Analysis of Extension Systems in Uganda for Identification of Suitable Extension Approaches for Scaling-up 'Trees for Food Security' Project in Eastern Uganda

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Acronyms

ACIAR	-	Australian Center for International Agricultural Research
BUDETU	-	Babuka Development Trust Uganda
CBO	-	Community Based Organization
DFO	-	District Forest Officer
DSIP	-	Development Strategy and Investment Plan
ECOTRUST	-	Environmental Conservation Trust
EFPs	-	Environmental Focal Persons
FIEFOC	-	Farm Income Enhancement and Forestry Component
GEF	-	Global Environment Facility
ITCP	-	Integrated Territorial Climate Plan
KIFANGO	-	Kitsi Farmers Non-governmental Organization
KIS	-	Key Informants Survey
MAAIF	-	Ministry of Agriculture, Animal Industry and Fisheries
Mbale CAP	-	Mbale Coalition Against Poverty
MFPED	-	Ministry of Finance, Planning and Economic Development
NAADS	-	National Agricultural Advisory Services
NaFORRI	-	National Forestry Resources Research Institute
NARO	-	National Agricultural Research Organization
NARS	-	National Agricultural Research Systems
NDP	-	National Development Plans
NPA	-	National Planning Authority
OPM	-	Office of the Prime Minister
PEAP	-	Poverty Eradication Action Plan
PMA	-	Plan for Modernization of Agriculture
PRDP	-	Recovery and Development Plan
REDD	-	Reducing Emissions from Deforestation and forest Degradation
SIP	-	Sector Investment Plans
SSPs	-	Sector Strategic Plans
STEI	-	Science, technology, Engineering and Innovation
TACC	-	Territorial Approach to Climate Change
T4FS	-	Tress for Food security

Executive Summary

A key informant's survey (KIS) was undertaken in March 2015 to understand the extension system in Uganda. The survey sought to determine the existing extension structure, and approaches used by various agencies to disseminate agricultural technologies, information and skills to farmers, as well as the policy context within which such processes take place. The key informant interviews were conducted with government extension staff at National, district and sub-county levels. Extension personnel from Non-governmental Organizations (NGOs) were also interviewed. Findings from this study will inform the *'Trees for Food Security'* project on different extension methods and their suitability in scaling up/out agroforestry practices in Uganda.

Extension in Uganda is under the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and the National Agriculture Advisory Services (NAADS). At the district level, extension falls under the Department of Natural Resources (Environment, Land and Forestry) and the Production Department (Agriculture, Commercial, Entomology and Veterinary). The department of Natural Resources has no operating offices at the sub county, parish and village levels. NAADS deploys district coordinators at the district level. Extension officers employed under NAADS in the lower administration levels– sub county, parish and village– have been removed and replaced with army officers (who mainly focus on input supply rather than service delivery).

The main extension methods used in the project area include trainings (individual and group), demonstrations, model farmers, radio outreach programs and farm visits. Extension information is focused on: animal health (tick control, vaccination); fodder production (feed mixing, hay and silage making); crop pest and disease control (Banana Bacterial wilt, coffee leaf rust, coffee berry disease); agroforestry (hedgerows for soil and water conservation, boundary planting, species site matching) and cross cutting issues such as gender and climate change.

The main challenges faced by the district in promoting improved natural resource management technologies include: understaffing; non-adherence to set rules and

procedures; lack of funds; conflicting messages between technical staff and civil society partners; trespass on fruit orchards as these are considered “open access” resources. This survey recommends that the Trees for Food Security Project builds on the existing approaches such as group trainings, the use of model farmers and demonstration plots to scale up evergreen agriculture in Eastern Uganda.

1.0 INTRODUCTION

1.1 Background

The ‘Trees for Food Security’ project is led by the World Agroforestry Centre (ICRAF), working with national partners in Ethiopia, Rwanda, Burundi and Uganda. The aim of the project is to enhance food security for resource-poor rural people in Eastern Africa through research that underpins national programmes to scale up the use of trees within farming systems in Ethiopia and Rwanda and then scale out successes to relevant agro-ecological zones in Uganda and Burundi. This involves understanding and addressing barriers to farmers enhancing tree cover on their farms, matching species and management options to sites and farmer circumstances and quantifying impacts of changing tree cover on long term water, soil and livelihood parameters. Working across field, farm and landscape scales, trees play a key role in making efficient use of water and nutrients while maintaining soil carbon. This develops a climate smart agriculture through intensifying and diversifying farm production, in a manner that leads to increases in agricultural productivity, additional income opportunities from tree products, as well as improved environmental outcomes that sustain the productivity gains.

The specific project objectives are;

1. To characterize target farming landscapes and systems, and develop tools for matching species and management options to sites and circumstances.
2. To generalize predictions of impacts of tree species and management on crop productivity, water resources and nutrients at field, farm and landscape scales to inform scaling up to improve food security and reduce climate risk.
3. To develop effective methods and enabling environments for scaling up and out the adoption of trees on farms.
4. To develop databases and tools for monitoring and evaluation of the impact of scaling up and out the adoption of trees on farms, and
5. To enhance capacity and connectivity of national partner institutions (including farmer groups) in developing and promoting locally appropriate options for adoption of farm trees.

The research approach is designed to underpin, and is therefore fully integrated with, national programmes to take agroforestry to scale in Ethiopia and Rwanda, and then to extend successes from these countries to Uganda and Burundi. The key research questions are designed to address how to transform site specific examples of how trees can improve farm productivity into scalable results that deliver productivity gains across large agro ecologies in the target countries. The research is organized in four scientific work packages that are tied together by a major effort to strengthen national capacities. They include;

1. Characterization and targeting;
2. Measurement and modeling of impacts of trees on crop yields, farming systems and livelihoods;
3. Innovations in scaling up methods (how to reach farmers with appropriate materials and information) and the associated enabling environments required for adoption (in terms of policies and institutions); and,
4. Monitoring and evaluation.

Recognizing that the development imperative to get more trees in farming landscapes to improve food security is leading to immediate national action, the four elements comprise an iterative cycle of co-learning and refinement that address key barriers to adoption of trees on farms followed by immediate promotion of best-bet agroforestry options across a range of conditions. The emphasis of the research on methods to take adoption to scale focuses, on the one hand, on developing appropriate seed and seedling supply and extension methods for different contexts, and on the other, on policies and institutions that address barriers to adoption.

One of the objectives of the project is to develop effective methods and enabling environment for scaling up and out adoption of trees on farms. A key activity towards this objective involves identifying, testing and promoting effective extension methods for reaching farmers in different contexts. With this regard, a key informant's survey aimed at understanding the extension system in Uganda was conducted to meet this objective.

The survey targeted key actors in agricultural extension at national, district and sub-county levels. It sought to understand the existing extension structures and methods used by various organizations to disseminate agricultural technologies, information and skills to disseminate to farmers, as well as the policy context within which such processes take place. Based on lessons drawn from this survey, best bet dissemination approaches will be selected and used for scaling up/out adoption of trees on farm for enhancing food security.

1.2 Objectives

The objectives of the survey were to:

1. Determine the existing extension structure in the country
2. Identify the extension methods used by various agencies to disseminate agricultural technologies, information and skills to farmers; and
3. Describe the policy context within which information on agricultural technologies is disseminated to farmers.

2.0 A REVIEW OF AGRICULTURAL EXTENSION IN UGANDA

2.1 Introduction

Agriculture contributes about 21.8% to Uganda's GDP hence making it vital in realization of growth and development targets through food security, income enhancement and employment (MFPED, 2011). According to Emmanuel (2012), this depends on creating an enabling environment through improved technologies, access to information and resources, a conducive policy environment, well developed infrastructure and markets. Productivity potential in agriculture is not fully realized due to lack of farmers' access to inputs, technologies and relevant information (World Bank, 2007). Farmers' access to agricultural technical information increases their ability to adopt sustainable practices and agricultural inputs (Nkonya et al., 2005). Extension activities facilitate access to technologies and information hence essential for agricultural development (Anderson & Feder, 2003).

According to Birner et al. (2006), agricultural extension entails training of farmers, dissemination of new technologies, assisting farmers to form groups, market their agricultural products and partner with various institutions in order to improve productivity in agriculture and livelihoods. It should facilitate adoption of new technologies and adaptation of the new technologies to local conditions, in addition to promoting farmer based innovations (Kibet et al., 2005; Anderson, 2007). Almost one billion small scale farmers worldwide benefit from extension services hence the need to determine the most appropriate systems for providing knowledge, information, technologies and empowering these farmers (Davis et al., 2010).Agricultural development in Uganda has suffered from lack of consistency in policies on agricultural extension until the late 1990s (Nahdy, 2004). The government of Uganda has therefore focused on modernizing agriculture with an aim of improving delivery of services to farmers and addressing past extension challenges (Ssemakula & Nalugooti, 2005).

2.2 History of extension in Uganda

Agricultural extension in Uganda has been changing since its introduction by the colonial government in the late 1800s (Mangheni et al. 2003). Various agricultural extension approaches such as regulatory, advisory and educational methods have been used in Uganda to disseminate technologies to the communities in the last forty years (Hakiza et al., 2004). Semana (1999) identified a number of evolutionary phases in agricultural extension in Uganda, these include (1) Regulatory service: 1920-1956. (2) Advisory Education: 1964-1971. (3) Dormancy: 1972-1981, (4) Recovery: 1982-1999 (5) Educational: 1992-1996, (6) Participatory education: 1997-1998. (7) Decentralized Education 1997-2001; currently agricultural services are under contract extension systems. Table 1 illustrates the chronological evolution of extension systems in Uganda.

Table 1: Chronological evolution of Extension services in Uganda

1920-1956	Extension involved distribution of materials and instructions on growing crops through chiefs and expatriate field officers.
1956-1963	Extension through progressive farmers; provision of technical advice and support in form of inputs.
1964-1972	Advisory education and commodity approach
1972-1980	Dormancy; Disruption of economy, political instability; civil war.
1981-1991	Restoration of basic services; improved infrastructure.
1992-1998	Government Agricultural Extension Programme (AEP), with a 'unified extension approach' and the 'Training & Visit system' introduced in phases to 27 districts; Criticisms of extension public services
1998	Village Level Participatory Approach' (VLPA) introduced into the public extension service and later put on hold after criticisms by the World Bank; Support for advisory service delivery by farmer organizations through DANIDA-supported Agricultural Sector Support Programme
1999-2001	Finalization of the Policy for the Modernization of Agriculture (PMA); Preparation of the National Agricultural Advisory Services (NAADS) programme. Support for advisory service delivery by decentralized farmer organizations. National Agricultural Research Organization (NARO) introducing Outreach Programme.
2001	NAADS Bill passed by Parliament; NAADS programme linked to broader decentralization of capacity-building initiatives

Source: Kidd, 2001; Semana, 1999

2.3 Extension by the government

In the 1980s four ministries were involved in extension in Uganda: Ministry of Agriculture, Ministry of Animal Industry and Fisheries, Ministry of Environment Protection, and Ministry of Commerce, Cooperatives and Marketing. In 1991 agricultural extension was brought under one Directorate in the Ministry of Agriculture, Animal Industries, and Fisheries (MAAIF) (Rivera & Alex, 2004).

As a result of decentralization in Uganda, responsibilities and functions of planning and implementation of agricultural extension services was transferred from the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) to district local governments (IFPRI, 2012). MAAIF was left with the responsibility of planning and policy formulation, regulatory functions, technical backstopping and training, setting standards for and monitoring performance of the agricultural sector, and managing funds of selected projects (Bashaasha et al., 2011).

According to Anderson & Feder (2003), decentralization not only enhances better coordination of extension with other agencies but also improves accountability and facilitates delivery of extension services at lower costs. As a result of decentralization, provision of extension services is mainly a responsibility of the district-level government where districts pay for most of the operational expenses while staff salaries are paid by the central government (Anderson & Crowder, 2000). At the district level, extension is headed by the District Extension Coordinator and at the county level by the County Extension Coordinator who supervises the field extension workers mainly working with the farmers (Ponniah et al., 2008).Public extension faces several challenges such as weak research and extension, bureaucracy, non-participatory approaches and lack of response to farmers' needs; the system has been gradually phased and replaced by a contract privatized system implemented by National Agricultural Advisory Services (NAADS, 2001). The ultimate goal of NAADS is to have 50% funding of advisory services by farmers in 25 years, sustainability of farmer groups and emergence of new farmer organizations (Bekywaso, 2006). In this system the district and sub county level local government contracts private firms, farmer associations or NGOs to provide extension services (Bashaasha et al., 2011).

2.4 Extension through the NAADS system

In the late 1990s policy makers in Uganda realized that a more effective extension system was needed in order to realize the new agricultural policy which is the Plan for Modernizing Agriculture (PMA) (Anderson, 2007). PMA was established under the Poverty Eradication Action Plan (PEAP), in 1997 by the government of Uganda. It is aimed at poverty reduction which is a primary goal of the country's policies and strategies (Nkonya et al., 2005). The Plan for Modernization of Agriculture's mission is to transform agriculture into one that is competitive, technology based, export oriented and one that increases productivity of land and labor (NAADS, 2001).

One of the core components of PMA is the National Agricultural Advisory Services (NAADS). NAADS is a 25 year government program with an initial phase of seven years that was designed to increase farmers' access to technologies and information. The mission of NAADS is "*Increased farmer access to information, knowledge and technology through effective, efficient, sustainable and decentralized extension with increasing private sector involvement in line with government policy*". PMA envisions that NAADS will be "*A decentralized farmer owned and private sector serviced extension system contributing to the realization of the agricultural sector objectives*". NAADS was designed based on five major components: 1) Advisory and information services to farmers. 2) Technology development and linkages with markets. 3) Quality assurance. 4) Private sector institutional development and 5) Programme management and monitoring (Nahdy, 2002).

NAADS was aimed at improving the traditional unproductive methods which had not provided the required productivity and expansion in agriculture. It was created to empower farmers, especially women, to demand and control agricultural advisory services in the country (Emmanuel, 2012). The expectation of NAADS was that it would operate as a decentralized system that is farmer owned and managed where privately serviced extension will be paid for by farmer-managed public funds (Opondo et al., 2006). NAADS was also expected to enhance farmers' access to quality knowledge and improved technologies through demand driven as opposed to supply driven delivery

systems (Sebaggala, 2005). Under NAADS Act of 2001, the public extension system was gradually phased out and replaced by a privatized system (Bashaasha et al., 2011).

According to Byekwaso (2006), NAADS approach is centered on: Use of public funds to support advisory services while exploiting opportunities for inflow of private sector resources; shift from public to private sector delivery of advisory services; empowering subsistence farmers to access private extension services; enhancing decentralization to bring control of advisory services and research, nearer to the farmers and commercialization including intensification of productivity and specialization. NAADS is coordinated through a secretariat and coordinators posted in each district, to run farmer groups and coordinate extension services. Community-Based Facilitators (CBFs) are also trained to provide quick follow-up advisory services according to farmers' needs (Benin et al., 2011). As further described by Benin et al. (2011), farmers willing to participate in the program join farmer groups in which they request specific technologies that they intend to implement. Farmers thereafter receive grants within the groups through which they can implement the technology and also obtain advisory services. The Technology Development Site (TDS) which is initially financed by the grant becomes a source of knowledge and skills development by the farmers in the sub county.

NAADS was designed to promote farmer participation through farmer groups which elect a hierarchy of representatives referred to as Farmer Forums (Diaz, 2004). Farmers organize themselves in groups based on their needs, they select representatives to the farmers forum at the sub county where priority technologies are identified (NAADS, 2001). A procurement committee in charge of contracting and monitoring service providers is elected by the forum. These service providers deliver advisory services on the identified priority areas and mainly consist of NGOs, private firms and agricultural professionals (Feder et al., 2011).

NAADS was initiated in 2001 in six districts: Arua, Kabale, Kibaale, Mukono, Soroti and Tororo and began working in 24 sub counties. In 2002/2003, it had rolled out in ten districts: Bushenyi, Busia, Iganga, Kabarole, Kapchorwa, Kitgum, Lira, Luwero, Mbarara

and Wakiso covering 46 sub counties, it also expanded to 54 sub counties in the trailblazing districts (Ekwamu et al., 2005). In 2004/2005 NAADS expanded to 13 new districts: Hoima, Kamuli, Mbale, Nakapiripit, Rakai, Apac, Kanungu, Kumi, Masaka, Moyo, Rukungiri, Yumbe and Bugiri covering a total of 29 districts and 280 sub counties (Benin et al., 2007). By 2006/2007 it had extended to 545 sub counties representing 83 percent of the total sub counties in Uganda at the time (Benin et al., 2008).

Several studies have been conducted over NAADS implementation and mixed results of the program performance have been obtained. Benin et al. (2008) observed improvement of extension services, farmer empowerment, better access to extension services, improved adoption of new technologies and advisory services in sub counties where NAADS had been implemented. However he noted that weakness in financial and market sectors were major setbacks in achievement of NAADS objectives adding that NAADS had not fully addressed soil fertility management, livestock productivity and commercialization of agronomic products.

A study conducted in Soroti district in Uganda showed that farmers who are members of Farmer Field Schools and NAADS have higher use of improved soil conservation and pest management methods than nonmembers (Friis-Hansen et al.,2004). NAADS was also found to be top down, prescriptive and abstract and needed farmers to have high levels of literacy to make sense out of it, the system also limited the number of enterprises and lack of provision of inputs and credits (Obaa et al., 2005).

2.5 Challenges experienced in implementation of NAADS

The transition from public extension to NAADS has faced several challenges such as limit of staff contracts to one year with no guarantee of renewal and few resources to train and upgrade skills of these staff on training and managing farmer organizations (Swanson & Rajalahti, 2010). Farmers' credentials are overlooked during selection due to political interference and nepotism (Okoboi et al., 2013). Lack of adequate information on existing opportunities and limitations limits planners' ability to design and implement effective delivery systems to farmers (Ssemakula & Nalugooti, 2005).

According to Mubangizi et al., (2004), quality of information provided to farmers in the NAADS framework is unauthenticated and unguided. Funding of extension services in Uganda is based on partnerships, government agencies and farmer organizations. Farmers who cannot pay for the annual fees are not likely to benefit from the farmer organizations extension programs (Saliu et al.,2009). Limited integration into the government programs and lack of commitment of other stakeholders at district, sub county and community level has also affected NAADS performance (Emmanuel, 2012).

Untimely release of funds and lack of prior consultations with financing partners before change of design led also to failure of NAADS as a reform model (World Bank, 2010). Use of extension budget to construct feeder roads by some district authorities has left extension staff without salaries for several months (Qamar, 2005). Introduction of input subsidies prior to the 2006 elections and lack of ownership of the key-actors such as the Ministry of Agriculture and Animal Fisheries are additional reasons for failure of NAADS (Kjær & Joughin, 2012; Joughin & Kjaer, 2010). Rwamigisa et al. (2013) further argued that exclusion of gradual reform coalition in the design and early implementation phase of NAADS increased the vulnerability of the program to political capture by a political coalition hence contributing to the performance problems of the program.

2.6 Extension by the NGOs

Government extension services are mainly under resourced hence need for NGOs to facilitate provision of relevant extension information (Kindness & Gordon, 2001). NGOs are important especially where the local capacity is weak. A task force was set up in Uganda to prepare guidelines on how NGO activities would be integrated in the district programmes and areas have been identified where this integration can be enhanced (Kleih et al., 1999).

Between 1980s and 1990s NGOs began operating at grass roots level providing channels for agricultural technology and information service delivery to the farmers using underutilized government extension staff through participatory methods and providing

operational funds, travel allowances, per diem and in some cases salary supplements. (Rivera & Alex, 2004; Anderson & Crowder, 2000). The major draw backs of this model are that the NGO programs are not developed in the district agricultural development plans; there is limited farmer involvement; extension staff' conflict of interest between NGOs and the government.

3.0 METHODS

3.1 Scope

The major focus of the key informant survey was Manafwa district where the 'Trees for Food Security' Project operates. Consultative discussions were held at district and sub-county and community levels. At the district level, local government technical officers from the Department of Natural Resources (Environment, Land and Forestry) and the Production Department (Agriculture, Commercial, Entomology and Veterinary) were interviewed. At the sub-counties, the team interviewed the Chiefs and Staff involved in extension work in both Butta and Namabya sub-counties Interviews were also held with members of Kitsi Farmers Non-governmental Organization (KIFANGO), a local NGO with a strong extension component. Some model/demonstration farms under previous extension programs in agriculture and natural resource management (NRM) under the NAADS and Farm Income Enhancement and Forest Conservation (FIEFOC) programmes were also visited.

In view of Manafwa district's carve from Mbale, it was prudent to hold a few discussions with the Mbale district NAADS Coordinator and the District Forestry Officer. These two were specifically selected due to their vast experience and in-depth understanding of extension processes in Manafwa district and the "Greater Mbale" region. Key Informants Interviews at the national level were conducted with selected officials from the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and senior lecturers from Makerere University's department of extension in the College of Agricultural Sciences.

3.2 Data collection

Rapid appraisal methods were used to collect data in the study sites. The methods comprised key informants interviews, farm walks and review of relevant documents. Key informants were sought from three administrative levels i.e. national, district and sub-county. At the national level, technical personnel from MAAIF, NAADS as well as subject matter specialists at Makerere University were interviewed. At the district level, technical personnel from the departments of Natural Resources (i.e. Environment, Lands and Forestry) and Production (i.e. Agriculture, Veterinary, Commercial and Entomology)

informed the study; while other informants included Chiefs, NAADS Coordinators, model farmers and non-governmental organizations involved in agricultural extension.

In addition, the study team conducted farm walks which enabled compilation of case-specific accounts of success stories in agricultural extension. The team visited various implementation sites such as model farms, demonstration plots and training centres where in-depth discussions were held with the respective residents to augment information obtained from the key informants. This also accorded the field team an opportunity of observing the actual conditions on the ground.

The team further conducted a rigorous literature review from various official documents and other secondary sources. These included policy documents: Vision 2040, National Development Plan (2010/11-2014/15), MAAIF's Development Strategy and Investment Plan (DSIP, 2010-2015), The National Agricultural Policy and relevant sister policies (related to livestock feeding, fertilizers, agrochemicals, forests, land etc.). The desk review also scrutinized past extension programs e.g. NAADS and FIEFOC (Farm Income Enhancement and Forestry Component); and also drew lessons from earlier studies on agricultural extension in Uganda.

4.0 STRUCTURE OF AGRICULTURAL EXTENSION IN UGANDA

4.1 Agricultural extension at national level

Agricultural extension in Uganda has been a subject of restructuring and reforms since the early 1990s and these have been triggered by the pressure towards more participatory approaches and the adoption of decentralization (Birner *et al*., 2009). There have been marked changes in the concept of agricultural extension, which is increasingly seen in terms of commercial or farming for market with emphasis on “modernization” of agriculture as opposed to subsistence farming (which produces most of the food consumed in Uganda). Agricultural extension is aimed at transferring information from the global knowledge base and local farmers; enabling small scale farmers clarify their own goals and possibilities; helping farmers make better decisions and stimulating desirable agricultural development. These goals are vital in creating an efficient agricultural sector, without which a country is severely constrained in its ability to sustain overall consumption.

Agricultural extension in Uganda is coordinated by the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). The ministry has three main directorates: crop, animal and fisheries resources with distinct departments under each directorate (Figure 1). The departments stream down to the different local governments (districts, sub counties and parishes to the lowest structures at village level).

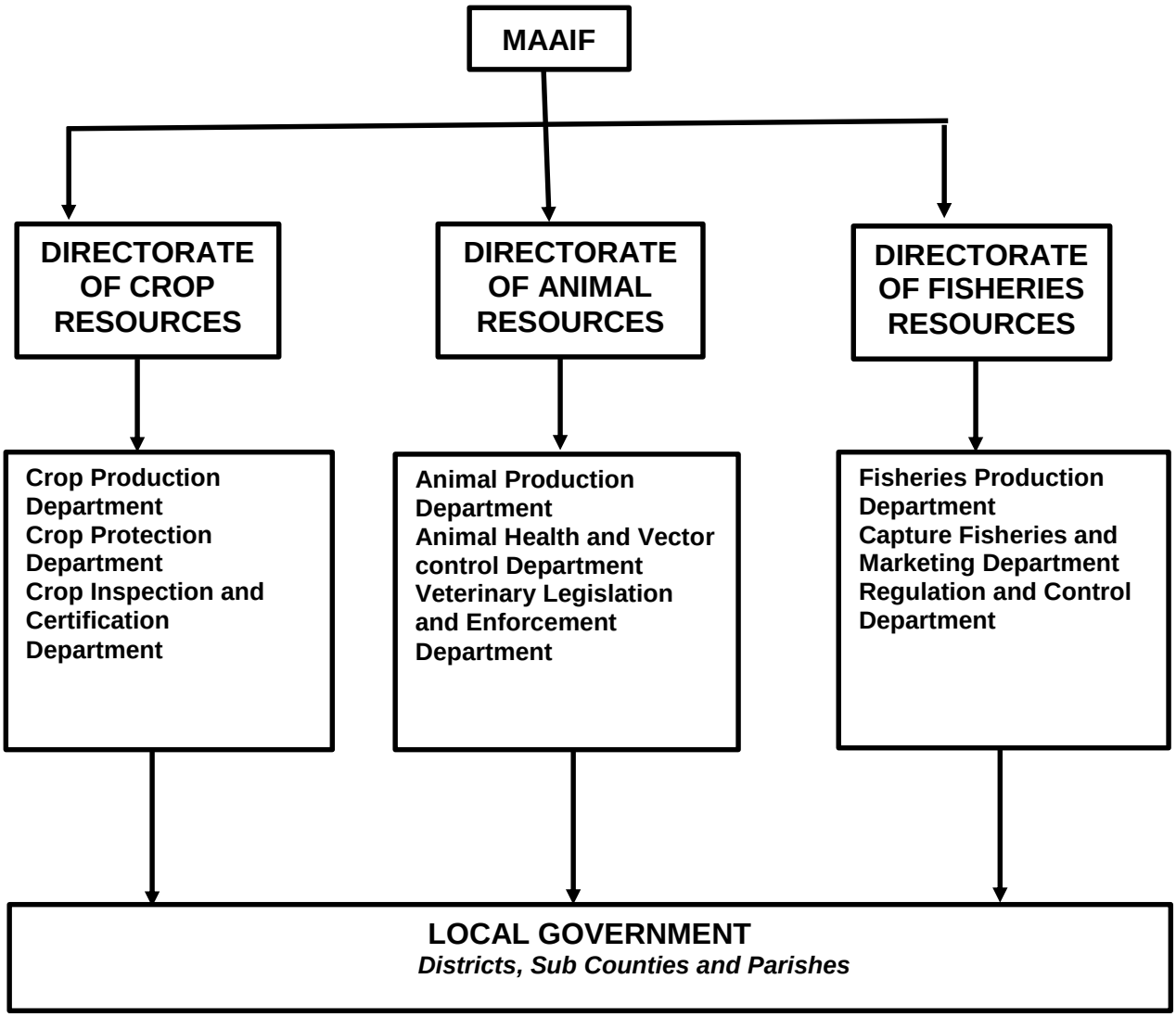

Figure 1: Agricultural Extension Structure in Uganda

Linkage between MAAIF and other stakeholders

The Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) has linkages to other government ministries through the Plan for Modernization of Agriculture (PMA). Other stakeholders linked to MAAIF include international and regional organizations, Development partners (Bilateral, Multilateral, Project and NGOS), the private sector (Civil Society organizations), Local governments and farmers, through commercial medium and

small scale enterprises (Figure 2). Such linkages facilitate flow of relevant agricultural extension information to and from the farmers.

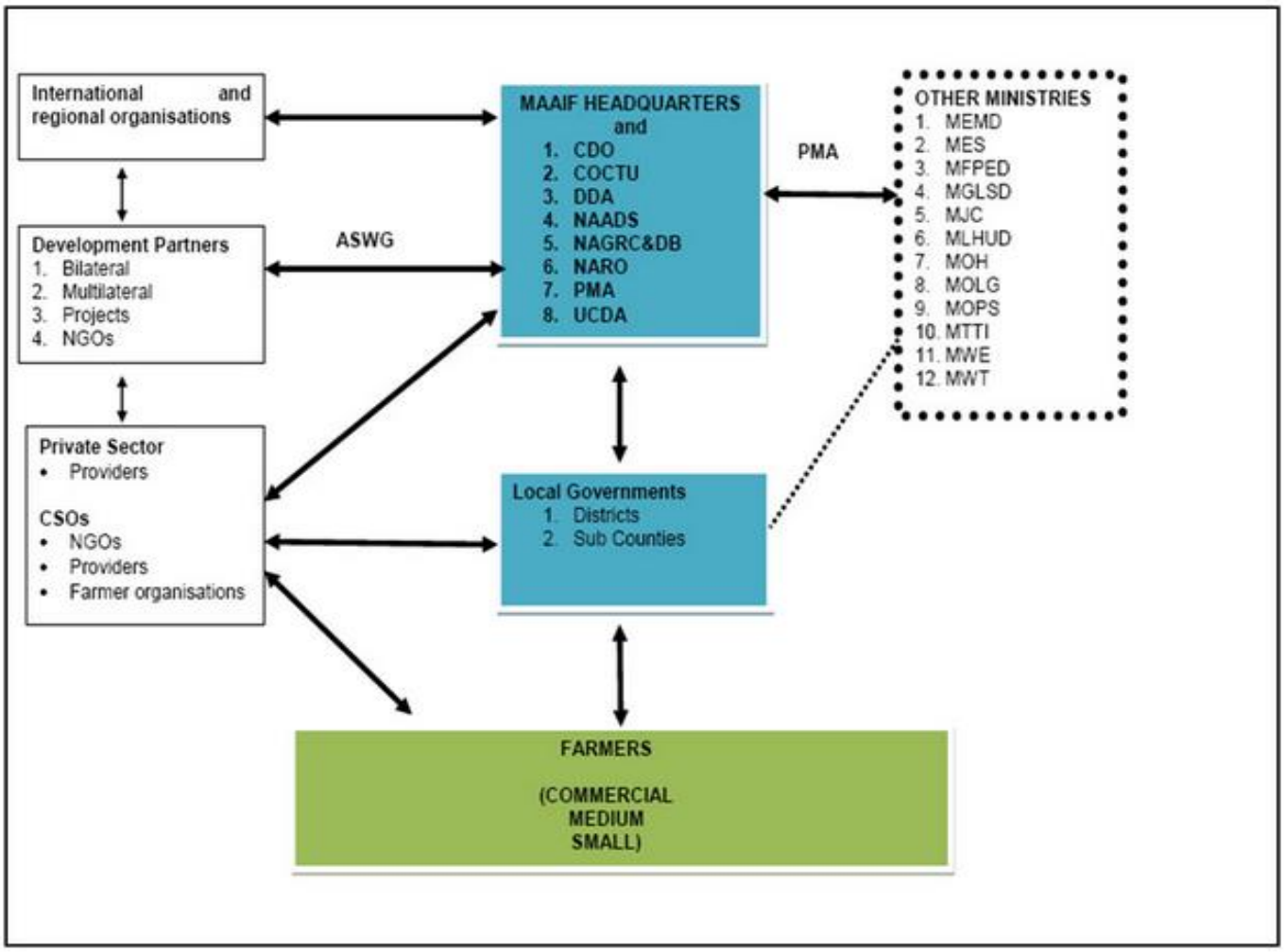

Figure 2: Linkage between MAAIF and other ministries and stakeholders. Source: MAAIF, 2015

4.2 Agricultural extension at district and sub-county levels

Decentralization of extension services in Uganda

Major reforms of agricultural extension planned under National Agricultural Advisory Services (NAADS) included: decentralization of agricultural extension responsibilities from the district to the sub-county level; contracting extension services from a range of providers; involving farmers in programme planning, evaluation, and decisions about extension providers; establishing cost sharing between national and local governments

and farmers; and the creation of more effective operational links between farmers, markets, extension workers, and agricultural researchers.

Under each programme, approximately 65% of the NAADS resources would finance the contracting of extension services. Opportunities were also created for a range of players (including private sector, NARO, Universities and technical training institutes, NGOs, and farmer associations) to bid for providing such services. The Ministry of Agriculture, Animal Industries and Fisheries was mandated to ensure that NAADS operated within well-defined policy guidelines and a regulatory framework. The NAADS Secretariat was supposed to help districts and sub-counties develop the capacity to participate in the programme. Farmers, through farmers' forums together with sub-county administrations would then manage the processes of planning, financing and contracting the service providers.

This new approach was different from previous extension programmes in a number of ways. For example, it moved away from monolithic and civil service heavy structures by explicitly encouraging plurality in extension providers and methodologies. Perhaps most importantly, the NAADS design attempted to make extension advisory services much more directly responsive to farmers' self-identified needs. However, NAADS programme was still not well implemented. Subsequent sections of this report highlight the bottlenecks to implementation of the NAADS programme, which later led to its collapse.

The Extension Structure at Local Governments

At the local government level, extension falls under two departments: Department of Natural Resources (Environment, Fisheries, Land and Forestry) and the Production Department (Agriculture, Commercial, Entomology and Veterinary), see Figure 3. District coordinators are in charge of extension at the local government level. The department of natural resources has no operating offices at sub county, parish and village levels. Also, the lower structures under the NAADS programme were abolished and replaced with army officers who mainly focus on supplying inputs to the farmers.

The Environmental Focal Persons (EFPs) coordinate environmental issues at the sub-county level. They act as contact persons for the District Forest Officer (DFO), and are answerable to the sub-county administration. The challenge in working through EFPs is that tasks assigned are considered as additional responsibilities to their mainstream activities. These personnel are frequently transferred to different areas hence disrupting the already ongoing processes.

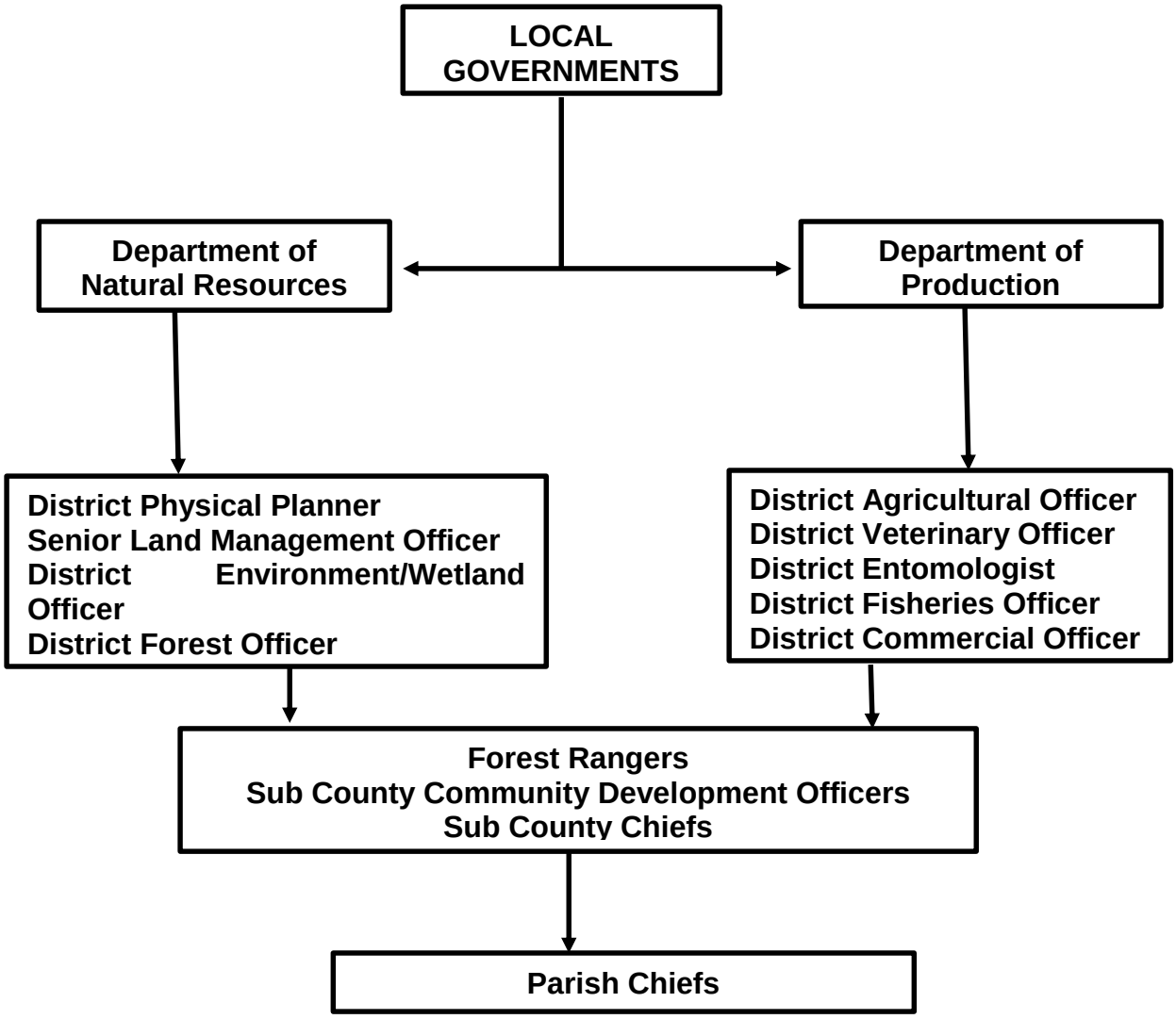

Figure 3: The Agricultural Extension structure at Local government level

Introduction of NAADS at local government level

One of the key challenges facing the agricultural sector in Uganda is the lack of an efficient farmer–extension–research-linkage (MAAIF, 2000). In response to this challenge, Uganda adopted the most far reaching agricultural extension reform in Africa, spearheaded by the National Agricultural Advisory Services (NAADS) programme. This programme was established by an Act of Parliament in 2001 (NAADS Act 2001) as part of the Plan for Modernization of Agriculture (PMA). The decentralized, farmer owned and private sector serviced contract extension system was intended to contribute to the realization of agricultural sector objectives.

The NAADS structure at local government level

At the local level, NAADS is headed by a district coordinator who supervises all programmes in the district. The coordinator is supported by the Sub county coordinators and the Agricultural advisory service providers (Figure 4).

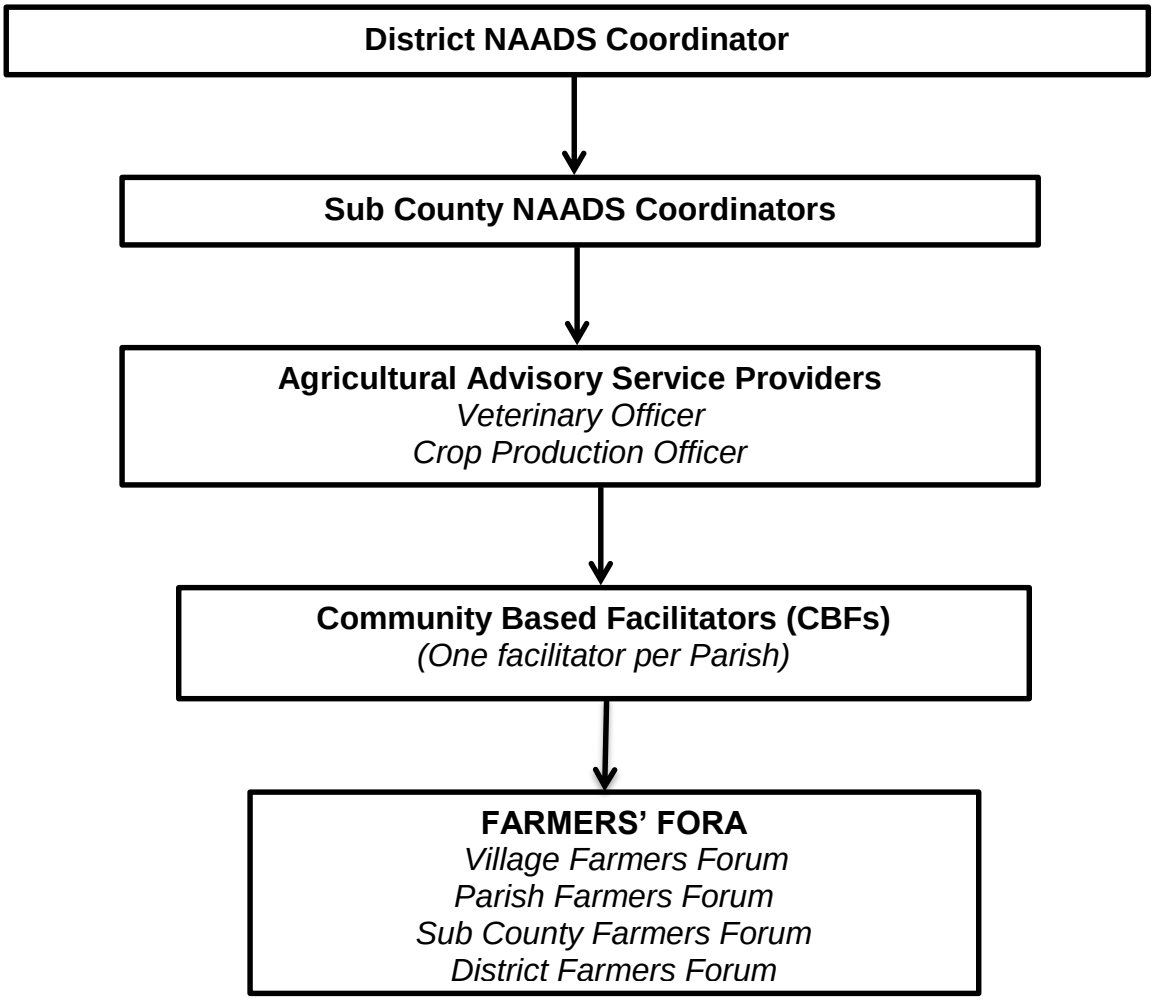

Figure 4: The NAADS structure at local government level

The Agricultural advisory service providers include a Veterinary Officer and Crop Production Officer. Community Based Facilitators support extension services at the parish level. Apart from the district coordinators, all personnel in the lower administrative levels have recently removed and replaced with army officers.

5.0. POLICY CONTEXT

5.1 Vision 2040

Over the last 30 years, Uganda's planning frameworks have focused on short to medium term goals. However, experience shows that long term planning is a key factor in propelling socioeconomic development and equitable distribution of wealth in many countries all over the world. The Uganda Vision 2040 articulates clear strategies and policy directions to transform the country into a competitive upper middle income country with per capita income of USD 9500. It is expected that over the Vision 2040 period, average real GDP growth rate will be above 8.2 per cent per annum translating into total GDP of about USD 580.5bn (from USD17bn in 2010) with a projected population of 61.3m (from 32.9m in 2010). It seeks "*A transformed Ugandan Society from a Peasant to a Modern and Prosperous Country within 30 years*." The implementation of the blue-print is being spearheaded by the president of Uganda and coordinated by the Office of the Prime Minister (OPM).



His Excellency Y. K. Museveni Launching Uganda Vision 2040 project at Kololo Independence Grounds on April 18, 2013; *Source: New Vision, May 14, 2013*

The National Planning Authority (NPA) is mandated to ensure National Development Plans (NDPs), Sector Investment Plans (SIP) and Sector Strategic Plans (SSPs) are aligned to Vision 2040. Vision 2040 is a modification of the failed Vision 2025 (MFPED, 1999) and Vision 2035 as well as a review of visions of Kenya, Rwanda, Malaysia, Botswana, Qatar and India. It also incorporates emerging development prospects and associated challenges including the discovery of oil and gas reserves, E-revolution, globalization and regional economic integration among others.

In order to become an upper middle income country by 2040, Uganda needs to generate 42, 000 MW of electricity from all hydro sources, the petroleum and gas sources, geo-thermal and nuclear sources using uranium. Uganda will need to exploit her enormous and novelty opportunities like oil and gas, tourism, minerals, ICT business, abundant youthful labor force, strategic geographical location, fresh water resources, industries and agriculture. These opportunities will be harnessed through strengthening fundamentals including Peace, Security and Defense, Physical infrastructure (transport, ICT and energy), Science, technology, Engineering and Innovation (STEI); Land; Urbanization and globally competitive human resource. While Uganda has the necessary resources to achieve Vision 2040, corruption in state and private sector institutions have to be addressed.

Vision 2040 highlights some of the key bottlenecks to Uganda's development. Those related to extension include; (1) Underdeveloped human resource which were not skilled and no healthy which don't power socio-economic transformation, (2) Inadequate infrastructure that causes the costs of doing business in the economy to go up, thereby rendering out product uncompetitive and undermining the profitability of investments by having the said high costs, (3) Small internal markets, (4) Lack of industrialization and exporting raw materials instead of finished products, (5) Under-developed services sector and agriculture. This implies that agricultural extension has a great role to play in achieving the Uganda Vision 2040 and the country should undertake radical interventions in her political and socio-economic realms of the economy.

5.2. National Development Plan (2010/11-2014/15)

The National Development Plan (NDP) of Uganda, a five-year development strategy, aims to address structural bottlenecks in the economy to accelerate socioeconomic transformation and bring a portion of the third of the population out of poverty. The NDP emerged from the Poverty Eradication Action Plan (PEAP) which had focused on poverty reduction since 1997. The plan outlines the development priorities and implementation strategies to help achieve this. Among these, climate change is acknowledged as an enabling sector that will require integration with other sectors of the economy for successful socioeconomic transformation. It covers the period of 2010/11 to 2014/15 and envisages 'a transformed Ugandan society from a peasant to a modern and prosperous country within 30 years' by focusing on 'growth, employment and prosperity for socio-economic transformation'. It translates "the desire to balance wealth creation with sustainable poverty reduction, which calls for growth with equity" and defines eight objectives, namely;

1. Increasing household incomes and promoting equity
2. Enhancing the availability and quality of gainful employment
3. Improving stock and quality of economic infrastructure
4. Increasing access to quality social services
5. Promoting science, technology, innovation and ICT to enhance competitiveness
6. Enhancing human capital development
7. Strengthening good governance, defense and security
8. Promoting sustainable population and the use of environmental and natural resources

These objectives are pursued under four sectorial clusters, including (i) Primary growth sectors, directly producing goods and services, (ii) Complementary sectors, providing institutional and infrastructural support to primary growth and other sectors, (iii) Social sectors, providing services to maintain a healthy and quality population and human resources for effective engagement in rewarding economic activities and (iv) Enabling sectors, providing a conducive environment for the economy. The NDP further outlines

the objectives and strategic interventions for all sectors in line with individual sector investment plans (SIPs).

At the sub-national level, Government has worked out the Peace, Recovery and Development Plan for Northern Uganda (PRDP) as a framework 'strategy to eradicate poverty and improve the welfare of the populace' of this region affected by two decades of conflicts. The PRDP provides the single framework under which all interventions in Northern Uganda are expected to take place. It has four strategic objectives that include; consolidation of State Authority, rebuilding and empowering communities, revitalization of the economy and peace building and reconciliation.

5.3. MAAIF's Development Strategy and Investment Plan (DSIP, 2010-2015)

The government has pursued previous policies and strategies under the Plan for Modernization of Agriculture (PMA) – a multi-sectoral framework aimed at transforming subsistence farming to commercial agriculture. Despite government efforts in the PMA, progress was made mainly in two of seven pillars of the PMA - research and agricultural advisory services, while limited progress was achieved in the other five pillars. As such, government identified areas of weakness in the PMA framework and addressed them in the five year Agricultural Sector Development Strategy and Investment Plan (DSIP) 2010/11 – 2014/15.

The DSIP aims to raise rural household incomes and improve food and nutrition security of all Ugandans. The immediate objectives are;

1. Factor productivity (land, labor, capital) in crops, livestock, and fisheries sustainably enhanced.
2. Markets for primary and secondary agricultural products within Uganda, the region and beyond developed and sustained
3. Favorable legal, policy and institutional frameworks that facilitate private sector expansion and increased profitability along the entire value chain developed
4. MAAIF and Agencies (such as NARO) functioning as a modern, client-oriented organization within an innovative, accountable, support environment

Four main challenges face the agricultural sector in Uganda; low production and productivity; low value addition to agricultural produce and limited market access; weak implementation of agricultural laws and policies; and weak public agricultural institutions. As such, the DSIP was designed to address these constraints in four investment programs – increasing agricultural production and productivity; increasing access to markets and value addition; creating an enabling environment for the private sector in agriculture; and strengthening agricultural institutions at the centre and in local governments.

In implementing these programs, the government committed to pursue a private sector led strategy by addressing key constraints that hinder more investment in the agriculture. During DSIP implementation, government committed to pursue and support public-private partnerships, increase funding to agriculture over DSIP's five years, guided by the priorities in the DSIP, and also in line with the CAADP principle of increasing spending to the sector. However, over the years, even as DSIP comes to end, the agricultural sector has continued to receive minimal funding from government and largely dependent on donor support.

5.4. The National Agriculture Policy (2013)

The National Agriculture Policy is meant to revolutionize farming, with the overall objective of achieving food and nutrition security and improving household incomes. Despite making a significant contribution to Uganda's socio-economic development through generation of household and national incomes, reduction of hunger, and supporting growth in trade, investments, and industrialization, agriculture had lacked a clear policy to guide regulation, planning and investment. The National Agriculture Policy was modelled on Uganda's Vision 2040, which calls for intra- and inter-sectoral coordination and approach in order to achieve the policy objective. To achieve this, the government shall pursue six interrelated objectives.

The policy's six objectives are: ensuring food security; increasing incomes of farming households; promoting specialization in strategic, profitable and viable enterprises and

value addition through agro-zoning; ensuring sustainable use and management of agricultural resources; promoting domestic, regional and international trade in agricultural products; as well as developing human resources for agricultural development. To ensure food security, the policy calls for the establishment of a national strategic food reserve system as well as development and improvement of food-handling, marketing and distribution systems that provide linkages to domestic, regional and international markets. In addition, the policy urges government to encourage and support local governments to enact and enforce by-laws and ordinances that promote household food security through appropriate production and storage practices.

Cognizant of the demand for agricultural zoning, the policy emphasizes that agricultural development strategies should be developed and pursued according to the agricultural production zones through a commodity-based approach. “Commodities that are best suited for each zone will receive public sector support for the purposes of food security and for commercialization,” the policy states. To address agriculture financing, a key impediment to the sector’s growth, the policy suggests that the Finance ministry, in collaboration with other financial sector players, will continue developing appropriate policies, financial products, and services. .“Complete information on the financial products and services available will be appropriately packaged and disseminated to all potential beneficiaries,” the policy reads.

The policy also calls for promotion of processing of food commodities, leather and leather products, textiles and garments, sugar, dairy and other value-added products for niche export markets. This agro-processing is to be achieved through collaboration between the ministries of Trade, Industry and Cooperatives, and Agriculture, Animal Industry and Fisheries. “The collaboration will foster the link between primary and tertiary agro-processing levels and encourage development and support of start-up agro processing enterprises in agricultural zones,” the policy says.

However, some policy analysts argue that the National Agriculture Policy does not change the status of agriculture working in a liberalized environment. The policy is couched within

the framework of private sector-led and market economy, which is why agriculture has failed to optimize its potential. Since there is a small portion of private farmers who can afford farm inputs, the government should come in to provides incentives and make lending to farmers easy. The government should also revamp the cooperative movement through which it will be possible to provide incentives to farmers.

5.5. The National Agricultural Research Organization (NARO) Strategic Plan 2008/09 – 2017/18

This strategic plan is based on NARO's comparative advantage as a coordinating body of the National Agricultural Research Systems (NARS); development trends and challenges; commitment to mission, vision, mandate and core values; and National and sector development frameworks and aspirations of the Government of Uganda. The overall goal set out in the strategic plan is to enhance the contribution of agricultural sector research to agricultural productivity, sustained competitiveness, economic growth, food security and poverty eradication. The mission and vision to guide attainment of this goal are "to generate and disseminate appropriate, safe and cost effective technologies" and "a market-responsive, client-oriented, and demand-driven national agricultural research system", respectively.

The strategic plan focuses on the following five results:

1. Client and impact-oriented, market-responsive agricultural sector research agenda developed and implemented
2. Capacity and efficiency of public and private agricultural sector research service provider teams to respond to client needs and market opportunities improved
3. Infrastructural and financial sustainability capacities to support and facilitate agricultural research enhanced and strengthened
4. Mechanisms for contributing to agricultural research sector policy formulation and development strengthened
5. Quality assurance procedures in the NARS established and implemented

To implement the proposed strategies, the ten-year strategic plan is clustered in short, medium, and long term distinct phases. In the short-term (2008 – 2010) efforts focused

on consolidating achievements of NARO accrued from previous strategic intervention, responding to emerging threats and market opportunities, piloting thematic research, identifying priorities for mid-term research agenda and the implementation of the NARS reforms.

The medium term plan focused on a research technology and institutional development priorities defined for a five-year period (2010 – 2014). Specifically the medium term plan steer technology development for increased production, and competitiveness along the value chain, through thematic research; institutionalize quality standards, processes in management, technology development and information dissemination, packaging, dissemination and impact assessment of outputs of the outgoing strategic plan. Other important areas to be addressed in the medium term are strengthening capacity for thematic Market-Oriented Research (MOR), pluralistic research, implement strategy for empowerment of private agricultural research service providers, review, and streamline competitive grants schemes (CGS), strengthening partnerships: synergies and complementarities for agricultural research and information sharing, especially the NARO-NAADS-farmer-market nexus, and initiate efforts to capitalize the Agricultural Research Technology Fund (ARTF).

The long-term plan, 2014/15 -2017/18 will be based on outcomes of implementing the medium term activities. In addition, the following areas will particularly be key in the long term: Consolidating mechanisms for private sector contribution to agricultural research, institutionalizing income generation by the Public Agricultural Research Institutes (PARIs) to contribute to research funding, actualization of client led demand articulation process, review of research service delivery public-private-partnerships (for sustainability and efficiency), and impact assessment of NARS performance. The strategy is focused on increasing access to improved knowledge, technologies, information and associated services that address, in a sustainable manner, the needs and opportunities of mainly economically active poor farmers.

6.0 FINDINGS FROM THE KEY INFORMANT INTERVIEWS

6.1. Existing extension approaches

The Key Informants highlighted the extension methods below as the main approaches used to deliver agricultural technologies to farmers in Uganda

1) Group training approach

Group training approach is normally used where a group of farmers share a common interest, such as bee keeping and dairy farming. This approach is common in Eastern Uganda especially in implementation of the Farm Income Enhancement and Forest Conservation (FIEFOC), Territorial Approach to Climate Change (TACC) and Mbale Coalition Against Poverty (MbaleCAP) programs. Group training approach is effective because of peer influence and competition among group members; close supervision of group members enables working with many farmers at the same time

Group training approach is normally demand driven and conducted when there is a felt need among a group of farmers. It was noted that gender composition is not considered during selection of trainees. It was observed that most of the group trainings are dominated by women with fewer youths.

2) Individual farmer approach

The individual farmer approach is used where commercial farmers, out of own initiative and/or need, approach technical extension staff and demand for specific extension services. The individual approach is often used in quest for advice on pest and disease control as well as produce marketing.

3) Mass media

Mass media is a common form of agricultural extension. Local and national radio stations are used to deliver key messages to the general public. In Eastern Uganda, mass media is supported financially by the on-going projects in the region. For example, the TACC project sponsors a number of radio programs on climate change awareness, promoting soil and water conservation practices and use of climate-smart agricultural technologies.

4) Model-farmer approach

In this approach, one farmer is selected, trained and a demonstration set-up on his or her land where other farmers can learn. The model-farmer approach is common among market oriented farmers. The approach has been widely used in transferring agricultural technologies on improved dairy cattle feeding and water harvesting within the project area.

5) Demonstration sites

In this approach, farmers willingly give out their lands for demonstration purposes. Both the farmers and the technical institutions support the establishment of technologies in the sites. Farmers in the wider community are subsequently invited to visit the sites for training purposes. Under the FIEFOC programme, a demonstration site for soil and water conservation has been established in Busoba village and a fruit orchard in Manafwa district.



A demonstration site for soil and water conservation structures in Manafwa district

6) Farm visits by extension staff

These visits entail either invitation of extension staff by farmers or impromptu visits by extension staff to farmers' land for regular monitoring. The latter is normally used when monitoring government programmes in the community. Farm visits were common in monitoring and follow up of the NAADS programmes. In some cases, farm visits are initiated by reports from Community Based Facilitators (CBFs), who shed light on specific problems observed among farmers in their communities. Farm visits are expensive hence difficult to reach the optimal number of farms.

7) Trainings

Farmers are invited to a central location and trained on aspects such as pest and disease management, marketing, new tree varieties such as clonal eucalyptus etc. Ordinarily,

farmers have no control over the content of the training programme hence a risk of not meeting the needs of the trainees.

8) Farmer Field Schools

Farmer Field Schools (FFS) comprise groups of farmers with a common objective of learning about important aspects in their specific sites. Each group contains 20-25 farmers with a common interest. Major areas of focus range from conservation agriculture, organic agriculture, animal husbandry, and soil husbandry to income generating activities such as handicrafts. Farmer Field Schools therefore provide opportunities where farmers can learn and implement the skills (mainly on agricultural management) acquired. Moreover FFS is an apt platform where farmers and trainers share the lessons learnt, observations, experiences and any innovative ideas. Farmers are encouraged to implement their own ideas in their own fields. Training materials, seeds, pesticides, herbicides and other inputs are provided for each FFS. The communities also construct temporary structures/shaded areas where they hold meetings and follow-up discussions. Facilitators are usually competent technical personnel who train farmers on guide the group in the actual implementation and also offer advisory services on communication skills building, problem solving and leadership and discussion methods.

6.2 Information disseminated during extension

Information disseminated through the various extension approaches relates to animal health (tick control through spraying, control of foot and mouth disease); animal fodder production (fodder management, hay and silage making, feed mixing); post-harvest handling of crops especially maize and beans; crop residue management; control of banana bacterial wilt disease (BWD), and control of coffee pests and diseases.

The agriculture information disseminated depends on the target group and it varies from one group to another. Extension is focused on animal health (tick control, vaccination), fodder production (feed mixing, hey and silage making), crop pest and disease control (Banana Bacterial wilt, coffee leaf rust, coffee berry disease), agroforestry (hedgerows

for soil and water conservation, boundary planting, species site matching) and other cross cutting issues such as gender and climate change.

Capacity and efficiency

During the National Agricultural Advisory Services (NAADS) regime, the local government agricultural extension departments and units had enough human and financial resources. There were technical service providers (Veterinary and crop production) per sub county, Community Based Facilitators (one per parish) and technical parish coordinating committees. All these were well facilitated. Currently, there are no extension staff below the district local government structures, leaving an inadequate extension personnel. The Key informants Interviews also revealed that information gaps exist in the training materials being used by extension staff who are also poorly facilitated due to limited funding.

6.3 Strengths and weaknesses in the existing extension approaches

An assessment of the extension approaches, based on key informants' perception is given in Table 2.

Table 2: Strengths and Weaknesses of selected extension approaches

Extension approach	Strengths	Weaknesses
Group training approach	With effective mobilization, a large number of farmers can be reached. The approach is participatory and facilitates learning	Most group trainings are dominated by women, men rarely attend. Farmers do not turn-up for trainings if there is no facilitation for food and transport Attendance to group trainings is inconsistent. Turn-up is low during the rainy season because most farmers get engaged in farming Low technology adoption levels among the trained farmers
Farm visits by extension staff	An effective extension approach, since it addresses the problem of a specific farmer High technology adoption levels can be achieved among the farmers visited	Requires a lot of funds and transport facilitation for the extension staff Limited coverage by the extension staff, thus difficult to reach out to all farmers
Demonstration sites	It enables practical learning among farmers	Demonstration sites are expensive to set-up and maintain. Theft of fruits from demonstration sites was reported in Manafwa district as a common hindrance to maintenance of orchards It covers a limited scope and normally few farmers benefit from it
Model-farmer approach	Suitable for transferring new technologies to farmers	This approach normally targets well-off farmers who have large pieces of land and are willing to co-finance the demonstration.

		Some model farmers are not willing to host and teach fellow farmers in the community
Mass media	It has a large coverage	Information may not be beneficial to all the farmers, thus it does not cater for individual farmer extension needs
Farmer Field Schools (FFS)	The approach is highly participatory and facilitates learning among farmers Farmers are empowered and own what they do during farmer field schools The approach is self-sustaining and exposes farmers to new technologies This extension approach is effective in imparting the required knowledge and skills to farmers because of the regular interactions between the farmers and the facilitators Group dynamics, participatory group presentation and discussion form part of the approach. As a result, a sense of cooperation and team coordination develops among the farmers which is helpful in spreading and sharing technologies with one other. The approach enhances community interest because impact is visible.	It is expensive to implement

6.4 Incentives

Provision of incentives to farmers has not been a common practice by government and private agricultural extension stakeholders in Uganda. However, some farmers have been recognized and awarded for their efforts towards promoting agriculture. Farmers also receive facilitation in form of transport and lunch during trainings, and some have been provided with inputs such as seeds, hoes, gumboots among others. In 2014, a competition referred to as 'Uganda's Best Farmers' was conducted in the country where ten best Ugandan farmers got the opportunity to visit The Netherlands and also shared a cash prize of 150 million Uganda shillings. The competition was facilitated jointly by DFCU Bank, the Royal Netherlands Embassy, KLM Airlines and Vision Group. The overall best farmer received a cash prize of 50 million Uganda shillings.



The overall winner of Best Farmer's Award_2014, Patrick Yiga (second right) after receiving a sh50m prize *(Source; New Vision Newspaper, Published December 1, 2014)*

6.6. Local innovation

Cases of local technology innovation were reported among farmers. Such innovations are promoted through training and demonstrations on innovators' farms. For example construction of soil and water conservation using stone embankments was evident among farmers cultivating in the highland and midland farming landscape levels in Manafwa district. Other examples of local innovation include: use of red pepper and ash to prepare local pesticide to control banana wilt; modification of grafted oranges to lemons root stock–to increase market value.

6.7 Involvement of civil society and private sector in agricultural extension

The directorate of natural resources at the district level collaborates with various civil society agencies and programs on various aspects. These include: (i) Mbale CAP (targeted planting 1 million and 2 million trees in phases 1 and 2 respectively); (ii) TACC Project through its Integrated Territorial Climate Plan (ITCP); (iii) World Vision; FIEFOC; REDD Plus; and (iv) the Uganda Environmental Conservation Trust (ECOTRUST) Trees for Global Benefits project. There are other small groups undertaking activities related to tree planting and natural resource management although many of these maintain minimal contact with the district technical units.

7.0 EXTENSION BY NGOS

7.1 Technologies disseminated

Technologies disseminated by most NGOs in Manafwa and Mbale include agroforestry (fruit trees and coffee agroforestry), soil and water conservation, animal health, improved livestock feeding (promotion of fodder) restoration of degraded areas, tree planting and nursery establishment, and on-farm tree management (silvicultural) practices. Trees promoted include *Grevillea robusta, Measopsis eminii*, *Mangifera indica, Artocarpus hetrophyllus* and *Persea americana*. Most of the NGOs put a lot of effort in ensuring household food security through promotion of sustainable post-harvest handling methods for crops such as maize, beans and cassava. Most of the farmers use agricultural wastes and fertilizer trees/shrubs to rejuvenate their soils.



Post-harvest handling of beans in Butta Sub County

7.2 Extension methods used

The most commonly used extension methods by the NGOs include trainings, use of model farmers and demonstrations on farmers' land. Model farmers are used to transfer technologies to other farmers. Model farmers approach is prominent among most of the

NGOs because most of the model farmers are opinion leaders and they help in convincing other farmers to adopt the technologies.

7.3 Case study of KIFANGO

Kitsi Farmers Non-governmental Organization (KIFANGO) was established in 1998 as a Community Based Organization (CBO) and later registered as an NGO in 2001. The membership based organization started with 40 members and now has a membership of 180 members. The leadership structure of KIFANGO is composed of the Board (with 7 members) and committees in charge of mobilization, monitoring, research and discipline. The organization has extension workers who work on voluntary basis and sometimes hired on a demand –basis. KIFANGO's main activities include sensitization of communities on soil and water conservation through promotion of terraces and contours, and tree planting. Most of the activities are donor funded and the prominent donors include Babuka Development Trust Uganda (BUDETU) and Global Environment Facility (GEF).

BUDETU's mission is to support local communities, identify, mobilize, utilize, develop and manage resources on sustainable basis. The Trust currently has over 239 members and over 400 beneficiaries in Bugisu sub-region. KIFANGO members have also benefited from this initiative and many of her members now practice Dairy Farming both Heifers and Goats, bee farming and horticulture.

Kitsi Farmers Agroforestry and Soil Management Project in Bubulo is funded by the GEF Small Grants Programme. KIFANGO's partners include the Mbale district local government and the Green Belt movement. This project targets communities living around the Mt. Elgon's fragile ecosystems that are under threat from human population pressure.



A signpost of the UNDP/GEF Funded project in Kitsi, Manafwa district

Kitsi Farmers Agroforestry and Soil Management Project in Bubulo aims at promoting Community based agroforestry and improved land management practices to reduce biodiversity loss; conserving and fostering sustainable land management and improved livelihoods of the people living around the Mount Elgon's fragile ecosystem. It also promotes soil and water conservation for increased productivity and agro biodiversity conservation through integrated approaches. The project promotes activities such as beekeeping, animal rearing, back-yard gardening and growing of multipurpose trees.

KIFANGO's key role in this project is to promote sustainable community development initiatives aimed at reducing biodiversity loss, restoring soil fertility and stabilization of soils on steep slopes, increase productivity, provide food, fodder, fruits, fuel wood, poles and timber for construction, stakes for climbing crops, providing income for the rural community and conservation of the threatened fragile ecosystems.

Lessons from KIFANGO on effective agricultural extension among communities

The management of KIFANGO has over the years drawn the following lessons on effective agricultural extension among the organization's members;

1. Having a monitoring committee as part of the organizational structure ensures follow-up of trained farmers and their progress towards adherence to the knowledge gained. The monitoring committee designs formal agreements with farmers before receiving the technology or knowledge. The agreement serves as the monitoring framework with key performance indicators. Some farmers are penalized for not meeting the set targets.

2. Community development is guaranteed by targeting youths during technology transfer and knowledge dissemination. This is because most youths are eager to learn and have the energy to implement various technologies such as brick making, tailoring, carpentry and building.

3. Communities are trained on highly valued technologies such as growing mango and orange fruit trees.

4. Incorporation of an economic component in a community intervention enhances sustainability of the intervention. Local communities are always looking out for an intervention from which they get generate income.

8.0 CHALLENGES IN UGANDA'S AGRICULTURE EXTENSION

Studies conducted over the NAADS implementation period showed mixed results on programme performance. In general, some assessment studies showed favourable evaluation (Adipala *et al*. 2003; IFPRI, 2007; ITAD, 2008; Benin *et al*. 2011). The findings of these studies corroborated the trend from the agricultural production statistics, which consistently showed a steady decline in real growth in agricultural output, from 7.9% in 2000/01, to 0.7% in 2007/08 (MAAIF, 2010).

The national service delivery surveys conducted over the same period also showed that only about 10% of Ugandan farmers received extension services. This study therefore sought to establish why the extension reform programme that consumed over 40% of the national agricultural budget, described as a 'big experiment' in changing extension in Africa (Chapman and Tripp, 2003), appear not to have yielded satisfactory results. Using the Advocacy Coalition Framework (Sabatier and Jenkins-Smith, 1993), the study established that lack of consensus was the key challenge in the agricultural extension reform in Uganda. Even with the introduction of the Army to supply agricultural inputs, some policy analysts still believe that key reforms must be put in place for NAADS to yield tangible results

Officials in Manafwa and Mbale districts indicated that delayed release of government funds hinders extension service delivery. Poor facilitation of extension personnel (especially the technical advisory service providers) was also reported as a key challenge.

There have been reports that middlemen usually convince some food insecure households to sell of their food and the inputs supplied to them. A few cases where famers instead cook and eat the treated seeds have also been reported in some parts of the country.



Miaze seed ready for distribution to farmers in Buttta Sub County, Manafwa

Other reported challenges faced by Uganda's agriculture extension include:

1. Low agriculture technology adoption levels by the farmers. This is usually associated with the high cost of some technologies which farmers cannot afford

2. Poor storage facilities for harvested produce

3. The NGO and NAADS' practice of giving transport facilitation and refunds has contributed to the low turn-up of farmers for the trainings where transport facilitation is not assured.

9.0. CONCLUSION

Extension in Uganda is under the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and the National Agriculture Advisory Services (NAADS). At the district level, extension falls under the Department of Natural Resources (Environment, Land and Forestry) and the Production Department (Agriculture, Commercial, Entomology and Veterinary).

The main extension methods in the project area include trainings (individual and group), demonstration, model farmers, radio outreach and follow-up visits. Follow up visits are constrained by poor transport facilitation and understaffing, given the large expanse of the area of operation.

Extension information disseminated to farmers depends on the target group and varies from one group to another. Most of the information disseminated is on animal health (tick control, vaccination), fodder production (feed mixing, hay and silage making), crop pest and disease control (Banana Bacterial wilt, coffee leaf rust, coffee berry disease), agroforestry (hedgerows for soil and water conservation, boundary planting, species site matching) and cross cutting issues such as gender and climate change.

The policy context within which dissemination of agricultural technologies, information and skills to farmers takes place is embedded in the a number of policy documents including Uganda's Vision 2040, the National Development Plan (2010/11-2014/15), MAAIF's Development Strategy and Investment Plan (DSIP, 2010-2015), The National Agriculture Policy (2013), The National Agricultural Research Organization (NARO) Strategic Plan 2008/09 – 2017/18, and the recently drafted Agricultural Sector Strategic Plan (ASSP 2016/2020).

10.0 Recommendations

The study gives the following key recommendations:

1. Agricultural extension will only be successful if all stakeholders take up their roles effectively. Private investors can provide a big opportunity for dissemination of agricultural information, at a low-cost, if they work in collaboration with existing public extension structures.

2. There is need to strategically build on existing government and private-business extension initiative. Given that Operation Wealth Creation is skewed towards supply of agricultural inputs, researchers and private investors could explore opportunities of collaborating with such initiatives to address other related bottlenecks.

3. The Trees for Food Security Project should build on the existing approaches such as group trainings, the use of model farmers and demonstration plots to scale up evergreen agriculture in the project sites (Butta and Namabya Sub counties) in Eastern Uganda.

4. The government should recognize that complementarities and potential synergy of different actors in agricultural development (farmers' organizations, research, extension, agricultural education institutions, input supply, micro credit and other public and private partners are important and hence establish linkages with them.

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APPENDICES

Appendix I: Baseline and Vision Targets Development Indicators

No.	Baseline and Vision Targets - Development Indicator		Baseline 2010	Target 2040
1.	Per capita income		USD 506	USD 9500
2.	Percentage of population below the poverty line		24.5	5
3.	Income distribution(GINI Coefficient)		0.43	0.32
4.	Sectoral composition of GDP (%)	Agriculture	22.4	10
		Industry	26.5	31
		Services	51.2	58
5.	Labor force distribution in line with sectoral contribution (%)	Agriculture	65.6	31
		Industry	7.6	26
		Services	26.8	43
6.	% share of national labor force employed		70.9	94
7.	Manufactured exports as a % of total exports		4.2	50
8.	Gross Capital Formation as % of GDP		24.1	30
9.	Saving as a % of GDP		14.5	35
10.	ICT goods & services as a % of total export		0	40
11.	Technology up-take & diffusion (Technology Achievement Index (TAI))		0.24	0.5
12.	Public expenditure as a % share of R&D to GDP		0.1	2.5
13.	Innovation as measured by patents registered per year		3	6000
14.	Electricity consumption per capita(kWh)		75	3668
15.	% population with access to electricity		11	80
16.	Water consumption per capita(m^3)		26	600
17.	% population with access to safe piped water		15	80
18.	% of standard paved roads to total road network		4	80
19.	% of cargo freight on rail to total freight		3.5	80
20.	% of population in planned settlements	Urban	51	100
		Rural	0	100
21.	% level of urbanization		13	60
22.	Labor Productivity (GDP per Worker - USD)	Agriculture	390	6,790
		Industry	3,550	24,820
		Services	1,830	25,513
		Total	1,017	19,770
23.	Life expectancy at birth (years)		51.5	85
24.	Infant mortality rate per 1000 live births		63	4
25.	Maternal mortality rate per 100,000 live births		310	15
26.	Under 5 mortality rate per 1000		96	8
27.	Child stunting as a % of under 5s		33	0
28.	Literacy Rate (%)		73	95
29.	Gender Related Development Index (GDI)		0.51	0.9
30.	Population growth rate		3.2	2.4
31.	Forest Cover (% land Area)		15	24
32.	Wetland Cover - % of total area		8	13
33.	Corruption Perception Index		2.5	7.1

Source: Uganda Vision 2040

Appendix II: Checklist for National/regional level Key Informants

National/regional level

- What is the overall extension structure in the country? (Include ministries and directorates involved, flow of services from the national, province, district to the lowest level)
- Which extension models are used by the government? (at all levels from the national to the county levels)
- What policies influence extension in the country?
- How is government extension linked to the private sector and NGOs?
- What are the benefits that have been realized as a result of extension? (describe the benefits in various sectors- agriculture, livestock, NRM etc)
- What are the challenges faced in extension systems
- What is the future of extension in the country, any strategies, policy recommendations and plans for improving extension among small holder farmers?
- What are your recommendations in improving extension in the country?

Appendix III: Checklist for NGOs and Private Sector Key Informants

National/District/County/Sub county/Parish
NGOs/Private sector

- Give a brief description of your organization (include activities, staff involved, funding mechanisms etc)
- What agricultural information (technologies /skills) do you disseminate to farmers
- What models of extension do you use (eg Private service providers, Participatory Demonstration and Training, farmer to farmer extension, community based facilitators etc)
- What are the strengths and weaknesses of each method used? How do you deal with the weaknesses?
- How do you decide on the target community?
- What interventions/activities/technologies were used in the past and have changed with time?
- What are the key lessons and successes for dissemination and uptake of new technologies/skills? (benefits of extension)
- How do you measure the general uptake of the information you disseminate/technologies you introduce?
- Do you have any framework for monitoring the activities after their uptake?
- Do you consider any policies when using the different activities used? If yes, what are the policies considered?
- How do you link with the government organizations, other NGOs and/or private sectors in your activities?
- What are the challenges faced in your work? And how do you address them.
- What are the future plans of your organization with regard to improving extension system?
- What recommendations would you give in order to improve delivery of extension services?

Appendix IV: Checklist for Local government officials

Extension approaches, technologies disseminated and target sites (agro-ecology/farming system)

- What agricultural information (technologies /skills) do you disseminate to farmers?
- What agro-ecologies /farming systems do you cover?
- How do you decide on the target community?
- How do you decide on the kind of information/technologies to disseminate to farmers
- Who participates?
- What model of extension do you use (eg Private service providers, Participatory Demonstration and Training, farmer to farmer extension, community based facilitators)
- What are the strengths and weaknesses of each method used? How do you deal with the weaknesses?
- How the technologies are packaged, multiplied and made available to farmers?
- What activities/methods do you use in dissemination (eg training, demonstration plots, exchange visits, media-posters, brochures etc)?
- If you use demonstration plots, where are they are normally set up? (On-farm, FTC, community land?)
- If on-farm, who decides on which farm the demonstration plot will be set up? How do you select the location of the demonstration plots?
- If at the FTC, who manages the demonstration plots?
- If on community land, who manages the demonstration plots?
- Are the extension services targeted at whole groups or individuals? If aimed at individuals, how is the information shared with other members of the community?
- In your experience is it more successful to disseminate information/skills to individuals or groups and under which circumstances?
- Who conducts the extension activities (e.g extension officers only or are there partners involved)?
- For each activity how much time (in months/ years and number of visits) do you spend with the group / individual? How many times would you normally follow-up after an activity with the group / individual?
- What interventions/activities/technologies were used in the past and have changed with time? What are the key lessons and successes for dissemination and uptake of new technologies/skills?
- How do you measure the general uptake of the information you disseminate/technologies you introduce?
- What would be the average uptake of the information disseminated in each activity (0-25, 25-50, 50-75, 75% +)?
- Do you have any framework for monitoring the activities after their uptake?
- Do you consider any policies when using the different activities used? If yes, what are the policies considered?

Community engagement and targeting:

- Is there a formalized method of training farmers? Who decides on the content farmers will be trained on? Explain the process of connecting the community needs to the information disseminated and activities
- Who develops the curriculum, training resources and tools?
- How is the target audience within the community selected for each activity?
- How does the community give feedback on activities? Explain the process
- Are the activities open to the wider community (beyond the target)? If yes are they allowed to actively participate in all activities or do they attend to receive information only?
- Are there specific roles for each gender when dealing with the different activities (eg farming activities, livestock keepingand marketing?
- Are men and women taught together?
- Are all the groups trained together? If not, what is the criterion used to separate the members into different training groups eg level of maturity, knowledge, farming experience etc?
- Do you generally find the community willing to be engaged? Explain further.
- What are the main obstacles you face in delivering technologies/skills to the community?

Capacity / efficiency:

- How many extension officers are involved in each activity?
- What are the costs associated with conducting the activities (hall hire, transport allowances, food etc)
- Are activities generally delivered at the Farmers' training Centres or on-farm? Explain when different locations are used.
- What is the comparison of benefits and costs between the different activities conducted?
- How many individuals / group members / groups do you train at one time (on average) for each activity**?**
- Where is funding received from for these activities? Is it sufficient and on-going?

Linkage with input suppliers/ research/private sector/and other pertinent institutions

- Explain to us the linkage you have with the Ministry of Agriculture, at the National, District, County and sub county level?
- Do you collaborate with other service providers and extension agents from NGOs?
- Do you collaborate with private service providers? Explain the terms of engagement and the enterprises they are involved in
- What is the level of coordination and linkages with other service providers or extension providers?
- In which areas do you collaborate?

Incentives

- Under which circumstances do you provide incentives to farmers and what incentives do you give?
- Who determines the kind of incentives?

Commercialization and Marketing

- Do you address issues of commercialization? How do you address issues of commercialization
- What commodities have been commercialized?
- Do you link farmers to markets?
- If yes, which markets, and how do you link them?

Local innovation

- How do you promote local innovation?
- How do farmers share experiences about local innovation?

Appendix V: List of key informants

Name	Gender	Designation	Organisation	Phone
1. Dr. Okello Denis Odongo	M	District Veterinary Officer	Manafwa district local government	0772883605
2. Ms. Doreen Khakusuma	F	District Commercial Officer	Manafwa district local government	0773367377
3. Mr. George Kutosi	M	Former NAADS Coordinator, Butta Sub county	Manafwa district local government	0782528702
4. Mr. Michael Mwangale	M	District Forest Officer	Manafwa district local government	0704058866
5. Ms. Sarah Bisikwa	F	District Natural Resource Coordinator	Manafwa district local government	0779665033
6. Ms. NambuyaModesta	F	District Agricultural Officer	Manafwa district local government	0772881582
7. Mr. George Wanakina	M	NAADS Coordinator	Mbale district local government	0782081906
8. Mr. George Mabuya	M	District Forestry Officer	Mbale district local government	0702879537
9. Mr. Samson Wakwabubi	F	Parish Chief	Butta Sub-county	0773711657
10. Ms. Nabukwatsi Evelyn	F	SAS	Namabya Sub-county	0776405205
11. Mr. Kisenge Robert M.	M	Chairman LC3, Namabya SC	Namabya Sub-county	0775417410
12. Ms. Lusike Sylvia	F	CDO, Namabya SC	Namabya Sub-county	0774517203
13. Mr. Soyi Stephen	M	C/person KIFANGO	Kitsi Farmers NGO (KIFANGO)	0778764757
14. Mr. Kundu John Sam	M	Secretary, KIFANGO	Kitsi Farmers NGO (KIFANGO)	0788010584
15. Ms. Barbara Kwaka	F	Chief, Butta SC	Butta Sub-county	0703405316
16. Dr. Prossy Isubikalu	F	Lecturer	Makerere University	0772345398