INNOVATING TOGETHER FOR DEVELOPMENT

Factors Influencing Agricultural Innovation Processes in Uganda

A case study in Lira District.

A Research Project submitted to Van Hall Larenstein University of Applied Sciences in partial fulfilment of the requirements for the award of Professional Master Degree in Management of Development

Specialization: Training, Rural Extension and Transformation

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List of acronyms

CAO	Chief Administrative Officer
NAADS	National Agricultural Advisory Services
DNC	District NAADS Coordinator
SNC	Sub county NAADS Coordinator
MAAIF	Ministry of Agriculture Animal Industry and Fisheries
TOR	Terms of Reference
EDF	Enterprise Development Fund
RDC	Residence District Commissioner
ISFG	Integrated Support to Farmers' groups
IDP	Internally Displaced Peoples' camps
DDP	District Development Plan
IGG	Inspector General of Government
PEAP	Poverty Eradication Action Plan
PMA	Plan for Modernisation of Agriculture
NARO	National Agricultural Research Organisation
ARENET	Agricultural Research Extension Network
IAP2	International Association of Public Participation
UBOS	Uganda Bureau of Statistics
PCC	Parish Coordinating Committee
CBF	Community Based Facilitator
SP	Service Provider
DPO	District Production and Marketing Officer
SMS	Subject Matter Specialists

Abstract

A qualitative case study was conducted on Extension System in Lira district, Uganda. The objectives of the study were to analyse factors influencing innovation processes and to examine the communication linkages that exist among the stakeholders in the extension in Lira district in the current NAADS extension approach.

The primary data was collected through group stakeholders review meeting and individual discussions. The discussions involved the district stakeholders; district technical staff, NAADS staff and farmers groups. Five farmers groups were sampled from the sub county of Ogur, where the NAADS programme started in 2002, and five technical staff from the district head office were also interviewed. Seven NAADS staff were interviewed and they included; the District NAADS coordinator, four sub county NAADS coordinators and two service providers. A semi structure check list was used to guide the discussions.

Data was analysed through descriptive summary and discussion focusing on the roles of the different stakeholders. Factors influencing innovation process were identified and analysed based on SWOT and PESTEC analytical framework. The communication and network linkages and the kind of information shared among the stakeholders were examined. The negotiation processes as a way of resolving conflicting interest were analysed.

The results of the study indicated that the NAADS extension approach involved a number of stakeholders each with specific roles, all geared toward the programme. There were a number of factors influencing the innovation process in the district both positively and negatively but stemming from two broad themes of internal and external factors. Communication and networking in found to exist but with some limitations. The findings also revealed that the negotiation processes is not well articulated in resolving conflicting interests among stakeholders. Internal factors that seem to hinder the process were highlighted as inadequate transparencies, inadequate coordination, inadequate information sharing, resource mismanagement, inconsistencies in carrying out some activities, rapid changes in the programme implementation and, self interests appeared to be above the programme goal. There exist conflicting interests but the strategies of resolving were not appropriate. There also exist external factors, which the current institutional capability cannot handle that affect the innovation negatively such as weather, insecurity, marketing arrangement and government policies. On the other hand there are also factors that have been influencing innovation process positively such as availability of funds, learning processes, involvement of stakeholders, increased farmers participation at the level of decision making process, interactions among farmers and service providers have led to improved information sharing.

Conclusively, the factors influencing the innovation process could be categorised under two themes of; internal and external factors. Communication linkages and networking are improving with some limitations in documentation, sharing and dissemination of information and knowledge. Therefore, I recommend more focus on public private partnership to improve marketing system, the spirit of teamwork and transparencies be built among stakeholders. Initiative towards negotiation process to resolve conflicts among stakeholders, stronger collaboration with other ministries handling other pillars of Plan for Modernisation of Agriculture, polices that affect innovation processes concurrently be handled with NAADS programme to achieve agricultural development.

CHAPTER 1: INTRODUCTION

Agriculture still dominates Ugandan economy though its contribution has been declining over the years, contributing 34% of the total GDP in 2006. Agricultural potential can still be realised if agricultural innovations are well utilised**.** The advent of colonial extension services in Uganda marked the beginning of documented agricultural innovations in the country in the late 1800's. Since then extension and innovation process have gone through a number of changes. The changes aimed to improve agricultural production and productivity, (Semana, 1999).

For instance by 1956, the introduction of cash crops which was also accompanied by other related innovative farming practices such as strict following of specified soil and water conservation methods and, crop pests and diseases control. There was subsequently the establishment of research stations to conduct agriculture and forestry research trials based on the scientific doctrines of the experts, explicit know how, that had no direct linkage or contribution of the indigenous, "perceived inferior", society who should receive the new technological innovations. The original concept of extension was that of bridging the gap between the farmers and the sources of knowledge. Sources of knowledge included organisations generating knowledge and technologies such as research centres, universities and administration. There has been top-down, paternalistic, inflexible, subject to bureaucratic inefficiencies and therefore, less able to cope with the dynamic demands of modern day agriculture, (Rivera *et al.,* 2003). According to Leeuwis and Van den Ban, (2004) called the approach linear model of extension, which does not take into account learning as an important part of the innovation process by making technical information flow unidirectional. The model focus on only the technical aspects of innovations, neglecting social aspect, this resulted to poor functioning of farmers-extension linkages and lack of sustained success by the extension system to respond to the real needs of the farmers, from Tizikara *et al*,(2006) citied by (Heemskerk *et al.*, 2008).

Several modifications followed but continued to follow a linear paradigm in which the interaction between and among actors and users to generate innovation remained elusive, non committal, and biased against the perceived "less powerful" communities viewed as recipients / beneficiaries of the "more powerful knowledge" generated through formal research and academic institutions. The need for a new strategy to look at extension - farmers' linkages by considering the social aspects of agricultural innovations remain eminent and can be achieved through public participation, social learning, increased.

1.1. Research Context

Uganda's Agriculture sector presents great opportunity for poverty reduction. It employs 80% of the labour force, which accounts for the greater percentage of the poorest population of the country. Therefore, agricultural development is imperative in the Uganda's quest for economic development. This resulted in drawing up of poverty eradication action plan, (PEAP), in 1997. Within the PEAP broader framework, sector wide approach to agricultural development was developed and that is the plan for Modernisation of Agriculture, (PMA). PMA's vision, aims at increasing incomes and improving the quality of life of poor farmers, reducing household food insecurity, creating gainful employment and promoting sustainable use and management of natural resources. National agricultural Advisory Services (NAADS) being one of the pillars PMA is a privatised extension service delivery system. The fundamental aim of the programme is to develop a decentralised; demand-driven farmers led agricultural service delivery system particularly targeting the rural poor farmers. The NAADS programme fits in the existing structure of decentralised local government. Involving appropriate levels of government in decision making, implementation and evaluation of

developmental programmes is an essential factors contributing to success of rural development, (Rivera, 2000).

The need to improve agricultural productivity is among the pertinent issues being addressed by the government of Uganda. Several factors are contributing among others are polices related, economic, inadequate production and sharing of knowledge, limited participation of various stakeholders in the development process, inadequate infrastructures, and poor design of innovations. The situation of agricultural development is complex and requires a multi-sectors and actors approach.

Improving agricultural productivity is one of the challenges Lira district is facing. The sustainability of innovation by the small-holder's farmers is limited. Inadequate use of knowledge, innovation and limited participation of stakeholders in the innovation design process is contributing to low production.

Agricultural innovation is more than the use of technological knowledge or new practice only, but is a mixture of social and institutional factors needed to enhance learning and interactions among stakeholders so as to improve agricultural productivity. Knowledge of farmers, extension service providers and other actors are important in innovation process. These have contributed to low productivity and poverty continues to prevail over the people, leading to low standard of living.

1.2. Problem Statement

There have been several reforms in extension service delivery systems to find the best ways to make agriculture contribute to poverty reduction. The current extension service being run in Uganda is a private extension service under the NAADS programme. Before, and with the current NAADS programme, a lot of agricultural technologies in terms of improved crops varieties and animal breeds have been accessed by the farmers in an attempt to improve agricultural production. The sustainability of these technologies has not been realised. Extension has been mainly playing the role of bridging between farmers and sources of new knowledge and innovations in terms of agricultural technologies. Attention has not been paid to the innovation processes with regard to social learning and network and negotiations on innovations among the stakeholders.

Therefore, this research seeks to study the analyse factors influencing innovation processes in regard to social learning, negotiations and networking. It will also examine the interactions between different stakeholders.

1.3. Research Objective

1. To analyse factors influencing agricultural innovations processes.

2. To examine the communication linkages among stakeholders in extension service delivery.

1.4. Research questions

Main questions

1. What are the factors enabling and constraining innovation process?

2. What kind of communication linkages exists among the stakeholders?

Sub questions

- How are these factors enhancing and hindering innovation process?
- To what extent do these factors impact on innovation process?
- What roles do stakeholders play in knowledge exchange?
- How do organisation arrangements impinge on communication?

1.5. Operational definition of concepts

Innovation is a practice which is successfully introduced into economic or social processes. It will, for this study, include new knowledge and agricultural technologies related to agricultural production. This could be improved crop varieties, animal breeds or farm implements.

Innovation process Are ways by which knowledge and agricultural technologies are generated and used in order to respond to social needs, market-articulated and technological demands and opportunities.

Social learning is a learning process which occurs between different social groups in this case the social groups will be extension researchers and farmers and farmers groups. Important issues here is that processes through which groups with different background and conflicting interests gain insights or not into each other's perspectives, develop mutual trust or not and are able to arrived at more convergent views.

Learning in this research will be looked at as a process of to create positive change toward improving extension service delivery systems. This will be looked at as utilisation of experiences gained and used to make decisions.

Negotiation is a process of communication, in which parties may fulfil their interests by solving discussed problems (Raiffa 1982).

Networking are activities that widen the options and increase chances for actors to become more involved in working together, which revolves around the creation of new social arrangements through learning and negotiation. In this research we shall look at network of actors that are involved in the innovation design process.

Communication is the process through which people exchange meanings; people share meanings through varieties of devices for example words, language and drawings. People can make deliberate attempt to communicate meanings to others, (Leeuwis & van den Ban, 2004).

Participation is the involvement of all parties who may potentially have interest in the development of or be affected by the project. It entails a wide range of activities that can be from providing information, through consultation to direct involvement of the community in the aspect of decision, (IAIP2, 2005).

Knowledge creation Knowledge creation in this research will be the ability on how the organisation is able to generate lessons and experiences from stakeholders and utilise it for the purpose of improvement of extension service system.

Knowledge management Knowledge management is the capability of the organisation collection, sharing, storing, or vice versa, and use of information at appropriate time to solve a problem or issue, (Chalkiti and Sigala, 2008).

CHAPTER 2: LITERATURE REVIEW AND THEORETICAL CONCEPTS

This chapter presents various theoretical concepts under which innovation takes place. It looks at innovation, innovation process, network building, social learning, negotiation, communication, participation and Knowledge creation and management. It is under this conceptual framework which the analysis of this research will be based.

2.1. Innovation

Innovation in this study is programmatically defined as successful application of new knowledge and agricultural technologies. From this perspective then innovation needs to be understood as a 'novel working whole'. In other words, it may be a new way of 'doing things' or even 'doing new things' but it can only be considered as innovation if it is actually works in every day practice. Looking at innovation in this way helps us to understand that an innovation is not only composed of novel technical devices or procedures, but also of new or adapted human practices, including the conditions for such practices to happen, (Leeuwis & van den Ban, 2004). Innovation is stimulated and influenced by many actors and factors both internally and externally to the organisations. This social aspect of innovation is referred to as collective learning processes between several organisations in the network observed Dosi, (1988). Although innovation is often considered as an instance of learning, the specific nature of knowledge exchange and sharing in the context of innovation is overlooked.

According to van den Ban and Hawkins (1996) the valuable knowledge gathered by farmers over generations, is often neglected by research although information can be quite location specific with recommendations for developing sustainable farming system. This kind of information is always generated by innovative farmers who might cooperate with researchers and extension agents in the process of innovation development. Extension agents can learn from these farmers much more of the information they require in order to provide other farmers with good quality information.

2.2. Innovation Process

Innovation process Are ways by which knowledge and agricultural technologies are generated and used in order to respond to social needs and market-articulated and technological demands and opportunities. It was basically assumed that innovations originated from agricultural scientists, transferred by communication workers and other intermediaries, and are applied by agricultural practitioners. This mode of thinking is called linear model of innovation, as it draws one directional line between science and practice. The model is further characterised by clear division of tasks between various actors, some actors are supposed to specialise in generating innovations others concentrate on their transfer, while farmers role remains to apply innovations(Leeuwis & van den Ban, (2004).

To build coherent innovations, communication workers, farmers and researchers need to play pivotal roles in generating technological innovations that suit current challenges. The key processes would involve social learning, network building and negotiations. This would help in designing innovations that are client oriented and it can enhance ownership of the innovation and its integration in the social practice.

To incorporate the social aspect to improve communication, innovation organisations need to consider provision of new services such as facilitation of interactive and negotiations, through joint exploration with clients and stakeholders in connection with services offered and innovation processes, argues (Leeuwis & van den Ban, (2004).

There is need to focus on the relevance of research and extension. While public sector support is needed for a variety of activities, such as marketing arrangements and agro

processing if agricultural growth is to be achieved. Uganda's *Plan for the Modernization of Agriculture* (PMA*)* assigns first priority to agricultural extension and research. Further, focus is placed on achieving greater relevance in both the research and extension programs. The analysis underlying the *PMA* suggests that the low productivity observed in Ugandan agriculture today is not the consequence of a lack of research activity, nor of a lack of extension activity, (World Bank, 2001). In fact, well established institutions are reasonably active in both research and extension. The report adds that, the low productivity of Ugandan farmers can be traced to lack of adequate interface between research, extension and farmers. At present, farmers' needs do not sufficiently drive the orientation of research and extension efforts while the know-how and the technologies which are produced by the system, even when relevant, are not widely taken up by farmers.

Based on the analysis of World Bank, (2001), the emphasis of Uganda's strategy is being placed upon improving the relevance as well as the effectiveness of the process of technology generation and transfer, which focus on agricultural research and extension programs. This means doubling efforts in the extension area, but now under institutional arrangements which have been transformed to ensure that extension would become more directly responsive to farmers' needs. It also suggests maintaining the program of investments in agricultural research, as in the case of extension which is now under a set of institutional arrangements transformed so as to improve the responsiveness of agricultural research activities targeted to the needs of extension organisations and the farmers they serve.

The Government's vision as outlined in the PMA is for a more relevant and responsive extension program which would be achieved through a redesign of the public extension program. The programs focus is on enhancing intensification and productivity of smallholder agriculture, increasingly, bringing research closer to farmers' fields and making it more demand driven, linkages between farmers, extension, learning, and building on successful experiences.

There are now considerable approaches as to how to improve research-extension –farmer's linkages, observes van den Ban and Hawkins, (1996). The social model has been used less frequently in the recent years while, use of problem solving model has increased. This is because we are aware of the desirable consequences of many innovations, the fact that farmers' knowledge and experience are very important resource for good solutions of their problems. Some people may have gone too far in this direction and underestimated the contribution of research.

Most extension in less industrialised countries follows the social interaction model of research extension linkages. This model stresses the diffusion of innovations by use of media and discussions with others who already have experience with it before. But they may need to think more often in terms of the problem solving model. That is starting with the person with problem rather than research or innovations. This is because only the farmers and their families can decide the best solutions to many of their problems, especially where values are involved, such as how much money to borrow to increase farm production.

2.3. Network building

Network building is an important aspect of innovation process it is a model when utilised properly can enhance communication linkages among the stakeholders. Network are activities that widen the options and increase chances for actors to become more involved in network building, which revolves around the creation of new social arrangement through learning and negotiation. Innovation processes need to include deliberate efforts to create effective linkages between technological arrangements, people and social organisational arrangements. Agricultural scientists often mainly work on technical dimensions of technology design and pay little attention to building effective network and arrangement with prospective users and supporting institutions, which cause their technically advanced products to fall in a social vacuum. Also in industry there are examples of how technically superior products fail of because of lack of network support, while inferior products become widely accepted as a result of energy put in network building. It is relevant to note that the roles of network and networking changes in the course of innovation process. At early stage it's important to mobilise creativity and get new ideas on table which in this case may be got from outside linkages with whom little contact were previously made. Thus, in early stages of innovation processes may benefit from widening and drawing upon from weak ties in terms of low frequency of contact, distance, durability. Later in the process, however it becomes important to consolidate specific linkages and build effective support to create strong ties as noted by (Leeuwis & van den Ban, 2004). Lack of knowledge exchange among the farmers, and those who produce farm relevant knowledge has often been regarded as the key issue in the pro-poor agricultural development. Knowledge cannot be easily generated in research organizations, and passed down to the extension services and development projects which diffuse it among farmers. Innovation can be adequately promoted through a network of technology providers, farmers, government organisations and private sector agents, (Hartwich, *et al.,* 2007).

According to Horton *et al., (*2003), although network is an important platform for learning in innovation process, "networking and linkages" attributing impacts to an individual actor within complex evolving networks of actors can easily be problematic.

2.4. Social Learning

Social learning is a learning process which occurs between different social groups. Important issues here is that processes through which groups with different background and conflicting interests gain insights or not into each other's perspectives, develop mutual trust or not and are able to arrive at more convergent views. The theory of social learning is used in this research as a process of understanding change in the field of agricultural innovation deign. Social learning is linked to process of social action which is triggered by particular needs. In the learning process there are reflections and communication which may inevitably support or inhibit learning inside and outside the social system as pointed out by (Arjen, 2007). It can be argued that behavioural and cognitive learning can, and must be supplemented by constructive approaches to individual, organizational and systemic learning.

Knowledge is created within organizations which involves a number of implicit sources that are sensed through social interactions. Organizational learning takes place in the context of social interactions. Kang *et al.,* (2007), consider that organizations are social communities specializing in knowledge exchange.

Innovation requires the existence and development of individual capabilities among farmers. Similarly, it requires the deployment of learning processes among a range of actors including knowledge and technology providers, farmers, research institutions, implementing organisation and other support from government and other agents. Social learning can

manifest itself in a variety of forms. It can range from capacity building or training of individuals, which often occur in college or higher educational programme to informal but structured processes in the community or organisation which use action learning, reflection and change to improve the effectiveness of a strategy, programme plans for sustainability. Learning challenges established structures and empowers individuals and groups to enable change. Sustainability will require social learning at all levels, (Arjen, 2007).

A learning experience has long been recognised as more important than task or lectures. Learning theories emphasises the importance of practice and previous experience. This is an important aspect of adult learning; adults learn in order to solve a particular problem and draw lessons from their previous experiences. This should be the starting points of designing innovations if there is need to improve the sustainability of innovation by the farmers. This is also in line with Jarvis *et al*., (2005), he urges that adult learning is self directed or self-planned which is goal oriented.

2.5. Learning

Learning will be looked at as the process to create positives change toward improving extension service delivery systems and utilisation of experiences gained and used to make decisions. The literature will look at factors influencing learning among the stakeholders in the innovation process. The adult learning theories will not be so much the main focus in this research at this moment.

According to Jarvis *et al.,* (2005) learning takes in two folds at individual and in groups. At Individual it refers to building knowledge through reflections about external stimuli and other sources and through personal elaboration of individual knowledge and experiences in light of interactions with others and the environment.

Learning may be positive in the sense that knowledge acquired is practiced and is negative when there is no acceptance or implementation of the knowledge, information and technology provided. Learning is a social process although the effects are felt and can change at individual level. Although culture and social context form the background of learning and strongly influenced the process involved, all learning remains at individual level and extends in social context.

2.6. Negotiation

Negotiation is a process of communication, in which parties may fulfil their interests by solving discussed problems (Raiffa 1982). This process may be examined from a static perspective of the negotiation situation, where various factors determine a structure and thus an outcome of the negotiation, and from the dynamic perspective of the process, during which parties collaboratively are constructing to the outcome. The first perspective is quite well described in the negotiation literature, whereas we still lack knowledge about how the process of converging to the common agreements proceeds (Bazerman *et a*l., 2000).
Learning is related to the process of negotiation which results from differences of interest represented inside and outside the social systems involved; the management of the differences can be consensus-oriented or disoriented, or a combination of both. The creative tension between consensus and dissent can trigger learning. As we have seen that innovations required coordinated action and is a collective process. Where different actors and stakeholders are involved, in meaningful change conflicts is likely to occur. Since such changes affect the value and interest of the stakeholders. Therefore all stakeholders should be involved in the process and the best way to resolve the conflict is through meaningful way such as negotiation to arrive at shared understanding. Negotiation can be divided into two distributive and integrative. In distributive the stakeholders tend to hold to their own

perspectives and positions. In integrative process the stakeholders develop new and partly shared problem definition and cognition on the basis of social learning, (Leeuwis & van den Ban, 2004).

2.7. Communication

Communication is exchange of experiences and ideas. It is not just the transfer of facts but an interactive process that work in a circular way. It is conversing with people with no permanent receiver and sender. In communication the roles of sending and receiving change hands depending on who is doing the talking and who is listening. Communication can also be defined as a process through which people exchange meanings. To exchange meanings, people share through varieties of devices: words and language drawings people can make deliberate attempt to communicate meanings to others, (Leeuwis & van den Ban, 2004).

Although communication is a form of human interaction, some authors like Rafaeli made distinctions of communication and would prefer to call the humanised, interactive model, places emphasis on how people use communication or messages. It stresses on genuine dialogue, free and proportioned opportunity to exert mutual influences, and rejects the idea that persuasion is the chief role of communication. According to Rafaeli, (1988) feedback is imperative; its importance lies in the opportunity it creates for understanding the other persons' point of view and, thereby, ensuring co-orientation influences. Knowledge and information are essential for people to respond successfully to the opportunities and challenges of social, economic and technological changes, including those that help to improve agricultural productivity, food security and rural livelihoods. But to be useful, knowledge and information must be effectively communicated to people.

Training is provided in communication skills and participatory processes essential for strategic, targeted communication activities that address specific audience needs and in monitoring and evaluating communication outcomes and impacts.

Communication for development encompasses many different media and approaches. For instance, folk media and traditional social groupings, rural radio for community development, video and multimedia modules for farmer training, and the internet for linking researchers, extension workers and producer groups to each other and to global information sources. Whether villages are connected to the outside world through modern telecommunications, learning about health care from folk proverbs and songs or listening to radio broadcasts on better farming practices, the processes are the same, therefore people communicate and learn together, (http://www.fao.org/sd/2001/KN1007_en.htm).

Knowledge and information through agricultural research are essential for improving food security. But to be useful, agricultural knowledge and information must be effectively communicated to farmers. A time-tested means of effective knowledge and information dissemination to farmers is participatory agricultural extension. However, weak linkages between extension and research often result in systematic knowledge and information "bottlenecks" and limit the effectiveness of research to contribute, (FAO, 2003).In Uganda there has been several communication channels used to convey agricultural knowledge. NAADS and NARO of late collaborate and run a web portal for a pilot project to link research and extension to strengthen information and communication. The objective is to develop the necessary institutional structures and processes, and build capacities, to improve communication and exchange of information between agricultural research and extension service providers in the country. Agricultural Research and Extension Network (ARENET) offers opportunities for the farming communities, researchers, extension agents and the

private sector to communicate among and to share their information knowledge and experiences themselves, (www.arenet.or.ug).

In Uganda mobile phone network coverage increased from 36 percent in 2003 to 92 percent in 2005. The increased coverage, rather than the possession of individual mobile phones, induced market participation by reducing transaction costs in crop marketing and increasing the prices received for sales, especially for perishable goods. Food net, a multi-partner public network in Uganda, collects the latest market price information for coffee and maize, which farmers can access at very low cost through short message service, SMS,(Anderson, 2007).

2.8. Participation

The word participation has been widely used in many contexts and to some people it means to "take part in" or to "be involved in". In this sense, everything people do is "participation" hence such literal definition does not help much to inform interventionist on how to involve stakeholders in innovation processes. On the one hand, a definition by Bank (2001) cited by Leeuwis & van den Ban, (2004) "participation is a process through which stakeholders' influence and share control over developmental initiatives and the decisions and resources which affects them". From this definition it can be derived that a process cannot be label "participatory" if 'influencing' and 'sharing' of initiatives, decisions and resources do not occur. Similarly, participation literature suggests numerous of normative principles that must be adhered to during participatory process as observed by Chambers, (1994a), Pretty *et al*.; 1995 and Fals Borda, (1998a).From these it can be derived that: all stakeholders should be involved in the participatory process; participant must have equal opportunities to speak out, participants need to speak out freely. The multiple perspectives including values of interest, local knowledge and needs of the stakeholders must be explored and taken into account, 'ownership' need to rest with participants as much as possible. Similarly, participation must lead to the empowerment of the participants and power imbalances among the stakeholders need to be as far as possible. IAIP2, (2005) defined participation as the involvement of all parties who are potentially have an interest in development or project, or may be affected by it. It entails a wide range of activities that can be from providing information, through consultation to direct involvement of the community in the aspect of decision.

Stemming from the definition of participation, public, participation is another concept that elaborates more on participation by including the public which can be stakeholders, communities or organisations which participate in the process. According (IAP2, 2005) participation is a process that involves the public in problem solving or decision making and use public input to make decisions. Public participation is the process leading to a joint effort by stakeholders, technical specialists who work together to produce better decisions than those that act independently, cited by IAIP2, 2005) from (Greying, 2005). The terms participation, involvement, and engagement are used more or less synonymously to denote a process by which individuals and groups come together in some way to communicate, interact, exchange information, provide input around a particular set of issues, problems, or decisions, and share.

2.8.1. Levels of Participation

The levels and forms of participation have also been looked at by various writers in different ways and in this text a few have been captured. According to (IAIP2, 2005) this has been categorised into five different levels, and they include the following.

The first level is to inform, that is to provide the stakeholders with balanced information to enable them understand the problem or community. The second level is to consult where the objective is to obtain the feedback on analysis or decisions. It involves acknowledging concerns of and providing the feed back to the stakeholders' or community on how to influence the decisions. To involve, has the overriding objective to directly work with stakeholders throughout the process to ensure that concerns are understood at very early stage and directly reflected in the planning, assessment, implementation and management of particular activity. To collaborate entails working with stakeholder as partners on each aspect of the decisions, including development of solutions and identification of the preferred solutions, and fifthly, to empower where the objective is to place the final decisions in the hands of the public or community. Mean while, World Bank (2002) identifies three levels of participation as;"passive participation", this levels dissemination of information to stakeholders such as through awareness campaign, secondly "Consultative participation", where stakeholders are consulted before the organisation make decisions but they do not share the decision responsibilities, and thirdly, an "Interactive participation", in which stakeholders are involved in collaborative analysis and decision making. Learning methodologies are used to seek multiple perspectives.

2.8.2. Importance of Participation

Effective stakeholders' participation involves people from the outset, proactively solicits the involvement of stakeholders representing all three dimensions of sustainability, provides them with sufficient and accessible information to contribute meaningfully, and build the capacity of the stakeholders to participate. The benefits of effective public participation in achieving sustainable development have been reported worldwide. Stakeholders can assist by providing information and identifying alternatives problems and solution.

Participation assist decision makers in establishing the point of sustainability for each project by contributing essential information and knowledge to project planning and design, and by clarifying the degree to which stakeholders are willing to accept or live or live with trade-offs. Thus, stakeholders' participation assists decision- makers in making informed and integrated decisions about the sustainability of the project (IAIP2, (2005).

2.9. Knowledge Creation and Management within Organisations

Defining knowledge from a constructivist perspective, it is argued that all knowledge management sub-processes begin with the collection, sharing, storing (or vice versa) and use of information. It is argued that when information is used for a different purpose than the one it was initially used for, then, knowledge is produced. It is also important to highlight that knowledge is only valuable once it is related to problem, a case or an issue. Moreover, the more knowledge is applied and used, the greater the organisation's benefits it yields, Chalkiti and Sigala,(2008).The double loop learning possibilities of knowledge management processes should also be highlighted, Argyrols and Schroon, (1978).

2.9.1. Knowledge Creation

Organizational knowledge creation is dependent on the ability of organizational members to exchange and combine existing information, knowledge and ideas, (Smith, Collins and Clark, 2005). This exchange process comprises of engaging in network and communication throughout the stakeholders so that everybody involved can learn from each other. The process of combination of connecting ideas those not so far connected to create new knowledge. Monika and Takeuchi, (1995) explained the organizational knowledge creation process as transformation of tacit knowledge into explicit and vice versa. It is a four-stage

process consisting of socialization, internalization, combination, and externalization as shown above. The socialization includes sharing of individual feelings, emotions, experiences etc. Externalization is the process of translating tacitly held knowledge into comprehensive forms of knowledge that can be understood by other individuals as well. Combination means the conversion of such explicit knowledge into more complex sets so that it can be easily diffused. Internalization is the process of converting such complex explicit knowledge into organizational tacit knowledge, which is held by organizational participants.

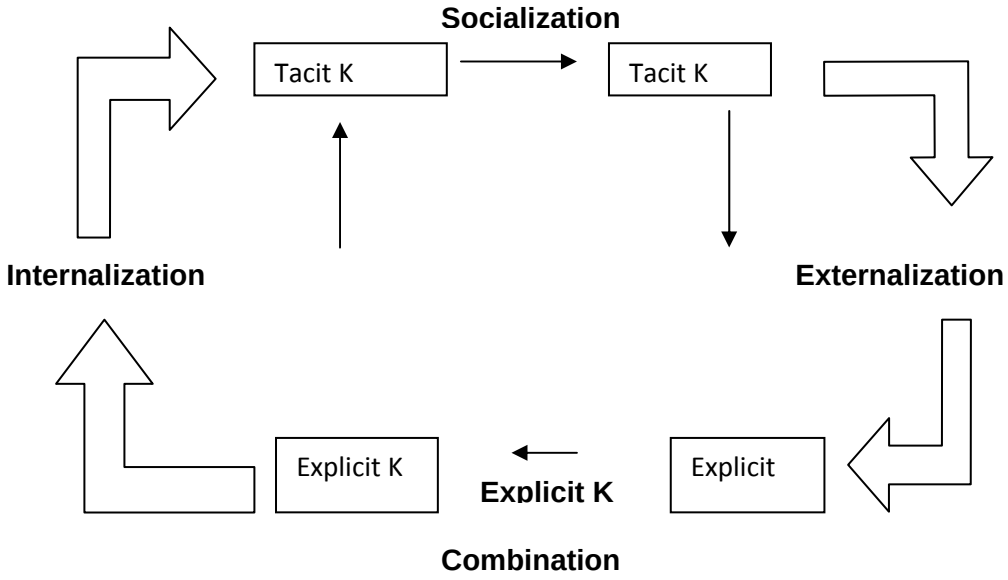

Figure 2. 1: Process of knowledge creation

Adapted: From Monika, I. and Takeuchi, H. (1995).

Constructivism argues that knowledge is created by learners as they attempt to draw meaning from their experiences, (Driscoll, 2000) thus a posterior, while social constructivists complements the, (Monika and Takeuchi, 1995), SIEC model by adding the social factor to the equation. According Driscoll, (2000) knowledge is produced from the social interaction of individuals with learning being a collaborative action fostered in social groups.

In creating knowledge within organizations, tacit sources will be open when organizational members extrapolate from past experiences, observations of others' success or failures and perspectives of what people consider being appropriate standards at particular situations, Turner and Mukhija, (2006).

The stock of individual knowledge within organizations comprises of individual experiences, education and functional heterogeneity of individuals engaged in. Ego networks and relational contacts in organizations concern the number of direct contacts, network range and the strength of network ties, as examples. Organizational climate means the values, beliefs, norms, and assumptions about how the organization should function. As such, organizational knowledge creation needs different bodies of knowledge to be integrated across the organization in order to create new knowledge, (Coff, Coff and Eastvold, 2006).

The figure below presents the vertical line of steps exhibit to be the process of creating organizational climate for knowledge creation.

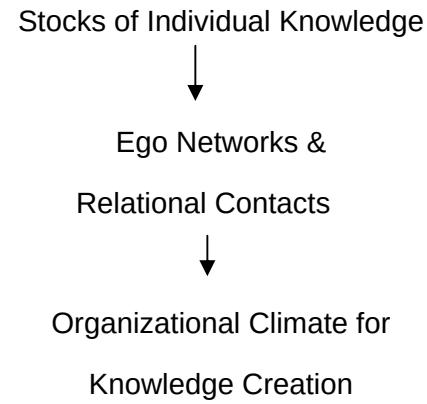

Figure 2. 2: Creation of Organisational climate for knowledge creation.

Thus, in organizational knowledge creation process, the individual knowledge stocks are combined and organization-wide relational networks are constructed.

Resulting in a particular climate for knowledge creation within organizations is created.

2.9.2. Knowledge Management

Knowledge management is about 'getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organizational performance' (O'Dell and Jackson, 1998).

As per Turner and Makhija (2006), the knowledge management process within organizations includes acquisition, transfer, interpretation and application of knowledge.

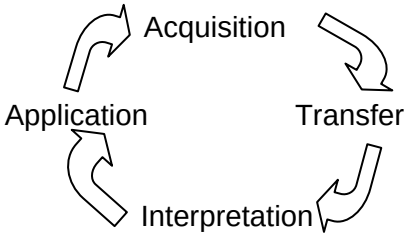

Figure 2. 3: The knowledge management process

These knowledge processes within organizations seems to be analogous to the process of creating organizational rationality, which can be viewed as a random constructive process in any organization.

CHAPTER 3: RESEARCH METHODOLOGY

This section provides general overview of the geographical, demography, economic and agricultural systems in the Uganda; with specific reference made to Lira district where the study was conducted.

3.1. Geography

Uganda is a landlocked country located in the Eastern region of Africa. It is bordered by Kenya to the East, Tanzania and Rwanda to the South, Democratic Republic of Congo to the West and Sudan to the North. The total area covered is approximately 241,039 km^2, 81% of which is suitable for agriculture. The remaining 19% is constituted by lakes, rivers, swamps and forests.

Lira District is located in Northern Uganda and is bordered by the districts of Pader in the North, Abim and Amuria in the East, Dokolo in the South-east, in the South; and Apac in the West. The district covers approximately a total area of 4,337 km^2 of which 3,482 km^2 is land area. The highest point is the peak of Otuke (1,600 m above sea level) in the extreme northeast of the district.

Table 3. 1: Lira District Area size in km^2 by subcounties

No.	**Sub-county**	**Area size (km2)**
1	Amach	320
2	Adekokwok	133
3	Ogur	273
4	Lira	85
5	Barr	293
6	Aromo	186
	Erute County Total	**1,290**
7	Aloi	408.7
8	Omoro	531.36
9	Amugu	193.41
10	Apala	351.31
11	Abako	335.17
	Moroto County Total	**1,839.95**
12	Olilim	445.21
13	Okwang	216.01
14	Adwari	316.35

No.	Sub-county	Area size (km2)
15	Orum	314.00
	Otuke County Total	1,291.57
	District total	**4,337**

Table 3. 2: Lira district administrative Units

Administrative units	Numbers
Counties	4
Sub counties	20
Parishes	123
Villages	1,613

Figure 3. 1: Administrative map of Lira District

Source: DDP (2009-2011)

3.1.1. Climate

The climate is continental, modified by the large swamp areas surrounding the southern part of the district. The rainfall in the district is bimodal with one peak during April-May and the other in August-October. The average annual rainfall in the district varies between 1200-1600 mm decreasing northwards. The rainfall is mainly convectional and normally comes in the afternoons and evenings. The average minimum and maximum temperatures are 22.5^0C and 25.5^0C, respectively. Absolute maximum temperature hardly goes beyond 36^0C, and absolute minimum hardly falls below 13^0C.

The climate favours the production of a variety of tropical and sub-tropical agricultural products throughout the year. Some temperate crops however also do flourish in the highland areas especially in the southern part of the country. The soils and climate permit low in put low output farming characteristics of subsistence smallholder farmers who dominate the farming sector.

The otherwise continental climate of the district is modified by the large swamp area surrounding the southern part of the district. The rainfall in the district is bimodal with one peak during April-May and the other in August-October.

3.1.2. Temperature

Uganda exhibits an equatorial climate with mean annual temperatures ranging from 18 to 30^0C. The precipitation is fairly reliable varying between 650mm in the semi arid North-east to over 1800mm per year along the shores of Lake Victoria in the south, the highland areas in the west and east, the mid west and parts of the northern regions.

Lira district is located in the hotter region of the country with an average minimum and maximum are 22.5^0C and 25.5^0C, respectively. Absolute maximum temperature hardly goes beyond 36^0C, and absolute minimum hardly falls below 13^0C.

3.1.3. Rainfall

The country is characterised by bimodal rainfall pattern in the southern part with peaks occurring between March-May and around August to early November with no pronounced dry season. The Northern and Eastern part however, is punctuated with a marked dry season from mid November to early March and protracted rainy period with only mild interruptions around July (MLWE, 2002).

In the case of Lira district the Equatorial Trough which brings rainfalls passes over the district. The South easterly which also brings rains to the district passes over Lira. Land and sea breezes are common in the district. Wind run is low (1.0 to 4.0 m/sec) during the rainy season and moderate (4.0 to 8.0 m/sec) during the dry season.

The average annual rainfall in the district varies between 1200 to 1600 mm decreasing northwards. The rainfall is mainly convectional and normally comes in the afternoons and evenings.

3.2. Demography

The National housing census of (2002) reveals that the Uganda national population stands at 24.2 million. The projection estimated to be 29.8 million people of which 87% live in the

rural areas, earning living on agriculture as means of livelihood. The smaller population of about 13% live in the urban areas and majority living in the capital city Kampala, UBOS, (2008).

Lira district has the lowest population density with about 49 persons/km^2 and average land holding of 3.5 ha/household. The population of the district is estimated at 530,342 people with 50.1 and 49.9% being females and males respectively. The rural population constitutes 83.1% (440,561) while 16.9% live in the urban area. The population growth here is however, highest estimated at 3.7% compared to the national average of 3.4%, Population and Housing Census, (2002).

Table.3. 3 Shows the population of the district by subcounties

No	District/Sub – county	Male	Female	Total
1	Abako	23,619	24,777	48,396
2	Adekokwok	31,767	31,864	63,631
3	Adwari	12,259	12,367	24,626
4	Aloi	27,968	29,089	57,057
5	Amach	25,461	26,635	52,096
6	Amugo	12,671	13,150	25,821
7	Apala	19,143	19,788	38,931
8	Aromo	16,774	17,389	34,163
9	Barr	19,960	20,556	40,516
10	Lira	12,107	12,842	24,949
11	Ogur	25,338	26,519	51,857
12	Okwang	7,454	7,901	15,355
13	Olilim	8,554	8,696	17,120
14	Omoro	18,523	18,597	37,120
15	Orum	10,523	10,796	21,319
16	Adyel	19,178	19,543	38,721
17	Ojwina	18,589	18,448	37,037
18	Lira Central	11,286	10,955	22,241
19	Railways	3,120	3,080	6,200
	District (total)	**324,294**	**332,992**	**657,286**

(*Source DDP for Lira)* District Total projected population 2009

3.3. Agricultural Production Systems in Uganda

Uganda has a variety of agro-climatic conditions across its regions. There exist five distinct farming systems that can be defined by rainfall pattern and soil characteristics. These include the high rainfall area around Lake Victoria where bananas, coffee, and other food crops are grown; eastern Uganda, with two distinct rainy seasons separated by a four-month dry period, where the main crops include millet, cassava, groundnuts, maize and cotton. Others include the northern region, where the rainfall pattern restricts cultivation to one season, with the main crops being cotton, maize and millet; the mountainous areas, where the altitude permits the cultivation of temperate fruits, vegetables and some traditional food crops; and north-eastern Uganda, where the rainfall of 80 mm per year is suitable for pastoralism and the cultivation of sorghum and millet, World Bank, (1993).

The country's natural environment provides good grazing for cattle, sheep, and goats, with indigenous breeds dominating the livestock industry. The most important cash crops are coffee, tobacco, cotton and tea. Coffee has been the main foreign exchange earner since colonial times. Its share in total agricultural exports was about 50 percent in the 1960s, grew to more than 80 percent in the early 1980s, but has fallen from 60% to 20% since then, Maize and beans have become important non-traditional exports, especially in regional trade.

The number of persons dependent on agriculture increased from 3.7 million in 1960-64 to 9.4 million in 2000-2004. During the same period, the agricultural land area increased from 9 million to only 12 million hectares. Ugandan agriculture is largely dependent on smallholder production, where own production constitutes a significant proportion of the consumption basket. Large-scale estates are only significant in the tea and sugar sub-sectors.

In 2001/02 the subsistence sector accounted for 44 percent of total agricultural output, compared to 52 percent in 1991/92. Large-scale estates are only significant in the tea and sugar sub-sectors.

Typical diet varies from region to region due to differences in staple crops, of which the most important are plantains (matooke), yam, cassava, maize, millet and sorghum.

Food production has not kept pace with population growth. Based on FAO (2006) statistics, mean dietary intake deteriorated between 1992/93 and 1999/2000, from 1,890 calories per day to 1,640 calories per day. The proportion of the population receiving less than 60 percent of required calories rose from 32 percent to 44 percent over the same period, (Opolot *et al.*, (2006).The production of cotton, tea, and tobacco virtually collapsed during the late 1970s and early 1980s. Since the late 1980s, the government’s export strategy has concentrated on reviving traditional exports as well as encouraging diversification in commercial agriculture that would lead to a variety of non-traditional export crops.

Narrowing down to Lira district where the study is conducted, the economy is basically a subsistence type, with 81% of the population engaged in subsistence farming. Industrialisation is very low with only 3.1% of the population involved in cottage industries. The traditional economic / cash crop is cotton which, in recent years had been on decline where some non-traditional economic crops have taken over. These include; simsim, rice, maize, beans and millet. These crops are in high demand and they do not only play their traditional role as food crops, but are nowadays cash crops as well. There are, however, some crops that are becoming popular in the district as economic crops these include sunflower, soya beans, banana, citrus and other fruit trees.

3.4. Trends in Agricultural Extension in Uganda

Agricultural extension was introduced in Uganda by colonial government in the late 1800s since then it has gone through a number of changes over the years. These were aimed at improving agricultural production and productivity, (Semana, 1999). This was the beginning of agricultural innovation in the country which went through a number of stages.

From 1898 to 1956, “extension by compulsion”, extension was characterised by emphasis on the distribution of planting materials of cash crops for export. A major method used was enforcement of by-laws requiring farmers to strictly follow specified agricultural practices such as soil and water conservation. There was also establishment of research stations to carry out agriculture and forestry research in Uganda.

1956 to 1963 saw “extension strategy”, which was based on progressive farmers, through identifying early adopters and concentrating them, by providing technical advice and supporting them with inputs and credits. It was thought that they would be models and the rest would follow.

The period from 1964 to 1971, extension service became more professional through training and use of appropriate extension methods. The roles of the extension workers became more educational in addition to teaching farmers what to do, they explained the “why” and “how”. Emphasis was on projects such as the Extension Saturation Project, Young Farmers of Uganda. Farmers were encouraged to organise themselves to meet more of their own needs thus creating more ownership and a community spirit. It was based on “single loop learning”, there was no room for questioning the underlying principles in the approach.

The period 1971 to 1980 presented the “dormant phase”. This was characterised by disruption of the economy. Service delivery was greatly reduced, as did the effectiveness of the extension staff as the latter concentrated on selling agricultural materials, tools and equipment contrary to their professional roles and farmers remained on the side of recipient of inputs.

On the one hand, 1981 to 1991, also referred to as the “revival phase” was when recovery or rehabilitation projects such as Agricultural Development Project, Agricultural Rehabilitation Project, and South-western Agricultural Projects were implemented in several districts in the country, MAAIF, (1998). This was the revival of the professional roles with strong focus on training, better linkages with research, farmers and other institutions including NGOs. Training and Visit, (T&V), was a major extension approach. Effectiveness, was however, undermined by organisational issues brought about by “parallel extension services” in different agricultural sector ministries and services being based on commodities and / or projects.

1991 to 1998 characterised “policy reform” phase several reforms including: liberalisation and privatisation which attracted pluralistic form of extension services which resulted to out sourcing advisory services provision through by public-funded programmes. National Agricultural Advisory Services (NAADS) was adopted in Uganda to curb the deficiencies in previous extension approaches. The mandates of NAADS are to provide agricultural improved technologies to farmers, market linkages, and information access to farmers.

Based on the above background, agricultural extension systems in Uganda have historically been based on linear model of delivery of services. This has led to increasing pressure on extension services to respond to ever changing challenges to show impacts, increase food production and income of the rural people but the results have remained unsustainable for a long time.

The challenges call for changes in traditional public extension system which is now seen as out dated, top-down, paternalistic and inflexible, subject to bureaucratic inefficiencies and therefore less able to cope with the dynamic demands of modern day agriculture, Rivera *et al.,* (2003). There are calls for re-examining the term "extension" as it is seen to reinforce the thinking in terms of 'downward technology development and transfer processes'. There is need for a new strategy to look at extension-research-farmers linkages by considering the social aspects of agricultural innovations. The original concept of extension was that of bridging the gap between the farmers and the sources of knowledge. Such included organisations generating knowledge and technologies such as research centres, universities and administration. This, according to, Leeuwis and van de Ban, (2004) is called "linear model". The linear model does not take into account the knowledge of the farmers as being partners in extension. And the social aspects of innovations were neglected. The focus was on only the technical aspects of innovations, this resulted to poor functioning of farmers-market-extension-research linkages and lack of sustained success by the research and extension system to respond to the real needs of the farmers, (Tizikara *et al.*, 2006) cited by (Heemskerk *et al.*, 2008)

During the last decades this approach has been repeatedly put in question. More balanced approaches have become common where the focus is not only on the supply side but also on satisfying the demand for the production of new knowledge. In agricultural, research and extension were based on the assumption that agricultural scientists generate technologies which extension experts transfer to users, ignoring local knowledge creation and sharing, as well as the relevance of articulating demands by farmers and promoting their self-confidence and empowerment.

First-generation knowledge management, in the corporate sector as in agricultural development, emphasizes a top-down and technological perspective where the main goal was getting the right technological information to the right people at the right time. In response to this there has been reforms geared toward improving this situation. In Uganda, this resulted into creating the National Agricultural Advisory Service, NAADS.

3.5. National Agricultural Advisory Service (NAADS)

Uganda's major transformation towards economic growth and poverty reduction began in the late 1980s with the adoption of the 'Vision 2025 Strategy', which set out the broad national ambitions, (Tizikara *et al*., 2006). The Poverty Eradication Action Plan, (PEAP), outlines the necessary policy actions for social transformation. The low productivity in the agricultural sector was diagnosed as resulting from poorly functioning farmer-market and extension-research linkages and, the lack of sustained success by the research and extension systems to respond to the real needs of the farmers, (Tizikara *et al*., (2006). In response to these issues a comprehensive Plan for the Modernization of Agriculture, PMA, was adopted in order to address the factors that undermine agricultural productivity, namely: poor husbandry (crops, livestock and natural resources), minimum use of improved inputs, limited access to technical advice and inadequate access to credit. Others include poor transport, communication and marketing infrastructures; and insecure land tenure and user rights.

Reforms to the national extension system by establishing the National Agricultural Advisory Services became the main driving elements behind the implementation of the PMA. The joint-donor/government-financed NAADS programme focused on increasing farmers' access to improved knowledge, technologies, information and associated services that would address the needs and opportunities of, mainly poor smallholder, farmers in a sustainable manner. Core aspects of the NAADS programme include the shift from public to private extension service provision and giving smallholders access to relevant services, which is

also achieved by contracting out of services by the local government on the basis of these farmers' demands. In order to make this coordinating role of outsourcing services possible, NAADS was set up as a statutory parastatal organization with a stakeholder Board and an Executive Secretariat. The tendering and contracting procedures at district levels were modified to allow sufficient control over the awarding of contracts for services.

The shift from a public extension service system to more pluralistic advisory services system (based on contracting services using public funds) required major changes in the relationships between stakeholders as well as organizational reform. The key stakeholders in the outsourcing process are the governments, at local and national levels, farmer's organisations and the private service providers.

The responsibilities of public employees have shifted from being service providers to quality assurers, by developing quality standards, registering service providers, monitoring and evaluating the effectiveness and impact of programmes, and technical auditing. The administrative and governance structure within which the NAADS programme is being implemented consists of the National and Local Council (LC) structures. Sub-counties are the leading local government entities for fulfilling the key functions in outsourcing which comprise; planning, implementation, contracting, monitoring and evaluation.

In Lira district NAADS was rolled out from the financial year 2002/03.It started as a pilot programme in three sub counties of Adwari, Omoro and Ogur. It was gradually expanded, within a period of four years, to cover all the 20 sub counties in the district, including the four divisions in the municipality.

Box1: Objectives of NAADS Programme

The main NAADS principles are: client-empowerment, decentralization, efficiency drive, roles for the private sector and civil society, contractor-provider accountability, separation between extension service management and provision, diversity in funding, incentive systems and partnership development. Among other things, NAADS was designed to:

1. Create alternative options for financing and providing advisory and technical services appropriate for various types of farmers

2. Shift from public to private advisory service provision, while ensuring more decentralization to bring the control of advisory services closer to the farmers;

3. Empower subsistence farmers to access private extension services and market information;

4. Develop private sector service capacity, professional capability and systems; and,

5. Enhance the commercialization of agriculture, including intensifying production and specialisation.

Source: GOU/NAADS, 2000

Adopted from: Heemskerk et al., (2008).

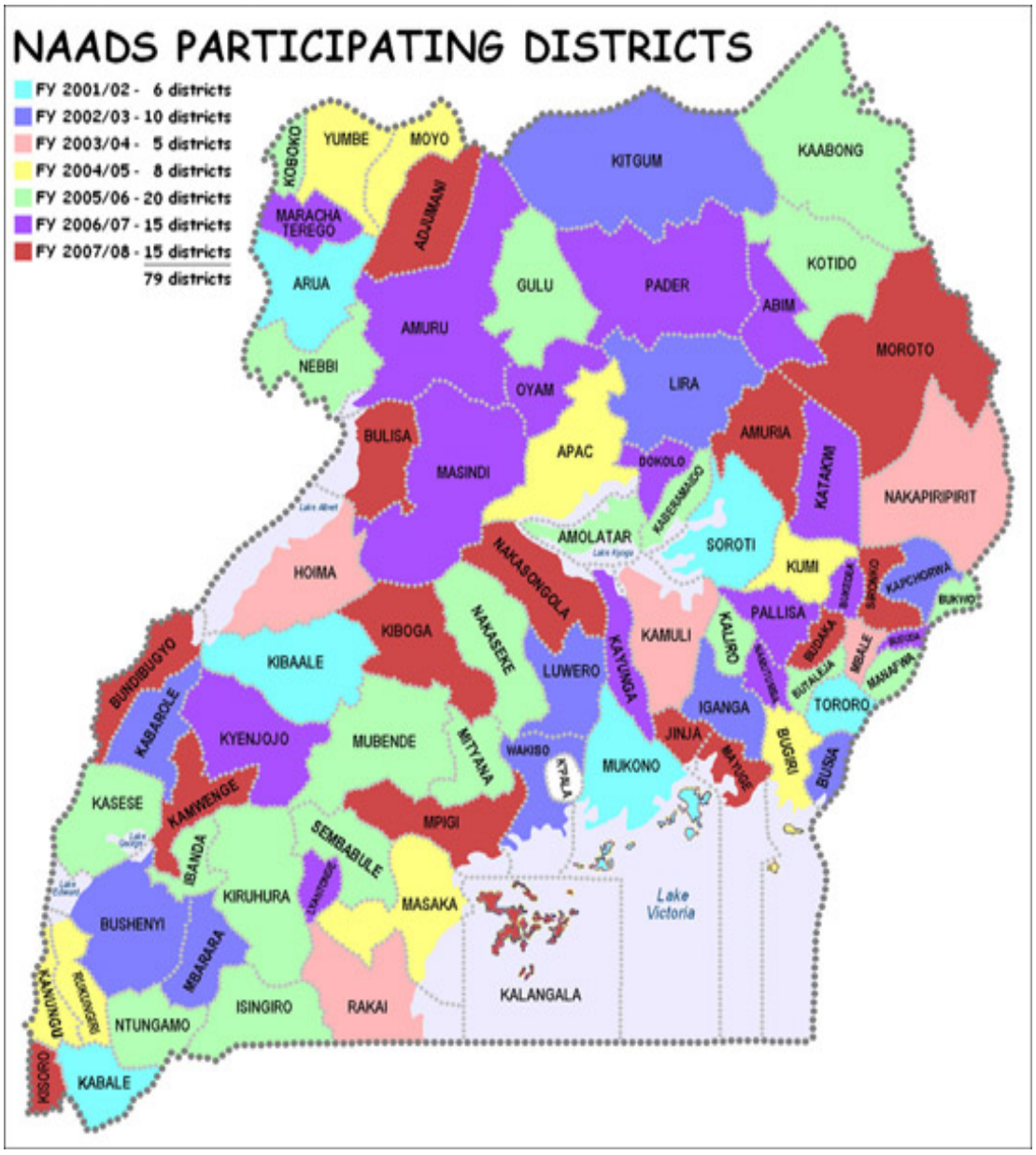

Figure 3. 1: Current NAADS coverage in Uganda

3.6. Study Area

This study was conducted in Lira district, located in Northern part of Uganda. The district has 20 sub counties including four divisions in the municipality. All the sub counties are now under NAADS coverage. Ogur subcounty was selected as case study area for the research. This is one out of three sub counties where the programme started in the financial year 2002/2003. The district was selected because the extension organisation which is the focus of the research is operational. All the sub counties are now operating within the new system of extension service of National Agricultural Advisory Services, as a new way of extension service delivery system in the district. For the purposes of this study, was important to focus on one subcounty because of the strategy of the research which is a case study.

Inadequate concerns have been put on the innovation processes of the agricultural technologies to find out the dynamics in the systems of innovation but all along the focus has been only on the technical aspects of the innovations.

There have also been several reforms for example unified extension system, Training and Visits and Farmer to farmer. Currently the district is now implementing NAADS extension service delivery system since 2002/3. There is no feedback sharing (learning) among the stakeholders involved in the extension service delivery in order to generate lessons for improvements. There is need to determine strengths, weaknesses and opportunities that exist between farmers and extension service delivery system to improve the linkages.

To analyse the factors that have been influencing the innovation process in the district and provide recommendations to the organisation for improvement of extension service delivery in the district.

3.7. Study Strategy

The study was qualitatively conducted as case study on the innovation processes in Lira District. It involved field work and desk study of literatures from NAADS office, agriculture (crops) sector, and planning unit was reviewed. The following literatures were consulted during the desk study both at the district and subcounty of the study. Implementation guidelines, quarterly and annual activity reports, monitoring and evaluation reports, review reports, NAADS master document, a three year district and sub county development plans for 2008-2011, Agricultural Journal and World Bank documents.

The case study strategy was used to get an in depth understanding of the factors affecting innovation processes in the district. Also to examine the communication linkages that exist among the stakeholders in the extension systems and the process of negotiation in resolving conflicting interests that may arise during the implementation of NAADS programme.

3.8. Respondents

Three categories of the respondents were interviewed. The first categories were five district technical staff. They are the head of production and marketing department, and heads of sectors of agriculture, veterinary, entomology and fisheries. They are responsible for technical staff in their respective sectors and responsible for quality assurance and technical auditing of service providers in NAADS programme.

The second category of the respondent is the NAADS staff which included the District NAADS Coordinator, four Sub county NAADS Coordinators, and two Service Providers.

The District NAADS Coordinator has been the one coordinating the activities for eight years now, and the service providers have been in the field with farmers. The sub county NAADS Coordinators oversee the implementation of the NAADS activities at subcounty level whereas service providers are responsible for agricultural service provision to farmers. Finally, the last category with fifteen, (15) farmers taken from five different farmers groups were interviewed. They are the target of NAADS programme and the final users of the technologies advanced by the programme.

3.9. Data Collection

The data was collected through interactive focus group discussions and individual interviews and stakeholder review meeting. Pre-tested checklists with structured questions were used to guide the discussions which focused on the factors influencing innovation process social learning, networking and negotiation processes and, the various roles of different stakeholders. The discussions were arranged on different days for different categories of stakeholders. The discussion started with the technical staff from the district, followed by NAADS staff and finally by farmers who were followed in their villages of residents.

The data was also collected during stakeholders review meeting that was organised at the district. All the sub counties attended the review meeting, issues and factors that were affecting the implementation of the programme were discussed. This triangulation provided a very good forum to compare what was in other sub counties with the case study area.

3.10. Data Analysis

The data collected was analysed qualitatively by describing, summarising and discussing the findings got from the respondents. The descriptions and discussions are grouped under the following themes; the stakeholders and their roles, learning points from different stakeholders, factors influencing innovation processes, communication linkages among the stakeholders and negotiation process among the stakeholders.

3.11. Limitations of the Study

The study was conducted when there was a state of confusion in the implementation of the NAADS programme in the district as there were some investigations going on in the programme management. Some of the programme implementing staff members were scared of being implicated during the investigation.

The time allocated for data collection and entry was a limited as such it could not be able to make broad coverage in terms of respondents. The respondents were so much scattered that it was not easy to cover a sizable number in a day. Therefore, several unbudgeted field trips were made which at the end, became very expensive as there were no funds allocated for data collection.

CHAPTER 4: RESULTS AND DISCUSSIONS

This chapter presents the results and discussions of the study. The discussions start with a focus on the identified stakeholders and their roles in the Extension systems under NAADS. The stakeholder roles are subsequently followed with a discussion on the factors that are facilitating and hindering innovation processes. It then followed with an analysis of the communication linkages that exist among the stakeholders in the implementation of NAADS in Lira district. The discussion then concludes with the analysis of the negotiation processes involved among the stakeholders.

4.1. Stakeholders and their Roles in the Extension System under NAADS

There are a number of stakeholders involved in the NAADS extension approaches and they perform different roles. During the study a number of stakeholders were found to be key players in the implementation of the programme. Some stakeholders were however, found to be redundant and passive with their roles actually not substantially felt in the implementation of the programme. The roles of the stakeholders however, were found to be changing from time to time. New stakeholders continue to be incorporated into the programme, for example there has recently been a direct involvement of political leaders in the implementation of the programme. The most notable stakeholders involved in NAADS implementation were found to include the following;

1. Political Leaders

The political wing starting from the Member of Parliament, MP, of the constituencies are supposed to participate in the NAADS programme including district and sub county political teams, who are key players in NAADS. There has been, however, limited supervision and monitoring of the NAADS programme by these political organs. According to the implementation guideline (2002), political leaders only performed political supervision, and as such would only do monitoring and approval of plans in general terms. Implementation guideline (2008), however, recommends that political leaders undertake the role of mobilization, enterprise identification and development, planning and follow up of the entire processes involve in the programme.

2. The National NAADS Secretariat

NAADS secretariat, a semi autonomous body is the management apex, is responsible for the management of the NAADS programme on behalf of Ministry of Agriculture Animal Industry and Fisheries, (MAAIF). Their roles include monitoring and supervising the programme activities at district and sub counties levels. Their roles also transcend to development of policies and guidelines that streamline the programme activities. The secretariat undertakes to provide technical and logistical support to the NAADS programme at district and sub county levels of governance. Direct supports in terms of technologies are sometimes extended directly to farmers with the involvement of technical officers at district and the respective sub counties where the supported farmers exist. Some of the technologies that have been supported by NAADS secretariat include construction of fish hatchery to one Farm (306) in Adekokwok subcounty and NARICA rice multiplication to 6(six) farmers in each of the three sub counties of Ogur, Omoro and Adwari. The secretariat also undertake procurement of equipments such vehicles, computers and office furniture for districts and sub counties coordination. It is inherent that in the design, the secretariat builds the capacity of the district staff and authorities who in turn, cascades the information down to sub counties and villages.

3. The District NAADS Coordination Unit

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For purposes of the activities at the district, the secretariat created NAADS coordination unit at the district and recruited a District NAADS Coordinator, DNC, to oversee the programme activities at the district. At sub county level, however, Sub county NAADS Coordinators are designated by the district administration to run the programme at that level. The service providers were responsible for the training through information dissemination to the farmers in the previous arrangement, where they were contracted for period of three months to provide technical information to the farmers and farmers groups on the selected enterprises by the farmers groups. In the new arrangement, frontline extension workers are the ones providing extension service to the farmers. They are recruited by the sub counties and they play similar roles like the service providers in the former arrangement. The duration of the contract of the frontline extension has been change to at least one year renewable contract based on the performance starting 2008/9 financial year.

The roles of DNC is to; participate in awareness raising among the stakeholders, facilitate review and planning sessions with farmers forum on quarterly basis, link farmers to other institutions such as banks to access credit services and agro processing industries to help farmers access marketing opportunities. This is done through signing of a memorandum of understanding between and / or among concerned parties. The DNC coordinates the programme under direct supervision of the District Production and Marketing Officer (DPO) and the Chief administrative Officer and, externally links the district with the secretariat.

At the district this is the summary of the enterprises under taken by subcounties in preference to other enterprises. The data reveals that groundnuts, simsim and goat improvement are the enterprises that are mostly taken up by subcounties. The enterprises that are picking up but are still low in percentages are piggery and citrus.

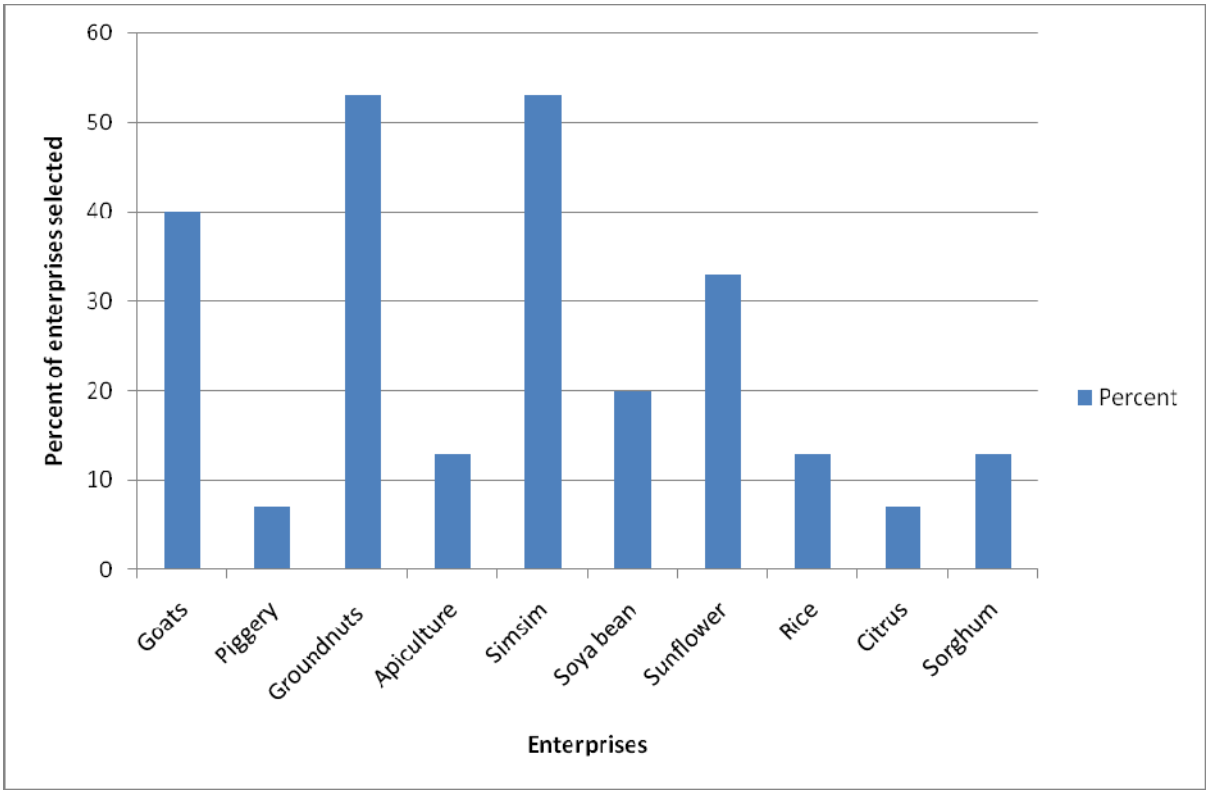

Figure 4. 1: Shows the percentage response of subcounties to enterprise preference

Source: Lira District NAADS Annual Report (2007)

4. District Technical Team

The technical team at the district is comprised of the mainstream conventional public extension personnel. They constitute the head of department, heads of sectors and subject matters specialists of the five sectors of agriculture, entomology, fisheries, veterinary and commercial services.

Under ideal circumstance, it is required that the Head of Department, as a technical officer oversees the coordination of NAADS activities in the district; coordinates heads of sectors; coordinates technical auditing to conform to the required standards which entails quality assurance. He also participates in the review and planning workshops of stakeholders, ensures work plan and budget of NAADS are incorporated in the overall district work plan and budget. Production Coordinator acts as link between NAADS secretariat, the district, MAAIF, and other districts implementing NAADS activities with the aim of sharing of experiences and identifies the gaps in the extension service delivery in the district. Other roles include overseeing financial and administrative activities of NAADS, staff deployment, linking farmers to market information, encouraging private buyers and linking farmers with private partnership to reach and buy farmers produce at a reasonable price. Lastly, he ensures that NAADS, by law conforms to sanitary procedures in the delivery of planting materials and animals. However, it was discovered during the study that there were discrepancies in the roles played by DPO compared to the ones outlined in the guidelines. It was also observed that the DNC was linking directly with Chief Administrative Officer, by passing the immediate supervisor and the technical officer in the department. This could be

one of the reasons for neglect of roles and responsibilities which should have been undertaken by the head of department. The roles were abandoned leading inadequate coordination and inefficiency in the management of NAADS programme. The actual participation of the DPO in the NAADS programme mainly remains on paper in practice it was minimal.

The heads of sectors are responsible for quality assurance of extension services being delivered by the private and public extension officers. Heads of sectors and subject matter specialists form the technical team and their major roles are the development of Terms of Reference, TOR, for sub counties to guide the service providers, quality assurances in extension services and technologies being deliver in the district, monitoring of the general performance of NAADS activities in the field to find out whether it complies with the TOR and, facilitate during enterprise selection process to help in the selection of enterprises taking into consideration technical issues, economic viability of such enterprise and capacities of the farmers. During the study it was noticed that most of the roles were insufficiently performed due to inadequate coordination between the sub counties and the district technical management team. This led to very little control over quality assurance of the NAADS activities as a new extension service in the district. The sub county on the other hand, complained that the technical teams were subjective in the auditing as most of the firms providing extension services belong to the technical officer. On the same note, it was not very easy to deny them contract, which accumulated to shoddy work performed in the implementation of the programme.

5. Public Extension Workers at Subcounties

In the new NAADS implementation guidelines (2008) there is now utilisation of the existing public extension workers in the local government in the delivery of advisory services. It is estimated that 1600 extension workers exist country wide. In utilising these extension workers by the district under the leadership of the District Production Officers (DPO) will undertake the inventory of capacities and skills base of staff in the production department at all levels. This is being implemented already and additional frontline extension workers have been recruited in all the sub counties to supplement the work of public extension worker in addition to coordination of the programme under supervision of the Sub county Chief. Performance based contracts will be utilised to ensure effective and efficient delivery of agricultural advisory services, the contract is signed for one year and renewed based on the performance of the staff. This has increased the number of service providers in the extension pool and has improved the ration of extension to farmers and increased the level of contacts.

6. Farmers/Farmers Groups

Farmers and farmers groups are the key stakeholders targeted in the innovation process. From the findings, the roles of target farmers have changed in the new NAADS approach. In the previous NAADS implementation guidelines, (2002), farmers were targeted in groups after registration at sub county levels. A farmers' group referred to a group of individual farmers, an association, a cooperative, or any other legal entity with common farming interest or interests. The criteria for registering the groups was that the group must have clear leadership with Chairperson, Vice Chairperson, Secretary Treasurer and any office bearer or bearers as agreed upon by the members of the group. In contrast, the new NAADS implementation guidelines of (2008), farmers are categorised as demonstration farmers, lead

farmers, model farmers and nucleus farmers. All these categories have respective roles to play in innovation process.

a)Demonstration farmers' roles are to provide suitable sites for the group demonstration, host the demonstration, ensure proper management of the demonstration sites and record and keep the all information and data collected by the group and ensure information sharing by all members.

a) Demonstration farmers' roles are to provide suitable sites for the group for demonstration purposes, host the demonstration, ensure proper management of the demonstration sites and, record and keep all information and data collected by the group to ensure information sharing by all members.

b) Lead farmers are to keep records of all the operations in the enterprises and share this information with all the farmers with the aim to encourage other farmers to adopt new technologies, take lead in prospecting for market, and information sharing, constitute a pool from which community based facilitators will be selected.

c) Model farmer is the one at take-off to commercialisation with his/her farm enterprises and, he/she is managing his/her farm as a business. The model farmers therefore provide good learning opportunities to other farmers. They serve as demonstration farmers for improved technologies and good management in the enterprises that they are promoting. They also provide advice to other farmers serve as a source of improved technologies by multiplying and, selling to other farmers. Their other roles are to share production and market information with other farmers, keep farm records and marketing information, and use this to advice farmers on market oriented farming.

d) Nucleus farmers/farm: a nucleus farmer or farm is purely commercial and employs professional management and labour force to run the operations of the farm. A nucleus farmer may be individual, farmers group, an association, cooperatives society or limited liability company. The main roles of the nucleus farmers are to host and provide learning platform for farmers groups and support establishment of out grower schemes through acting as a source of planting and stocking materials. A nucleus farmer also provides advisory services to other farmers, linking farmers to market, provision of bulking facilities and support for value addition to farmers produce.

e) Supplier: this is another stakeholder that was found to be very common and playing key role in supplying the technologies to the farmers. Farmers identify suppliers who have the technologies that they want and enter into an agreement, stipulating terms and conditions for the supply. The farmers pay the suppliers after technical officers have ascertained the quality of the technologies. If the technologies do not meet the required criteria or quality the suppliers will be charged with the responsibilities to replace or the farmers can totally reject the technologies from the suppliers.

f*) Community Based Facilitators (CBF), and Parish Coordinating Committee (PCC):* Due to communication and coordination gap that was realised in the sub county within FGs and among the FGs themselves, PCC and CBF were established, these are small committees formed at community levels comprising of farmers. Clear roles and responsibilities why these were established were to improve communication network and to improve and increase participation, steer and maintain implementation momentum to acceptable levels. Also, as a link directly with the farmers to boost information linkage and transfer among the farmers. PCC consolidates interests, plans and budget of individual groups on different enterprises into a parish plan that is subsequently submitted to the sub county planning team.

In this study the categories that are functioning are the lead farmers who have just started accessing the Enterprise Development Funds (EDF), to implement the new approach. There are few farms and farmers groups that have been identified as nucleus farmers. The categorisation of farmers into four sets as indicated in the new guideline (2008) has not brought the different moments of learning together as feelings of unfairness overrides among the different categories. This is reflected in the fact that only lead farmers are fully supported with inputs and technical information therefore, they are the only category of farmers fully on the ground. They are however, doted and could not provide effective learning even among themselves as their interests and enterprises are also different. In some instances however, the lead farmers have become sources of information and technologies which has strengthened and improved access to information and innovation in proximate areas. On positive note some farmers are reported by district NAADS coordinator to be in the category of nucleus farmers. A farmer (Farm 306) having fish hatchery, six farmers in each of the Subcounty of Ogur, Aromo and Adwari are multiplying NARICA rice for seeds in the district.

Formerly, the farmers were targeted in groups and there were no clear ownership of the technologies provided to the groups. In the new NAADS arrangement, farmers are selected from each parish to be lead farmers. These lead farmers belong to some farmer group, and become owners of the technologies. They are supported with technologies at a cost which they will later on base as loan to the sub county account and other farmers will again access this fund, (revolving fund), to buy the technologies. This has improved sense of ownership and commitment toward management of the technologies because even the benefits that will accrue from the enterprises belong to the lead farmers other group members benefit from the site as a training point, where they can learn. This will overcome a say of *our thing* which in the end does not belong to any body which caused a lot of mismanagement in the previous arrangement under the group approach.

Table 4. 1: Shows the response of the farmers groups interviewed in regards to enterprises

Farmer group name	Membership F	M	Total	Enterprises	Enterprise status and responses
1.Can omia ryeko	6	14	20	fish farming breeding stock	In good progress the group members are selling the fingerlings, source of breeding stock for fish
2.Gum pe rom	8	7	15	Poultry layers	The stock was not attaining good production. The farmers intend to change to broilers production Not realising the profit because of the cost of feeds and low production
3.Yotkom a twero	11	19	30	Soya beans production	*The bad weather destroyed the crop for this season badly. Otherwise soya is a profitable crop.*
4.Aye lweny ican	12	18	30	Goat improvement	Late deliveries of technologies could not catch up with planting date for some crops Lack of transparencies among stakeholders Knowledge sharing among farmers
5.Konya konyi (women group)	15	-	15	Animal traction	Reduced labour force, increased land cultivated, they hire out to other famers and earn income to the group.

There are also other farmers that are using some technologies selected but not in the lists of groups interviewed and they have successfully adopted the technologies. For example two rice farmers have registered some yield improvement in rice production according to him.

Figure 4. 2: Farmers in the rice field and harvested rice

Table 4. 2: Shows successful farmers groups visited

Farm/farmer group	Enterprises	Status
Farm 306	Fish hatchery	Breeding stock
Acan kwete	Goat improvement	Other farmer are now breeding their goats for improvement
Can dag goro	Local poultry improvement 80 local hens	She collects 75 eggs everyday

7. The National Research Organisation

National Agricultural Research Organisation (NARO) is mandated with generation of technologies, including adaptations and testing of new technologies in Uganda. According to the implementation guidelines, NAADS is supposed to work closely with NARO both at national and zonal levels to; (i) develop the research priorities (ii) develop capacities of agricultural advisory service workers both at district and the sub counties and jointly take adaptive trials and demonstrations at farm level. There is no clear evidence of linkage between research and farmers in identifying research priorities and making adaptations directly. The research stations are still acting independently, not working together with farmers developing research priorities, this still make adaptations of technologies quite not easy to suit the locality.

8. Private sectors

The private sector is one of the stakeholders whose actual roles are not yet witnessed among the farmers. This is partly attributed to minimal opportunity as the farmers have not yet reached the level of bulking their products. Linking farmers to market is weakly done because the marketing sector is weakly established and farmers are not at the level of commercialisation, this is because food security is still seen as a priority due to low level of production. Therefore, the interventions of private sector in developing the following areas are highly demanded. (i) Development of farmers' capacity for increased production and productivity through farming enterprises by availing improved technologies. (ii) Enhancing the marketability of farmers produce through quality improvement and standardisation, and increased productivity (iii) Support to the development of farmers' institutions, (farmers groups and association), for organised marketing and for collective access to input and market through farmers' mobilisation and training as well as bulking and organised marketing of produce. As an example of private partnership, Akonykori oil mill has supported some farmers groups with two incubators to boost the production of chicks in the district to increase the sources of technologies to be accessed by farmers.

The multi stakeholder approach used in implementation of the NAADS programme could have been of value if there was adequate coordination and transparencies in conducting activities. This would have increased and strengthened the sharing of information and intensity of the interaction among the stakeholders. The roles of most stakeholders do not link directly with the farmers. Only a few stakeholders have direct contact with farmers. The forum that brings the stakeholders together is not adequate to facilitate efficient and effective interactions to increase learning. However, the stakeholders have clear roles and responsibilities and the stakeholder have capacities to handle the roles assigned to them in the implementation.

NAADS has implemented some partnerships in the Lira district to develop and promote profitable enterprises and enable better linkage to the markets. The partnerships are collaborations mainly with private firms and government programmes (NUSAF and NARO) with contracts and Memoranda of Understanding signed respectively.

Overall, the NAADS extension system has provided evidence of social learning among stakeholders. The lessons learnt have been incorporated in making modifications and some adaptations in the programme which motivated the stakeholders. However, the top-down approaches in effecting changes are still very common and the ideas of the farmers are not yet clearly streamlined in the modifications. The farmers are not yet empower enough to voice their interest, therefore making the issues that affect them do not surface very strongly.

Table 4. 3: Shows NAADS private and government partnership

Partners	**Enterprise**	**Status**
NUSAF	Citrus, apiary, animal traction	NUSAF provided inputs and NAADS provided advisory services.
Mukwano AK Oil	sunflower	Mukwano supplied the seeds and market for sunflower and NAADS provided advisory services.
Akonykori Oil mill	incubators	Akonykori provided incubators to NAADS farmers group to boost poultry production
FICA Seeds Company	Maize and upland rice	FICA supplied maize and upland rice to NAADS farmers groups.

4.2. Learning points among the stakeholders

The implementation of extension activities underwent several changes and a lot of lessons have been learnt in the implementation process. Several new ideas are being use to improve the implementation of NAADS activities. The learning platform for stakeholders has been review workshops which are always organised twice a year as semi-annual and annual reviews. Participants in the district review meetings are stakeholders ranging from; district farmers' forum, sub county farmers' forum, the district councils, sub county NAADS Coordinators, members of the district core team, Office of the RDC and the private sectors. The functions are presided over by representatives from NAADS secretariat.

At the sub county the stakeholders who participate in the review sessions are the farmers' group Chairpersons, two representatives of Parish Coordination Committee, Executive of the sub county farmers' forum, Procurement Committee, all councillors and technical staff. At the sub county the review is presided by the technical team from the district. On the other hand, reflection meetings are organised on monthly basis. Issues arising from the implementation are discussed during these reflection meetings and resolutions are made, and shared during the semi-annual and / or annual reviews.

The kind of information that is shared during the review meetings are experiences from the different stakeholders, each makes a presentation on the implemented activities against planned activities, the achievements, bottlenecks and challenges realised.

The initial guidelines of NAADS had weak linkages with different stakeholders especially the public extension system leading to minimal contribution. This was later on revised through incorporation of various stakeholders at all level of implementation. It became quite difficult to achieved 100% privatization of service delivery without de-layering the public extension staff which rendered

inadequate number extension service providers. This situation created vacuum in the qualified people to provide extension service.

In the initial NAADS approach, technology demonstrations, goods and funds given under Institutional Support to Farmers Groups (ISFG), were owned by all the group members. Most of the technologies supplied under this arrangement never succeeded as ownership could not be attached to any individual group member. In some demonstrations, members abandoned the technologies completely in the hands of the host farmers who in most cases, did manage well and are now reaping benefits, the members who abandoned the demonstrations are ashamed to ask for the proceeds from the technologies. Never the less, under the new approach, technology demonstrations and ISFG are given to an individual farmer who is squarely accountable for the technologies. The rest of the group members access the demonstrations as a learning site. There is sharing of information among the group members and other farmers from outside the groups.

There is decentralisation of the procurement process at parish level which has reduced the level of complaints that existed in the previous centralised procurement at sub County. This has increased the level of participation at farmer's level. Another situation where farmer's participation is also witnessed is at enterprise selection of the technologies which gives opportunity to farmers to participate and exercise freely.

The two review meetings and reflection meetings, in combination with technical back stopping, if organised consistently as planned in the work plan could be a good learning platform for the programme implementation. Similarly, the lessons learnt at sub counties when incorporated into district reports and the information utilised at the secretariat, could be beneficial for adjustments in NAADS programme and other extension services in the district.

District officials attend the review meetings and play the roles of facilitators while the SNCs make presentations of activities planned, implemented and challenges, before discussions are invited from the floor. It's during these review meetings that the issues are brought forward and resolved. Those who participate in the review meetings are the representatives from the various farmers groups, SNC, sub county administration and the Secretary Production representing the political wing, and subject matters specialists from the district facilitate the session.

4.3. Factors Influencing Innovation Process

The research has pointed out the main factors which are influencing innovation process. These factors can be categorised as internal, external and challenges. Under the internal factors it is discussed under two sub themes internal facilitating and internal hindering.

4.3.1. Internal factors facilitating

There are increased interactions amongst private-public and NGO service providers which has improved farmers' access to information through meetings, trainings, technologies and proven practices. A numbers of private extension service providers were contracted since the inception of NAADS in 2002 in the district till now the extension contacts made by the private service providers has increased compared to the previous years. Due to increased interactions, the number of farmers accessing the information has become increased the farmers themselves have become source of information. Farmer's exposure has contributed to accumulation of knowledge on new technologies and practices. There was evident of knowledge availability of knowledge and information among the farmers in agricultural technologies, but the application of this knowledge in not visible.

> *Quote from the farmer ''we have knowledge about production what is missing is the financial capacity to implement some of the technologies''.*

Rolling out of NAADS was viewed to be successful especially at the start because the stakeholders were sensitized at the district and sub counties. The technical team at the district and sub counties as well as the political and the civil society at parish level were firmly on the ground to scale the operations. This created some pockets of information but it was not adequate to spread and create better understanding of the programme.

Availability of funds has improved the level of implementation of activities in the district and more farmers are reached compared to the previous extension services. Availability of fund in the district facilitated the activities of the extension staff in terms of fuel and subsistence allowance facilities the operations of the programme.

Farmers and staff exposures through field tours and trainings, meetings and workshops of field have been facilitating learning in NAADS programme this was successful because of the availability of funds. Farmers' interaction and linkages with other farmers have increased too. The kinds of information shared by farmers are information on management practice of the technologies. This hinted out the importance of horizontal knowledge transfers among the farmers themselves.

The learning process that is championed by NAADS programme has provided a good learning environment for the stakeholders. The incorporation of the lessons learnt has motivated the stakeholders to participate. The stakeholders are free to discuss any concerns and provide ideas for improvement. Stakeholders views are always incorporated in the new strategies both at sub county levels, and the district level and the guidelines are relatively flexible with some adaptations in the implementation at sub county level.

The medium of communication during review meetings is local language which gives opportunity for every stakeholder to participate in giving out their views during the learning sessions. Favourable environment are organised for stakeholders to participate in small discussion groups which results in freedom of speech where each stakeholder is encouraged to give his views. This is organised in the forms categorising different stakeholders in discussion groups.

Community based procurement committee are formed at parish level to build the capacity of the farmers to procure their own technologies. In the past the farmers were rejecting the technologies procured by the sub county procurement committees. This called for new adaptations and community based procurement committees was instituted at community level. The approach is perceived by farmers that it has improved procurement process. Now if the farmers are not satisfied with the inputs delivered by the suppliers he/she can reject the input. This in line with the view of Heemskerk *et al*., (2008) that, farmers determine what they want on the basis of information they receive through their community network such as contact with fellow farmers, local and traditional authorities and elders and service providers. *'Farmers and small scale entrepreneur are expected to take on the procurement function, develop capacity to contract and partially share the funding function''.* This is happening in Lira district where the farmers have the taken up the procurement function and partly funding the programme by contributing matching grant.

Availability of resources such as land makes it possible for the promotion of some technologies. This was witnessed by one of the farmer promoting goat improvement programme. To him goat rearing does not require a lot of fund for initial investment.

Farmers participation in the programme by partially contributing financially to support the programme is a good approach because it gives them sense of ownership as they *say free thing are expensive''* because it sustainability is most likely not to be realised. In the district this was practiced through cofounding which the farmers' groups and Subcounty contribute 2% and 5%

respectively depending on the amount of funds released to the Subcounty. The issue of revolving funds under institutional support to farmers groups (ISFG) is also a better approach to empower farmers who could not financially access the technology. The utilisation of this service by farmers could contribute to accessibility of technologies. On the other hand the service has been abused by other farmers hence not paying back the revolving fund saying. ‘*’This is government money there is no need paying it back”.*

4.3.2. Internal factors hindering

The terms of contracts were not realistic for NGOs and Service providers for better interaction with farmers. Most contracts had short cycles not exceeding 90days and could not give room for further interactions for services that may be necessary beyond this time. Further still this contracts was always designed in favour of annual crops and to the detriment of perennial which has longer production cycles.

It was also evident that although the roll out of the programme seemed to have worked successfully, the sensitization of stakeholders did not adequately take place. Most stakeholders did not thoroughly understand the operating system at the onset. Some stakeholders were excluded from the programme, for instance the NAADS coordinators at subcounties and district excluded some technical officers who should have provided technical information to guide farmers during planning and implementation.

There was deliberate effort to have the publicly employed technocrats exempted from direct implementation of the programmes and as such there was no clear way as to how their skills and experiences gained could be tapped. Those directly involved ended up operating with impunity and thus the jeopardy in learning, networking and negotiation of the innovation processes under NAADS approach.

Inconsistencies in carrying out some activities such as review meetings, monitoring and supervision both at the district and at Subcounty levels. The actual planned reviews, monitoring and supervisions are not conducted as per work plan and budget. These reduce the learning which should have taken place. If these functions were done consistently it could have provided early warnings to take corrective measures in areas of weakness.

Some of the institution of the programme is not working for example the technical core team consisting of district planning unit, head of department chief administrative Officer and chaired by Local council (V) chairperson has not been working as required. The linking pins at top management which should have provided the guidance in the implementation strong weakness which led to the activities in the programme went with limited checks.

The speed at which the changes are taking place is too fast and uncoordinated. Often new guidelines have changed before an existing one is internalised by both the users and beneficiaries. Lessons learnt are often taken on short notices and observations which do not pay attention to prevailing situations and interests of the beneficiaries. So there is mismatch in the speed at which the changes are taking place to the speed of the implementation of the changes.

Political interference seems to be playing an upper hand both at district and at sub counties as stakeholders supersede their roles and are roles conflicting with technical staff whose roles is to coordinate the NAADS programme at the subcounties Political wings particularly at the sub county are not adequately playing their role to sensitize the community they are mostly focused on individual interest neglecting the roles of providing guidance, monitoring and supervision in the implementation of NAADS activities closely.

The sharing of information, knowledge is still having some limitations and entry of technologies in the market/public domain and does not often take into consideration the input of other stakeholders who may have better alternative approaches that may improve the innovation process.

The funds that have been remitted to the district could have contributed to a greater extent but there have been evidence of financial mismanagement of the fund in the implementation of the programme, the amount of funds that have been flowing to the district if compared with the impact on the ground is not satisfying. For example farmers group of 20 members could be supplied with 100 seedlings of oranges and three trainings conducted. The cost would be four million Ugandan shillings an equivalent to 1600$, the values of the technologies and service does not match the value and service provided which raised some queries for investigations by Inspector General of Government (IGG). At the beginning of the programme the Subcounty NAADS Coordinators seem not to allocate fund for the right activities for example they could organised goat roasting feasting for the farmer groups. This was an indication that the programme was not perceived well in the beginning resulting to misuse of fund which could have been put to best use instead of feasting.

Quote from one of the farmer in Ogur Subcounty ''you see when we started NAADS the Coordinator would slaughter for us goats and we would feast. NAADS is becoming new every year! Every year new NAADS!

4.3.3. External factors

Adverse climatic condition has also affected the implementation of some technologies that were being promoted to farmers. These therefore discouraged the farmers from trying out alternative ideas they may have acquired. The impasse greatly contributed to scores of farmers not actively implementing novelty of innovations as they wouldn't wish to risk their very means of survival. Uganda's Agriculture being controlled by nature has always been unreliable and required proper timing of agricultural input delivery. This was not the case in NAADS implementation. Most technologies were delivered offseason and they failed due to bad weather, with crops worse affected.

For some time Lira district and others in the neighbourhood suffered from rebel and rustling insurgence hampered the implementation of NAADS activities in the district. People were displaced in Internally Displaced Peoples Camps (IDP) and the agricultural livelihood and infrastructures which could complement NAADS activities and innovations were destroyed. These resulted into a dependency syndrome as farmers relied on aids and relief for survival. Any introductions of new technology would always require investing significantly by farmers whose capacities have already been thwarted. This shattered the learning and uptake of new technologies under NAADS programme which appeared pure development orientated that intervention into emergency situations.

There is weak economic power base among farmers. According to the three year district development plan, (DDP, 2009/10-2011/12), over 80% of the farmers in the district live through subsistence means which negatively impacts on their learning and negotiation capabilities. Even if they learnt or have an innovation in their mind it is difficult to implement because of the weak economic capacities and power. This even derails them from active participation in accessing related services and knowledge. The quest for economic empowerment is however, being addressed through the integrated support which involves allocation of input grants to farmers. This is an amendment in the operational guideline but it is limited by the fact that the high number of farmers per given time could not be covered with the limited resources at hand. There is still exist the problem of organised market arrangement system which does not favour farmers due to fluctuating prices and low prices in times of bumper harvest.

Most technologies are not attainable in the rural farming communities. The stockists are not well distributed in the communities and as such the distance from source of technologies to points where the demand increases the costs involved in acquisition. Since most farmers are financially handicapped they are rendered unable to afford the technologies. This situation could not allow for adequate learning or incremental modifications in such technologies thus partial information is always used to determine the success or failures in the process. This obstructs further development as tacit knowledge is masked by incomplete data. Even the few that have entered in the communities have not contributed to a greater extent to economic development of the farmers. Some of the reason is attributed to the form in which the information is package and disseminated. Lack of utilisation of the knowledge is also linked to the less economic power of the farmers and lack of commitment by farmers to put what they have learnt into practice.

4.3.4. Challenges

The uncoordinated policy issues that are affecting the innovation process currently are the operating structure of the Department of Production and Marketing in which NAADS is based. The staff at lower levels is merely designated from the pool of public extension officers without any clear terms of reference to run the programme. There is therefore conflicting condition and terms of services as the nature of the work given to the staff are in the forms of assignments. The extension staffs are pensionable but under guidance and supervision of a district Coordinator who is on contract. This makes it very difficult to supervise and streamline the work of the staff. The NAADS assignments though constitute the bulk of the work, is secondary to the core assignment one is recruited for. The structures continue to be a disincentive to the beneficiaries and the well trained and experience officers on the ground that cannot get the chance to directly make their contribution in the programme operations.

There is weak coordination of activities at district level. This is more especially due to the fact that creation of NAADS as semi-autonomy with extension administration in the district. The coordination expected to link with the existing administrative structure of the production department on mutual grounds and share information. However, the authority bypassing of the chain of command in the leadership also ended up jeopardising the supervision and regulation of services by subject matter specialists. The Subject matter specialists are rendered redundant as they could not technically influence or negotiate the actions that enhance learning and innovation development. There is also lack of coordination with other institutions such as research, commercial/industries, microfinance, NGOs and Education. These operate their activities parallel to NAADS programme.

Table 4. 4: Shows the summary of the major factors influencing innovation process in the District

Category of the factors	**Major factors highlighted to be influencing innovation process in Lira District**
Internal factors Facilitating	Roll out of the programme to subcounties successful Availability of fund to support the programme. Improved farmers participation in the programme Favourable learning environment Farmers and staff exposures led to increased knowledge Increased number of extension service providers
Internal factors hindering	Lack of transparencies in carrying out activities Political interference was resulting into roles conflicts Inadequate sensitisation of the all the stakeholders in the beginning left some with high expectations Terms of contracts were not realistic for NGGs and Sps Inconsistencies in carrying out some activities in the programme Exclusion of some stakeholders in the beginning of the programme
External factor	Adverse climatic conditions affects crop related technologies Weak economic power base among farmers. Technologies are not attainable in the rural farming communities Insurgency and cattle rustling caused insurgency in the district in the last two decades
Challenges	weak coordination of activities at district and subcounties The unfavourable government policies Insufficient sharing and dissemination of information

4.4. Communication linkages among the stakeholders

The communication linkages among the stakeholders were examined to exist at various levels. The networking takes place at various levels; national, district sub county and farmers' groups but the focus of the discussion is based on three levels district, subcounty and farmers.

4.4.1. District level

At the district levels the interactions is much stronger among the technocrats as their direct linkages with farmers are limited by the roles they play. These interactions are conducted in specific gatherings such as technical planning meetings, departmental meetings, workshops, council meetings, sectoral committee meetings, reviews and special reactive meetings. This is attended by the district technical core team which is comprised of Heads of departments, district planner, District NAADS coordinators , and executive committees chaired by District Chair person and the kind of information shared also depend on the kind of forum gathered. Similar meeting are also organised at the sub county, however, networking seems to be low and depended so much on the roles played by different stakeholders, and other stakeholders' roles do not link them directly to the farmers because of the presence of technical team at the sub counties who have direct contact with the farmers.

The kinds of information shared at the district forum are policies issues, general performance of the programme, emergency issues, planning and technical information. There is also direct linkage from the district to the sub counties, secretarial, and other district and other participating district, and Ministry of Agriculture Animal Industry and Fisheries.

The method of disseminating information, knowledge and skills is formally oriented which is affected by level of education. The forms in which the materials are disseminated tend to limit information sharing. This is especially in the use of the operational guidelines which is only available with selected authorities and often written in an unfriendly language to be utilised by all categories including farmers. The formulation of the guidelines didn't take into consideration the input of beneficiaries and even the technical people at the grass root which made it difficult to incorporate new ideas.

4.4.2. Subcounty level

At the sub county farmers are represented in a committee of farmers' forum of which the members are drawn from different farmers groups. This organ was created to improve farmers' decision making process on innovation development process. The farmer forum represents the individual farmer group's decisions made at the sub county farmers' forum are fed back to farmers groups. Farmers' forum executives link the farmer's decisions with the sub county council. A similar committee was created to handle the procurement of services and goods on behalf of the farmers groups at subcounty. Procurement committee meetings are organised monthly but it is also dependence on the availability of the contracts, in most cases if the situation warrants it is more frequent. Community Based Facilitation committees were created to improve communication linkages between the sub county and farmers groups. They participate in the selection of enterprises and follow up of field activities and reporting the progress to the SNC through monthly reports.

There is Technical Planning Committee (TPC) which is comprised of technical staff. The team is responsible for planning process, selection of enterprises and provide the technical advice on selected enterprises. There have been some additional roles of providing extension service to farmers by SNC on top of coordinating activities. In each sub county a font line extension service provider is recruited alongside the SNC both of them are responsible for provision of extension services in line with their various specialisations.

In most cases the programme design does not give the illiterates and the “perceived” less enlightened stakeholders the opportunity to internalise the documents, for example the guidelines. This inhibits the level of participation in learning by farmers who are not well empowered with the formal training systems but are more action oriented. This forces them away from actively demanding for and putting their interest openly. According to Waters-Bayers *et al., (*2006), many innovations are not often technical in nature but rather socio-economic and institutional including within the rural farmstead but are seldom recognized. Often, it is thought that innovations are steered from above, brought to farmers through extension officers but the reverse has always been true. The farmers have detailed knowledge in what works best in their situations and share experiences amongst themselves, identifying best practices in their situations.

4.4.3. Farmers’ level

The networks created have improved the communication linkages among stakeholders but the one initiated by the farmers themselves as a quest to learn particularly about a technology is most utilised. The important aspect of documentation is still lagging behind and makes it difficult to trace the valuable information and knowledge which has been generated, therefore, limiting dissemination and sharing. Significantly the traditional practices that focus on the transfer of knowledge and technologies to farmers appeared to dominate the mechanism of networking among stakeholders. The information tends to remain more within a particular cluster of stakeholders and only little is shared in a particular forum. This does not give adequate time for sharing the available information.

It was observed that the stakeholders who interact with farmers more frequently are the sub county NAADS coordinators and contracted service providers, currently termed front line extension workers. They are directly in contact with farmers providing trainings and technical information on the management of technologies. Not all farmers are, however, contacted by the service providers and front line extension workers. The sharing of information among the farmers themselves is relatively high through horizontal knowledge transfer. The Parish Coordinating Committees were created to improve communication linkages between farmers and service providers. They facilitate enterprise selection and planning processes among farmer groups. The community base procurement committee was also formed to increase the level of interaction and improve communication gap between the farmers and the sub county authorities. The farmers interact with other stakeholders in forum such as sub county semi and annual review meetings which is organised twice a year. The medium of communication used is the local language to facilitate farmers’ interaction with other stakeholders.

Despite of creation of all the above committees aimed at improving communication linkages, there exist communication gaps among the various stakeholders. There is inadequacy and delays in information management and transfer. Such delay creates vacuums and malfunctioning of programmes such that the information reaching the final destination is often distorted and/or sometimes outdated. This observation is in line with O’Dell and Jackson, (1998), who noted that knowledge management is about ‘getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organizational performance. In essence it is therefore undoubtedly clear that the kind of knowledge management in the NAADS approach has not caused much improvement to its performance.

There is evidence of communication linkages among the stakeholder but with varying degree of interactions between stakeholders directly indirect interaction is not illustrated by the figure below.

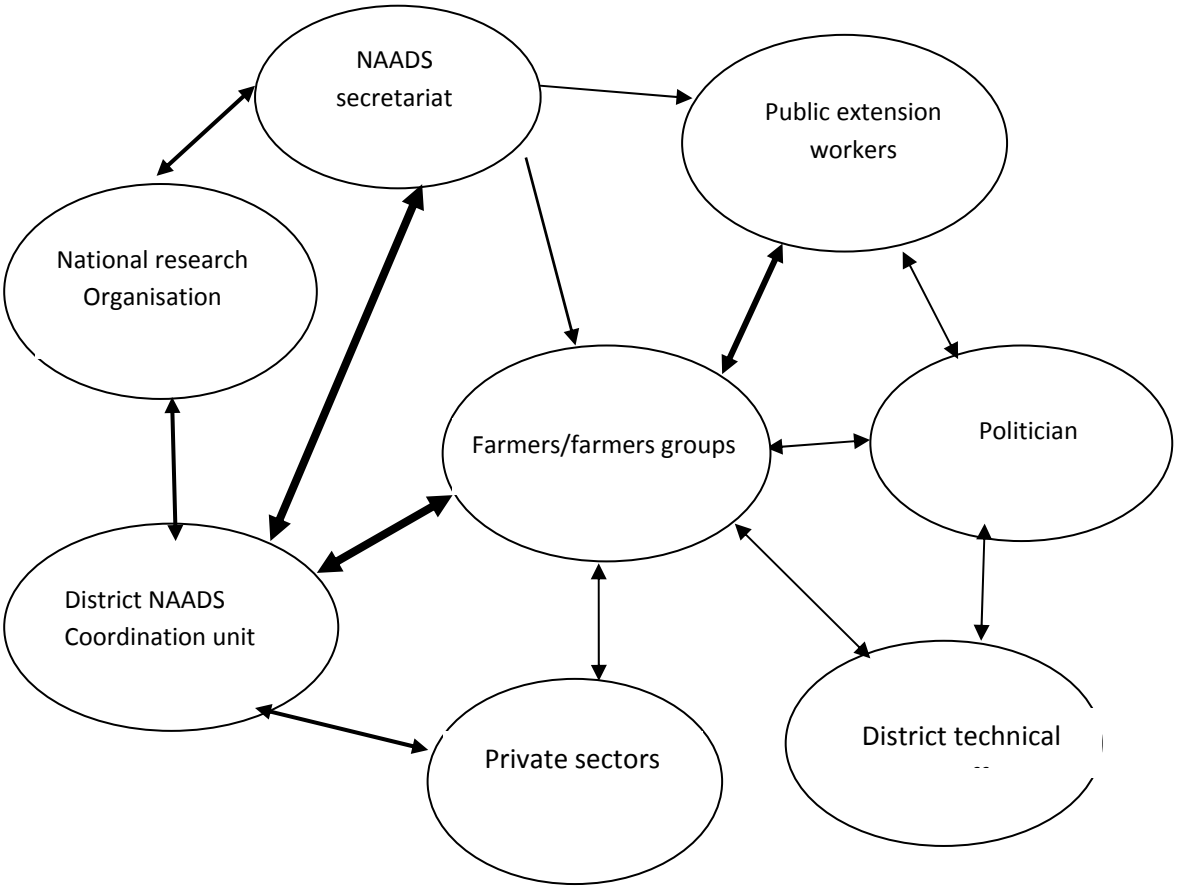

Figure 4. 3: shows communication linkages among stakeholders in NAADS

4.5. Negotiation process among the stakeholders

There are found to be conflicting interest among the stakeholders that can be group as role conflict and conflict of resources. The strategy utilised to resolve conflicts are found not to be appropriate. The organisation does not practiced negotiation process as away to resolve conflicting interest among stakeholders found out as not being practiced among the stakeholders.

4.5.1. Conflicting issues

There were a number of conflict issues that were realised among the stakeholders implementing extension in the NAADS approach since the start of the programme to date some of these conflicts because they were not well managed and the right resolutions derived or negotiated for have ended up impacting on the programme negatively.

At the district management level, there was silence over the roles conflict in following the chain of command. The existing production structure requires the DNC to report to Head of civil service through district production coordinator but this was bypassed and the DNC was reporting directly to the Chief Administrative Officer. (CAO).In this situation negotiation never took place to resolve the issues the officer concerned decided on his own to abandon his roles of supervisory work in the programme.

In the initial NAADS arrangement, public extension staff as per the guidelines were not allowed to provide private extension service but they stealthily get contracts violating the guidelines and these brought a lot of conflict between the management and field staff who ended up performing shoddy contracts which never impacted positively on the programme.

Variations in facilitation of public extension staff and private extension staff created inadequate co-operation among two categories of extension service providers. This resulted in selfishness in sharing information between the two categories of extension service providers hence hindering learning.

The selection of the six farmers per groups raised an intense conflicting interest as to who should be selected to participate although the tasks were given to community based facilitators in consultation with the group members. There is a possibility that some of the groups may disintegrate as a result of the selection of one member to manage the technologies.

Limiting of enterprises to three per subcounty was seen as approach that could improve learning process. This was arrived at by the secretariat to legitimise ownerships and management of the technologies. However, this was seen as limiting participation of some farmers whose enterprises are not funded. There was some bitterness from the farmers who have so far met their contribution of co-founding obligation.

There were conflicts over resources by Sub county Chiefs as the NAADS Coordinators worked under the supervision of the Sub county Chiefs who are the principal signatories to the NAADS accounts. Sometimes they are compromised to act beyond financial regulations and have led to financial losses in some subcounties.

There were also some conflicting interests on the distribution of inputs such as seeds by the farmers groups. Some members wanted to plant the seeds jointly as a group but others wanted the seeds to be distributed to individuals. Resolutions were arrived through majority voice but the minority group later on compromised the decisions made by the majority.

4.5.2. Strategies used in containing the conflicting interests

Strategies that were used in settling conflict were through management meetings organised in order to forge a collaborative approach and avoidance which was unassertive and uncooperative way of resolving conflict. Meetings were organised by DNC to discuss the conflicting issues among the stakeholders at the Sub counties most especially the Subcounty chiefs, Subcounty NAADS Coordinators, Chairpersons of local council III. The second strategy that was used had been by transferring some of the staff from a particular work station to another to terminate the escalating conflicts.

Transparency through sharing of information in a meeting and involving all the stakeholders was one of the ways some NAADS coordinators reported they have used to avoid suspicions on financial issues and over expectations by other players. They would organised the meeting declare the budget lines to stakeholders at subcounty level. They would also jointly implement some of the programme together and the details of the activities were clear to all stakeholders.

The negotiation processes as a way of resolving conflict is not being practiced by stakeholders. Negotiation process did not feature and became source of frustration to some staff who decided to avoid getting involved in the programme. The strategy of organising staff meeting to forge a collaborative means to resolve the conflicting issues without follow up were not appropriate way to resolve conflict. Transferring of staff to different work stations could not resolve the conflict as this cannot work on the root causes of the conflicts. It leaves the problem unsolved and no win-win situation could be arrived. This encourages injustice and impedes participation. In the view of Leeuwis & Van de Ban, (2004), whenever different actors and stakeholders are involved in

meaningful change, conflicts are likely to emerge, since such changes may have consequences that affect the value and interests of many stakeholders. In participation and interactive processes, it is assumed that conflicts can be overcome by social learning and decision making. Typically it is important that all stakeholders should be involved in the process, and that conflicts of interest between stakeholders can be resolved through the development of a shared understanding of a situation as result of learning and improved communication. For the case of stakeholders involved in NAADS programme in Lira, this was lacking which led to failure to resolve conflicting interest appropriately by bringing the two conflict parties on board and to arrive at shared understanding among the stakeholders in the district.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

The analysis of the factors influencing innovation processes in Lira district indicates that there are a number of factors influencing innovation processes both positively and negatively. These factors are attributed to certain issues that could be categorised under internal and external. Internal factors are those that are affecting innovation process positively and negatively within the institution under which NAADS is operating. Then the external factors are those that affect the innovation processes but outside the institutional jurisdiction. In the analysis the negative factors seemed to be overwhelming the facilitating factors.

Stakeholders have the technical capacities to manage the innovation process but there are other factors beyond technical aspects. Attempts have been made by stakeholders to improve the innovation processes through learning but the impact has not been fruitful.

Although changes and adaptations are ways to enhance learning process, the rate which changes are taking place in the NAADS approach is too fast to be internalised by the stakeholders. These changes would be of great importance if given adequate time for internalisation.

Farmer's financial capacity is an important aspect in developing innovation process, some farmers who had some reasonable finances have been successful in developing innovation. Some farmers are also motivated to learnt and adapt changing environments as results from both market opportunities that exist for the technologies.

Farmer's organisations are still very weak and not coordinated and united to voice farmer's problems at a higher level for development of individual capabilities among farmers as well as the deployment of learning processes among a wide range of actors, including knowledge and technology providers, farmers, financial institutions and other support from government. Therefore, there is need for farmer's organisations to organise themselves and strengthen their organisations.

Farmers' level of participation is at increase in deciding and taking up what kind of technologies to undertake. These technologies if well managed will become closer to the farmers, implying accessibility of technologies will be improved and; the costs of facilitating innovation process shall be reduced. But to achieve all the categories as streamlined in the implementation guidelines will still take time.

The level of interactions between both public and private service providers, farmers and other stakeholders have increased in terms of contacts and sharing of information. Horizontal knowledge exchange among farmers is seen to be more valuable and widely used source of information and knowledge about innovations.

Inadequate coordination and transparencies still remain a stumbling block in the management of extension under NAADS arrangement. Technocrats have diverted their attention from performing their normal roles and were more interested in personal gains. These intensions compromised the quality assurance in advisory services. This has led to bias in vetting for advisory services and goods in the districts resulting to shoddy work in the delivery of goods and services. The technical audit team show some favours for the firms that belong to the district technical Officers.

5.2. Recommendations

This section presents some of the recommendations drawn from the study to help improve the innovation process in the district and the programme as a whole. The greater tasks have to be taken by NAADS secretariat, NAADS coordinating unit at the district, farmers' organisation, the department of extension and all the stakeholders involved.

- The NAADS secretariat focusing on Public- private partnerships is essential to develop market pull for the small scale subsistence farmers, to enhance farmers' development towards market orientation and commercialization of agriculture and linking farmers' product to agro processing and add value to agricultural products for increased income. This can be done by organising farmers in to farmers' marketing groups to solve the problem of marketing.

- The stakeholders need to understand and work as teams and value the importance of transparency and trust practiced in sharing information and knowledge in the networks to strengthen the ties between the stakeholders. Activities in the network need to be well coordinated with every cluster in the team having information on what surrounds the programme.

- The Department of Production and Marketing together with NAADS coordinating units both at the district and Subcounties initiate the negotiation process in resolving conflicts that exist among the stakeholders. Institutional space need to be created to allow use of innovative negotiation results. A greed code of conduct created regarding conflict resolutions among staff, so that each party is guided by code of conduct. Emphasis still need to be put to strengthen the social learning and communication linkages among the stakeholders by improving on the dissemination of information and knowledge in more user friendly form which can cater for all stakeholders.

- The NAADS secretariat organise a forum for discussions with other Ministries handling other components of the PMA programme, ministry of trade and industries, Microfinance and Ministry of work for infrastructural development and those concern with agricultural, and land policies is essential and bringing on board and enlighten the pertinent roles and contributions in the development of agricultural innovation played by those ministries. NAADS cannot work in dependently without those other sectors contribution and linkages and innovation impacts are sustained.

- Farmers' organisations at the national level to make initiative and take lead in strengthening the existing farmers' organisations at the district and Subcounties into a stronger network and voice some of the policies that affect farmers' development such as marketing policies and organisations. In order to improve farmers' communication linkages further as more reliable source of information and knowledge, the successful farmers should be utilised to support farmer to farmer extension.

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APPENDICES

Appendix 1: Checklist for data collection research in lira district

Part one: Social learning process all stakeholders

A: NAADS staff (District NAADS Coordinator, Sub county NAADS Coordinators, and Service Providers)

1. How frequent are the review/workshops organised at various levels for stakeholders?

2. At what levels are learning sessions in terms of review meetings and workshops being organise?

3. How has it facilitated or hindered learning process among stakeholders?

4. What have been your main learning points as an individual or a group?

5. What have been the major outcomes of the review meetings, workshops, and meetings in NAADS learning process?

6. What has been the contribution of the learning review meetings, workshops and meetings in improving NAADS activities?

7. What other factors may not be within NAADS limit that might affects or have affected social learning in the systems?

B: SMS (head of sectors an district based technical staff)

1. What has been your level of contribution in NAAD activities?

2. What have been the learning points in NAADS activities for you?

3. Does your level of participation enable you incorporate new ideas for improvements of NAADS activities?

4. What factors within the institution that might inhibits or facilitates learning among stakeholders in extension services in Lira as a whole?

5. What other factors that may not be within the limit of the institution that may hinder or facilitate NAADS learning process to improve the activities?

*C: **Farmers (Farmers groups, Farmer Forum, Procurement committee under NAADS)***

1.Are there learning sessions organised for farmers groups in terms of review meetings, workshops, farmers meeting to share experiences?

2. What have been your perceptions as individual about the learning lesions and lesson learnt?

3. What have been your main learning points as individual or a group?

4. What are the difficulties faced in the process of learning?

5. Are there issues which are discouraging which might have affected participation in the group?

Part two: Networking process (interactions) all category of stakeholders.

1. What has been the level of your participation in the in your group?

2. How frequent do the stakeholders meet?

3. Which stakeholders do you normally interact with most?

4. How do you relate to each other stakeholders?

5. What kind of information or knowledge do you share among different stakeholders?

6. What bring the groups and other stakeholders together?

7. What difficulties do you face in working with other stakeholders?

Part three: Negotiation process all category of stakeholders

1. Do you normally experience conflicting interest as a group or as an individual?

2. What were issue(s) on?

3. How was it resolve?

4. Did the conflicting interests result in new ideas or not?

5. What made it work or not?

6. What were the difficulties faced in trying to resolve?

7. Are there things that you did not like about the way the conflict was resolved?

Appendix 2. Table showing the list of enterprises and percentage preference for each *enterprises*

Table 1 Percentage response of subcounties to enterprise preference

Enterprises selected	Percentage response of subcounties to enterprise preference
Goats	40
Piggery	07
Ground nuts	53
Apiculture	13
Simsim	53
Soya beans	20
Sunflower	33
Rice	13
Citrus	07
sorghum	13

Source: District NAADS Annual Report (2007)