The extension agents were simply required to suggest ways for harmonizing the activities of stakeholders.

The results of the study on the issue of harmonizing the activities of stakeholders is summarised in Table 4.5.8 below.

Table 4.5.8.: **Ways Suggested by Extension Workers for Harmonizing the Activities of Stakeholders**

No	Suggested ways	No. of Extension Agents Suggesting it	Percentage
1.	Holding of regular joint stakeholder meeting at the beginning of the farming season and at the end of the season.	6	37.5
2.	Holding of periodic review and planning sessions of stakeholders	3	18.75
3.	Periodic visit of stakeholders to interact with one another at the organizational level	2	12.5
4.	Working visit among stakeholders to learn more about each others activities	3	18.75
5.	Informal interaction among individual stakeholders	2	12.5

Source: Survey Data.

From Table 4.5.8., it is evident that the extension staff suggested five ways of harmonizing the activities of stakeholders in innovation communication in the Builsa District for the common good of all. These suggestions are listed below.

1. Holding of regular joint stakeholder meetings at the beginning of the farming season and at the end of the season. This suggestion was made by six extension staff who represent 37.5% of the total number of extension staff interviewed.

2. Holding of period review and planning sessions of stakeholders. Three extension staff representing 18.75% made the suggestion.

3. Periodic visit of stakeholders to interact with one another at the organizational level. This suggestion was made by two of the extension staff, who represent 12.5% of those interviewed.

4. Working visit among stakeholders to learn more about each others activities. The suggestion was made by three extension agents representing 18.75% of the total number of agents interviewed.

5. Informal interaction among individual stakeholders to discuss pertinent issues that commonly affects them. This suggestion was made by 12.5% of the agents covered in the study.

From the study, it became clear that extension agents are quite aware of the importance of other actors activities and how these actors' activities affect their own. They therefore strongly believe that if the suggestions they have made can be implemented through the joint efforts of all actors, then their activities can be efficiently harmonised for the common good of all actors involved in innovation communication in the Builsa District.

The farmers, like the extension agents were required by this study to suggest ways for harmonizing the activities of stakeholders involved in innovation communication in the Builsa District.

From the interviews conducted among the 120 farmers who were covered in the survey, the following suggestions were made by farmers.

- Holding of period joint stakeholder meetings before and after the farming season. This activity the farmers said is already being done in the district.

- Working visit among stakeholders to the work situation of each other, this, they said will enable them have practical understanding of how their activities affect each other.

- Informal interaction among individual stakeholders to facilitate free and frank discussion of issues that have a bearing for their mutual benefit.

- Strengthening relationship at the formal and informal levels through joint planning, review and monitoring of their plans and programmes.

- Organizing policy review sessions with the view to influencing policy on innovation development, communication and consumption. This, the farmers said will allow for the identification of common interests that will promote unity of purpose required for enhancing the communication of innovations in the district.

From the findings and discussions on the role of stake holders in innovation communication, it can be concluded that there is a high level of collaboration among stakeholders in the innovation communication industry in the Builsa District. Stakeholders is hold periodic joint meetings, co-ordinate their activities and hold joint planning sessions. The implication of this is that the potential exist in the district for enhanced communication of innovations if other complementary factors in terms of increased personnel, logistics and incentives are provided.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1. CONCLUSION

The need to raise the productivity of small scale farmers in Ghana, resulted in the establishment of research and extension programmes to generate and disseminate new innovations of farming to small scale farmers with the view to modernizing their production system, raise their output and income so as to increase their general welfare.

Over the years however, research and extension activities has not succeeded in modernizing the production patterns of the majority of small scale farmers who dominate the agricultural landscape of Ghana. This failure has in many ways been blamed on the inefficiency of the extension system which is responsible for communicating innovations to farmers.

The fact that Agriculture has remained predominantly traditional is because in Ghana, since the introduction of the extension service as an agency for modernizing agriculture through bringing innovations generated by research, the process of bringing these innovations to farmers has for many years taken the form of Transfer of Technology (T.O.T.).

The Transfer of Technology approach is a simple linear process which involves the extension agent picking the new idea generated through research and communicating it directly to the farmer. The farmer in this process is expected to adopt and operationalise this new idea in his farming business.

It is the contention of this study that research and extention has not been able to produce an impact in modernizing agriculture and increasing the productivity of small scale farmers, particularly in resource- poor farming regions because the Transfer of Technology approach adopted by extension and practised over the years is ineffective. The approach is ineffective because it is alienating and non-participatory. It is a linear process, from research to extension to the farmer (Research – Extension Farmers).

This approach therefore alienates the researcher and those engaged in marketing agricultural inputs and outputs in the process of communicating innovations to farmers. The communication is only between the extension agent and the farmer. Even in this process, the

farmer is only a passive recipient of innovations. The process of Transfer of Technology (T.O.T.) cannot therefore be considered to be fully participatory.

It is this non-participatory nature of the process of Transfer of Technology (T.O.T.) that has largely contributed to making research and extension ineffective in modernizing and transforming agriculture despite several years of research and extension activities in Ghana.

It is the conviction of this study that if extension re-orients itself and factor in the researcher, the farmer and marketing agents of agricultural inputs and outputs as well as agricultural policy makers in the process of innovation communication and change its present mode of linear transfer of innovations to that of facilitating an all embracing process of innovation communication in a participatory framework and within the diversities and knowledge systems of farmers then giant steps would be made towards agricultural modernization and national development.

In terms of agricultural development, the different stakeholders can together be perceived as a social organization and it is their joint action which enhances or limits the development and communication of innovations.

The findings in the study area has shown that farmers are aware that the strategies extension workers use in communicating innovations to them have their associated problems.

The problems the farmers identified to be associated with innovation communication strategies extension workers use are;

a. That the strategies are non-participatory
b. That the strategies make the extension worker the embodiment of all knowledge of innovations.
c. That the strategies basically aim at transferring new ideas to farmers without factoring farmers own knowledge and experiences.

Innovations, the farmers said are passed onto them in a dictatorial manner, "take it or leave it approach".

According to the farmers, innovation communication strategies need to be participatory enough to allow the indigenous knowledge and experiences of farmers to be acknowledged during the process of innovation communication.

In relation to the age characteristics of extension workers in the study area, the main finding of the study is that majority of them are aging which the study observed may have the effect of reducing their effectiveness in communicating innovations to farmers.

With regard to gender among extension workers, the finding of the study is that there is a dominance of men over women. Majority of extension workers in the study area are men. Women play a minimal role in innovation communication in the area, a situation the study observed to be unacceptable if we agree that women are the majority in society and the fact that increasing numbers of them take up farming as a full time profession and income earning venture.

On current strategies of innovation communication used in the study area, the main finding of the study is that, the extension workers rely heavily on the "visit and training system which even though is effective has limited coverage of farmers.

With regard to the medium of communication used in the study area, the finding of the study is that both farmers and extension staff rely on verbal mode of communication between and among them.

The finding of the study on joint learning of innovations points out that even though extension try to encourage it, in practice the approach is little used because of its demand on time, resources and energy.

As regards feed back on innovations, the finding of the study indicate that farmers to a large extent provide feed back of the experiences of innovations communicated to them.

An important finding of the study reveal that farmer to farmer communication is the major source of innovation to farmers.

From the study other findings that have emerged are;

- There is regular upgrading of the skills of extension staff in the study area
- Low level of experience among the majority of extension workers in the area.

- Whilst majority of extension workers agree that gender differentiation in innovation communication does not affect women, majority of farmers agree that it affects them
- There is high level of collaboration among extension organizations in the study area.
- Joint fora of stakeholders involved in innovation communication in the study area are held periodically.

The study has on the whole demonstrated that the extension service in the area even though is wrought with many problems and remains largely ineffective has the potential to improve its effectiveness in communicating innovations.

The indicators for enhanced communication of innovations are clear. These indicators include the following;

- There is a high level of collaboration among extension organization in the district.
- Periodic meetings of stakeholders involved in innovation communication are held.
- Extension staff of the various extension organization in the district do high level interaction among themselves to share ideas and experiences at their operational level.
- The services of actors involved in innovation communication are made known to each other through awareness creation by extension staff and during joint stakeholder meetings
- Increasingly, problems associated with the various strategies of innovation communication are discussed at joint fora of stakeholders and solutions are being evolved to address them.
- Gender issues in innovation communication are also being discussed with a view to finding solutions to them.
- Stakeholders in innovation communication are aware of other actors and the relevance of their services to them.
- There are efforts in the study area to periodically hold harmonization meetings of stakeholders so that their activities can be harmonised to promote unity of purpose and mutual benefits among stakeholders.

Any scheme to enhance innovation communication in the study area must take cognisance of the fact that, farmer to farmer communication of innovation is the major source of innovation

to farmers and any such a scheme must properly address farmer to farmer innovation communication issues and problems if it has to make any significant impact.

From the study, we know that increasingly women are taking up farming as full time profession and income earning venture. Unfortunately, women role models in innovation communication in the study area is not anything to write home about. Since innovations are crucial to productivity and women best understand their fellow women, it is important that the gender problem in extension in the area be addressed as a measure for enhancing innovation delivery to women farmers.

The multiple roles of women is another gender issue that affect innovation communication among women farmers. This study has identified several suggestions that need indepth study to better understand how to deal with the problem of the multiple roles of women and how it affects their participation in innovation communication programmes.

The study has also identified the effects of the traditional beliefs and perceptions that women are not farmers and do not own land and the impact of these beliefs and perceptions have on women's participation in innovation communication activities. From the study several suggestions have been made to address the effects these traditional beliefs and perceptions have on women's participation in innovation programmes.

5.2. RECOMMENDATION

After analysing the main findings and problems associated with innovation communication in the study area, the following recommendations are made in looking for their solutions.

- In view of the important role local expert farmers play in innovation communication in the study area, the government through the Ministry of Food and Agriculture should design a sustainable programme for the identification and training of these local experts in relevant communication skills to upgrade their competence.

- From the study, it was found out that, farmer to farmer communication of innovation is the major source of innovation to farmers. In this regard all efforts should be made by

the government and Non-governmental organizations involved in innovation delivery to reach as many farmers as possible by extension agents.

- The various suggestions made in this study by both extension workers and farmers for improving on the efficiency of the strategies used by extension workers in innovation communication should be rigorously implemented by the various extension organizations in the district.

- The role of women in farming has become very important. All efforts should therefore be made by the government, the District Assembly and organizations involved in innovation communication to address the problems that affect their participation in innovation training programmes.

- In the study area, the extension agent – farmer ratio is very high. This makes it difficult for many farmers to be reached. It is therefore recommended that government and extension organizations should recruit more extension workers for the area.

- Extension organizations in the district should endeavour to promote participatory strategies in innovation communication in the area. Currently, participatory approaches are less used by extension agents in communicating innovations.

- The suggestions made by both the extension agents and farmers to enhance women's participation in innovation activities should be implemented by the various extension organizations in the district.

- More women extension agents should be recruited by the government and other extension organizations to serve as role models in innovation communication in the district.

- Extension organizations, the government and District Assembly should endeavour to improve on the logistical support for extension agents to enable them reach as many farmers as possible.

- Incentives by way of promotion, salary increases and other allowances should be provided for the extension staff to serve as motivation for them to put extra effort in their work. This should be the responsibility of the government and extension organizations as well as the District Assembly.

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DEVELOPMENT IN GHANA: A CASE STUDY OF AGRICULTURE IN THE BUILSA DISTRICT QUESTIONAIR FOR EXTENSION WORKERS

1. Serial Number:.....

2. Name:.....

3. Sex:.....

4. Grade:.....

5. Organization:.....

6. As an extension worker, you have over the years tried different strategies of communicating innovations to farmers: can you list these strategies

.....

.....

7. What medium of communication do you use in communicating with farmers? Verbal (1) written (2)

1	2

8. If you use verbal communication under question 7, how do you communicate with the farmers? Through an interpreter (1) directly (2)

1	2

9. Do you encourage joint learning of new innovations among farmers? Yes (1), No (2)

1	2

10. If yes, under question 9, what form does the joint learning take? Group discussion (1), Brain storming (2), practical field demonstration (3), film show (4) tick those applicable)

11. Which of the above learning techniques under question 10 do you use often?

1	2	3	4

(tick those you use often)

12. Do farmers often provide a feed back of their experiences of the innovations you communicate to them Yes (1), No (2)

1	2

13. If yes to question 12, does the feed back meet your expectation? Yes (1), No, (2)

1	2

14. If no to question 13, do you border to find out farmers' reaction to the innovation?.....

15. What in your opinion is the main source of innovations, to farmers? Extension workers (1), marketing agents (2), input sellers (3), From other farmers (4)

1	2	3	4

16. Can you suggest ways (strategies) of improving communication of innovations to and among farmers .....

17. In your communication of innovations to farmers, do you communicate in the local dialect of farmers or through an interpreter? Communicate in the local dialect (1), communicate through an interpreter (2)

1	2

18. If you communicate through an interpreter, how do you access that the farmers have effectively received your message? When they ask many questions (1), when they keep nodding their heads (2), when they challenge the ideas communicated to them (3), when they are silent and do not ask questions (4)

1	2	3	4

19. How many farmer are under you .....

20. How many times do you visit each farmer in a mouth? Once (1), twice (2), thrice (3), four times (4), more than four times (5), not at all (6)

1	2	3	4	5	6

21. How is your relationship with farmers? cordial (1), strain (2), very cordial (3)

1	2	3

22. What is your means of transport to farmers? Bicycle (1), motor cycle 92), car (3) no means of transport (4)

1	2	3	4

23. Do farmers accept your ideas often? Yes (1), No (2), sometimes (3)

1	2	3

24. If no, or sometimes, have you bothered to find out? Yes (1), No (2)

1	2

25. As an extension worker, you have responsibility to communicate new innovations to farmers. How committed are you to this responsibility? High commitment (1), Low commitment (2) very high commitment (3) Very low commitment (4), no commitment at all (5)

1	2	3	4	5

26. If you have high or very high commitment to your responsibility in question twenty- five above can you give any three reasons for it ?.....

27. If you have low or very low commitment to your responsibility in question one above, can you assign three reasons for it.

28. Can you Identify three main factors that motivates you in your work as an extension worker?.....

strain (2), very cordial (3)

1	2	3

30. How long have you been on your present grade as an extension worker

31. Since when did you become an extension worker

32. How often are you invited to take part in knowledge and skill training courses? At Regular intervals (1), At very irregular intervals (2), cannot remember the last time I participated in any training course (3)

1	2	3

33. As an extension worker, do you see gender differentiation affecting innovation communication in the Builsa District? Yes (1), No (2)

1	2

34. If yes to question 33 above, can you assign three main reasons for this?.....

35. In the Builsa District, farmers are perceived mainly to be men, do you think this perception affect women's participation in innovation communication programmes? Yes (1), No (2)

36. If yes to question 35 above, give three main effects of this perception on women's participation in innovation communication programmes?.....

37. What is the main source of innovation to women farmers in the Builsa District? Extension workers (1), men farmers (2), other women farmers (3), input suppliers (4) , Traders in agricultural products (5)

1	2	3	4	5

38. Do you think women's multiples roles as domestic managers and as farmers have effect in their participation in innovation training programmes? Yes (1), No (2)

1	2

39. If yes to question 38 above, can you list 3 main effects? .....

40. Can you suggest three main ways to enhance women's participation in innovation communication activities in the Builsa District .....

41. In the Builsa District, the perception is that women do not own land. Given this perception, do you think it worth while for women to invest their time and energy in knowledge and innovation acquisition activities for land development?
Yes (1), No (2)

42. If yes to question 41 above, why? .....

43. As an extension worker, are you aware of other extension actors in the Builsa District? Yes (1) No (2)

1	2

44. If yes to question 43 above, can you list these other extension actors?.....

45. In the process of communicating innovations to farmers do you co-ordinate your activities with these other actors you listed in question 44 above? Yes (1), No (2)

1	2

46. If yes to question 45 above how do you do the co-ordination? Through organised co-ordination fora by the Extension organizations in the District (1), Through group discussion among individual Extension workers at their Zonal levels (2), Extension workers of the different Extension organizations having individual face to face contact discussion at the sub-district level (3)

1	2	3

47. Since you do not control other actors' services such as input suppliers, how do you ensure that their services are made relevant to the farmers?

48. How timely are other actors services, such as input suppliers to facilitate innovation communication to farmers? Good timely supply of inputs (1), poor timing in the supply of inputs (2),

1	2

49. Do you organize joint fora of stakeholders involved in innovation communication in the Builsa District? Yes (1) No (2).

50. If yes to question 49 above, how regular do you organize such fora? once a year (1), twice a year (2), three times in a year (3), once in every quarter

1	2	3

51. Can you suggest ways for harmonizing the activities of stakeholders in innovation communication in the Builsa District?

ENHANCING COMMUNICATION OF INNOVATIONS FOR AGRICULTURAL DEVELOPMENT IN GHANA A CASE STUDY OF AGRICULTURE IN THE BUILSA DISTRICT

FARMERS QUESTIONAIRE

1. Interviewer :.....Date .....

2. Name of Farmer.....

3. Sex: Male (1) Female (2) [ ] [1] [2]

4. Village/Locality:.....

5. Educational Level:

   Primary (1) Middle (2) Secondary (3)
   University (4) Non [1] [2] [3] [4] [5]

6. Over the years, extension workers have tried different strategies of communicating innovations to farmers, can you list some of these strategies? Bringing farmers together for a brainstorming exercise with them (1), Practical field Demonstration on Demonstration farms (2), Organizing farmers to visit other farmers who are successful to learn from their experiences (3), Organization of training workshops and seminars (4), visiting farmers in groups and passing on relevant information to them (5) visiting farmers individually on their farms or at their homes to pass on new ideas to them (6) [1] [2] [3] [4] [5] [6] (Tick those applicable)

7. What medium of communication do you use in communicating with extension workers? Verbal (1), written (2) [1] [2]

8. What medium of communication do you use in communicating with other farmers? Verbal (1), written (2) [1] [2]

9. If you use verbal communication under question 8, how do you communicate with extension workers? Through an interpreter (1), Directly (2) [1] [2]

10. Again if you use verbal communication in question 9, how do you communicate with other farmers? Through an interpreter (1), Directly (2) [1] [2]

11. Do extension workers encourage participatory or joint learning of innovations amongst farmers? Yes (1), No (2)

Group discussion (1), Brainstorming (2), practical field Demonstration (3), Film show (4), seminars and workshops (5)

1	2	3	4	5

(Tick those applicable)

13. Which of the above learning techniques listed in question six are used most often (Tick those used most often)

1	2	3	4	5

14. As a farmer, do you provide feed back on innovations communicated to you to extension workers? Yes (1), No (2)

1	2

15. If yes to question 14 above how do extension staff react to your feed back? Positively (1), Negatively (2)

1	2

16. If no to question 9, do extension workers border to find out from you, your experiences with the innovations? Yes (1), No (2)

1	2

17. As farmer, can you identify the main source of innovation information in your farming enterprise? Extension workers (1), Marketing agents (2), Input sellers (3), from other farmers (4)

1	2	3	4

18. Can you suggest ways (strategies) of improving innovation communication to and among farmers? .....

19. Do extension workers communicate new innovations to you in your local dialect directly or though an interpreter? Communicate directly in the local dialect (1) communicate through an interpreter (2)

1	2

20. If innovations are communicated to you through an interpreter, how do you ensure that the message is well received and under stood by you? By asking questions (1), when we raise suggestions to the innovations (2), when we relate experiences about earlier innovations (3), when there is absolute silence and no questions are raised (4)

1	2	3	4

21. How many times does an extension worker visit you in a month? Once (1), twice (2) thrice (3) four times (4), more than four times (5), not at all (6)

1	2	3	4	5	6

22. How is your relationship with extension workers? Cordial (1), strain (2), Very Cordial (3)

1	2	3

23. Do you accept ideas communicated to you by extension workers often? Yes (1), No (2) some times (3)

1	2	3

24. Do extension workers often ask to know your own experiences with specific innovations they communicate to you? Yes (1), No (2)

1	2

25. As a farmer what problems do you associate with innovation communication strategies used by extension workers? The strategies are non-participatory (1) the strategies make the extension worker the embodiment of all knowledge of innovations (2). The strategies basically aim at transferring new ideas to farmers without factoring the farmers own knowledge and experiences (3)

1	2	3

(Tick those applicable)

26. Do you agree that the visit and Training strategy for innovation communication mainly used by Extension workers have not made adequate impact over the years? Yes (1), No (2)

1	2

27. If yes to question 26 above, why .....

28. As a farmer can you indicate what makes you want to access new innovations in your farming enterprise? Yield potential of the innovation (1), interest in the new idea (2), Market and financial prospects associated with the idea (3), Prestige and recognition among fellow farmers(4), the social and economic responsibility associated with the new innovation (5)

1	2	3	4	5

(Tick those relevant)

29. How do you judge your personal relationship with your extension workers? Cordial (1), strain (2), Very Cordial (3)

1	2	3

30. How do you judge the innovation communication strategies used by the extension workers? Satisfactory (1), Poor (2), good (3) Very poor (4), Very good (5)

1	2	3	4	5

31. How would you rate the communication ability of your extension worker? Satisfactory (1) poor (2), good (3), Very poor (4) Very good (5)

1	2	3	4	5

32. Experience is an important factor that can positively influence innovation communication to farmers. How would you rate the experience of your extension worker? Satisfactory (1), Poor (2), good (3), Very poor (4), very good (5)

1	2	3	4	5

ENHANCING COMMUNICATION OF INNOVATIONS FOR AGRICULTURAL DEVELOPMENT IN GHANA A CASE STUDY OF AGRICULTURE IN THE BUILSA DISTRICT

FARMERS QUESTIONAIRE

1. Interviewer :.....Date .....

2. Name of Farmer.....

3. Sex: Male (1) Female (2) | 1 | 2 |

4. Village/Locality:.....

5. Educational Level:

Primary (1) Middle (2) Secondary (3) University (4) Non | 1 | 2 | 3 | 4 | 5 |

6. Over the years, extension workers have tried different strategies of communicating innovations to farmers, can you list some of these strategies? Bringing farmers together for a brainstorming exercise with them (1), Practical field Demonstration on Demonstration farms (2), Organizing farmers to visit other farmers who are successful to learn from their experiences (3), Organization of training workshops and seminars (4), visiting farmers in groups and passing on relevant information to them (5) visiting farmers individually on their farms or at their homes to pass on new ideas to them (6) | 1 | 2 | 3 | 4 | 5 | 6 | (Tick those applicable)

7. What medium of communication do you use in communicating with extension workers? Verbal (1), written (2) | 1 | 2 |

8. What medium of communication do you use in communicating with other farmers? Verbal (1), written (2) | 1 | 2 |

9. If you use verbal communication under question 8, how do you communicate with extension workers? Through an interpreter (1), Directly (2) | 1 | 2 |

10. Again if you use verbal communication in question 9, how do you communicate with other farmers? Through an interpreter (1), Directly (2) | 1 | 2 |

11. Do extension workers encourage participatory or joint learning of innovations amongst farmers? Yes (1), No (2)

33. As a farmer what other factors can you suggest that influence innovation communication in the Builsa District?.....

34. There is the perception in the Builsa District that only men are farmers. Do you think this perception affect women's participation in innovation communication programmes? Yes (1), No (2)

1	2

35. If yes to question 34 above, can you list three main ways that women are affected in innovation communication programmes?.....
.....

36. If women are also farmers in reality, what do you think is the main source of innovation to them? Extension workers (1) men farmers (2), other women farmers (3), input suppliers (4), Traders in Agricultural products (5)

1	2	3	4	5

37. As a farmer, do you think women's multiple roles as domestic managers and as farmers have effect in their participation in innovation training activities? Yes (1), No (2)

1	2

38. If yes to question 37 above, can you enumerate three main effects ?
.....

39. In the Builsa District, women are traditionally perceived as not owning land, With this perception do you think it is prudent for women to invest their time and energy in knowledge and innovation acquisition activities for land development?
Yes (1), No (2)

1	2

40. If yes to question 39 above, why?
.....

41. As farmer, can you suggest three main ways to enhance women's participation in innovation communication activities in the Builsa District?.....
.....
.....

42. As a farmer, are you aware of the existence of the various extension organizations in the District? Yes (1), No (2)

43. If yes to question 42 above, can you name these organizations .....
.....
.....