

# RE-IMAGINING Agricultural Extension through a Learning Lens (RAELL)

## *Uganda Report*

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# **Re-Imagining Agricultural Extension through a Learning Lens (RAELL): Analytical Report from Gulu, Uganda**

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## 1 History, Background and Context

Agriculture is the major source of livelihoods in Uganda. A 2017 report by the Uganda Bureau of Statistics (UBOS) reported that 80% of Ugandan households were engaged in agricultural activities, with 92% of those households living in rural areas and practicing small scale agriculture - the majority being women (UBOS, 2017). Despite being one of the biggest economic activities in Uganda, the agricultural sector is faced with a number of challenges, including; low production and productivity, a changing climate, lack of access to sustainable markets, low value addition to produce, an inconsistent policy regime, and a lack of adequate and skilled manpower (FEWSNet, 2021; MAAFI, 2011).

Ugandan agricultural extension has changed substantially since colonial times due to constant pressure to respond to the ever-changing food production system and adjustments in economic structures which render old extension systems inappropriate (Obaa, Mutimba & Semana, 2005). Despite various changes since pre-colonial times, evidence suggests that, in general, the implementation of agricultural extension systems in Uganda has been disheartening (Barungi, Guloba and Adong, 2016). Not all categories of people, particularly vulnerable groups, are able to access extension services due to factors including corruption, low pay of AEOs, funding challenges and the top-bottom approach (AfranaaKwapong and Nkoya, 2015).

The transformation of the agricultural extension system in Uganda from the colonial period to early 2000 as described by Obaa, Mutimba & Semana (2005) is set out below:

- **1898-1907:** Early colonial period - involved importation of foreign cash crops, such as cotton, tobacco and the establishment of research stations.
- **1920-1956:** extension service run through administrative chiefs under the British government; these were assisted by a few field officers and African instructors.
- **1956-1963:** extension through progressive farmers; technical advice and support was given to selected progressive farmers.
- **1964-1972:** extension methods phase; extension service became more professional through training.
- **1972-1980:** Non-Directional (Dormant) Phase; economic disruption impaired the delivery of goods and services. Extension staff selling inputs to farmers due to political turmoil.
- **1981-1991:** Recovery period; emphasis on rehabilitation of infrastructure and restoration of basic services.

- **1992-1997:** Agricultural Extension and Education/Reforms; radical reforms such as decentralisation, liberalisation, privatisation and restructuring. Reforms had negative impact; districts lacked capacity to support extension and farmers lost access to extension services.
- **1998-2002:** public extension service at a stand-still; NGOs increased activities with handouts and increased donor support to support government programs like Plan for Modernization of Agriculture (PMA). National Agricultural Advisory Services (NAADS) established in 2001.

### **1.1 National Agricultural Advisory Services (NAADS)**

Public extension work in Uganda was dormant from the late 90s until 2001, with NGOs taking up the (formerly public) activities which mainly involved distributing ‘handouts’. However, in April 2001, the Parliament established the National Agricultural Advisory Services (NAADS) with the aim of developing a demand-driven, client-oriented agricultural service delivery system that targets the poor and women (Obaa, Mutimba & Semana, 2005). NAADS had five major sub-components;

- Advisory and information services to farmers
- Technology development and linkage to markets
- Quality Assurance-Regulations and Technical Auditing
- Private sector institutional development
- Programme Management and Monitoring

NAADS was planned as a 25-year programme, and the initial seven-year phase was to increase farmers’ income and quality of live through increased agricultural productivity, market linkages and improved technologies (Benin et al. 2011). Benin et al., 2007 showed that the NAADS programme has helped to strengthen the institutional capacity and human resource skills of many farmers to demand and manage the delivery of agricultural advisory services, as a majority of the groups participating in the programme reported having received useful training in several areas and individual members’ participation in farmer groups’ activities was high. Service providers were also highly rated on the methods used in their training and on their performance. Studies also affirm that the programme had positive impacts on factors such as technology uptake, marketed output, and in reaching a significant number of farmers, as it

was active in 79 of the 80 districts by 2015 (Benin et al., 2007; AfranaaKwapong and Nkonya, 2015).

A study to assess the returns of spending on NAADS in Uganda showed that participation in the programme had a significant positive impact on agricultural revenue overall (Benin et al., 2011). Furthermore, the same research showed that overall participation in the programme resulted in an average increase of between 32-63% in agricultural revenue per adult equivalent, while direct or indirect participation resulted in average increases of 37-97% and 22-55% respectively. Turyahikayo and Edson (2016) conducted research that showed that trust, perception and effectiveness affects the way farmers respond to government extension services and, over the years, this could have affected the effectiveness and implementation of the NAADS programme.

## **1.2 National Agriculture Extension Strategy (2016)**

The current National Agriculture Extension Strategy (2016) (NAES) is a five-year programme aimed at:

- (i) Establishing a well-coordinated, harmonized pluralistic agricultural extension delivery system for increased efficiency and effectiveness;
- (ii) Empowering farmers and other value chain actors (youth, women and other vulnerable groups) to effectively participate and benefit equitably from agricultural extension processes and demand for services;
- (iii) Developing a sustainable mechanism for packaging and disseminating appropriate technologies to all categories of farmers and other beneficiaries in the agricultural sector;
- (iv) Building institutional capacity for effective delivery of agricultural extension services

## **1.3 The Role and Purpose of Agricultural Extension Officers (AEOs)**

The Agricultural Extension Guidelines and Standards (AEGS) (2017) produced by the Ministry of Agriculture, Animal Industry And Fisheries (MAAIF) define the roles of Agricultural Extension Officers (AEOs) as:

- Policy advocacy for extension services at all levels

- Resource mobilisation for agricultural extension services
- Private extension service provision
- Supply of quality agricultural inputs
- Support post-harvest handling, storage, value addition and processing
- Provide services in transport, trade and marketing
- Mobilise farmers into groups
- Sensitization and training of farmers
- Support vulnerable groups
- Support capacity building in extension services

(AEGS, 2017, p.10)

Based on the perspectives of the farmers, AEOs, students, NGOs, and both private- and public-sector training institutes interviewed for this study (see next section for further details of the study), we identified three main expectations of government AEOs.

1. The primary role of agriculture extension officers is to listen to and observe (mainly small holder) farmers in an effort to identify and solve the problems they are facing. From the extension officer perspective, this is through data collection, monitoring and surveillance. They collect data and send it up the chain of command to policy makers, and receive directives back in terms of trainings that align with national policy.
2. AEOs are also seen as technical advisors in the production process. They are meant to advise farmers on when to plant, when to spray, and when to harvest, and extend the technical specifications to environmental related issues such as “*not farming too close to water*”, “*preserving soil fertility*”, “*How to use biological pesticides*”, or “*the type of ploughs to use*”. The extension officers are meant to visit farmers, deliver training, and set up demonstration farms.
3. Another function is to distribute government inputs such as seedlings and farming equipment related to government and international agriculture projects, such as Operation Wealth Creation.<sup>1</sup> Related to this, extension officers explain that planning, budgeting, reporting and accountability form a large part of their role.

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<sup>1</sup> Operation Wealth Creation was launched in 2013 with the aim of “raising household incomes and wealth creation by transforming subsistence farmers into commercial farmers to end poverty.” (<https://owc.go.ug/>)

The farmers in this study also felt that agriculture extension officers - as government officers - should play an active role in facilitating markets, and ensuring fair prices for farmers. This advocacy component was not something we heard from extension officers - apart from gathering data from farmers, which was mostly about technical issues and production levels.

Another component identified by community-based and self-identified agriculture extension agents was helping farmers with basic business skills, such as balancing their books, saving money, and record keeping. They also generally took a more holistic approach to the understanding of extension services, by developing savings and farming plans, health and sanitation learning, family planning, and gender rights.

#### **1.4 Methods**

We used qualitative data collection processes to understand more deeply the perceptions of various stakeholders in the public extension system and the related sphere of influence. As part of the process of data collection, we spoke to a number of farmers, NGOs, university representatives, vocational institution teachers, students and directors, private companies, and community-based organisations. We also spoke to a number of recent graduates of universities and vocational programs who are working in the private and NGO sectors and who see themselves as doing agriculture extension work.

We began by coding data from interviews and focus groups previously conducted in the VET Africa 4.0 Research. We identified relevant interviews and used open coding to broadly identify any data related to agriculture extension and learning. We did just one round of coding, collecting long quotes that we felt might be relevant to the upcoming research. We then left these codes while we worked on:

- a) Compiling a data base of agriculture extension workers
- b) Assembling and analysing curricula from training institutions
- c) Compiling a literature review
- d) Compiling and analysing job advertisements for AEO roles
- e) Conducting in-depth interviews with stakeholders
- f) Developing a framework for analysis

We then returned to and included the broad codes from VET 4.0 in the RAELL data. Information about the type, number and gender of participants in the interviews and focus groups are shown in Tables 1a,1b and 1c.

**Table 1: VET 4.0 Interviews Used**

Typology	Number and Gender
Directors of Vocational Training Institutes (VTIs)	2 female, 4 male
Teachers at VTIs	2 female, 1 male
VTI Students (agriculture)	2 male
Director private sector farm	1
Extension worker (private sector)	1
Private sector seed company director	1 male 1 female (recent Gulu U alumni, former extension worker)
University lecturers	4 male
NGO workers (different orgs.)	1 female, 2 male
Community-based organisation (CBO) co-founders (same org.)	3 male
Farmers	1 female, 6 male

**Table 2: VET 4.0 Focus Groups Used**

Typology	Number and gender
Teachers VTIs	1 female, 4 male
Middle(women)	2 female, 3 male,
Middle(women), extension officers, farmers, university lecturers	2 female, 4 male
VTI students	5 female, 9 male,
Forest research Group (uni. and private sector)	1 female, 4 male

**Table 3: RAELL In-Depth Interviews**

Typology	Number & gender
Farmers	7 female, 10 male
Extension officer	1 female, 9 male
Trainers of AEOs (different institutions)	3 male
AE Implementation Actors (NGO and private sector)	3 male
Students	1 male

## **2 Scope of Training Sector, Institutional Networks and Their Roles and Relationships**

### **2.1 Key Institutions Involved in AEO Training**

#### **2.1.1 Directorate of Agricultural and Extension Services (DAES)**

The Extension Services Guidelines (2017) explain that agricultural extension is a pluralistic extension system made up of the Directorate of Agricultural and Extension Services (DAES), a decentralised local government public structure, technical directorates and agencies, and non-state actors. At the top is MAAIF (Ministry of Agriculture, Animal Husbandry and Fisheries). DAES falls under MAAIF and provides leadership, management and coordination of public and private extension delivery service systems. It also works with technical directorates that are responsible for animal, crop and fisheries resources, and commodity agencies for example, the Uganda Coffee Development Authority, Cotton Development Authority and Dairy Development Authority. Technical directorates generate technical information that DAES puts together for dissemination to extension service providers. Finally, the technical directorates develop commodity value chains, refine the type of extension services required along the value chains. This is then followed by the local government level where extension is done by staff at district and sub-county level through government extension workers. This is demonstrated in Figure 1 below. Within this structure, our research focused on the extension services provided at the county and sub-county level - where the AEO's function - together with their relationship with the farmers.

#### **2.1.2 Universities, Vocational Training Institutes and Research Centres**

The government AEOs in Gulu have primarily been trained at Makerere and Gulu University - the senior AEOs we spoke with, a role which corresponded with the government job adverts, all explained that a bachelor's degree was a prerequisite to become an AEO. However, we spoke to some lecturers at Gulu University who referenced existing AEOs in their bachelor programme, so in reality they are not all already degree holders.

There are other key institutions of learning that are involved in broader learning networks providing extension-like services, but which are not related to the government extension services directly. These include a number of large public and private VTIs whose graduates, alongside Gulu University graduates, play a large role in working with NGOs, private enterprises, and community-based organisations to learn together and provide a range of often more holistic and research-based farming initiatives.

Professional development for AEOs is conducted regularly by government research institutes and by NGOs seeking to introduce new techniques and crops as components of projects. There are no such institutes in the Acholi subregion<sup>2</sup>. These trainings are usually conducted with senior AEOs and the knowledge then trickles down to junior AEOs and eventually to farmers.

## **2.2 Sources of Knowledge for AEOs**

Zwane et al. (2015) explain that current changes in climate, food security systems, globalisation and developments require extension staff to be technical experts, strong communicators, flexible and empowered to embrace change. This requires ongoing learning and professional development. It also requires on the ground learning for systemic flexibility and learning. In this section we focus on the current sources of ongoing knowledge for AEOs, which we find are rather vertical in nature. We will begin to demonstrate why this is a problem in this section and continue the discussion more thoroughly when we discuss and compare knowledge flows (see Section 4).

### **2.2.1 Government Professional Development Programmes**

The core sources for ongoing information come from regular professional development delivered by government services, the content of which is decided by centralized government research institutions, presumably with some input from extension officers. One extension officer explained that when they observe a common problem facing farmers, they can alert the chain of command and request specific research and training. Likewise, AEOs collect data and formulate reports that feed into decisions around the training.

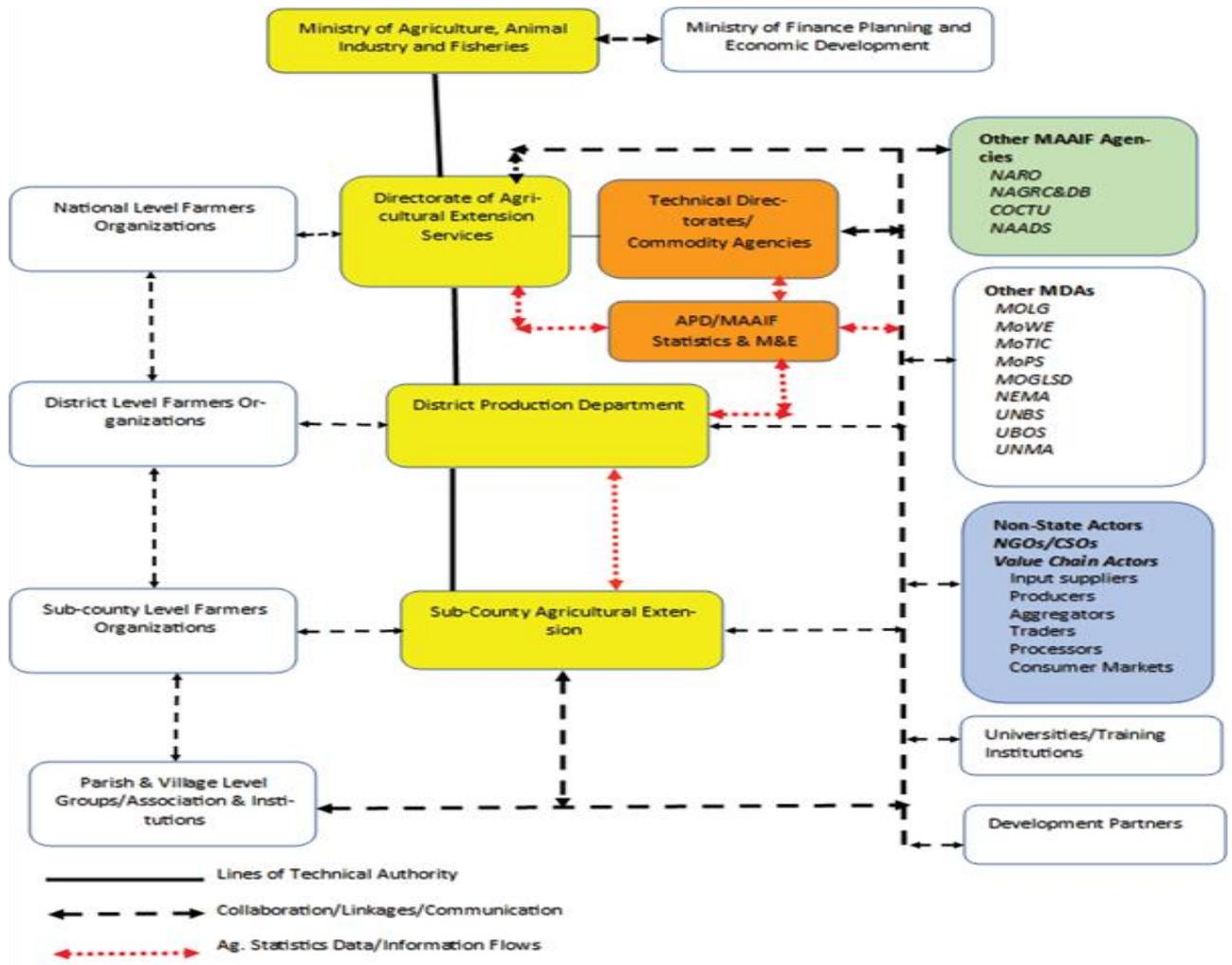
Agriculture extension officers explain that there are quarterly training sessions for senior agriculture officers who then share their knowledge with junior officers, who then do implementation with farmers:

*“We have research stations. They're the ones who generate the new technologies. Then through the ministry. We get to know those new technologies. We are trained as the subject matter specialists. Then, after that, we come and train our extension workers who are also on the ground for them to train the farmers now.... It used to*

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<sup>2</sup> Region in Uganda encompassing Gulu and other districts in Northern Uganda.

be quarterly, but, because of the COVID situation, we have not been doing it regularly.”



**Figure 1: Organisational Structure of National Agricultural Extension System in Uganda. (AEGS, 2017, p. 11).**

AEO’s see accessing modern technologies for personal learning and for communicating with farmers as one of their core needs. Younger farmers especially are shifting to online processes, and having online platforms to meet their needs will not only be more efficient for sharing information but also less costly for training.

### 2.2.2 NGO Projects

Another source of training is through NGO projects, who often go through government extension workers as a component of introducing their projects to farmers. This involves

learning new technologies and varieties of crops. Government sponsored programmes, such as Operation Wealth Creation, were also working with AEOs to implement their programming aimed at increasing agriculture productivity.

### **2.2.3 Farmers**

A third source of information is taken directly from farmers. This is in relation to delivering a core component of the AEO work - responding to and solving immediate issues faced by farmers. Barungi, Guloba and Adong (2016) emphasize the importance of extension service providers understanding the various practices that farmers are carrying out as this will help to equip them with the relevant information on how best to support farmers. Agriculture extension officers that we spoke to concur that a core component of their work is to listen to the needs of farmers to deliver what Yadav et al. (2013) describe as ‘needs-based’ training.

In relation to this, extension officers feel, and traditional literature such as Zwane et al. (2015) supports this, they need to have strong communication and listening skills to be able to address farmers changing needs, to better convince them to take up new technologies, and to track whether they are taking up new opportunities. However, what is missing here is active learning *from* farmers. Even in the instance where information is gleaned from farmers about the issues they are facing, it is in a vertical model where the farmer is sharing a problem and the extension officer is attempting to solve it. The information is therefore about the circumstance of the farmer, rather than seeking out learning *from* the farmer.

### **2.2.4 Large Seed Companies**

In the large seed companies, there is also a cascading model of learning - but with a particular focus on the crop that the company is looking to purchase. These companies also work with students from the universities. However, this is also very much a top-down model.

### **2.2.5 Smaller Private Businesses and Community Learning Networks**

In contrast, the smaller private businesses and community learning networks function very differently, with local knowledge integrated more deeply into programming, with the learning systems relying on farmer knowledge and lives, while integrating learning from online sources and broader international networks. The farmers in this instance are considered to be agentic rather than empty vessels or robotic implementers.

This is a fundamental distinction seen in the departure point and goals of agriculture. The first is a clear mandate to improve agriculture productivity in Uganda. From a productivism model this means teaching farmers to produce more quality food for national consumption and export. There is a focus here on a GDP-type model, with a focus on the broader economy and a tendency towards industrial production. One AEO summarizes: *“when we look at the production and their productivity. We look at how we can improve on that, because we are gifted with good land. But our production and productivity are not increasing.”* The second model is a capacity building and improved livelihoods model, with a focus on community development, with agriculture as an (integral) component. This one has a stronger focus on empowerment, cooperation, farmers rights, and holistic wellbeing.

### **3 Training for AEOs: Types of Training and Curriculum Analysis**

#### **3.1 Main Types of Courses Available**

Below we offer a brief breakdown of the main types of courses associated with agriculture available in Uganda. Recognising the important role non-university programmes offer in non-government AEO work, we include certificates in agriculture.

##### **3.1.1 Certificate in Agriculture**

Certificates in agriculture are offered by a number of universities and technical and vocational education and training (TVET) institutions in the country. The minimum academic requirement for this is an Ordinary level certificate, with at least three principal passes for universities, while vocational institutes can also ask for a certificate in agriculture or related fields, such as building construction, carpentry and joinery, from community polytechnics. The course lasts two years in most institutions. For example, Uganda Martyrs University offers two certificate courses in agricultural related fields in addition to the certificate in agriculture - in agricultural economics and agribusiness management. The curriculum of both of these courses offers a number of extension-based modules such as field extension methods, field practical for crops, field practical for animals, methods and materials in extension, and rural sociology.

##### **3.1.2 Diploma in Agriculture**

To be admitted for a diploma in agriculture, one must have a Uganda Advanced certificate of education or a certificate in agriculture, in which case one must have majored in science-based subjects. The diploma in agriculture is a two-year course and is offered throughout government

and private universities and VET institutes, with an example being Nkumba University which offers a diploma in sustainable agriculture and another in agribusiness.

### 3.1.3 Bachelor of Agriculture

There is a large range of degrees in agricultural courses across Uganda. Gulu University, for example, offers four courses: bachelor of science in agriculture, bachelor of agri-entrepreneurship and communication management, bachelor of science in food and agribusiness, and bachelor of bio systems engineering, and all of these have a duration of four years. Entry requirements for these courses are: direct entry with an Advanced certificate of secondary education with science majors (taking agriculture, biology and chemistry as essentials), a diploma in an agriculture-related field, or a mature entry scheme once one passes the entry examinations. Meanwhile, Uganda Martyrs University offers three degree courses of 3 years, each with the same entry requirements. These are; bachelor of agriculture, bachelor of science in agricultural technology and bachelor of science in organic agriculture.

The following chart is based on analysis of curricula in programmes related to agriculture extension. We differentiate between the types of knowledge included and provide examples.

### 3.1.4 Types of Knowledge in Programmes Related to Agriculture Extension

**Table 4: Types of Knowledge in Programmes Related to Agriculture Extension**

<b>Agricultural Knowledge</b>	<b>Contextual Knowledge</b>	<b>General Education Knowledge</b>
Agricultural Botany	Extension and Training Methods	Communication Skills and Computer Applications
Introductory Soil Science	Entrepreneurship and Agribusiness Management	Project Planning and Management
Agricultural Zoology	Principles of Farm Management and Accounts	Human Resource Management
Introductory Entomology and Nematology	Agricultural Marketing and Price Analysis	Agricultural Policy, Planning and International Trade
Introduction to Plant Pathology	Rural Sociology and Community Development	
Soil Fertility and Fertilizers		
Livestock Management		
Animal Nutrition, Feeds and Feeding		
Soil and Water Conservation		

Annual Crops Agronomy		
Dairy Production		
Poultry Production		
Animal health and Hygiene		
Food Security and Community Nutrition		
Post-Harvest Technology		
Fish Farming		

## 3.2 Curriculum Analysis

### 3.2.1 Vocational versus Academic Training

The official qualifications for being an AEO are a bachelor's degree in agriculture. As one senior agriculture extension worker explained, “*we don't recruit those from Labora and Bobby (VTIs) - national certificates not accepted.*” The job advertisements we examined for this study corroborate this; however in practice, we see a number of AEOs with certificates in agriculture from vocational institutes and experience in working with NGOs in many instances. One university lecturer on a bachelor's degree programme explained, for example, that he had a student who was also an agriculture officer. He questioned the capacity of this officer, because when he was supervising him in the field, he found that he did not have basic knowledge of growing bananas, and had to spend extra time helping the farmer improve his practice.

This echoes the main criticism of agriculture extension officers by farmers that we encountered - their lack of experience. They are not seen as farmers, and this plays a large role in the low levels of trust attributed to them and the limited uptake of new ideas, with older farmers especially preferring to rely on traditional crops and experienced farmers they know. Some extension officers also see their lack of practical experience as a shortcoming:

*I think I have not had direct experience as a practical person because of limitations, but there is not enough planned practice, there is not enough time to be a team.... So, I can't say I am busy hands on.... But I can also say that is one route I am very much working towards, because I believe agriculture can be very good business.*

Comments such as these are telling of the programmes offered at university level, and also the students that enter into them. The agriculture programmes in both the polytechnics and vocational institutes are overly theoretical, largely due to the heavy content and lack of

resources and space for hands-on practice. There are also very large class sizes, a problem throughout the entire education system. However, in the vocational institutes, the students are usually from a farming background, and already have hands-on experience, which makes it easier for them to integrate and apply the theory - they are already farmers.

At the university it is a different story. The students are mostly from the city with the expectation that they will become farm managers, owners, or enter into agribusiness. This was borne out by the senior extension officers we spoke to – all were in the process of getting their master's degrees in agriculture-related fields and were interested in pursuing PhDs. In terms of pathways, they had career aspirations of either moving up in the bureaucratic chain of command, and/or moving to the university as a lecturer. Students entering agriculture courses have often not been on a farm before, and, as one lecturer from Gulu University put it, they are afraid of getting dirty. So, the programme tries to get them into the field in surrounding farms as quickly as possible. They also try to focus on practical experiences and internships for students to gain a stronger knowledge of the field, but this does not make up for the lack of real-life farming experience. As one farmer taunted - when students and lecturers from the university come to the farm, they start the day several hours later than the usual 5AM start, because they are accustomed to getting up at 7 or 8 for their lectures.

### **3.2.2 Integrating Collaboration with the Community**

Still, within these parameters, the programmes at Gulu University have a strong orientation towards agriculture extension, teaching, and getting to know the community in a broader sense than simply technical agriculture skills delivery. This is the case not only for extension workers but for all students in the Faculty of Agriculture. They do this by integrating collaboration with the community on projects such as supporting farmers to produce better quality products, developing reinforced food to address malnutrition, and other community needs into the teaching programmes. Students, as a component of their attachment, are asked to identify and help to improve an issue at the farm where they are working. The attachment is seen as the primary source of integrating theory and practice, as well as getting to know the community. A student explains the value of the attachment in his learning, and in developing a passion for dairy farming:

*I saw how they farm. The farm is small, and well organised. Then, they have all the units, but all are incorporated and they cross cut. They do things in order to make*

*sure that your product is very good. And your customer likes it. So, it caught my attention and my passion too”.*

Passion is seen as one of the key attributes to successful agriculture extension practice. Official AEOs recognise this, and it is especially evident in the community-based practitioners. One for example, also a graduate of Gulu University, provides regular training for farmers, particularly around organic farming – she has a timetable set and every weekend she goes into the field. She is well known by current students who often accompany her to learn as well. She has her own business model premised on this outreach - she sells farmers seeds, but it is much more than that. She is also a farmer and is genuinely interested in improving the livelihoods of the community where she works.

A senior university lecturer explains another important learning component for shifting student mindsets about the community:

*“we find it also an advantage if our university students can team up with those others and learn those hands-on skills. but on the other hand, university students, in terms of soft skills and entrepreneurship skills, they are better placed.”*

### **3.2.3 Agriculture as a Cross Cutting Theme**

There is no specific programme for agriculture extension at Gulu University; however there is a stand-alone course unit where students learn facilitation, communication, presentation and report writing skills. Additionally, agriculture is a cross cutting theme for many courses. A student explains this:

*“We had also agricultural Information Systems, which is related to extension where you get information right from the farmer and how you can incorporate it into another organisation. Also, we have agribusiness value chain patterns, which will also give a student a knowledge of how value is added to agricultural product or produce from the farm - how a farmer can add value. Also, how value is being added from those middle(wo)men up to the final consumer”*

Another important component of the university programme is a course unit on gender and food systems, where they learn a little about sociology and community dynamics. They learn a lot of this when they spend time in the community as well:

*“When we are going to the farm early in the morning, we find a man already drunk in the morning. While you see women with hoes going to the farm. Okay, so it's not just a stereotype. I'm a man talking.... women will more likely do the whole work and men are also the ones who do their financial allocation. After the work is done, men are more likely to take the money and go and drink or go to a hotel for a week... to squander the money. And women are more likely to save it for, yeah, for the family.”*

Consequently, the students are learning about how to bring men into learning process, improve gender equality and not make them feel like they are losing too much of their masculinity as systems and society changes.

### **3.2.4 Educational, Training and Facilitation Skills**

Taking Gulu University as an example, educational, training and facilitation skills are primarily covered under the stand-alone course unit on extension and training methods. This has sub-topics looking directly at education/training facilitation and they include:

- Introduction to extension; definition, concept, practice and functions of extension, extension as a process, the decision-making process. Principles of agricultural extension, history and systems of agricultural extension, conventional and recent advances in extension methods in Uganda and elsewhere.
- Adult learning; principles and theories, difference between pedagogy and andragogy, characteristics of adult learners, the adult educator, planning, assessing and designing adult learning sessions.
- Training and facilitation techniques; visual aids production and usage, operation and maintenance of visual aids.
- Training needs assessment and evaluation of training programs.
- Clientele targeting and equity in equity in extension training.
- Methods; tutorials, practical, demonstrations, working with farmer groups and case studies.

### **3.2.5 Online Awareness and Learning**

While online awareness and learning is clearly lacking among practicing extension workers, we can see it being taught at the university level. It is not as present in vocational institutes, but

university graduates - at least from the faculty of agriculture - have a strong understanding about how to search for information online and how to connect to networks. Indeed, many of the graduates that we spoke to are at the centre of developing these online learning networks in different capacities:

*“As a student, I have many platforms, like we have an association of food scientists, people who have been practicing in the food processing industry, and I'm part of it. So if you have a question you don't understand, you just go in a WhatsApp group... If you need any direction, maybe on any agricultural base process, you ask, and then you get feedback, and also sometimes ResearchGate - you can register and if you see an article about something that you like, you can ask the author to give you a copy to read, and I also receive monthly things about dairy farming and I learn how to do things.”*

It is difficult to know if this particular student is an exception or part of the norm, but our findings indicate that he fits into a pattern of some of the dynamic leaders who are graduates of Gulu University. We also see some individuals working in the community, from a range of backgrounds, who are going out and seeking these skills and integrating them into their practices. They are important aspects of the informal learning that could be captured by the formal system - teaching people to become lifelong learners rather than certificate chasers. If the university programme is indeed building on this, it is a strong component that has potential to fill a big learning gap. Integrating this knowledge into extension services will be the next step; however, this will require significant system changes.

#### **4 AEO Knowledge Flows and Functions**

The findings of this study indicate that knowledge flows within the sector generally operate in a vertical and hierarchical pattern, with training and directives going up and down silos. The government has research institutes in Uganda which conduct trainings with senior extension officers who in turn train junior officers who then are supposed to train farmers.

##### **4.1 Approaches Used to Deliver Information to Farmers**

A variety of extension approaches are then used to deliver information to farmers. Buyinza et al. (2015) described the advantages and disadvantages associated with some of most recent approaches, and these are summarized in Table 3.

**Table 5: Approaches Used to Deliver Information to Farmers**

<b>Approach</b>	<b>Description</b>	<b>Merits</b>	<b>Demerits</b>
Group training	Involves training of farmers with a common interest. Commonly used in Eastern Uganda	Peer influence and competition within the group makes it effective  Enables working with many farmers at a time	Lack of gender consideration during selection of trainees and few youths involved  Limited attendance unless transport and food provided  Uptake of new technology is quite low
Individual farmer visits	Used by commercial farmers who contact the extension service providers with specific area of interest	Usually used to gather information on pests, diseases and market.  High level of technology adoption	Very costly to transport and facilitate farmers  Difficult to reach multiple farmers
Mass media	Various forms of media used to deliver information to the public	Information reaches a large number of farmers	Not all information is useful to all the farmers especially those with individual needs
Model-farmer	A single farmer is selected and trained to be a learning point for other farmers. Used for market-oriented farmers	Enables easy transmission of knowledge to farmers	Can only be afforded by established farmers capable of co-financing extension services
Demonstration sites	An interested farmer offers his/her land to act as a demo site. This is then supported by farmer and extension service provider while the rest of the community uses it as a learning centre	Enables farmers to learn practically	Costly to establish demo sites  Benefits are limited to few farmers
Farm visits by extension officers	Farmers are visited on invitational or prompted occasions to monitor their performance	Service providers are informed of the problems faced by farmers and communities in general	Costly and very few farmers are reached at a time

Farmer field schools	Groups of 20-30 farmers are trained in common areas of interests	<p>Farmers are given chance to learn and implement skills,</p> <p>There is knowledge exchange and co-creation among farmers and trainers</p> <p>Trainers can also teach other relevant topics such as communication skills, leadership skills.</p> <p>Improves the interests of community through visible impacts</p>	Costly to implement
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Recent extension approaches, Buyinza et. al, (2015, pp. 34-35)

## 4.2 Obstacles to Effective Knowledge Flows

### 4.2.1 Identifying the Knowledge and Support Required

A key component of the AEOs' jobs is to monitor common problems which they send up the chain for analysis by senior officers. AEOs explained that the usual procedure is for farmers to contact them with a problem and then they go and visit the farmer. *"It is demand driven. Okay, yes. It is [for] the farmers to express the need. [...] We don't force them. Okay, yes they are the ones who come to us that we have this and this problem, can you train us, or can you set up demonstration so that we get to know how to do it"* When they observe similar problems, or when the government or an NGO has a programme, they deliver specific trainings to groups of farmers. They also have regular site visits to follow up on implementation, but these are difficult because of resource constraints, so, they have to be strategic, both in terms of where they have demonstration sites, and which farmers they visit:

*"when dealing with key/individual farmers we consider a lot of things. First of all, the farmer must be committed. He/she must also be in a strategic location with a good population of farmers who can easily access the knowledge and also the person must be social and able to teach other farmers."*

We spoke with one farmer who had asked for training and was able to get an extension officer to come and deliver it. She felt that the training itself was very practical and hands on. Likewise, another farmer was able to get a site visit from an extension worker upon request - but had to pay for fuel and did not take the advice of the extension worker he contacted. Another NGO programme aimed at improving agricultural livelihoods with youth also worked closely with extension officers, but they were giving them daily allowances and fuel as well to come and conduct the workshops.

A challenge identified by extension workers was timely responses because of bureaucracy and also because farmers don't know where to communicate their problems in time. One extension officer suggested that working with individual site visits was not effective in this regard. He felt that technology could be better harnessed to deal with some questions more quickly, which would in turn *“allow more time to identify those who are left behind those who are really in this cycle of poverty that need my approach... for example, if you go on the radio and then the farmers give you 10 questions that you need to address. And the next week you come and address them in depth - done. So, information flow is not as fast as our teaching requires.”*

Karubanga et al. (2016) carried out research looking at integrating a face-to-face approach with a video-media approach to extension and concluded that while each approach supports farmers' learning, using both together was more effective in extension. They found that while the video approach raises awareness and self-learning among both farmers and non-farmers, the addition of the face-to-face approach supports practical knowledge acquisition with a guided learning process.

#### **4.2.2 Resistance to New Ideas and Lack of Trust**

Although AEOs use a lot of radio programmes and demonstration farms on the ground, some complain that there is a hesitancy among farmers to embrace new technology and new crops. As one officer explained: *‘someone will go for his local foods, but for us we know that if we want to improve, we need to have this exotic one... we have this development partner who wants us to teach how to plant it.’* However farmers have experience of a number of introduced crops that failed to find a market... *“ginger, chia, moringa.. Things like chia, I've been hearing people selling it at 15,000 per kilo, but we were sceptical about it. I knew this would come. But I never ventured into it. My auntie ventured into it. But she lost massively.”*

Likewise, there are examples of poor-quality crops being distributed. At the time when we were collecting data, the government was distributing casava. One farmer used this as an example of poor-quality products: *“this casava, it does not grow well in this soil of ours, it will not last longer than 2 years... It will fail just before the time for harvest”* It was generally recognised that to receive quality products or services you had to *“either know someone or pay someone.”*

One retired professor interviewed for this study suggested that part of the problem around trust is that the extension officers are not asking the farmers to share their knowledge of the crops and soil, and thus showing AEOs inability to integrate the new ideas. This is perhaps why farmers suggest that *“this advice is better from people who are doing it. Someone might be called the extension worker but they’re not practically doing it - sometimes their advice would be good based on the textbooks, but on the practical ground, it doesn't work that much.”*

#### **4.2.3 Weak Ties Between AEOs, Farmers, and Learning Institutions**

For a healthy learning ecosystem to flourish and a successful extension service to develop, there needs to be trust between partners. Building such trust requires stronger relationships and ties between local institutions of learning, AEOs, and farmers. We found examples of such relationships and networks flourishing among farmers and private sector providers at the informal level, especially among a younger generation of agri-entrepreneurs seeking to build their communities and improve on quality produce so as to reach larger markets without needing to go through middle(wo)men. However, beyond the initial training, there does not seem to be very much networking or learning happening between extension officers and the universities. Government extension offices do not even take on university students as interns.

All parties suggest that they would like to interact more; however our findings indicate that extension officers are more interested in internal training rather than partnerships with universities. Perhaps there is something here related to a perception of universities as certificate-producing institutions rather than spaces of learning. One of the Makerere graduates interviewed for this study explained that many people graduate from school with hopes of *“never opening a text book again”*. More likely is the lack of fiscal partnerships, with NGO programmes providing private funding for training initiatives and choosing to run them through their own systems and local government rather than build sustainability in public universities. This is a systemic problem with broader aid models, which are competition oriented rather than

partnership oriented. This isolating practice among NGOs does not offer opportunity for longer term learning, and reduces the chances to develop networks of learning. Farmers recognise this and express distrust of the extension system as a result because they have seen too many short term cash crops fail. They look mainly to other experienced farmers instead.

## **5 RAELL: Future Perspectives on Agriculture Extension Officers**

### **5.1 Recognising Teaching and Training as Core Functions**

Our findings suggest that teaching and training is increasingly recognised as one of the core functions of the AEO role. As discussed above, the curriculum of most formal programmes includes course units on adult education, and all programmes include elements of communication. We only spoke with one student specifically in relation to agriculture extension courses - a fourth year student in the faculty of agriculture - and he acknowledged that within the courses he studied he was developing facilitation skills. In the Gulu University programme, one student explained that *“they teach you about how you can get information from farmers and how you can also give them information and get them to adopt it.”* Other agriculture students from VTIs that we spoke with - outside of the national teachers' colleges - did not reference learning to teach as a component of their practice, but, at the time we spoke to them, this was not a core focus of the research. However, they gave us important insights into some of the agriculture programmes, as did their instructors, and these are discussed in the section below.

The AEOs we interviewed also felt that teaching skills are important to their role. However, it is striking that none of the job adverts that we saw required any form of teaching certification, and none of the AEOs were from an education background - despite agriculture being a core teaching area in teaching education programmes. These are pathways that have not yet been developed. Still, all of the practicing extension officers recognised that teaching was a primary goal, and, within this, convincing farmers to take up new methods and technologies was the primary focus. Examples of teaching include specific trainings of farmers around new techniques or crops - often through NGO programme initiatives, demonstration farms, and radio talk shows.

## 5.2 Addressing Financial and Resource Constraints

The funding challenges in the agricultural sector greatly impede the delivery of efficient and effective agricultural services in Uganda, and government budget allocations to the sector remain low at about 3% of the national budget (MFPED, 2019). In addition, while a large portion of that budget is given to NAADS to provide inputs to farmers through Operation Wealth Creation, some of the activities still exist only on paper with no on the ground evidence (Barungi, Guloba and Adong, 2016). Furthermore, there are also delays in releasing allocated funds and this affects climate dependant agriculture in Uganda (Buyinza et al., 2015)

Most stakeholders recognised that agriculture extension officers are under-resourced. They have huge areas of land to cover, and they do not have enough people to cover it. The AEOs interviewed for this study explained that they are also missing fuel for motorbikes, have too few motorbikes and do not have money to repair them. This lack of resources is in fact at the core of many of the problems facing the extension system. The effectiveness of the system relies on establishing trusting relationships with the farmers and these require time and regular connections. One extension officer explained how these dynamics play out:

*“when it comes to farmers adjusting.... when frequent monitoring visits by an extension worker take place, the farmer now gains more trust with the person and what the person says is trusted. If it works out, more trust is again built... But if we don't visit the farm at a very frequent basis, what we see is again, shifted (practice) by another key informant on the ground.”*

Most of the farmers we spoke to had not seen an extension officer for several years at their farm. Some had never seen one. One fairly new farmer said, *“I've not encountered any, but I've heard about them”*. Several farmers explain: *If you go to a senior farmer, like that uncle of mine in matters of groundnuts, I ran to him rather than the extension office in my area who has never had a garden.*

**Overcoming Short-Termism Among Farmers** On the side of the extension officers, there was also a feeling that farmers are more interested in short term gains. Often at the time of harvest, they need money to pay workers, so they will do a quick harvest and sell poor-quality product to get the money to pay the workers. Also, often they see it as just being easier to sell to a middleman who comes to their home and buys the raw produce directly rather than putting

effort into marketing it or adding value in any way. One community-based extension officer explained that “*when a farmer is storing the produce in their own home, if a middleman comes and offers them cash of 1 million, they will take that cash, even though they know if they save it, they will get 4 four million if they put it together with ours*”. Likewise, a well-established farmer explained that “*finding a market is easy, and developing a brand and registering a company is easy*”, but when prompted about why he simply sold to middle(wo)men, he had no answer - only that he should start doing post-harvest handling. Another, young farmer understood that she could get 60% more money by processing her ground nuts and selling them as peanut butter, but she was hesitant because she was new in the market, and wanted to try a few seasons of farming first. Also, because all of the farmers around her were selling raw product - a phenomenon referred to by extension officers as “group think”. With more hands-on work, the extension officers would likely be able to develop the trust of farmers and help them work on the post-harvest handling and marketing - an area where we see success among networks of farmers.

### **5.2.1 Building Online Capacity**

Finally, a general retardation of the system is the lack of capacity to be online, and a lack of knowledge about online opportunities for learning and connecting to markets. This was raised primarily by young farmers who reported trying to reach out to extension services by email without receiving a response. Some extension officers suggested that this is an important gap that needs to be addressed - especially given the distance needed to travel to meet with farmers. None of the public extension officers we spoke to were aware of any of the plethora of apps that have been developed for farmers. Others pointed out that most farmers do not have phones, and in many areas, there is often no reception, so going in person is the only option. However, as will be discussed below, they are missing out on a fundamental source of self-learning and general information which is widely available and could be used to support their efforts.

### **5.3 Developing Horizontal Networks of Learning**

While the AEOs that we spoke with clearly have passion and care for their communities, and a strong consideration of needing to work with farmers and develop relationships with them in order to drive innovation and change, we note a number of opportunities for learning that have emerged from the informal learning sector - primarily driven by personal motivation of groups of farmers. In this section we rely primarily on the voices of the farmers we have spoken with,

many of whom are providing informal extension services. The focus - which we have gleaned from successful examples of extension - is on horizontal networks of learning which centre farmers and community needs more broadly and integrate learning with life.

Trust and relationships of shared respect, risk, and benefits are a core component. Initiators recognise the intelligence and share the challenges of the community. The networks of learning are based in more than just technical learning, but they are about participation in greater depth in each other's lives. Out of this we see compassion and care as driving factors in bringing motivation for learning. People at the centre of this understand networked learning very well - they recognise that different people have different areas of strength, and that spaces of learning need to be opened up to facilitate diversity to flourish, and trust in decisions made together. Some other elements of trust include increasing transparency, especially around access to programmes and finances.

One director of a community-based organisation (CBO) promoting agriculture development and a private farmer who works with women farmers said *“when I work with these women, I see my mother... I know the challenges she went through and they are the same... I am helping my mother”*. It is these small CBO initiatives and assemblages of farmers - both function very much like cooperatives - that appear to be making real change in farming and in livelihoods. As we examine knowledge flows and learning in agriculture, we have come to learn that these informal –and at times non–formal– networks are important spaces for learning institutions and government programmes to learn from. We uncovered in the data, that farmers have a tendency to learn from each other in very informal –and as one agriculture extension officer claims– “risky” ways. We will unpack more of this below, but first let us return to the spaces of formalized informality, where we see knowledgeable knowledge seekers bringing groups of farmers together to learn and advance themselves. Unlike many government and NGO programmes, they are a real melange of farmers coming together out of choice to learn together and improve their livelihoods cooperatively.

### **5.3.1 Spaces of Formalized Informality**

All of these non-government/ non-NGO learning practices work with farmers groups – many are in fact farmers coalitions, and have the interest of circumventing the infamous ‘middleman’, by pooling together enough quality product to sell directly to larger markets. We see learning happening here in a myriad of ways– through a series of interconnected networks– often

involving tech-savvy young people who have access to internet systems, have developed a curiosity for farming, and know how to learn (as one respondent explained “*I am a lifelong learner*”). We see youth going online to learn from people nationally and internationally, using Facebook, Telegram, Twitter and WhatsApp. The online networks are used for learning from individuals and also through facilitated seminars, where experts are invited to present to the groups. Examples are largely about business development but also some technical skills.

They also demonstrate a passion for agriculture, care about their community, and are strong networkers. They are usually at the centre of developing slightly more formalized learning processes – often with consideration of climate smart agriculture. They are also driven to improve their own lives. They combine business acumen with moderate risks as they test different products and methods, and attempt to engage their communities through demonstrable success on a peer-to-peer basis. As one younger farmer speaking about a poultry union he recently formed with 80 members explained “*you have to be a farmer, you have to show them (the community) that what you are doing is working– and this is maybe a problem with extension workers.*”

We see, for example a network of women in agribusiness across Africa that has regular meetings. The members are all working with their local communities, and are learning business skills and facilitation skills. They host regular, closed, learning programmes that they then take and apply in their local contexts. They have also developed a credit union and they offer loans in the form of equipment and seeds. In some instances, they help each other find shared markets internationally, including selling and buying from each other. These networks then share that information within their community programmes, offering training to their community members who are interested. They do outreach to bring people in, but have conditions of membership that include sharing produce. They encourage diversifying practice, so for example, if they are focused on developing quality soy beans for market, they ask the farmers to also learn some other skill that they can rely on in the off season, and in case the crops fail. They also focus on food sovereignty - making sure that enough food for home is grown first.

The learning that we see here is horizontal and considerate of the needs of all parties. So, for example, while there may be a desire to demonstrate new techniques for planting, and especially for post-harvest handling, often in relation to climate smart and organic practices, the key facilitators recognise that they have to engage local farmers to take up skills that “*they don’t even know that they need because climate change is impacting them slowly and they can’t*

*see it, but that doesn't mean that it isn't happening*". There is a clear teaching prerogative here, and the initiators explain that they have to use language and materials that are appropriate for the farmers. They develop learning materials such as picture books to leave with farmers as references following practical training for example. However, they make no mistakes about intelligence; as one facilitator explained: *"we need to develop facilitation for non-educated people, to meet them at the level they are at... this does not mean that they are not smart, they are very smart, they just have not been to school and so they learn differently, but they understand, they get it..."* It is this horizontal learning space that drives most of the learning networks that we observed - a recognition that *"networks are important because people have different strengths in different areas"* and experienced farmers have as much to contribute as new techniques are learned and implemented.

These networks of learning seem to be successful because of an interdependency, compassionate relationships, and trust. There is an understanding that there is a shared goal - farmers are coming together, or joining, out of personal interest, and for shared gain. The instigator comes from the community of farmers - she or his is known and trusted, and present in the community. There is a recognition that the instigator(s) have a shared risk, interest, and benefit. Likewise, the instigator knows the challenges faced by the farmers, and values their experience. The learning and building from each other is integral to programme; it is emergent, adaptive, flexible, compassionate, and democratic.

### **5.3.2 Entangled Learning and Living**

A key learning point that emerges when speaking to initiators of such networks is lifelong learning. These instigators view themselves as curious, passionate, perseverant, research oriented, and community oriented. It is clear, in all instances, that these individuals and group leaders (they are not all individuals - there is one 20-member "extension workers cooperative" for example) are actively and continually seeking out learning to meet their needs. They self-differentiate themselves from formal AEOs in this way because they believe the formal education system trains people to *"never have to learn again"* once they finish their degree. This societal attitude towards education with the goal of getting a certificate or a position and rank within society is a result and remnant of the colonial system that divided people and chose a select few to enter into education for the sake of joining the colonial administration. It is based on a particular form of learning through memorization, neither particularly enjoyable nor engaging, and designed to be exclusive. The consequence is that, as education has been

extended through universal education initiatives, the competitive, ranking system that is designed to push people out of school is doing just this. Those who make it through to the end, see it just like that - the end of it. They are now the ones who are recognised to have the knowledge, and they are no longer interested in learning further, nor do they see a need for it. As one respondent explained: *“people [extension officers] are getting out of school to never read again.. They are not open to new innovative skills”*. This is a particularly damning and vivid condemnation of formal education in Uganda. Likewise, those who have been excluded from the system, are not very much interested in being taught because it was a poor experience that did not work for them, and, mostly likely, just degraded them to the status of “peasant” or “ignorant”.

These emerging learning networks whereby farmers are both teachers and learners are so very important because they recognise and depart from a point of entangled learning and living, which is very different from the formal learning system and the AEOs who are not as trusted, because, as one farmer describes, *“they have the theory but it is different on the farm”*. While our findings indicate that many farmers do not trust the learning system that has generated the extension officer, there is a clear differentiation in attitude between farmers who have been more successful in their formal learning and those who have not. Some networks, for example, tend to have access to and bring in extension officers to do some trainings when they feel something is outside of their knowledge base. This is typically around a particular desired skill, and when they get access, they are generally happy with the outcome of the training. However, farmers who are less familiar with the system, are less likely to seek out extension officers. They look to experienced farmers instead. This is true of both youth “initiators” and older farmers. Even those who have greater trust and access to the extension officers are doing research first online and through their networks of experienced farmers. They all recognise the potential power of the extension officer, however, and they want a key part of the AEOs role to be relaying farmers’ concerns about markets and middle(wo)men up through the government structures in order to change unfair policy. They want government reform, and they see extension officers as representatives of the government that should be advocating for farmers.

One of the key challenges is that AEOs simply do not have the skills for researching things online, they do not have broader national or international networks other than the hierarchical towers of the bureaucratic system in which they function. One respondent, when asked this question explains that *“it requires a deliberate move to start (learning differently).”* Clearly

drawing on her own experience she explains “*you find it if you are looking*”. This is representative of an emergent network of farmers. They are looking, they are passionate to learn and they are transforming their communities.

### **5.3.3 Gender Inequality**

Gender inequality in agricultural extension is still a major challenge in Uganda. Despite gender differences such as women being more informed about extension, and having more interest in activities aimed at improving livelihoods, women still have more limited access to extension and advisory services compared to their male counterparts (Caritas-Norway, 2019). Our study indicates that women leaders also face a more difficult time in the field because they are not respected for their knowledge. Women we interviewed report that they are often judged by their appearance: “*they are not considered pretty, somehow everyone expects you to be pretty*”. This is perhaps why we hear of women students in agriculture wanting to wear skirts and heels when they first arrive in their programmes. One head teacher explains that overcoming this dressing phenomenon is a core component of the learning. He points out that it is not safe or appropriate or practical. But he has missed the social expectations placed on the female students by their peers which is such that they feel that they have to look pretty, and gumboots are not seen as pretty. Linked to these social stereotypes, they also explain that they face a constant barrage of sexual harassment by the male farmers and general disrespect.

Women farmers face particular shared challenges, especially in terms of combining work with household duties. One leader explains that she works with women because “*the people that I could get to work for me were women... we share a lot of stories, we face similar challenges*”. However, she finds it more difficult to work with women because “*they bring their babies, they have to leave early and they come late because they have to prepare food for their husbands and do the house chores*”. Others reported that when training is done with men, the women will “*have a male employee pretend to be the boss*”. Despite these difficulties, it is perceived that women and women’s groups tend to be more successful than men. As one AEO explains in terms of dairy farming: “*I think most of these are women, women, women, not men. And not that men have not also been successful, they're also there, but if you look statistically, women are more compared to men.*” Yet, in the formal AEO system, we did not find any women agriculture extension officers employed.

## **5.4 Curriculum Gap Analysis**

Analysis of a number of Occupational Role Profiles (ORPs) compiled from online job adverts placed by different government, NGO and private sector organisations indicate that there are varying job opportunities in agriculture and similar titles are used in the public and private sector. The most common titles are extension officers, field officers, coordinators, community development officers, trainers etc. in the sectors of crop production, animal production, agribusiness, fisheries and environment (See Appendix 1).

### **5.4.1 Competences Listed in Job Adverts**

The key competences in the job adverts focused on technical knowledge in the sector, such as vegetable production, disease and pest surveillance, climate change resilience, and field skills, like establishment of demonstration farms for crops and animal production, health, disease control in animals. Training, mobilisation, agribusiness, marketing and facilitation skills were also key competences. Additional skills include: research, language, gender, technology, coordination, collaboration, record keeping, planning and budgeting. With reference to academic qualifications, junior/assistant positions required a minimum of a diploma while extension officers and senior officers were required to have at least a bachelor's degree, with a master's being an added advantage. The private sector appeared to offer more opportunities for diploma holders while, in most cases, public-sector roles had a bachelor's degree as a minimum qualification. At a personal level, candidates were required to possess certain qualities, such as passion for farming, languages, decision-making skills, community engagement, knowledge of government procedures, and strong interpersonal skills. A composite ORP showing all the knowledge, skills and abilities specified in the job adverts is provided in Appendix 1.

### **5.4.2 Key Gaps in Training and Recruitment**

Building on the previous sections, four key issues emerge from the analysis of the ORPs and the interviews which are receiving little or no attention in the curriculum or in recruitment. These are: 1) a lack of attention to lifelong learning and the technologies that can facilitate ongoing learning; 2) honesty and integrity; 3) environmental science; and 4) advocacy for the farmer. A commitment to learning is essential to face the challenges of the future, not only learning from technologies, but also from and with farmers. The second is essential to address the challenges of corruption that farmers observe to be deeply ingrained in the system. Farmers need extension services that are willing to acknowledge gaps and to stand up against pressures

and products that will not meet the needs of the farmers or are exploitative of them. The third issue, environmental science, is a major gap and reflects the blind pursuit of industrial methods of agriculture over environmental practices that will preserve soil fertility, water sources, and general social wellbeing. Branch (2011) has pointed out the major problem of deforestation in Uganda, with Northern Uganda losing 70% of forest coverage in the last 25 years, fuelled to a great extent by large scale agriculture. Equally, a focus group discussion we held with farmers, middle(wo)men, university researchers, and AEOs concluded that a major problem was the inability of government to regulate large companies selling poor-quality or fake seeds, GMOs, and herbicides. This brings us to the final point: advocacy, which emerged as a key farmer demand in this study.

### **5.4.3 Improving Policy Monitoring and Post-Harvest Handling**

A common challenge that all farmers are facing is getting a fair price for their produce. They say that middle(wo)men take advantage of them and offer unfair prices. Putting them in debt by giving them seedlings on credit and then buying back at lower prices is another concern. A focus group with extension officers suggested that farmers are not doing appropriate post-harvest handling and this results in them being given lower prices. They also complain of farmers slipping rocks into the sacks prior to weighing. Other AEOs also spoke of poor quality or a lack of even basic post-harvest handling. For example, one reported:

*I always see a lot of problems mainly [with] post-harvest handling [by] the farmers who produce. You will even see that the level of production is okay. But then there are a lot of losses, before they even probably utilize what they have, what they've produced. They report the level of losses to me, and we'll even read it at almost 50%. That means half of what you produce is lost. It is wasted. So, I can see that if there is an avenue where there could be an improvement in the cost of assembling it would be so good.*

A focus group with extension officers, middle(wo)men and farmers concluded that seed inputs were a major problem, with private companies not being regulated. Across the board policy monitoring, post-harvest handling, and adding value to crops were identified as key issues that need to be addressed.

Farming groups are emerging to circumvent these problems by being self-sufficient, and improving their own linkages to markets. Some farmers who were not part of these groups felt that it would be important for the extension system to bring farmers together, so that they can reach a common market together and get more for their produce.

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## 7 Appendix 1: RAELL Occupational Role Profile (ORP)

A competent AEO needs to <i>know about</i> ....		
<b>AEO knowledge and learning role: Know about</b>	<b>Elaboration</b>	<b>Educational underpinning</b>
Animal production	Planning and budgeting in animal production	Diploma in either Veterinary science or Animal Husbandry
Crop production	Train farmers on crop production, monitor pests and disease in crops	Bachelors in Agriculture
Agribusiness management	Management of Agribusiness development, rural livelihoods, planning, development and implementation of rural development projects	Master's Degree in Agriculture, Agricultural Economics, Agribusiness, or other relevant fields
Vegetable production	provide agricultural enterprise development support to Ugandan smallholder farmers	Diploma/ Certificate in Horticulture/ Agriculture or related
Fisheries production	Increase fish production	A diploma in fisheries
Climate change	Evaluate, recommend and promote multiplication of appropriate and climate resilient agricultural practices/technologies/approaches for food security and climate adaptation	An Honours degree in Agriculture, Agriculture Extension, Environment Science, Soil Science, Land Use Management, Natural Resources or related field from a recognised university  Master's degree in any of the above fields.
Land Management	Support the implementation of the project, and adoption of Sustainable Land Management and INRM practices and approaches including pastoral/rangeland management, climate smart agriculture, catchment /watershed management, agro-ecological approaches	An Honours degree in Agriculture, Soil science, Land Use, Agricultural Extension, Rangeland Management, Natural Resource Management from a recognised university  Master's degree in any of the above fields.
Post-harvest handling	Train on best post-harvest practices	Bachelors in Agriculture

Agricultural marketing	Market farmers produce and link farmers to markets	Bachelors in Agriculture, Agribusiness
Pest and disease management	Identify and control common animal and crop diseases	Bachelors in Agriculture
Community development	capacity building, training and mentoring for inclusive agribusiness development, processing and value addition	Masters' Degree in Community Development, Rural Development or any other relevant fields
A competent AEO needs to <i>know how to...</i>		
<b>AEO knowledge and learning</b> <b>Role: Know how</b>	<b>Elaboration</b>	<b>Educational underpinning</b>
Budgeting and planning	Planning and budgeting of activities	
Research	Collect data, surveys and write reports	
Report writing	Collect data, analyse and timely prepare necessary reports	An Honours degree in Agriculture, Agriculture Extension, Environment Science, Soil Science, Land Use Management, Natural Resources or related field from a recognised university  Master's degree in any of the above fields
Decision making	Operate as facilitators and communicators helping farmers in their decision making and ensuring that appropriate knowledge is implemented	
Gender specialisation	Enhance women participation in project activities and their access to information for improved agricultural production	A qualification/training in a gender related field from a recognised institution
Information Technology	Carry out field surveys and data collection for purposes of preparing plans and designs for civil works projects such as roads, irrigation infrastructure, storage	An Honours Bachelor's Degree in Civil Engineering, or Water Resources Engineering, or Agricultural Engineering, or Irrigation Engineering

	infrastructure, buildings, etc. Supervise civil, mechanical and electrical works for constructions, operations and maintenance activities at project sites	
Coordination	Coordinate activities in area of focus among various stakeholders	
Collaboration	Foster collaboration and partnerships between different stakeholders like organisation and leaders	
Management	Manage people and activities in the field	
Record keeping	Ensure proper record and documentation of all relevant information	
GIS Knowledge		
Organisational skills		
Communication skills	Use the necessary language skills	
Analytical skills		

A competent AEO needs to <i>embody</i> ... (the values, attitudes and skills [incl. interpersonal, learning and social skills] necessary to perform the role)
<b>AEO knowledge and learning Role: Embody</b>
Must have passion for farming
Possession of knowledge and experience of government planning and reporting procedures
Engagement with rural communities and socio-economic issues of pastoral, agro-pastoralist and agricultural farming systems.
Interpersonal skills
Riders' permit with a motorcycle class
Language skills: Fluent in English (oral and written) and local language
Knowledgeable of demo field plot design and establishment
Must possess community mobilisation and facilitation skills
Comprehensive understanding of agricultural development involving public and private sectors