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ALLIANCE for AFRICAN PARTNERSHIP

Developing the Next Generation of Extension Workers in Sub-Saharan Africa

By

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Alliance for African Partnership (AAP) is a consortium of institutions supporting work that transforms lives and addresses global challenges through sustainable, effective, and equitable long-term collaborations among African institutions, Michigan State University, and other international partners.

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ABBREVIATIONS AND ACRONYMS

AAP	Alliance for African Partnership (AAP)
ADP	Agricultural Development Program
AFADU	Alliance for Farmer Development Uganda
APS	Agriculture Planning Services
ARET	Agricultural Research and Extension Trust
ATA	Agricultural Transformation Agenda
DAES	Department of Agriculture Extension Services
DAES	Department of Agriculture Extension Services
DAESS	Decentralized Agricultural Extension Services System
DALRRD	Department of Agriculture, Land Reform and Rural Development
EO	Extension Officer
FAO	Food and Agriculture Organization
FFS	Farmer Field Schools
FGDs	Focus Group Discussions
FMARD	Federal Ministry of Agriculture and Rural Development
FRT	Farm Radio Trust
GDP	Gross Domestic Product
ICTs	Information and Communication Technologies
IFPRI	International Food Policy Research Institute
IGNOU	Indira Gandhi National Open University
KEFAAS	Kenya Forum for Agricultural Advisory Services
KEFAAS	Kenya Forum for Agricultural and Advisory Services
LUANAR	Lilongwe University of Agriculture and Natural Resources
MSU	Michigan State University
NAADS	National Agricultural Advisory Services
NGOs	Non Governmental Organizations
PIRA	Partnerships for Innovative Research in Africa
SAA	Sasakawa African Association
T&V	Training and Visit
UFAAS	Uganda Forum for Agricultural Advisory Services
UNN	University of Nigeria Nsukka
ZABTA	Zirobwe Agaliawamu Business Traders' Association

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EXECUTIVE SUMMARY

Assessment of the current needs of agricultural extension, core skills, and competency gaps in undergraduate agricultural extension curricula would help to develop competency-based curricula and promote development of skillful future extension workers that serve the needs of farmers across sub-Saharan Africa. Hence, this study assesses the perspectives of various stakeholders on the undergraduate agricultural extension training needed for contemporary extension service delivery in Africa with the following research questions:

1. Do extension programs effectively address the needs of current food and agricultural systems?
2. What are the critical job skills and core competencies required of extension workers to effectively plan, implement, and evaluate extension work in today's changing context?
3. Does the undergraduate curriculum in extension education include education and/or training on these job skills or core competencies?
4. What are the barriers to effectively training extension workers with required core competencies, and how can these barriers be removed?

The study was carried out in Kenya, Malawi, Nigeria, South Africa, and Uganda. Qualitative data for the study was collected through 12 focus group discussions (FGDs) involving 97 participants across the five countries. The FGDs were guided with a semi- structured interview guide. The key findings from the FGDs are :

- Extension professionals graduating from universities come with the technical theoretical knowledge, but they have been missing out on some critical practical competencies such as provision of holistic EASs including production techniques, processing, marketing, and business planning.
- Frontline extension professionals are demotivated by issues such as limited resources, operational funding, infrastructure, and incentives. On the other hand, farmers have little trust in them because of lack of accountability and poor attitudes.
- EASs are inadequately targeted, and the quantity and quality of advisory contacts are compromised, especially for the poorest farmers, women, and spatially remote households.
- Gaps in critical communication skills needed by extension professionals include networking, negotiation, persuasion, facilitation, interpersonal, conflict resolution, lobbying, proposal writing, gender relations, group dynamics, and teamwork.
- Gaps in critical managerial skills needed by extension professionals include planning and organizing skills, leadership skills, monitoring, budgeting, and reporting, program evaluation and documentation, and knowledge management.

- The social and emotional skill gaps include intelligence, empathy, integrity, positive attitudes towards the job, respect for other cultures, self-directed learning, and professional ethics.
- Common skill /competency gaps in the UG agricultural extension curriculum across sub-Saharan Africa include practical and technical skills, knowledge of ICTs, soft skills (e.g., communication, facilitation, social skills), marketing and entrepreneurship skills, resource mobilization, project management, monitoring and evaluation, and problem-solving analytical skills.
- Curriculum revisions are not taking place at regular intervals and most of the universities across sub-Saharan Africa lack some basic facilities and funding to ensure quality extension training to UG students. Most of the extension professionals, therefore, lack the required skills and competencies.
- Suggested courses related to process skills include ICTs, agribusiness management, entrepreneurship, program proposal, community mobilization and local organization development, and management of change to enhance the technical competencies of the students.
- There is a dire need of curriculum revision of the agricultural extension programs offered in the sub-Saharan African universities.

The respondents of FGDs suggested several recommendations to improve the current agricultural extension systems, particularly in human resource development,extension programs and delivery, and improvement of the public extension systems. Perceived barriers to effectively teaching undergraduate extension students across sub-Saharan Africa included lack of networking, lack of comprehensive outreach programs and practical, inadequate facilities within universities, lack of student motivation, inadequate trainings for the students and staff, shortage of qualified and adequate teaching staff, bureaucracy in the decision-making process. Suggested strategies to improve the undergraduate extension curricula as indicated by the respondents were strengthening involvement of industry stakeholders in reviewing extension curricula and developing competency-based curricula, use digital methods in teaching extension courses, involve students in working collaboratively with farmers and rural communities, establish longer internship programs, recruit adequate and competent faculty and staff, and improve teaching facilities in the universities.

CHAPTER 1 : INTRODUCTION

1.1 Agriculture in Africa

In Africa, the agricultural sector plays a dominant role in the economy. Agriculture is an important source of livelihood for most Africans. African agriculture is dominated by smallholder systems except for a few large farms and plantation crops. Ayim et al. (2022) reported that about two-thirds of the total African workforce is engaged in agriculture.

Benin (2016) argued that the nearly stagnant economies in parts of Africa are, to a large extent, a reflection of a stagnant agricultural sector. The preceding 40 years have shown that Africa has been steadily lagging in agricultural production, and its share of the global agricultural market is also seen as diminishing. The performance of the agricultural sector in Africa is inhibited by problems in governance, poor soil fertility, low use of fertilizer, poor access to inputs, insufficient postharvest storage, poor transportation, and marketing infrastructure, limited technical knowledge, lack of information, and weak information dissemination (Livingston et al., 2011;Gashu et al., 2019).

Agricultural growth could play a crucial role in improving the livelihoods of farmers and landless laborers by increasing employment, reducing rural-urban migration, stabilizing food prices, and increasing their resistance to shocks by enabling them to develop assets (Gashu et al., 2019). To be viable in the future, the agricultural sector in Africa requires that immediate attention be paid to devising strategies for sustainable agricultural growth. This should be addressed from several fronts. Jayne et al. (2010) suggested: increased public goods investments to agriculture; a policy environment that supports private investment in input, output, and financial marketing; a more level global trade policy environment; and provision of key support services.

1.2 Agricultural Extension in Africa

Agricultural extension is regarded as one key component in the development agenda of Africa. It is also a key support service of agriculture. Extension programs, especially within the rural communities, play a crucial role in engaging the farmers and other actors in the rural development agenda. Additionally, agricultural extension agents link smallholder farmers to high-value and export markets, promote environmentally sustainable production techniques, and help farmers to cope with health challenges such as HIV that would affect their agricultural production activities (Anderson, 2020). Thus, extension services play a crucial role in agricultural productivity and household food security in sub-Saharan Africa (Lee et al., 2020). Therefore, following the independence of most African countries, effective extension services and research-led agriculture were regarded as strategies that could

increase agricultural productivity and accelerate poverty reduction. Although public spending for agricultural research and development during the 1960s and 1970s improved substantially across the continent, dedicated budget allocation and commitment from the government and development partners remained a challenge. Poor public agricultural extension services and training contributed considerably to the underperformance of agriculture and led to a series of problems. The farmers served by public extension were less satisfied with the provision of the services than those served by the private sector (Davis et al., 2020). Private systems emerged, but there remains a question mark about their ability to fill adequately the gap left by state withdrawal, especially in the short term. Further, current education, training, and extension structures were incompatible with innovative approaches to agricultural development.

A variety of agricultural extension approaches have been introduced over the course of time. The acknowledged failure of the Training and Visit (T&V) extension model in Africa in the late 1980s and early '90s stimulated debate on extension reforms and the introduction of new extension models such as farmer field schools (FFS) (Eicher, 2007). Extension reforms are underway in many countries in Asia and Latin America and to a lesser extent in Africa, where observers have noted a pluralism of models being used (Birner et al., 2009). According to Davis (2006), there is no "best fit" extension model for a particular country.

1.3 Study Background and Significance

Inadequate training, top-down approaches, marginalization of women, and limited-resource farmers are regarded as some reasons for the failure of extension systems in Africa.In most African countries, there are no recognizable platforms for agricultural extension workers to share their experiences that they gain through learning. In the absence of extension platforms, extensionists operate as individuals, each struggling to find the best way they know how to make a difference (Mutimba and Khaila, 2011).According to Suvedi and Kaplowitz (2016), agricultural advisors/extension agents of the 21stCentury do not possess adequate skills and competencies required for effective extension work.In other words, extension workers must be competent communicators that can share the latest research-based knowledge and information with their clients. They must be skilled in adult learning principles and techniques to facilitate the teaching learning process. Therefore, to strengthen the human development dimension of extension services, meaningful efforts should be made to assess the process skills and competencies gaps in the undergraduate extension curricula (Suvedi and Sasidhar, 2020). This would develop a competency-based curriculum that would promote modernization of agricultural extension and advisory services in the future.

There have been limited studies on the core competencies of agricultural extension professionals in Africa (Shimali et al., 2021). Further, these studies do not juxtapose in a detailed manner empiricalevidence of the challenges of agricultural extension service delivery

and identification of the critical skills and competencies and the skills gaps of agricultural extension professionals.

The extension systems and educational institutions of many African countries are in dire need of improvements to support and produce extension professionals with appropriate skills and competencies. Therefore, the Michigan State University Alliance for African Partnership (AAP) launched a multi-country research study to strengthen the agricultural extension curricula of African educational institutions.

This report provides empirical evidence, from focus group discussions (FGDs) in five African countries, on the challenges of agricultural extension service delivery, critical skills and competencies needed, and skills/competencies in the undergraduate extensioncurricula. This would help provide policy recommendations aimed at improving the agricultural extension systems in Africa.

What are the common challenges of agricultural extension systems in the five countries? What are the critical skills and competencies needed by agricultural extension professionals? What are the barriers to training undergraduates students following agricultural extension curricula? How could the undergraduate agricultural extension curricula be improved to prepare the next generation of agricultural extension professionals to competently handle extension service delivery?

1.4 Research Questions

This study addressed the following research questions with focus on MSU-AAP Consortium members -- Kenya, Malawi, Nigeria, South Africa, and Uganda.

1. Do extension programs effectively address the needs of current food and agricultural systems?
2. What are the critical job skills and core competencies required of extension workers to effectively plan, implement, and evaluate extension work in today's changing context?
3. Does the undergraduate (UG) curriculum in extension education include education and/or training on these job skills or core competencies?
4. What are the barriers to effectively training extension workers with required core competencies, and how can these barriers be removed?

1.5 Objectives

1. Review agricultural extension curricula currently in use at AAP member universities at the UG level in Nigeria, Malawi, South Africa, Uganda, and Kenya.
2. Identify critical process skills and competencies of agricultural extension professionals, process skills gaps, and areas of potential curricular reform.

3. Recommend improvements/reforms of agricultural extension curricula to prepare the next generation of agricultural extension professionals to competently handle EASs delivery.

4. Introduce new/improved curricula among the agricultural extension faculty engaged in training and education in sub-Saharan countries.

1.6 Organization of the Report

Chapter One gives an overview of the agricultural sector, agricultural extension and challenges in agricultural extension in Africa. It also describes the study background and significance, research questions, and objectives of the study. The second chapter, on theoretical orientation, discusses agricultural extension services and process skills and competency gaps in UG agricultural extension curricula. Chapter Three describes methods used and limitations of the study. The fourth chapter focuses on the results and discussion of FGDs. The conclusions and policy implications of the study are highlighted in the fifth chapter. References and the instrument used for FGDs are appended at the end.

CHAPTER 2 : THEORETICAL ORIENTATION

In the early 1950s, development institutions in Western countries played a prominent role in supporting the establishment of extension systems of a number of developing African countries. Since the beginning of this wind of change, extension services have evolved with various modifications inspired by the experiences in each country.

2.1 Agricultural Extension Services in Kenya

Agriculture is the backbone of the Kenyan economy. It contributes around one-third of the GDP (Central Intelligence Agency, 2022). The report indicates that around 75% of Kenya's population works at least part-time in the agricultural sector, including livestock and pastoral activities, and over 75% of agricultural output is derived from small-scale, rain-fed farming or livestock production.

During the colonial period, Kenya had two extension delivery systems: a system for the white settlers with combined extension services and credit and subsidized inputs, and the other for the indigenous Africans(Mukembo and Edwards,2015).After gaining independence from the colonial government, the responsibility for agricultural extension was bestowed upon the national government through the Ministry of Agriculture. In the beginning, Kenya adopted many top-down extension approaches: namely, the integrated agricultural development approach and whole-farm extension approach (Mukembo and Edwards,2015).In 1982, the World Bank financed the Training and Visit (T&V) extension system in Kenya. Budget deficits, however, made the expensive T&V approach unfeasible and unsustainable. The initial approach to extension in Kenya was top-down; information started at the Ministry of Agriculture and filtered down to farmers through extension agents. Research and extension were focused mainly on large-scale farms or smallholders in areas with high and medium agricultural potential. Trials and demonstrations were mostly done in research stations (Collinson, 2000). Unfortunately, except in the case of hybrid maize, the state extension model failed to successfully transfer many technologies to farmers. The top-down approach adopted from the colonial era continued, however, through the 1980s (Collinson, 2000).

In the 1990s, Kenya tried to adopt a more horizontal and farmer-driven approach.Adopting a participatory approach led to decentralization of the extension services, and the bloated state service was to be reduced and privatization was encouraged. Other organizations, including the private sector, community-based organizations, cooperatives, faith-based organizations, and non-governmental organizationsalso rendered services to agricultural extension. However, these services were more commodity specific (Muyanga and Jane, 2006).

Kenya has now adopted a more demand-driven and participatory approach (Lopokoiyit et al., 2013). Demand-driven extension refers to a system of extension that depends on an actual or simulated market in which farmers, individually or collectively, buy advisory and support services to carry out their farming activities. Thus, an environment is created to supply advisory services for sale and a demand for such services from farmers. Recently, a few organizations

have been promoting Information and communication-basedtechnologies (ICT) to improve extension services (Omulo and Kumeh, 2020). Kenya's government has purchased laptops and smart phones to transition to a more digital-led extension service. Kenyan's government undertook a devolution process to transition from a federal system to a county-led system in which funding decisions became the responsibility of the county governments (Tata and McNamara, 2018).

The public extension services are, however, generally perceived as ineffective in Kenya, as in other African countries (Muyanga and Jayne, 2006). Apart from many other challenges, agricultural extension in Kenya is constrained by the poor management skills of the extension staff, knowledge gaps between theory and applicability, and the difficulties in satisfying the expectations of a heterogeneous group of farmers (Lopokoiyit et al., 2013).

2.2 Agricultural Extension Services in Malawi

Malawi, a landlocked country, is regarded as one of the least developed countries. The economic performance of Malawi has been challenged by policy inconsistency, macroeconomic instability, poor infrastructure, corruption, high population growth, and poor health and education.The economy is driven by agriculture, with about 80% of the population living in rural areas.Around 76.9% of the labor force is involved in agriculture (Central Intelligence Agency,2022). Agriculture accounts for about one-third of the GDP and 80% of export revenues (Central Intelligence Agency, 2022). Agriculture in Malawi is divided into estate and smallholder sectors (Harrigan, 2003). High-value crops such as tea, coffee, sugar, and tobacco are produced for the export market. Tobacco accounts for more than half of exports, although Malawi is looking into other cash crops and diversification. The smallholder sector is characterized by resource constraints.Nevertheless, the sector is the main producer of food commodities such as maize, rice, horticultural crops, and livestock products.

Since the colonial time, agricultural extension service provision has mostly been the responsibility of the government. In 1907, the British established the Department of Agriculture, which adopted a somewhat coercive approach. Malawi adopted a range of extension approaches over time,including master farmers (in the colonial period), group approaches (in the 1970s), and T&V.However, in 1981, the T&V system was modified as the block extension system to suit the local context in Malawi (Knorr et al., 2007).

In 1998, the Ministry of Agriculture reformed its policy to adopt a more pluralistic and demand- driven approach for extension services (Knorr et al., 2007; Agunga and Manda, 2014). This made some progress in increasing agricultural productivity and economic growth and improving food security.Themonopoly of the state sector crumbled when some non-governmental organizations (NGOs) began offering agricultural extension services to smallholder farmers. In addition to NGOs, several private-sector organizations and farmer-led organizations provide extension services (Masangano and Mthinda, 2012).

Agricultural extension in Malawi is challenged mainly by structural problems in the agricultural extension system and in the training needs of the extension officers (Agunga and Manda, 2014). The effectiveness of the Department of Agriculture Extension Services (DAES) in improving agricultural development has declined over the recent past because of low staffing levels and inadequate training of personnel in the department (Phiri et al., 2012). Contributing factors include logistical issues, poor staff motivation, lack of a proper career ladder for extension officers, insufficient technical capacities, and too many ad hoc programs (Phiri et al., 2012). Thus, there is an urgent need to retrain and upgrade the skills and competencies of extension workers, particularly in development and communication theories and methodologies(Agunga and Manda, 2014).

2.3 Agricultural Extension Services in Nigeria

Nigeria is considered Africa's largest economy, and it is the most populous nation in Africa. Preceding the 2008-09 global financial crises, the banking sector was effectively recapitalized, and regulation was enhanced (Central Intelligence Agency, 2022). Since then, Nigeria's economic growth has been driven by growth in agriculture, telecommunications, and services. Agriculture, forestry, and fishing value added contributes about 17.2% of the overall GDP (World Bank, 2022), and around 36% of the labor force is involved in agriculture, but agriculture's stagnation has resulted in a rise in poverty rates -- over 62% of Nigeria's population still lives in extreme poverty (Central Intelligence Agency, 2022).Nigeria's export economy mostly relies on oil as its main source of foreign exchange earnings and government revenues; cocoa and rubber account for the next largest share (Central Intelligence Agency, 2022).

During the colonial era, the aim of agricultural extension in Nigeria was mainly to promote production of export commodities desired by the colonial country (Kagbu& Issa, 2017). The first decades of Nigeria's independence coincided with the Green Revolution, and agricultural extension was mainly focused on cash crop development and technology services (Iwugwu, 2008). In 1966, the Federal Ministry of Agriculture and Rural Development (FMARD) was established to administer agricultural policy in Nigeria at the federal level. In the 1980s, some extension programs were conducted to focus on domestic food production, especially maize, the principal staple food (Phillip et al., 2009). A major feature of the Nigerian agricultural extension service in the recent past is the involvement of NGOs in extension delivery in Nigeria. In 2011, FMARD initiated a five-year strategy named Agricultural Transformation Agenda (ATA) to revitalize Nigerian agriculture, which was designed to improve the income of smallholder farmers (FMARD, 2016).

As in any other African country, Nigerian extension services are challenged by inadequacy and instability of funding, poor logistic support for field staff, capacity gaps of extension workers, ineffective agricultural research/ extension linkages, insufficient and inappropriate agricultural technologies for farmers, and lack of qualified extension staff (Banful et al., 2010;Kagbu& Issa, 2017;Madukwe and Anugwa, 2020; Camillone et al., 2020).

2.4 Agricultural Extension Services in South Africa

South Africa is a middle-income, emerging market and a country rich with natural resources. Despite all that, it is a country where unemployment, inequality, and poverty remain persistently high (Sihlobo and Kirsten,2021). Its agriculture is oftenaffected by drought(Raidimi and Kabiti, 2019). Agriculture accounts for around 3% of the GDP of South Africa and employs around 4% of the labour force(Central Intelligence Agency, 2022). Yet agriculture plays a vital role in ensuring food security and providing employment to the rural people.

The history of South African extension can be divided into two eras: pre-1994 and post-1994 (Koch and Terblanche, 2013). Over the past four decades, extension services in South Africa have shifted from a traditional focus on public-sector technology transfer and farm management information to a broader public-private consulting service approach. Thus, the agricultural extension service is taking a new dimension in Africa.

Extension services in South Africa faced some challenges during the past decade, mainly due to the socioeconomic changes and agricultural sector reforms taking place. Extension services require staff with good understanding of technical knowledge and skills to manage social processes. Currently, the public sector is confronted with new challenges in its roles, functions, and organization, as well as its relationship with civil society and market actors. New policies need to be developed to address the gaps, norms, and standards for extension advisory services. Worth (2008) argued that there is a need for the integration of agricultural policy and curricula with a clear understanding of the needs of the agricultural sector. In this 21stcentury, extension and advisory services needs to reinvent itself and clearly articulate its roles in the rapidly changing rural and agricultural context to improve its relevancy.

2.5 Agricultural Extension Services in Uganda

A landlocked country, Uganda is substantially rich with natural resources, including fertile soils, regular rainfall, substantial reserves of oil, and small deposits of copper and gold.In Uganda, agriculture plays an important role in economic growth and poverty reduction. Agriculture accounts for around 28.7 % of the GDP (Central Intelligence Agency, 2022). It employs around 72% of the work force. Sixteen percent of its export income is from the coffee harvests, and around 10% of exports from gold (Central Intelligence Agency, 2022). Although the agricultural sector is considered an important sector in its economy, land productivity in Uganda remains low because of various constraints such as limited access to various inputs and resources (Lee et al., 2020).

Uganda's agricultural extension during its colonial era was mainly handled by the chiefs with the help of trained agricultural extension personnel (Oumo and Cho,2014). As in Malawi, extension services during the colonial era were coercive and focused on improving the colonial revenue. However, in 1956-1963, extension was shifted away from the chiefs to support a model for progressive farmers in their respective communities (Oumo and Cho,2014).

In the mid-1980s, Uganda adopted various extension approaches, including the T&V approach, but as happened in other African countries, these approaches were not successful (Mukembo and Edwards,2015). Uganda's National Agricultural Advisory Services (NAADS) (2001-2014) adopted a public-financed and private sector-delivered,more participatory, demand-drivenand decentralized approach with the involvement of farmer organizations. This involved contracting extension provision to private-sector firms and NGOs (Mukembo

and Edwards,2015). The public extension system in Uganda delivers inadequate performance. Development analysts have shown that the main cause is an ineffective incentive structure for the public extension agents (Turyahikayoand Edson, 2016). Further, farmers in Uganda have a low level of trust in the extension officers. Thus, there is a dire need for the extension staff to demonstrate their reliability and commitment through the advice they give to the farmers (Turyahikayo and Edson, 2016), even as they must deal with poor transportation and organizational challenges (McCole et al., 2014). A review study also revealed that private-sector involvement in extension inUganda is no panacea (Feder et al., 2011). The public sector may need to provide some regulatory oversight of private-sector extension activities, particularly when public funding is involved.

2.6 Agricultural Extension Training in Sub-Saharan Africa

Agricultural systems and practices across the world are changing.External forces such as development of information communication technologies (ICTs), emphasis on meeting demand-driven needs, food security needs of the clients,emphasis on extension research towards and poverty education, and climate change havemade providingextension services even more challenging. Therefore, to be a successful extension professional, one should possess appropriate core competencies and a blend of unique areas of expertise. Suvedi and Kaplowitz (2016) grouped the essential competencies for effective frontline workers into four major extension programming functions: program planning, program implementation, program evaluation, and communication and information technologies. Agricultural extension training has to play a vital role in developing these skills.

Human resources are a major element of rural development. Agricultural education and training in sub-Saharan Africa can be traced backed to the colonial times. Agricultural education during the colonial times was providedby a very limited number of elite universities and colleges and restricted totraining only the professionals needed by the colonial administration. Agricultural education was regarded as a practical and second-rate subject compared with medicine, law,science, and the arts.This was reflected in the curricula of the universities, and this led to the current situation -- too few Africans having college degrees in agriculture. These colonial approaches have not significantly changed even today, especially in Francophone sub-Saharan Africa. Post-independence created a significant changein agricultural education and training in the Anglophone sub-Saharan Africa, however. These changes includeincorporatingan extensive research mandate into tertiary education, linking universities' research programs in agriculture to agricultural research and extension organizations and investing in the tertiary education system. TodayAfrica offers training in agriculture through several local universities. Further, individuals have been trained in universities in Asia, Europe, and the USA. The quality of agricultural training programs in most African institutes, however, requires substantial improvements,particularly the in-service trainings.Some of the agricultural education institutionsstruggle with inadequate resources,physical infrastructure,and equipment, limited human resources for teaching and research (in quality and quantity), and poor incentives for staff to improve.

CHAPTER 3 : METHODOLOGY

3.1 Study Design

This study adopted FGD as the research strategy. In this study, the project team of each country had a moderated interaction with a group of agricultural extension professionals and collected data on their experiences, beliefs, perceptions, and attitudes. Need assessment is a remarkably complex process (Krueger and Casey, 2000). The FGDs can be used as an extension tool to assess needs and enhance awareness in program development and evaluation, and thereby facilitate change processes (Bitsch, 2004). Focus groups enable people to ponder, reflect, listen to experiences and opinions of others, and interact (Krueger and Casey, 2000; Onwuegbuzie et al., 2009).

3.2 Population and Sample

The study was based on the focus group research conducted in five African countries: Kenya, Malawi, Nigeria, South Africa, and Uganda. These five countries cover a wide expanse of sub-Saharan Africa: South Africa and Malawi from the south of Africa, Uganda and Kenya from the east, and Nigeria from the west. The population for the study was agricultural extension professionals within these five countries drawn from universities, public-sector organizations, private-sector organizations, and NGOs. A purposive sampling procedure was applied to select the participants for the focus group discussions. The research team members in each country identified suitable participants using existing databases of extension professionals, their networks, key informants, and available public information. The sample for each focus group is shown in Table 1.

Table 3.1 : Sample of focus group discussion participants in the five countries

Country	Mode of FGDs	No. of female participants	No. of male participants	Total number of participants
Kenya	In-person and online	13	9	22
Malawi	In-person	6	8	14
Nigeria	In-person and online	9	13	22
South Africa	Online	6	15	21
Uganda	Online	4	10	14
Total		**38**	**57**	**93**

Source: Compiled by the authors.

3.3 Data Collection

3.3.1 Focus Group Discussions in Kenya

Two FGDs were conducted in Kenya. The first group was conducted in person with 10 members from: Ministry of Agriculture; Bio Vision Africa Trust; Farming Systems Kenya; Egerton University; Baraka Agricultural College; Kenya Forum for Agricultural Advisory Services (KEFAAS).

The second focus group was conducted online with 12 participants: from Jaramogi Odinga University of Science and Technology; Machakos University; Mercy Corps (NGO); Egerton University; Laikipia University; Masinde Muliro University of Science and Technology; Pwani University; and Just Earth (NGO).

3.3.2 Focus Group Discussions in Malawi

Two FGDs were conducted in Malawi. The first included seven members from the Kalenjeka Farmer Field School. The second focus group consisted of seven members, with one member from each of the organizations: Agricultural Research and Extension Trust (ARET); Department of Agriculture Extension Services (DAES); Farm Radio Trust (FRT); Agriculture Planning Services(APS); ConcernWorldwide, a charity organization; Self-help Africa; and Lilongwe University of Agriculture and Natural Resources (LUANAR).

3.3.3 Focus Group Discussions in Nigeria

Two FGDs were carried out in Nigeria. The first was an in-person session with nine participants: members from the Department of Agricultural Extension, University of Nigeria Nsukka (UNN); Enugu State Agricultural Development Program; African Centre for Rural Development and Environment; Agriculture and Extension Services Enterprises, Enugu State; Advisory Services for Catfish and Allied Farm Services Association, Enugu State; and Network of Women in Agriculture in Nigeria. The second focus group discussion was hybrid in nature. Four members attended in person; the other nine participants attended online. The participants were drawn from the following academic institutions:University of Nigeria; Alex Ekwueme Federal University Ndufu-Alike, Abakiliki; University of Abuja; University of Ibadan; Federal University of Technology, Akure; University of Port Harcourt; Ahmadu Bello University, and Michael Okpara University of Agriculture,Umudike.

3.3.4 Focus Group Discussions in South Africa

Three FGD sessions were conducted online in South Africa. The first session was conducted with six participants: members from Vinpro (non-profit company), Department of Agriculture and Rural Development, Free State Province, and University of the Free State. The second session was conducted with five participants: members from the University of KwaZulu Natal, University of Mpumalanga, University of Pretoria, and Western Cape Department of Agriculture. The third session in South Africa was conducted with eight participants: members from Cotton South Africa; Free State Agriculture; Department of Agriculture, Land Reform

and Rural Development (DALRRD), Limpopo Province; and companies Intelligro and Hortgro. There were two facilitators for each focus group discussion.

3.3.5 Focus Group Discussions in Uganda

Three FGDs were conducted in Uganda. The first focus group was conducted with eight academic staff members from Kyambogo University, Christian University, Gulu University, Makerere University, and Bishop Stuart University. The next focus group discussion was based on two agricultural extension experts in the public sector: a district product marketing officer from Buvuma District local government; and a representative of Sasakawa African Association (SAA). The next FGD in Uganda was conducted with four members from the private sector: the ZirobweAgaliawamu Business Traders' Association (ZABTA), Alliance for Farmer Development Uganda (AFADU), and Grain Pulse Limited. The FGDs in Uganda were carried out virtually.

A predetermined FGD semi-structured guide was developed to maintain uniformity across all the FGDs. The FGD question guide was developed after a vigorous literature review and consisted of 12 open-ended questions. The facilitators of each focus group encouraged participants to think critically, honestly, and freely about their experiences with and perceptions of agricultural extension in their country during the discussions. The FGD sessions were conducted both in person and online. One member of the project served as facilitator, another member documented the discussion, and the third conducted independent data-method quality assurance. The FGD participants were encouraged to brainstorm ideas for explaining the current issues in agricultural extension, critical skills and competencies required by agricultural extension personnel, gaps in the agricultural extension curricula, barriers to training the undergraduates, and finally, recommendations to improve the agricultural extension curricula in African countries. The facilitator guided the sessions, offering procedural clarifications where necessary. Then, each participant independently generated a set of ideas to address the questions, after which all the individual responses were collected, and identical ones were grouped by the documenter. The online focus groups were recorded through the Zoom platform, and the transcripts were computer-generated.

3.4 Method of Data Analysis

Despite the long history of focus group research, it lacks a proper guide that delineates the types of qualitative analysis techniques for focus group research. Analyzing focus group data is much more complex than analyzing data from an individual interview, and an array of qualitative analysis techniques is available to qualitative researchers (Onwuegbuzie et al., 2009). Glaser (1965) developed a method called constant comparison analysis, also known as the method of constant comparison, which was first used in grounded theory research. This is used as one of the best ways to analyze transcripts of interviews. Constant comparison analysis consists of four main steps:

1. Inductive categorization
2. Refinement of categories

3. Exploration of relationships across categories, and
4. Integration of data.

This study adopted a modified approach of the constant comparison analysis. The analysis was done using the transcripts, both audio-recorded and then manually transcribed and online-generated. Transcript-based analysis is the most rigorous and time-intensive mode of analyzing data (Onwuegbuzie et al., 2009).

This study thus adopted five steps to analyze the focus group data. The first step involved carefully reading and reviewing the transcripts of all 12 FGDs conducted in the five countries -- i.e., Kenya, Malawi, Nigeria, South Africa, and Uganda -- to familiarize researchers with the content. The second step was to identify themes. The researchers identified six themes:

1. Challenges of extension service delivery systems of each country.
2. Recommendations to improve the agricultural extension systems.
3. Critical job skills/core competencies required for "agricultural extension workers", "training students".
4. Skills competency gaps in the undergraduate extension curriculum.
5. Barriers to training undergraduate extension students with the required skills.
6. Suggestions for the improvement of the undergraduate extension curriculum.

Consequently, the researcher developed a color code (Figure 3.1) and highlighted the context within the transcripts for each country based on the following themes:

	Challenges of the extension service delivery systems of each country
	Recommendations to improve the agricultural extension systems
	Critical job skills/core competencies required for "agricultural extension workers", "training students"
	Skill competency gaps in the undergraduate extension curriculum
	Barriers to train students with the required skills
	Suggestions for the improvement of the curriculm

Figure 3.1: Color code used in theme identification

The fourth step was highlighting the statements that resonated with each of the themes and categorizing them. The statements of the respondents identified for each theme were then listed in an Excel sheet. The researchers then read all the statements and further categorized these statements into subcategories. For example, all the statements that supported the theme "issues in the current extension system" were sorted and categorized under six broad subtopics: capacity gaps of the extension officers (EOs), issues related to public extension systems, lack of support to EOs, issues related to information delivery by the EOs, issues

related to the farmers, and lack of trust in extension officers. The statements under the theme recommendations were classified into four categories: human resource development and support, ways to improve extension programs and delivery, recommendations for the public extension systems, and recommendations for the universities. The barriers were categorized as human resource development, institutional barriers, and issues related to the curriculum.

The final step was counting the frequency of respondents who supported a particular statement identified across the five countries. Though the frequencies were counted, the numbers were not included in the reports for several reasons: sample size in the focus groups is too small, not everyone answered every question, and some participants may have commented three times on the same issue. Instead, modifiers such as “no one”, “few”, “many”, “most” or “all” were used to describe how many people talked about an issue (Krueger and Casey, 2000).

CHPATER 4 : RESULTS AND DISCUSSION

4.1 Challenges of Agricultural Extension Service Delivery

The focus group discussions across the countries revealed the current underlying challenges in agricultural extension system across Africa, as summarized in Table 4.1. The researchers categorized the extensive list of issues into six broad categories: capacity gaps of the extension officers (EOs), issues related to public extension systems, lack of support to EOs, issues related to information delivery by the EOs, issues related to the farmers, and lack of trust in EOs.

Development paradigms have hugely influenced agricultural extension in Africa. Technological advancements and new ways of thinking have influenced how farmers think about agricultural innovation. Further, the roles and attitudes of extension workers are evolving in response to changing agricultural systems in Africa. Therefore, the focus of agricultural extension is widening and becoming more comprehensive at the same time.As a result of these improvements in extension and development models, the scope of extension practice has been expanded. As Davis et al. (2019) argued, these various agricultural extension models cannot possibly fit every occasion. Farmers, extension officers, and extension professionalshave criticized these existing models as being ineffective and irrelevant at times.

Capacity gaps among EOs are a common problem across Africa. The focus group discussions revealed that extension officers lack ICT literacy and show remarkable ineptitude in using such skills. This fact washighlighted by many of the respondents in Kenya and Malawi and few from Nigeria,South Africa, and Uganda.Experts from Malawi and Uganda note that:

> *"Extension workers lack the skills to use such ICT platforms."*
>
> *"Lack of capacity among extension workers to deliver extension messages through ICT."*
>
> *"They are illiterate, they manage to handle these phones, they don't know the functions."*

According to Tata and McNamara (2018) and Ayim et al. (2022), inadequate information technology resources, insufficient ICT infrastructure, rising costs, and electricity power problems have been highlighted as barriers to agricultural extension workers' adoption of ICTs.

The FGD participants had serious concerns about lack of technical and practical knowledge by the extension officers, and this was acknowledged by many of the respondents of all five countries. Experts from Nigeria and Uganda said:

> *"Extension agents give out poor quality information. Extension personnel do not have adequate information about livestock production. For example, in piggery and fish production, extension agents are not grounded in these areas."*
>
> *"They don't have the knowledge, and if you talk to him about blended fertilizer of the quality standards that are required, he will be at a loss."*

Farmersusually depend on the extension officers as key informants or advisors who will provide them with quality information and advice that will enable them to make vital farming

decisions.Therefore, lack of technical and practical skills in the extensional professional poses a huge threat to farmers' perceptions of the trustworthinessof extension services in the future.

Apart from lacking technical and practical skills, EOs do not possess adequate knowledge on business planning, marketing,prevailing economic conditions, or market trends. This fact was acknowledged by many of the respondents in Kenya, Malawi, Nigeria, and Uganda, and few from South Africa. Experts from Malawi and Uganda said the following, respectively:

> *"The reality is the extension workers that come from the university come with the technical knowledge, but they have been missing out some critical elements like the realistic elements we have just talked about in the markets."*
>
> *"Extension workers should have business skills. Who told them that they are not supposed to do business? That they should be linking farmers to businesspeople? They can access funds in the bank and start doing business themselves. They are supposed to be business-oriented."*

One serious challenge is that extension agents see their primary purpose as only ensuring access to subsidies or inputs; thus, the core educational component is missing (Camillone et al., 2020). Farmers need holistic advisory services from input gathering until they sell their final output in the market. An expert from Uganda said:

> *"Farmers need holistic advisory services including production techniques, processing, marketing, and business planning. Farmers need information on pricing and customer needs, especially concerning the quality of the products."*

Issues related to public extension services include weak administration, failure to address local needs by the agricultural project, ineffectiveness in dealing with emerging challenges of marketing and other risks such as climate change, mismatch of policies implemented and what they do, inadequate funding for agricultural extension services, and recruitment of unqualified staff to provide extension.

Many of the respondents of all five countries voiced concern about weak government extension systems.For instance,the current agricultural extension system in Malawi, called theDecentralized Agricultural Extension Services System (DAESS), is reported to be overly ambitious and expensive to run, and non-functional except where there are projects that supportit.Few respondents from Kenya and Uganda noted that most of the development's projects have failed to address the local needs. An expert from Kenya noted that:

> *"Most developments did not put agricultural extension as a very important concept in food security."*

This resonates with the argument brought forward by Bridges and Woolcock (2017) in their report. They provided a plethora of interventions adopted in Malawi thatwere known to be "best practices" elsewhere yetfailed to fix underlying problems when they were employed in Malawi. This points out that some of the developmentprojects in Africa have failed to address the real needs of the people.

Few respondents from Kenya brought up the point of mismatch of policies implemented and what they do,noting that government officials don't walk the talk.

A Kenyan expert said:

> *"At the national level in policy level, there is that issue or a bit of mismatch between the policies which are done at the national level and the ones which are being customized, soadopted at the county level."*
>
> *"That policy is on shelves in offices. There is a need for them to read policy because it is there, it emphasizes collaboration, it emphasizes on who is an extension person, and which approaches are really being favored in the field."*

Recruitment of unqualified staff to provide extension is another challenge identified in all the five countries. One reason for this could be the shortage of qualified extension professionals within Africa. Therefore, as a result, unqualified staff will be recruited to ease the shortage of extension staff. These issues brought into light the severe institutional gaps within Africa.

Further, government-led extension is challenged by limited resources and operational funding. Most of the sub-Saharan African countries are regarded as poor.Thisleads to issues such as the government failing to provide the required services, infrastructure, resources, and incentives to the EOs to perform their duties. For instance, the Ministry of Agriculture lacks the resources to cover transport costs so that EOs can visit farmer groups and provide services in remote locations. An expert from Nigeria noted:

> *"Although the Agricultural Development Program (ADP) is unpopular to the political elites, they however established a bureaucratic structure in the ADPs. There are inadequate funds to provide extension services".*

On the other hand, the extension officers lack motivation and perform their duties poorly. One major precursor of this is the lack of government support to the EOs.Many of the respondents of all the five countries pointed out lack of mobility support and lack of resources to carry out the duties bestowed upon the EOs and subsequent demotivation of EOs.

An expert from Kenya said:

> *"The frontline extension workers are not well motivated as they are demotivated with issues like poor housing, poor mobility mostly using push bikes, lack of promotions--because I remember the first time, we joined the extension services we used to have the records, and then you choose a farmer or a farmer has come to the office, and you're supposed to go and visit them. You come prepared in the office only to realize the farmer is like 7 kilometers one way, and there is no vehicle, no phone in the office, so you start wondering how do you go? That means if you must visit this farmer, you have to do 14 kilometers. You must go and come back, so that was a very bad experience for me, and I tend to imagine as the farmers say that they don't see the extension workers, those are some of the challenges that extension workers meet and they call it off, so I found it a challenge. You feel that you're not motivated as an extension worker."*

The public and farmers have poor attitudes and little trust in the extension officers because of EOs' lack of accountability and poor attitudes. Many FGD participants observed that farmers did not place high value on advisory services, and so, for most farmers, advisory services were not a priority. A study conducted in Uganda also revealed that farmers in Uganda have a low level of trust and a poor perception on the extension services (Turyahikayoand Edson, 2016).Thus, trust and perception have an impact on the effectiveness of the extension services (Turyahikayo and Edson, 2016).Therefore,it is important for extension staff members to demonstrate their reliability and commitment through fairness, credibility, and trustworthiness.

Issues related to extension program delivery include inadequate extension officers and extension programs, poor targeting, lack of promotion of local technology, and poor message delivery and feedback. Inadequatenumbers of extension officers serving is a challenge identified in all the five countries. In Africa as a whole, the extension officer-to-farmer ratio averages 1:1000, well below the Food and Agriculture Organization (FAO) recommended ratio of one agricultural extension officer to 400 farmers (Tata and McNamara, 2018). Thus, each extension officer must cover a large territory, ranging from 20 to 50 square kilometers, with large distances between farmer groups. This was viewed as sometimes ineffective for the dissemination of information and technology. Inadequate numbers of extension programs were also identified as challenges by few participants from Malawi, Nigeria, and Uganda. This could be areason due to inadequate extension staff to design and implement extension programs to thefarming community. Poor message harmonization feedback was pointed out by many of participants of the five countries.

An expert from Malawi noted:

> *"The issue of conflicting message from extension workers due to lack of message harmonization. For example, others will say when you harvest maize, burn the stalk to control fall army worms, yet others say mulch the stalk to conserve moisture."*

Further, agricultural extension services must often reach a large and widely dispersed farming population characterized by diversity in opportunities, constraints, individual aspirations, and consequently, information needs. A farmer from Malawi noted:

> *"Lack of proper targeting for different categories of farmers like the youth, elderly, women and urban farmers. Most organizations are biased towards rural farmers only when urban agriculture is currently trending."*

For an instance in Nigeria, the government-dominated procurement system was criticized as narrowly targeting large-scale farming and being inefficient in quantity and timeliness of materials reaching farmers. These types of biased rationing and poor targeting often mean that the quantity and quality of advisory contacts are compromised.

Many development analysts have repeatedly pronounced that the key cause of the poor performance of the public extension system is the ineffective incentive structure for the extension agents (Turyahikayo and Edson, 2016). The focus group discussions of this study did not fail to bring that fact out. Across Africa, extension staff are faced with organizational

challenges and poor transportation infrastructure, as well as limited access to resources (Turyahikayoand Edison, 2016; Phiri et al., 2012; McCole et al., 2014). Demotivated because of these challenges, extension staff would in turn fail to carry out their respective duties and responsibilities, resulting in poor performance of the public extension system.

Issues related to the farmers include poor access to farm inputs, inadequate visits by the EOs to the farms, and poor support by farmer cooperatives. An expert from Uganda complained that the inadequate visits are mainly due to the low ratio of extension staff to farmers and inadequate resources provided to extension staff.

> *"You know the challenge we have is the extension farmer ratio. It is very small because like in my instance, one extension staff needs to visit around 18,000 households, which would probably spend another 4 years without visiting the households. The other challenge is resources are inadequate. Some of the extension staff don't have motorcycles."*

The respondents from Malawi complained about the services provided by the cooperatives, especially on the support on value addition of the farm produce. An expert from Malawi said:

> *"The other issue is value addition by cooperatives. Trust me, the cooperatives I saw 10 years ago are no longer vibrant. They just start to add value and stop."*

Therefore, considerable efforts should be developed to improve the cooperatives in such a way that they address the needs of the farmers and the needs of the emerging new markets.

Issues	Kenya	Malawi	Nigeria	South Africa	Uganda
A. Capacity gaps of the Eos					
Poor ICT literacy	Many	Many	Few	Few	Few
Lack of practical experience and hands-on experience	Many	Many	Many	Many	Many
Possess outdated information	Few	Many	Many	Few	Many
Lack of knowledge on marketing and business planning	Many	Many	Many	Few	Many
Poor knowledge of the economy	Few	Many	Few	Few	Few
B. Issues related to public extension services					
Weak government extension system	Many	Many	Many	Many	Many
Less focus on extension in development projects	Few	None	None	None	Few
Agricultural projects do not address the local needs	Few	None	None	None	None

Not effective in dealing with emerging challenges of marketing and other risks like climate change	None	Many	None	None	Few
Mismatch of policies implemented and what they do	Few	None	None	None	None
Inadequate funding for agricultural extension services	Many	Many	Few	Few	Many
Recruitment of unqualified staff to provide extension	Many	Many	Many	Many	Many
C. Lack of support to Eos					
Mobility support to the extension officers	Many	Many	Many	Many	Many
Lack of resources to Eos	Many	Many	Many	Many	Many
Demotivated EOs	Many	Many	Many	Many	Many
D. Lack of trust in Eos					
Poor perception by the public toward extension officers	Few	Many	Few	Many	Many
Doubts on the reports EOs produce	None	None	None	Few	None
E. Issues related to the information delivery by Eos					
Inadequate number of field extension officers	Many	Many	Few	Few	Many
Inadequate number of extension programs	None	Few	Few	None	Few
Poor message harmonization feedback	Many	Many	Many	Many	Many
Uncoordinated efforts	Many	Many	None	None	None
Poor promotion of local technology	Few	Few	Few	Few	Few
Lack of local verification of technologies promoted	None	Many	None	None	None
Poor targeting (weak handling of diverse farmers)	Many	Many	Many	None	None
F. Issues related to the farmers					
Poor access to inputs by farmers	Few	Few	None	None	None
Inadequate number of visits by EOs	Few	Few	Many	Few	Few
Poor promotion on value addition by cooperatives	None	Few	None	None	None

4.2 Recommendations to Improve Agricultural Extension Delivery

This study attempted to explore recommendations to improve agricultural extension services in sub-Saharan Africa. The recommendations were classified into four categories: human resource development and support, improved extension programs and delivery, recommendations for the public extension systems, and recommendation for the universities (Table 4.2). Agricultural extension is one of the programs that facilitate the access of farmers, value chains participants, and market actors to knowledge, and it is one channel that can possibly increase agricultural productivity. The primary role of extension is to improve farmer decision making and skills needed to apply agricultural innovations and thereby develop the agricultural sector.Therefore, improving the agricultural extension services will lead to improving the farmers' decision making.

Recommendations on human resource development and support made by the participants of all the five countries include motivating extension officers by providing incentives, logistic support, and other resources to the EOs, capacity building by providing training and reorientations, and improving their technical and practical skills and ICT literacy. Motivation of extension officers to serve farmers is crucial for knowledge transfer to farmers.Therefore, it is important to provide incentives -- including compensation, housing, and a decent transport system –which will facilitate their extension activities. Suggestions from some professionals in Malawi and Nigeria are presented below, respectively:

> *"Support provision of resources to extension staff on the ground (compensation, transport, housing and training)."*
>
> *"Equip extension workers with necessary working equipment such as computers, protective clothing, and motor bikes."*

Respondents of the FGDsalso shared recommendations to improve the extension delivery. Improving the quality of extension programs was one recommendation by the experts in Kenya and South Africa. A professional from South Africa suggested the following:

> *"Digital approaches to lighten the workload of EOs, e.g., Smart pen system, should be adopted."*

Traditionally, the role of the extension officer has been fulfilled by face-to-face information delivery. This information delivery method has changed as agricultural sectors and economies have evolved and new types of agricultural information communication technologies have become available. In recent years, the agricultural industry has been experiencing increased use of ICTs around the world. This new change has affected extension services' efficiency and productivity of the agriculture sector (Ayim et al., 2022). Therefore, to harness the full potential of new ICTs and apply them in their extension delivery, extension officers need adequate trainings.

Experts from Malawi pointed out the need for proper targeting of farmers with innovations and local verification of the technologies. Extension service often plays crucial roles in both agricultural food production and income-generating purposes in Africa, but research on

the impact of agricultural extension and its issues has been limited. The empirical findings of Lee et al. (2020) have implications for local governments and policymakers regarding a comprehensive and realistic strategy to increase investment in local-specific targeting of extension and advisory service delivery. Further, in the long run, agricultural extension policies and practices need to be tailored to suit the real needs of farmers.

South African professionals mentioned that EOs should build mechanisms to develop close connections with contact leaders of the farmersand thereby improve the extension delivery. Previous studies have shown that interpersonal channels were generally found to be more available, accessible, and used by the farmers than the mass media to obtain information on improved farm production(Okwu and Daudu,2011). Therefore, building close relationships with contact leaders would easily facilitate technology transfer to farmers. Professionals from Malawi recommended more practical demonstrations to farmers on extension services. Practical demonstrations are found to be more convincing than other methods of delivery. Therefore, it is advisable to incorporate practical demonstrationsas extension deliverables. Professionals from Malawi and Kenya also suggested increasing the extension workers in proportion to the farmersas a recommendation to improve the delivery.This could serve many farmers.

Malawi and Kenya have highlighted the importance of adopting a pluralistic approach.The following comments are from Malawi and Kenya, respectively:

> *"Pluralistic approach has helped many farmers access extension advisory services. Other players in the extension sector-- e.g., private sector and NGOs -- have resources to be able to reach out to many farmers, supporting the effort of government."*
>
> *"Public extension services can often learn a lot from private extension services that are privately funded and in many cases with better resources to do their duty."*

Pluralistic approach is the provision of extension services from more than one source of extension service.Many countries has pluralistic models that involve many different extension providers, but few countries like Malawi make a deliberate effort to tap into the potential synergies between these providers (Mutimba, 2014). Non-government organizations have provided complementary advisory services to public extension for decades. Private-sector entities have participated in advisory services in the process of expanding markets for their products. It's also worth noting strategic linkages with non-extension actors (NGOs, private-sector entities) that impact how farmers are treated through the system. These linkages would bridge the extension and research needs, so that farmers can obtain crucial information and support in a timely manner, and so research activities may be tailored to farmer requirements. Further, the pluralistic approach would also reduce the financial burden of national government due ineffectiveness of the public extension services and institutions.

The stakeholders further recommended the need to develop, monitor, and review the regulatory aspects of extension services. They also emphasized the need to review the District Agricultural Extension and Services System programs and establish more research institutions at the division and regional levels.

Also, recommendations from South Africa and Malawi suggested that universities should collaborate more closely with training institutes. Revising the curriculum by incorporating digital extension approaches was recommended by FGD members from all the five countries. Respondents from Malawi suggested including knowledge management in the curricula to address the current gap.

A respondent from Kenya recommended increasing the funding and support to the university training program. Rivera and Schram (2022) mentioned that in almost every country of Africa, technical and financial assistance from the bilateral donors is being provided for strengthening training institutions or training national in donor institution. Yet financial constraints act as barriers in most of the universities.

Recommendations	Kenya	Malawi	Nigeria	South Africa	Uganda
A. Human resource development and support					
Provide incentives to Eos	*	*	*	*	*
Provide reliable logistic support	*	*	*	*	*
Provide the necessary working equipment to EOs	*	*	*	*	*
Provide reorientation programs for the Eos				*	
Provide professional trainings to Eos	*	*	*	*	*
Build ICT capacity among extension workers	*	*	*	*	*
Extension officers should have collaborations				*	*
B. Improve extension programs and delivery					
Improve the quality of extension programs	*			*	
Properly target farmers with innovations and local verification of the technologies		*			
Incorporate urban farmers, who are resource rich, in the commercialization drive		*			
EOs should build mechanisms to develop close connections with contact leaders				*	
Provide practical demonstrations to farmers on extension services		*			
Increase the number of extension workers in proportion to the number of farmers	*	*			

C. Recommendations for the public extension systems					
Adopt the pluralistic approach	*	*			
Improve the regulatory aspect of extension	*			*	
Review the District Agricultural Extension and Services System programs	*	*			
Resuscitate farm systems research and extension			*		
Establish more research institutions at division and regional levels					*
Increase funding to apex programs	*				
D. Recommendations for the universities					
Closer collaboration between universities and training institutes and industry		*		*	
Include digital extension approaches in the extension curriculum	*	*	*	*	*
Include knowledge management in the curricula to address the current gap		*			
Increase the funding and support to the university training programs	*				

4.3 Critical Job Skills, Competencies, and Skills Gaps

Table 4.3 summarizes the respondents' feedback on the critical skills required by agricultural officers in Africa. The researchers categorized all the skills listed by the respondents into six broad categories: practical know-how, technical knowledge, communication skills, innovativeness, managerial skills, and personal qualities which are considered critical. Further, this study attempted to find out the skill competency gaps identified across Africa as summarized in Table 4.4.

The present customer-driven markets added the responsibility to agricultural agents to help farmers understand changing consumer demands. Further, privatization; a demand-driven, grassroots and bottom-up approachhad resulted the agricultural agents in performing the functions of planning, implementing, and coordinating extension activities at the district, divisional, and local levels. This also increased the responsibilities of the extension officers. Thus, the expectations of extension service providers are no longer restricted to technical agricultural competencies but have expanded to the wider social and economic context of agriculture (Lopokoiyit et al., 2013). This requires different competencies among extension service providers. Competency is a "cluster of related knowledge, attitudes, abilities, behaviors, and collective processes and capabilities (Athey and Orth,1999).According to Lopokoiyit et

al. (2013) competencies in extension management is needed in four main aspects namely: managing extension programs and projects; managing other extension staff; collaring with other stakeholders and networking; and finally managing the relationship with the farmers. Lindner et al. (2003) had emphasized the fact that the most important agricultural and extension education competencies varied by country. The authors categorized competencies into knowledge, skills, and abilities, with knowledge comprising theories, principles, and practices related to agricultural development; skills relating to technology design and information technologies; and systems skills and abilities including communication abilities, time management, and problem solving (Lindner et al., 2003). Extension workers' skills can be divided into two categories: functional or technical abilities, and soft or process-oriented skills (Tata and McNamara, 2018).

All the respondents across the five countries acknowledged that EOs lackpractical and technical knowledge. Today, every extension agent is expected to be an expert in at least one technical agriculture field and to be able to deliver excellent service. The extension agent must have the knowledge and skills to plan a farm physically, biologically, and economically, as well as the skills to adapt and transform the technical message to be applicable to the specific farm and farmer. Strengthening the extension officers' education system and delivering in-service training courses on topics requested by farmers are some of the critical points that will ensure that the system serves farmers effectively (Davis et al., 2010).

Further, harnessing the full potential of new information and communication technologies (ICTs) innovations to meet farmers' needs requires favorable government policies and investment in telecommunications infrastructure. Study results suggested that there are gaps in ICTs or digital literacy among the extension officers across Africa.

Results also revealed that respondents of all five countries consider communication skills to be critical. Communication is a key factor for interaction between extension officers and farmers. It serves as the vehicle through which extension takes place (Terblanche, 2008). The extension officer must be able and confident to convey information and ideas in a clear and concise manner appropriate to the audience to influence people to accomplish the desired objectives (Terblanche, 2008).The focus group discussions revealed various subsectors of communication skills such as networking, negotiation, persuasion, facilitation, interpersonal, conflict resolution, lobbying, proposal writing, gender relations, group dynamics, and teamwork, which are regarded as critical skills needed by extension officers. Gaps in communication skills were identified in all the five countries.

Managerial skills were also identified as a critical job skill area for extension officers. Planning and organizing skills; leadership skills; monitoring, budgeting, and reporting; program evaluation and documentation; and knowledge management were the skills revealed through the focus group discussions. The results revealed that gaps in marketing skills of EOs were seen in Malawi and South Africa; gaps in knowledge of resource management werespecificallyidentified by therespondents in Malawi; gaps in entrepreneurship were seen in Kenya,Malawi, and Uganda; gaps in project management skills were seen in Kenya, Nigeria,

and Uganda, and monitoring and evaluation gaps in Kenya and Nigeria.Respondents from Uganda pointed out that there are gaps in problem solving; respondents from Nigeria and South Africa pointed out gaps in analytical skills. A professional from Uganda pointed out how universities are lagging inproblem solving:

> *"One of the things I want to say about universities is that in my own view, universities are in general very good at studyingproblems. But they are not yet good at solving problems."*

Further, the study revealed that personal qualities of extension officers were seen as being of utmost importance. Respondents listed social and emotional intelligence, empathy, integrity, positive attitudes towards the job, respect for other cultures, self-directed learning, and professional ethics. This was highlighted in some insights from a Malawian farmer on how the poor personal qualities of the EOs have led to poor perception of the overall agricultural extension system:

> *"Our extension agent has a bossy attitude and does not relate well with the farmers. For example, when she comes to teach us something, instead of demonstrating how it should be done, she just stands somewhere and tells us to do it. If we want her to come and demonstrate, she shouts at us that she is learned and hence her job is to tell us what to do.*

> *"Sometimes we tell them, but they force us to do it. They say we just have to do it whether we want it or not. The other problem is that the extension worker has groups which she favors in her mind such that when a project comes, for example, a goat pass-on project, she will take it to those groups of her choice. This does not work well with some of us as we feel left out. This further brings disunity among us."*

Table 4.3 : Critical skills and competencies

Practical know-how	Technical knowledge	Communication skills	Managerial skills	Personal qualities
• Practical technical skills • Research/ analytical skills • Skills in partnership mapping • ICT skills and digital literacy	• Agronomy • Animal production • Natural resource management • Disease management	• Networking • Negotiation • Persuasion • Facilitation • Interpersonal • Conflict resolution	• Planning • Organizing • Leadership • Monitoring • Budget and reporting • Program planning and evaluation	• Social and emotional intelligence • Empathy • Integrity • Positive attitude • Respect for other cultures

	• Postharvest management • Production and processing • Home management skills • Farm business management • Product costing • Marketing • Financial management	• Lobbying • Proposal writing • Soft skills • Gender relations • Group dynamics • Teamwork	• Documentation and knowledge management • Entrepreneurship • Innovativeness • Creativity • Critical thinking • Problem solving	• Self-confidence • Self-directed learning • Professional ethics

Table 4.4 Skill competency gaps

Gaps	Kenya	Malawi	Nigeria	South Africa	Uganda
Practical and technical skills	*	*	*	*	*
Knowledge of ICTs	*	*	*	*	*
Soft skills: communication, facilitation, social skills	*	*	*	*	*
Marketing		*		*	
Entrepreneurship skills	*	*			*
Knowledge of resource mobilization		*			
Project management skills	*		*		*
Monitoring and evaluation	*		*		
Problem-solving skills					*
Analytical skills			*	*	
Self-confidence	*				

4.4 Barriers to Training Future Extension Professionals

Table 4.5 summarizes barriers to training future agricultural extension professionals. The barriers are categorized as human resource development, institutional barriers, and issues related to the curriculum.

The barriers related to human resource development revolve around lack of training, incompetence of trainers, and lack of motivation among students. Teachers'/trainers' lack of

competence in the practical aspects was a barrier identified by an extension professional in Kenya:

> *"When it comes to teaching of these courses, it is not just a topic as we look at, it is because we are lacking on how it should be unpackaged to allow the learner to interrogate it, to interact with others and really be able to do practical aspect that makes them to be more competent in the field. That is lacking when it comes to teaching, that those who are teaching today, from my own experience, the practical aspect is missing."*

Inadequate workforce to teach students at universities was a major barrier experienced in Nigeria and Kenya. Kenyan and Nigerian professionals, respectively, made observations as follows:

> *"The major barrier I see is manpower. We don't have adequate staff, those who can teach, can handle the agricultural education and even extension, and this could be attributed to maybe funding levels of those universities to hire more staff."*
>
> *"Lecturer to student ratio is very high, many students with few lecturers."*

As Ssebuwufu et al. (2012) noted that brain drain, and moonlighting were some major reasons of inadequate quality staff withinthe sub-Saharan African countries.Comparatively low salaries within Africa had led the academic staff to either migrate to wealthier nationsorto carry out moonlighting activities.This had left many universities within sub-Saharan Africa with few qualified academics.

Lack of motivation among students was another barrier highlighted in Uganda, South Africa, and Nigeria. Professionals from Uganda and South Africa revealed, respectively:

> *"One of the challenges is that we get students from different family backgrounds and some of them just find themselves in Agriculture, but their passion and interests might not be there, so as they go to the field for them it is a punishment. They are doing it for marks, for earning, so we need to interest them in the discipline they have chosen for us to be able to package them better as extension facilitators or workers."*
>
> *"Students who do not qualify to study their desired degree often end up in agriculture as a last resort. The result is demotivated people with very little interest in what they do."*

For an instance in South Africa, though the number of schools offering agricultural subjects have increased, the number of students sitting for agricultural subjects have declined and performing poorly in agricultural courses (Kinder and Worth 2012). Agriculture has a negative image as a career choice among the youth.

A Nigerian extensionprofessional commented on lack of training for the teachers, whereas professionals from Malawi, Nigeria, and Uganda pointed out the lack of practical trainings for the students.Human resources are the most important factor in a nation's development. Well-equipped and skilled human resources would thereby contribute to the individual, organizational, and national development of a country through improved performance (Suvedi and Sasidhar,2020). Therefore, there is a dire need for awell-trainedworkforce to train futureworkers, so they are technically and professionally competent.

Lack of funding and poor facilities were identified as institutional barriers in Uganda, Nigeria, and Kenya. Professionals in Uganda also indicated that having no farms to carry out their practical sessions was a major barrier. Thus, most of the universities across the five countries lack some basic facilities to ensure quality extension education. A Nigerian extension professional noted the poor facilities:

"Poor facilities such as communication studio, ICT laboratory, vehicles."

Apart from lack of funding and poor facilities, the focus group discussions revealed that universities have little interaction with other institutions.A Nigerian extension professional emphasized:

"There should be synergy between universities and research institutes."

Close interactions with other institutes would provide several opportunities to the universities, including internship opportunities and off-campus experience needed for students to understand the real job environment. Further Ssebuwufu et al. (2012) revealed that industry partnerships could also be an important alternative funding avenue for universities including funding for commissioned research, investments in labs and equipment, student scholarships and funding for graduate research.

The respondents also noted that bureaucracy in decision making, and poor national policies also acted as barriers to training undergraduates effectively. A South African professional said:

"The absence of applicable policy -- for example, the lack of policy on sustainable agriculture -- has a direct impact on the attention/funding."

"At the University of Limpopo, the honors degree in agricultural extension is not recognized by the South African Council for Natural and Scientific Professions."

The study also revealed some shortfalls of university agricultural extension curricula. The reviewing process of the curriculum itself takes a long time, according to the academics in Kenya. This has discouraged reviewing and updating the curriculum to meet current standards and requirements. Further, the poor practical component in the curriculum is observed as a major barrier in South Africa and Uganda and was pointed out by many participants of the focus groups. However, a participant from South Africa pointed out:

"In many instances the diploma students are better equipped than the students with degrees because the focus in diploma programs is more on soft skills and practical skills and not so much on science."

Lack of comprehensive outreach programs and hands-on experience are also major obstacles to developing the competencies required by future extension professionals. Time allocations and funding have been revealed as major precursors to this, as revealed by a Kenyan academic:

"You cannot have a comprehensive outreach program unless you have good funding-; it's a serious problem that needs to be looked into."

Few participants from Kenya, Nigeria, and South Africa noted that the timeallocated forpractical components in the curriculum is not sufficient. Few members from Kenya, Malawi, Nigeria, South Africa, and many participants from Uganda criticized the inadequacies of thedepth of courses. As was discussed under the issues of the agricultural extension system, most of the extension officers therefore lack technical skills and knowledge.Inadequacies of the content taught could be a reason for the students who graduate and secure an extension-related job tolack the technical knowledge required to serve the farmers.

Table 4.5 : Barriers to training of extension workers

Barriers to training	Kenya	Malawi	Nigeria	South Africa	Uganda
A. Human resources issues					
Teachers/trainers are not competent in the practical aspects	Few	No one	Many	No one	Few
Inadequate manpower at universities	Few	No one	Many	No one	Many
Lack of motivation of students due to no passion for agriculture	No one	No one	Few	Many	Many
Lack of practical training for teachers	No one	No one	Few	No one	Few
Few student-teacher interactions	No one	No one	No one	No one	Many
B. Institutional barriers					
Shortage of funding	Few	No one	Few	No one	Many
Poor facilities	Many	No one	Many	No one	Many
Lack of networking with the industry/ stakeholders/research institutes	Many	Few	Many	Many	Many
National and university policies	No one	No one	No one	Few	Few
Bureaucracy in decision making	No one	No one	No one	No one	Few
C. Issues related to the curriculum					
Reviewing the curriculum takes a long time	Few	No one	No one	No one	No one
Poor practical component	Few	Few	Many	Many	Many
Lack of comprehensive outreach programs	Few	No one	Many	Many	Many
Little time for practical	Few	No one	Few	Few	Many
Lack of depth of the courses	Few	Few	Few	Few	Many

4.5 Recommendations for Improvements / Reforms of the Undergraduate Extension Curriculum

Table 4.6 summarizes the recommendations provided by the FGD participants on the improvements/reforms of the undergraduate agricultural extension curricula needed to prepare the next generation of agricultural extension professionals to competently handle extension service delivery. The respondents suggested courses on topics such asinformation and communication technology, plant nutrients and soil fertility, agribusiness management, entrepreneurship, proposal management and community mobilization and local organization development, climate-smart agriculture, and management of change to enhance the technical competencies of the students. According to Kidane and Worth (2012), students studying agriculture should develop competencies in soil science, plant science, animal science, agricultural economics, basic chemistry, basic biology, and sustainable natural resource management. In addition to these competencies, agricultural sciences and technology should also address social and economic justice issues such as food security and risk management. In addition to these skills and knowledge, agricultural science should aim at developing skills such as the ability to investigate and analyze sustainable agricultural practices, indigenous agricultural knowledge and historical development, and interrelated issues in agriculture (SAQA, 2003).

Apart from the above courses recommended by the participants, there were few recommendations on incorporating courses on entrepreneurship. Thefollowing are from two professionals in Nigeria and one professional from Malawi:

> *"Drop courses on rural youth and women programs and include entrepreneurial courses."*

> *"Nutrition is an important area that should be included. Other areas are climate change, renewable energy, food security, extension development and health- related issues."*

> *"I think we should focus on Entrepreneurship. This should be emphasized in the curriculum. This is where partnerships and joint ventures should be emphasized. For, example, students from extension, animal science, agribusiness and other disciplines can form a partnership and start their own business."*

The FG participantsshowed their interest in incorporating courses on entrepreneurship. Entrepreneurial capacities and innovation are essential to uplift the lives of the farmers. Therefore,building the entrepreneurial capacities of the students who ensure that the future extension staff would effectively meet the needs of small-holding farmers and contribute to their successful integration into the food value chain.

Curriculum revision is vital to prepare the next generation to competently provide their services to farmers. Reviewing the curriculum was suggested by FGD members from all the five countries,emphasizing the fact that there is a dire need of curriculum revision of the agricultural extension programs offered in the African institutes. That process

should involve stakeholders who are directly linked into extension and the private sector. Respondents also advised carrying out job analyses and identifying occupational standards for extension workers and developing courses accordingly. Conducting a comparative study to identify the need for changes in the industry would also aid in curriculum revision.Ssebuwufu et al. (2012) also suggestedthat alignment of curricula to labor market needs is a key requirement that should be met by higher education institutions.The following are some comments from some professionals from Kenya, Uganda, Malawi, and Nigeria,respectively:

> *"When developing the program, the stakeholders have been left out and sometimes when you invite the stakeholders, maybe we are biased just the way professors put it that maybe the participant in this particular training are not well versed in the topic of discussion. When it comes to curriculum development, the stakeholders who were brought on board may not be the ones who are in touch."*

> *"There is need to bring in more experts, but also, I would think that the university can also go back to redesign the curriculum."*

> *"I think there are several actors you can engage. Some of them are the ones we have been mentioning here. Such factors include the cooperatives, the processors of various agricultural produce."*

> *"Although the review of extension curriculum is ongoing, but there is a miscarriage in the curriculum preparation such that experts are not involved in the review of the extension curriculum. Thus, a new curriculum that does not meet emerging areas in agricultural extension may be introduced. It is necessary for the new curriculum to be standardized such that all universities can adopt them."*

Standardizing the extension curriculum was another suggestion from the participants from Kenya and Uganda. For instance, B.Sc. AGED programme at Egerton University is the pioneer programme in Kenya,and the young universities within Kenya have borrowed heavily from the Egerton University AGED curriculum. However, many of these universities have not been able to match the standards at Egerton University, and sometimes their graduates are considered inadequately trained.Therefore,rather than merely copying things haphazardly, it would be better to have a standardized curriculum within a country to ensure that all graduates produced aregiven equal and adequate training. The following was said by an expert in Kenya:

> *"I wish that even as those other young universities mount the program, there could be a standard curriculum so that we don't have like in ..., I mean, you have a curriculum that is deficient in some skills such that we have graduates out there who feel like they're misplaced."*

Incorporating indigenous knowledge into the curriculum was suggested by participants from Malawi. Extension curricula have given more emphasis on acquiring scientific principles and concepts in agriculture. Therefore, most courses are designed around particular subject matter areas. Holistic integration of their indigenous knowledge systems into curricula would permit the construction of knowledge and social relations that were overlooked and marginalized by western dominated knowledge. Kidane and Worth (2012) also revealed that many post-colonial African countries borrowed western Agricultural education systems rather than developing their own models. Kidane and Worth (2012) also suggested that such Agricultural education and training systems should be developed based on the existing demand and responding to local and global development contexts and the borrowed Western systems would not address the real agricultural problems in the regions.

Participants from Malawi, Nigeria, and South Africa suggested reducing the specialization courses and including morebasic courses. A participant from Malawi complained about the overspecializationof the students:

> *"Over specializing is also another barrier. This leaves the students with very narrow area of focus hence they are challenged to work on areas that they did not cover during their training."*

Participants from Nigeria and Uganda proposed increasing the ratio of practical hours to lecture hours in calculating credit units.Overall, FGD participants recommended increasing the practical or hands-on experiencesof the students.Collaborating with farmers, rural communities, and commodity associations; monitoring current outreach programs; arranging for longer internships; inviting guest speakers from the field to enhance the knowledge of the students;andinvolving students in research projects using/establishing mini farms for hands-on educationare some recommendations to improve the practical courses of the agricultural universities. Professionals fromUganda and Malawi said the following, respectively:

> *"If we look at most of these curricula, really, they provide for student outreach and students are involved. They go to the farmers but probably, where we are not doing well is the supervision on the side by the university.Lecturers need to follow up on regular basis. It may be not daily but probably after a week or two, you visit the student who is there in the field."*

> *"I think there is a need to enhance internships and incubations to give the students the practical side of their program. These should not be done after graduating but during their four-year period of study."*

Social and communications skills are also regarded criticaltoimproving students' practical and hands- on experience. This was pointed out by FGD members from all the five countries.A Nigerian professional suggested:

> *"Students should be taught communication and ICT skills. Therefore, there is a need for a communication studio in all universities so that they may create films/documentaries*

based on their contacts with farmers, learn how to map communities, get information online, utilize gadgets, and create applications like a one-stop shop for extension agents. This skill will also enable them to organize and conduct interviews, particularly with members of the farming community, to improve students' presentation skills, to present research/field reports with convincing arguments clearly in writing or orally, and to be equipped with information technology skills required for global communication."

The respondents from Malawi and Uganda suggested that a proper screening of students should be done at the time of intake to the universities and admission be given to students who have some prior knowledge of extension. Thus, they assumed that students with a prior knowledge of extension would be more likely to be motivated on learning more on extension.

"There is a need to recruit those students who have a rough idea about extension work so that they have prior knowledge of what the field of extension is."

Table 4.6 : Recommendations to improve / reform the undergraduate extension curriculum

Recommendations	Kenya	Malawi	Nigeria	South Africa	Uganda
A. Courses to be included					
Information and communication technologies (ICTs)	*	*	*		
Plant nutrients and soil fertility		*			
Agribusiness management	*				
Entrepreneurship	*		*		
Proposal management	*				
Community mobilization and local organizations and development				*	
Climate-smart agriculture	*		*		
Management of change				*	
B. Curriculum revision process					
Review the curriculum.	*	*	*	*	*
Carry out job analyses, identify occupational standards for extension workers, and develop courses accordingly.	*				
Conduct a comparative study to identify the need for changes in the industry.	*				
Avoid repetition of subject matter.	*				

Involve stakeholders who are directly linked into extension/private sector in curriculum revision process.	*	*			*
Make the courses more practical oriented.	*		*		
Standardize the extension curriculum.	*				*
Develop a competency-based curriculum.	*				
Incorporate indigenous knowledge into the curriculum.		*			
Reduce the specialization courses and include more basics.		*	*	*	
Increase the ratio of practical hours to lecture hours in calculating credit units.			*		*
C. Practical or hands-on experience					
Work collaboratively with farmers and rural community, commodity associations.	*	*	*	*	*
Monitor the current outreach programs.	*				*
Arrange longer internships.	*	*			*
Invite guest speakers from the field to enhance the knowledge of the students.		*			*
Devise mentorship programs.		*		*	*
Use mini farms for practical experience.		*			
Involve students in more research and projects.					*
Make social skills and communication-related courses crosscutting in all undergraduate programs.	*	*	*	*	*
D. Recruitment of students					
Recruit students who have a little background in extension.		*			*

CHAPTER 5 : CONCLUSIONS AND RECOMMENDATIONS

This study identified challenges to effective agricultural extension service delivery as well as skills and competency gaps in the undergraduate extension curriculum in five African countries. Generally, challenges to the effective delivery of agricultural extension services across the five countries were weak public extension systems with many underlying issues, such as unqualified/incompetent extension officers, lack of resources, demotivated extension officers, lack of support for the extension officers, inadequate numbers of field extension officers and extension programs, poor message harmonization, lack of local verification of the technologies promoted, and poor targeting of diverse farmers.

The skills/competencies gaps identified in the undergraduate curricula across the five countries studied were ICTs, marketing, entrepreneurial knowledge on resource mobilization, practical and technical skills, facilitation, management, monitoring and evaluation, analytical, communication, project management, and personal qualities such as self-confidence and problem-solving and social skills. Incompetent trainers and teachers, inadequate manpower at universities, poor facilities in universities, lack of networking with other industry stakeholders, lack of motivation among the students, inadequate trainings for the faculty/staff, limited student/ teacher interactions, lack of comprehensive outreach programs and hands-on learning opportunities, and bureaucracy in the decision-making process in the university system were identified as barriers to effectively training the undergraduate extension students in the various universities.

To improve agricultural extension delivery in Africa, FGD participants recommended adopting a pluralistic approach and improving the coordination of all players in the agricultural extension system. Further, they recommended reviewing the district agricultural extension services, systems, and programs. Efforts to motivate extension officers could include providing adequate trainings, incentives, logistic support, and other working equipment. Reorientation and frequent training programs should be given to extension officers, particularly to improve their ICT literacy and capacity to move forward with technological advancements. Participants also recommended increasing the number of extension workers in proportion to the number of farmers.

Furthermore, in addition to reviewing curriculum with the involvement of the stakeholders, participants recommended that a job analysis be carried out to identify occupational standards for extension workers and develop courses accordingly to address skills gaps. The courses developed should be practical rather than theory oriented. The practical skills

of the undergraduate students could be enhanced by allowing them to work collaboratively with farmers, rural communities, and community associations, and through longer internship arrangements.Acompetency-based extension curriculum should be developed and standardized within Africa.Further, the educational institutions should build their networking capacity with the public and the private sectors to identify the current needs in agricultural extension. This would help future extension professionals learn about real-world scenarios and equip them to engage with local communities and become role players in the agricultural sector.

Unfortunately, as with education, the benefits to investments in agricultural research, extension, and other public goods accrue mainly over the long run, and governments tend to have short-term time horizons. To helpgovernments foresee the tangible and intangible benefits of investing inextension, the senior authorities or top-level officials in agricultural extension should make the policymakers aware of the imperative role of agricultural extension and how it supports the farmers to access timely and relevant information, which can help farmers to improve their production and productivity.

On the basis of the analysis, the researchers make the following recommendations:

1. The current undergraduate agricultural extension curricula should be overhauled to emphasize practical skill acquisition. The current needs of the job market require skills and hands-on experiences, not just degrees. Courses need to be taught as applied subjects rather than for their theoretical and academic values, so they need to be designed around specific skills or competencies rather than around specific disciplines. Particular attention needs to be paid to application of knowledge in field settings, such as on-farm experiences including internships, student farms, short-term visits, and conversations with farmers. Courses on entrepreneurship and ICTs should be given more emphasis.
2. A competency-based curriculum should be developed in which the students can acquire and apply knowledge, skills, and attitudes to situations they encounter in real farm settings.
3. Astandardized curriculum should be developed for each countrytoensure that all students of a particular country have access to a curriculum deemed adequate by the experts of agricultural extension and thereby enter the job market well prepared to succeed.
4. Promoting functional working relationships and linkages between the private and public sectors is essential to enhance extension worker training. This can be accomplished through internship programs. Further, apart from the technical and generic skills, the graduates need to develop their leadership and entrepreneurial skills to build leading teams, put innovations into practice, and respond to a competitive environment.

5. The study also revealed that the extension faculty and staff are poorly trained. Thus, there is an urgent need to develop the capacity of the agricultural faculty members to train undergraduates to become competent extension professionals. The extension faculty and staff should thereby undergo trainings and refresher courses on extension services to upgrade their knowledge and skills. The African countries need external assistance and funding primarily for creation of additional training capacities. Fellowship programs should be arranged for the agricultural extension professionals to get training from resourceful and developed countries.

6. The study revealed that young people's interest in the agricultural sector is declining. Students usually pursue an agricultural degree when they have no other options. Introducing modern farming techniques and management principles through technologically integrated agricultural courses could make the curriculum more attractive to potential students.

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Developing the Next Generation of Extension Workers in Sub-Saharan Africa

FGD Invitation Letter

Date: ----------

To

Dear Sir / Madam,

Greetings.

We are conducting a research project **"Strengthening Agricultural Extension Training in the MSU Alliance for African Partnership Consortium Partners in Africa"** funded by Michigan State University. The core objective of this work is to identify Process Skills and Competency Gaps in Undergraduate Agricultural Extension Curriculum in Africa.

As part of this research work, we are conducting a Focus Group Discussion on **'Process Skills and Competency Gaps in Undergraduate Extension Curriculum'**, with extension faculty, researchers, practitioners and employers in both public and private organizations as well as extension postgraduate students.

Venue: ----------

Date & Time: ----------

The Focus Group Discussion will be followed by a Lunch.

May I request you to kindly participate in the Focus Group Discussion and share your viewpoints on **"Process Skills and Competency Gaps in Undergraduate Extension Curriculum."**

Please confirm your participation by ---------- (date) by calling me at: ---------- (Phone Number) or via e-mail at: ----------

Thank you for your time and cooperation.

Yours Sincerely,

(Name & Designation of Researcher)

Developing the Next Generation of Extension Workers in Sub-Saharan Africa

Good morning / afternoon ladies and gentlemen and welcome to the FGD. My name is ---------- (Name & Designation). Assisting me is ---------- (Name & Designation). We have asked you to join us today so that we can listen to you, our colleagues and friends of agricultural extension services. More specifically, we are interested in your thoughts and opinions regarding agricultural extension and how extension services could address the evolving needs of our graduates, farmers, agribusinesses and development partners.

The objectives of this FGD are to gather information, including perceptions and ideas, from you about:

a. How effective our extension programmes are in addressing the needs of our food and agricultural systems?

b. What are the critical skills and core competencies required of extension workers to effectively plan, implement and evaluate extension work in the changing context?

c. Does our undergraduate curriculum in extension education include education and /or training on these job skills or core competencies necessary for successful extension service delivery?

d. What are the major barriers to effectively train extension workers with the required core competencies and how can these barriers be removed?

Your responses will be used to supplement the results of a broader, nation-wide, and continental survey on ***"Strengthening Agricultural Extension Training in the MSU-Alliance for African Partnership (AAP) Consortium Partners in Africa (Nigeria, Malawi, Uganda, Kenya and South Africa)."*** The results of the FGD and the nation-wide online survey will be used to recommend subsequent development of competency–based curriculum for extension professionals across Africa. Therefore, it is very important that you respond as openly and thoughtfully as you can. There is no right or wrong answers in our discussion today. Many people have different experiences in extension activities, so feel free to comment even if your thoughts, ideas, and experiences are different from what others have to say. My job is to guide the conversation and keep us on time to be sure we finish in the allotted time, so along the way I may interrupt, or I may push us along a little bit faster, so that we can finish our conversation on time.

This session is audio-taped to ensure accuracy in our written summaries. However, we will do everything in our ability to ensure the confidentiality of your responses; no transcribed comments will be attributed to any individual. To make sure we capture all the comments, we ask that you speak one at a time. Indeed, focus groups are mostly successful when participants

share the time among themselves, but don't feel like you have to respond to every question. If any question is ambiguous or confusing in any way, please ask for clarifications.

The session may last about 90 minutes and we will not take a formal break, so if at any time, you wish to get up for coffee or a snack, please feel free to do so.

Do you have any question before we begin?

Let us begin by finding out a little more about each other. As we go around the room, please introduce yourselves and tell us a bit about your involvement in extension and agriculture related business or industry.

1. What are you hearing among your fellow extension professionals and/or from people in the agricultural community about agricultural extension in ----- (Country name)?
2. What has been your own experience with respect to agricultural extension? Are you involved in developing extension curriculum, teaching extension courses, hiring extension workers, supervising extension workers or developing extension programs or policies? Please share your experience.
3. How effective are our extension programs in addressing the needs of the changing agricultural systems? What are one/two things that extension service is doing particularly well in your university, state or region in agriculture arena?

   [Pass around a blank white paper page and pencil. Ask them to list one or two things that extension is doing well.]
4. If you could come up with three major recommendations to improve agricultural extension services and program delivery, what would they be?

   [Pass around a blank paper and pencil. Ask them to list three things to improve the extension services.]
5. What are three critical job skills or core competencies required of agricultural extension workers in the changing agricultural and rural development context?

   [Pass around a blank paper and pencil. Ask them to list three process skills or competencies required of extension workers for effective extension work.]
6. Does our undergraduate extension curriculum effectively train students on the above job skills core competencies?
7. If not, what are the gaps that need to be filled in terms of the current curriculum in existence?
8. Again, what are the main barriers to effectively train undergraduate students with the required core competencies and how can these barriers be removed?

   [Pass around a blank paper and pencil. Ask them to list the main barriers and how these barriers can be removed.]
9. What changes or modifications might you recommend with respect to agricultural extension curriculum? Are there courses we are not teaching that we should consider

including extension curriculum? What courses or contents are outdated that we should consider dropping out?

10. Finally, we have invited you here because we value your inputs and responses to our questions, but we would like to know who else we should be asking. Do you have suggestions for others we should be including as we continue to seek inputs and advice on how to improve our curriculum? Who are they? What should we be asking them?

11. Are there any final comments?

Our time has passed so quickly. On behalf of Research Team on this Project, I want to thank you for taking time from your tight schedules to share with us this important information. Your comments and suggestions will help us develop recommendations for **"Strengthening Agricultural Extension Training at the Undergraduate Level in Africa."**

If you would like to receive a copy of the research report, please provide your e-mail:

[Pass around a blank paper and pencil to write the e-mails.]

Thank you for your participation!

About This Document

Assessment of the competency gaps in undergraduate (UG) agricultural extension curricula would help to develop competency-based curricula and promote training of skillful next generation of extension workers in sub-Saharan Africa. This AAP-PIRA research report addressed this issue qualitatively through 12 focus group discussions (FGDs) conducted in Kenya, Malawi, Nigeria, South Africa, and Uganda with specific research questions: (a) Do extension programs effectively address the needs of current food and agricultural systems? (b) What are the critical job skills and core competencies required of extension workers to effectively plan, implement, and evaluate extension work in today's changing context? (c) Does the undergraduate curriculum in extension education include education and/or training on these job skills or core competencies?, and (d) What are the barriers to effectively training extension workers with required core competencies, and how can these barriers be removed? The synthesis of 12 FGDs revealed that the agricultural extension systems in these countries and possibly others in the region are constrained by capacity gaps among the extension advisory services (EASs), weak public EASs and several barriers to effectively teaching UG extension curricula. Based on the study recommendations, the agricultural colleges and universities could improve their UG agricultural extension curricula to prepare the next generation of extension workers in sub-Saharan Africa.

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