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Strengthening Agricultural Extension Training

Process Skills and Competency Gaps in Undergraduate Agricultural Extension Curriculum in Malawi

By

Charity Chanza, Frank Tchuwa, Ifeoma Quinette Anugwa, Saweda Liverpool-Tasie, Dimelu Mabel Ukamaka, Agwu Ekwe Agwu, Murari Suvedi and P.V.K. Sasidhar

LILONGWE UNIVERSITY OF AGRICULTURE AND NATURAL RESOURCES

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Charity Chanza
Malawi • Lilongwe University of Agriculture and Natural Resources

Frank Tchuwa
Malawi • Lilongwe University of Agriculture and Natural Resources

Ifeoma QuinetteAnugwa
Nigeria • University of Nigeria, Nsukka

Saweda Liverpool-Tasie
USA • Michigan State University

Dimelu Mabel Ukamaka
Nigeria • University of Nigeria, Nsukka

Agwu Ekwe Agwu
Nigeria • University of Nigeria, Nsukka

MurariSuvedi
USA • Michigan State University

P.V.K. Sasidhar
India • Indira Gandhi National Open University

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ABBREVIATIONS AND ACRONYMS

AEAS	Agricultural Extension and Advisory Services
AIS	Agriculture Innovation Systems
ASP	Area Stakeholder Panel
CAADP	Comprehensive African Agriculture Development Programme
DA	District Assembly
DAECC	District Agriculture Extension Coordinating Committee
DAES	Department of Agricultural Extension Services
DAESS	District Agricultural Extension Services System
DAHLD	Department of Animal Health and Livestock Development
DAHLDO	District Animal Health and Livestock Development Officer
DANRC	District Agriculture Natural Resources Committee
DAO	District Agricultural Office
DARS	Department of Agricultural Research Services
DSP	District Stakeholder Panel
EPA	Extension Planning Area
FAO	Food and Agriculture Organization of the United Nations
FGD	Focus Group Discussion
GoM	Government of Malawi
IEC	Information, Education and Communication materials
KII	Key Informant Interview
LUANAR	Lilongwe University of Agriculture and Natural Resources
MGDS	Malawi Growth and Development Strategy
MoA	Ministry of Agriculture
NAP	National Agriculture Policy
NASFAM	National Smallholder Farmers Association of Malawi
NGO	Non-Governmental Organization
NPC	National Planning Commission
NRC	Natural Resources College
UN	United Nations
VAC	Village Agriculture Committee
VDC	Village Development Committee

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– Authors

EXECUTIVE SUMMARY

Agricultural training institutions are expected to produce extension workers needed for transforming agri-food systems and reducing poverty for rural populations. The training programmes delivered by these institutions must equip students with process skills and competencies that address the global changes that have affected agricultural development. However, the current learning methods and materials used in the training institutions are inconsistent with present agriculture demands for the local contexts. This has led to shortage of extension professionals who are able to design, implement, and evaluate agricultural extension programs that support sustainable food systems and rural economies in SSA countries, including Malawi. This challenge could be solved with continual updating of agricultural extension curriculum. Although there have been few studies on core competencies of agricultural extension professionals in sub-Saharan Africa, a systematic assessment of agricultural extension training in Malawi was lacking. This study was conducted to solicit views and perspectives of faculty members, extension professionals, employers of extension workers and related industries, and farmers about the current agricultural extension undergraduate curriculum, the gaps, and ways to improve the curriculum 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 research was carried out in Malawi between August 2021 and April 2022. The study population comprised extension professionals in the public sector, private sector, academia and civil society organizations. A mixed method approach was adopted to collect data with 40 respondents completing an online survey questionnaire that captured both quantitative and qualitative data. Two focus group discussions were conducted in Lilongwe collect qualitative data. Quantitative data was analyzed using SPSS and qualitative data processed using the Qualtrics software.

Respondents perceived the current undergraduate extension curricula as having a good coverage of topics related to program implementation and soft skills needed by extension workers. However, there is inadequate coverage of several emerging topics related to resource mobilisation, administrative and financial management, ICT, reporting, documentation, integration of ICT in M&E, engagement of stakeholders with evidence, personal and professional development, development of youth programs, engagement of marginalised

groups, marketing, brokering and value chain development, healthy diet, integration of indigenous knowledge, and addressing risks and uncertainties.

The study also established several barriers that affect implementation of the extension curriculum in Malawi including, lack of quality faculty members to develop and deliver an effective curriculum; limited budget support and insufficient time for faculty members to deliver course content; poor networking between the university and stakeholders (private, NGOs and government); and the drive to specialize extension programs whilst dropping the general agricultural and rural development topics.

Based on the findings of this study the following policy recommendations are put forward:

- Improve pre-service education at agricultural colleges and universities
- Strengthen agricultural extension as a field of study
- Improve in-service training and professional development
- Capacity building of university extension faculty

CHAPTER 1 : INTRODUCTION

1.1 Agriculture in Malawi

Agriculture is a key sector in terms of food security, economic growth and wealth creation in Malawi. More than 65 percent of the country's population is directly and indirectly employed in the agricultural sector, which also accounts for 67 percent of foreign exchange earnings and 29 percent of Gross Domestic Product (GDP) (GoM, 2020). Agriculture occupies about 56 percent of the land area covering 5.3 million hectares of the country's 9.4 million hectares and supplies at least 65 percent of the manufacturing sector's raw material requirements (Chirwa, 2008; Mbukwa, 2015).

The agricultural sector in Malawi is dualistic. This means it consists of small-scale farmers and the estate sub-sector. These sub-sectors are key farm types in the country and have been historically distinguished based on legal and constitutional laws regulating land tenure, type of crops grown and marketing arrangements. The smallholder sub-sector (smallholder farm type) is based on a customary land tenure system and is primarily subsistence while the estate sub-sector comprises 30000 estates occupying about one million hectares of privately owned land under leasehold title (GoM, 2020). Estates in the country focus on high-value cash crops for export such as: tea, sugar, tobacco, coffee and macadamia. On the other hand, the country has a record of over 4.2million smallholder farmers on 3.3 million hectares under communal land tenure; with an average land holding size of 0.4 hectares. The dual nature of the sector has investment implications for different interventions and most important for agriculture extension and advisory services (GoM, 2011; GoM, 2020; Phiri et al., 2012). The agriculture sector has a number of opportunities such as growing interest by organisations to invest and support agriculture commercialization, abundant water resources in some parts of the country, conducive policy environment, and hardworking farming population. Despite its importance, the agricultural sector is facing several challenges including low productivity due to overdependence on rain-fed farming, limited absorption of improved technologies, insufficient technology development, shrinking public sector resources, climate change, weak extension services for the smallholder sector and lack of dedicated extension and advisory services for the commercial agriculture sector in the country, weak farmer organizations, high transportation costs for farm inputs and outputs, inadequate and inefficient inputs and output markets, as well as limited access to agricultural credit and market information (GoM, 2020).

Initiatives to commercialize the sector have been hampered by weak private sector participation, low investment in the sector in addition to levels of mechanization along value chains including: production, harvesting, storage, processing and other forms of value addition. Although there exist various policies guiding the sector, implementation of the policies is largely weak with stakeholders hardly participating, linking-up and coordinating on different interventions in the agriculture sector (GoM, 2010). The policies have also failed to inform the delivery of quality and relevant agriculture extension and

advisory services. In addition, the policies have not triggered increased and coordinated funding of agricultural extension and advisory services. The aforementioned state of affairs emphasizes the need for agricultural extension and advisory services to ensure that farmers of all gender groups and scale access information and messages in good agriculture practices to stimulate contribution of the agricultural extension subsector to agricultural development (GoM, 2020).

Ministry of Agriculture thus developed the National Agricultural Extension and Advisory Services Strategy (NAEASS) for Malawi to strengthen the effectiveness and efficiency of pluralistic, demand-driven and market-led agricultural extension and advisory services (from 2020 to 2025) with a view to contributing towards agricultural transformation for food, income and nutritional security in Malawi (GoM, 2020).

1.2 History of Agricultural Extension in Malawi

lIn Malawi, agriculture extension has a long history and can be traced back to the colonial times under the British Cotton Growers Association. The objective of the association was to reach out to African farmers who were willing to grow cotton (Dequin, 1970). Instructors known as traveling agents were dispatched to teach farmers about cotton production and there was high compliance to the recommendations. Later, the concept of Master Farmers was incorporated into the mainstream of extension activities. These Master Farmers who were better-off and innovative received government support in terms of inputs and extension services in contrast to the other farmers (Chanock, 1972; Masangano and Mthinda, 2012). At this time focus was still on commercial farmers and the predominant extension approach was individual contact supported by mass media approaches such as radio programs, puppet shows, and farmers' magazines (Masangano, 1990).

The post-colonial era adopted the Master Farmers approach that was referred to as Achikumbe. Just as in the colonial era, the Achikumbe or progressive farmers were given preferential support by extension workers (Masangano and Mthinda, 2012). The use of the group extension approach was recognised in the 1970s as means of spreading agricultural messages to a wider farming community including the resource poor and women. The group approach was also scaled up in the 1980s through the Block Extension system, a modification of the World Bank's Training and Visit Extension System. The Block Extension System involved visits by extension workers to subsections called blocks where extension activities were implemented through on-farm demonstrations (OFDs) on contact farmers' farms. The system was faulted for reaching fewer farmers than anticipated; dominated by larger and resource-rich farmers; costly due to increased operational costs; and use of top-down approaches that did not consider farmers' needs (Masangano and Mthinda, 2012).

For most part of the post-colonial era (1960s to 1990s), the Ministry of Agriculture was the main provider of agricultural extension services in the country. However, the dominance of the government in the provision of extension services changed in 2000 following the adoption of the pluralistic and demand driven extension policy (GoM, 2000). The reformed

policy recognized the role of multiple actors in providing extension and advisory services. It placed emphasis on the vital role of farmers in demanding and influencing extension service delivery. The 2000 extension policy was followed by the District Agriculture Extension Services System (DAESS) (GoM, 2006). The DAESS replaced the Block Extension System and provided a structure and guidelines for operationalizing the envisioned pluralistic and demand driven extension services. Recently, Malawi has adopted a new National Agriculture Extension and Advisory Services Strategy (NAEASS) which will guide the implementation of extension service delivery from 2020 to 2024. The strategy document also recognizes the demand driven extension services, the role of multiple players in the delivery of quality extension services as well as the need to embrace the agriculture innovations systems thinking.

1.3 Organogram of Agricultural EASs in Malawi

Pursuant to the changes that DAES underwent, the organizational framework for DAES was restructured along with the upgrading of posts to match the challenges of the new millennium. The Department, headed by a Director of Extension Services, has six sub-programmes (see Figure 1.1) as follows:

i. Extension Research, Planning and Training which is responsible for:

- Policy direction in harmonized planning and implementation of programs,
- Providing guidelines for capacity building of staff and farmers and,
- Overseeing management of financial and human resources.

ii. Extension Methodologies and Systems:

- Uses innovative approaches, strategies and methodologies to contact farmers with agricultural technologies in order to improve food security and livelihoods. These are:
- Approaches-The model village approach which is used as the entry point and planning and implementation base for all programmes.
- Strategies for farmer mobilization- These are farming clusters, *ulimiwam'ndandanda* and lead farmer which are strategies for mobilizing farmers to collectively engage into group activities.
- Extension Methodologies- Such as on-farm demonstrations (with packaged technologies), field days, study tours and training for information and knowledge sharing.
- Institutionalization of the District Agricultural Extension Services System (DAESS) to improve coordination of service providers and bring service delivery closer to the farmers.
- Strengthen Research-Extension-Farmer Linkage mechanisms in agriculture.

iii. **Agricultural Communication Branch- This provides media services in the Ministry and to other stakeholders through:**

- Production of farm radio programmes.
- Development and printing of agricultural extension technical messages.
- Upgrading and maintenance of equipment in multi-media, mobile vans, radio studio, and video-graphics and print workshop.
- Programming all media services in Agricultural Communications Branch.

iv. **Agriculture Gender Roles Extension Support Services: Provide policy guidance and guidelines on mainstreaming gender and HIV and AIDS through:**

- Supports mainstreaming of Gender and HIV and AIDS in agricultural programs and the agriculture sector in general.
- Improves male and female staff and farmer capacity in mainstreaming gender and HIV and AIDS in agricultural programs and projects;
- Enhances participation of women in agriculture and food security programs and project activities.

v. **Food and Nutrition:**

- Promote nutrition education with emphasis on food processing, preservation, and utilization for diversified diets at household levels;
- Strengthen coordination and collaboration with other stakeholders;
- Build capacity for all nutrition programs.

v. **Agribusiness Development and Management:**

- Promotes business development and management through establishment of Farmer Based Organizations (FBOs):
- Improves marketing of agricultural produce
- Establishes Farmer Business School

DAES delivers extension services to the farm level using a comprehensive organizational structure or extension delivery system which has 8 Agricultural Development Divisions (ADDs) demarcated based on agro-ecological characteristics. Each ADD is manned by a Program Manager. The 8 ADDs have 28 districts which were previously called Rural Development Projects (RDP), each headed by a District Agricultural Development Officer (DADO). There are more than 200 Extension Planning Areas (EPA) in the 28 districts, each managed by an Agricultural Extension Development Coordinator (AEDC). There are about 2880 sections each manned by an Agricultural Extension Development Officer (AEDO) who is the frontline extension officer. AEDO translates extension messages at the farm level (to the farmer) (Chingaipe and Msukwa, Undated). Figure 1.1 below depicts the DAES structure.

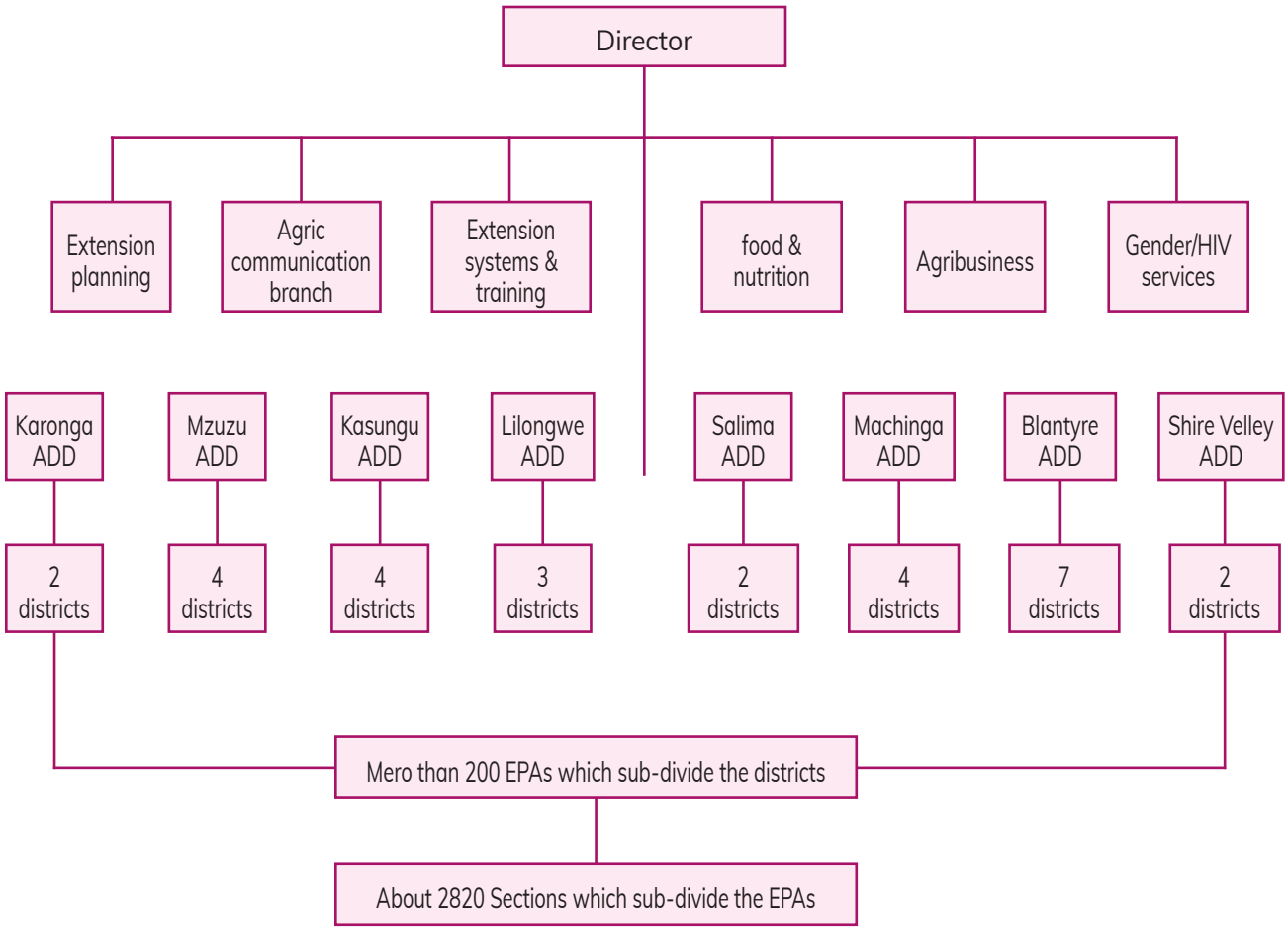

Figure 1.1 : Organogram of DAES

1.4 Challenges in Agricultural Extension

The NAEASS judged the performance of agricultural extension and advisory services in Malawi using the seven guiding principles of the Agricultural Extension Policy of 2000 as a frame of reference. The principles are: Pluralism, demand-driven services, accountability, those who benefit pay, resource sustainability, equalization, and decentralized coordination (GoM, 2000). The assessment concentrated on pertinent policy documents that recognize the crucial role of agricultural extension and advisory services in contributing to the achievement of their objectives such as the National Agriculture Policy (NAP), the National Agriculture Investment Plan (NAIP) and the Decentralization Policy. The NAP, for example, acknowledges delivery of agricultural information and innovations as the key duty of agricultural extension (GoM, 2016). Figure 1.2 portrays the interrelationships of the principles of the Agricultural Extension Policy of 2000 and how they influenced the effectiveness and quality of agricultural extension and advisory services. Figure 1.2 also paints policy weaknesses that hamper effective services delivery to clientele in Malawi.

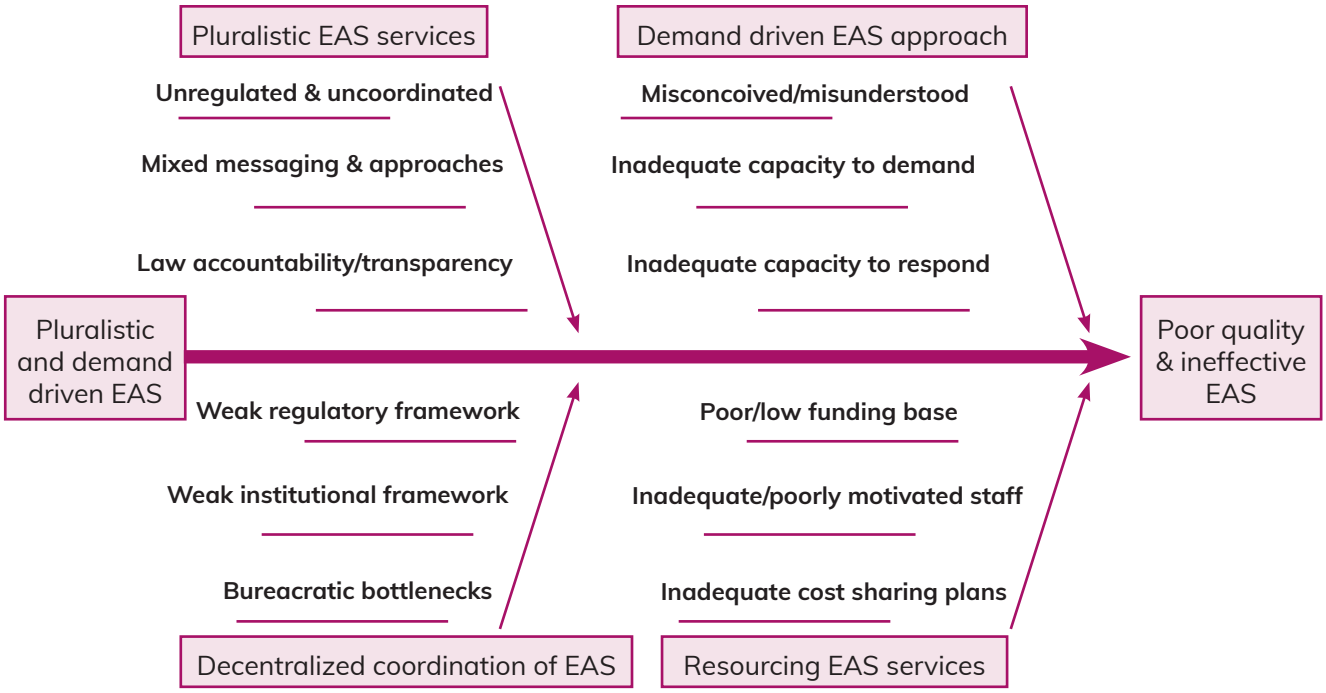

Figure 1.2 : Agricultural Extension and Advisory Services Challenges in Malawi

(Source: GoM, 2020)

1.4.1 Regulatory Framework for Agricultural Extension and Advisory Services in Malawi

Conducive policy environment is key to increasing investment and efficiency of service providers and institutions in AEAS delivery in Malawi. Furthermore, policy coherence throughout the various sectors and departments is vital for effective AES delivery. Malawi recognizes that enabling commercial climate is an incentive for agricultural transformation. Along with others, government policies and regulations have performed a central role in building the business environment through their impacts on costs, risks and barriers to competition for different players in the value chains and have also impaired agricultural growth. In Malawi, literature has shown that policies and regulations are defined by high spatial stickiness implying that they cannot cascade freely across the country particularly to the districts and local structures, causing weak implementation. Additionally, the precarious nature of the regulatory framework and business environment leaves stakeholders, especially the private sector in a challenging position to boost their productive choices and investments.

Further, weak and non-supportive regulatory framework for AEAS has brought about poor performance of the agricultural sector. Presently, there is no legal instrument authorizing DAES to impose guidelines and standards for the delivery of quality and proficient AES. This has resulted in several service providers who defy the expectations of professional service provision. The direct consequence on the agricultural sector has been below potential productivity for crop and livestock enterprises. This necessitates the enactment of the Agricultural Extension and Advisory Services Act to help enforce standards in agricultural extension services investment and provision that can instigate increased agricultural productivity in Malawi.

1.4.2 Coordination of Agricultural Extension and Advisory Services

The Decentralization Policy (1998) (GoM, 2018), Local Government Act (1998) (GoM, 1998), Extension Policy (2000) (GoM, 2000) NAP (2016) (GoM, 2016) and NAEASS (2020) (GoM, 2020) appeal for strengthened and decentralized coordination in the provision of AES. Subsequent to these policies, Malawi has seen an inrush of AES providers with typical district having an average of 20 service providers, with a range of 15 to 50 service providers per district. Nevertheless, the stakeholders are uncoordinated. The existence and involvement of many uncoordinated actors has generated problems to sustain coherence and quality in delivery of AES. The poor coordination has resulted in development and use of conflicting approaches and messages, and weak coordination and collaboration between extension, research and markets. NAEASS aims to support strengthened coordination of service providers and linkages among research, extension, markets and farmers in Malawi.

1.4.3 Institutional and Organizational Capacity for Agricultural Extension and Advisory Services

Institutions for supply and demand of AEAS in Malawi include the public sector, non-state actors, academia and farmers. The institutions use agricultural extension operational structures at local level under the District Agricultural Extension Services System (DAESS). There is no functional agricultural extension structure at national level connected directly with DAESS structures. This presents challenges of coordination and harmonization between national based and district-based structures on matters of services delivery more especially priorities and needs of farmers in different districts. This gap leads to delivery of top-down services because of poor understanding of farmers issues and lack of response from farmers owing to nonexistence of formal involvement between national level decision-makers and district-based actors. Considering this, the NAEASS has provided for the development of a national level structure to leverage coordination with considerable representation from district-based structures for articulation and feedback purposes of district and nation-wide goals and experiences with service provision respectively.

Although institutions for providing AEAS are available, Malawi's AEAS providers are challenged by few well-trained staff, limited staffing, and non-participation of private sector extension service providers. Additionally, farmers are not capacitated enough to demand AES hence buttressing the top-down attitude among service providers. Provision of AES by public and private actors is also influenced by the bad working conditions arising from limited access to basic amenities such as housing, schools, hospitals, electricity, roads and mobility in the public sector. Public frontline extension workers are not inspired to stay and work in the rural areas thus depriving farmers of AES. NAEASS has provided for actions to address this situation.

1.4.4 Ethical Erosion in Agricultural Extension and Advisory Services

Ethics are at the center of professionalism in any trade, and agricultural extension is not an exception in Malawi. Services providers, agents, clients, and farmers have to uphold ethics

to be able to build trust among them. Agricultural extension and advisory services are self-incentivized because clients appreciate the value and impact of agricultural extension and advisory services on them and the society they belong to when the services are ethically delivered and with efficiency. However, ethics seem to be eroded in a number of agricultural extension service providers in Malawi. There are experiences of suspicious actions at organizational level where one sees organizations buying participation of farmers in the implementation of its interventions. Such actions are detrimental to agricultural extension as they have eroded the sense of commitment and the self-help spirit. This has resulted in lack of both ownership and sustainability of agricultural development interventions by farmers in Malawi. Cases of farmers demanding compensation for participating in agricultural extension interventions are common is some districts that have been hosting so many service providers. This has resulted from the fact that service providers are accountable more to their financiers than clients or farmers. Some service providers buy participation of farmers to outcompete others in terms of patronage of their activities so they can show-off their financiers for more resources. This is undesirable in Malawi and is partly responsible for slow progress in agricultural development. This strategy has provided for redress of the current situation with strategic actions to be implemented by stakeholders and the government.

1.4.5 Agricultural Extension Approaches and Methods Pluralism

In keeping with the principle of pluralism in the provision of agricultural extension and advisory services in Malawi, several approaches and methods are in use by various agricultural extension services providers. In principle, this presents clients and especially farmers with a basket of approaches and methods to access agriculture extension and advisory services through a wide range of approaches in the country. However, in practice pluralism of approaches and methods has not benefitted farmers significantly because of limited validation and adaption of the extension approaches and methods. This has led some service providers to use approaches that are technically wanting and conflicting. In view of this Malawi needs to promote innovativeness and coordinate extension approaches and methods that are technically sound, ethical and relevant to farmers' varying situations including the unprecedented farmer population growth rates. This strategy advocates promotion of innovative approaches, including ICT-based extension approaches.

1.4.6 Financing Agricultural Extension and Advisory Services

AEAS have gained currency in Malawi in terms of number of players expressing interest to provide the services. Agriculture extension policy orientation has partly influenced this development. There is relative ease of entry in the agriculture extension subsector in Malawi because of weak regulatory mechanisms. Relatively having more service providers in principle suggests relatively, more financial and other resources available for use. However, the practical picture of financing agriculture extension services in this country is not clear different because it is difficult to get details of budgets dedicated to agriculture extension and advisory services with organizations apart from the government where budgets

are easily accessible. In Malawi, the general trend is that the public sector agriculture extension and advisory services are poorly funded and not prioritized at project, program, district and national budgets except in few projects implemented through the government system. Other associated challenges are limited coordination of resources for agriculture extension and advisory services and farmer payment systems for the services particularly for underdeveloped agriculture value chains.

In cases where clients of agriculture extension and advisory services pay for the services transparency, accountability and governance have emanated as challenges. The government has been providing limited financing to agriculture extension and advisory services over the years because of competing needs for same resources. This has been manifested in limited service delivery, inadequate maintenance of extension workers' offices, houses, limited staff capacity building, low provision of portable water, no access to electricity, and poor means of transport for staff especially at grass-root level. Some non-state actors have not been crystal clear about budgets they dedicate to agriculture extension and advisory services' operations. Lack of openness has triggered questions of transparency and accountability by the service providers. The uncertainty of available finances from some stakeholders has in practice over the years challenged overall planning for service provision at all levels in Malawi.

1.4.7 Food and Nutrition Security

Despite agriculture extension services being key to addressing food and nutrition insecurity, malnutrition, stunting and wasting remain common challenges in Malawian communities. Usually, agriculture programs fail to mainstream nutrition interventions resulting in poor access and availability of nutrient dense foods. Worse more, not all households have the right information about quality food and nutrition. This strategy unmasks the role of extension in preventive malnutrition and attaining food and nutrition security.

1.4.8 Gender, HIV and Youth Participation in Agricultural Extension

About 70% of fulltime farmers in Malawi are women and produce 80% of food for home consumption. However, women and the youth, compared to men, have low access to and control over agriculture production resources and services such as extension, farm implements, technology and inputs, land, credit. Furthermore, the participation of women in decision making in the agriculture organizations and institutions is also limited. The situation is even worse among the youth whose participation in agriculture is limited partly due to the unattractive nature of the sector. Another challenge in the delivery of agricultural extension and advisory services has been HIV and AIDs pandemic that has affected both staff and the farming community. This strategy will promote a gender and youth sensitive approaches in the provision of agricultural extension and advisory services.

1.4.9 Climate Change and Variability, and Agricultural Extension

Climate change and variability continue to pose threats to agricultural production and food security. Farmers and stakeholders have limited capacity to make appropriate decisions for their farming enterprises in the face of these challenges. Agricultural extension and advisory

services play an important role in helping farmers to make informed decisions and choose plausible options that respond to the climatic conditions in line with their different contexts and risks. In addition to challenges associated with climate change, Malawi faces serious land degradation resulting in low agriculture productivity. The critical role for extension is to promote sustainable best land management practices. This strategy prioritizes integration of climate change and variability interventions in agriculture extension and advisory services in Malawi.

1.4.9 Agriculture Commercialization and Agribusiness Management

In Malawi, agriculture commercialization remains largely undeveloped mainly because more emphasis has been placed on improving agriculture productivity with little or no emphasis on strategic agribusiness development. This is also constrained by poor market systems where trading of most agriculture commodities]is done through unstructured and unregulated markets usually offered to the market in raw form. This strategy proposes to organize farmers, build their capacity to effectively participate in the value chains. The strategy further encourages provision of agriculture extension to emerging and commercial farmers to improve the capacity to produce for the market and enhance agribusiness in Malawi.

1.5 Study Background

The sub-Saharan Africa region needs sustainable agri-food systems that deliver affordable, healthy, nutritious food for all in an economically, socially, and environmentally sustainable manner. The second sustainable development goal (SDG) mirrors the sustainable agri-food system in pressing for increasing agricultural productivity and production while maintaining ecosystems and strengthening the capacity for adaptation to climate change (SDSN, 2015). The drive to actualize sustainable development is reflected in the Africa Agenda 2063. This African vision, “The Africa we want by 2063,” calls for inclusive economic growth and expanded job opportunities, especially for youth and women; emergence of agro-based commodity value- addition manufacturing enterprises; doubling productivity in agriculture and abandoning use of the hand-held hoe; and reducing incidences of malnutrition.

Notwithstanding the formulation and championing of a progressive development agenda, the African continent continues to undergo tenacious rural poverty, a deepening food security crisis, and a deteriorating natural resource base. Although the poverty rate in the region had dropped from 56% in 1990 to 40% in 2018, the number of poor people keeps on rising. In 1990, 284 million people in the region were deemed to live in extreme poverty, increasing to around 433 million in 2018 (World Bank, 2020). The number of undernourished people rose from about 170 million in the period 1990-1992 to 282 million in the period 2001-2020 (FAO, 2020a). In many African countries, rural poverty and inequality are increasing, particularly between rural and urban areas, and poverty reduction in Malawi has been undermined by the COVID-19 pandemic. Approximately 12% of the economically active population have lost their jobs because of the crisis. For over 15 years, the country’s poverty rate has remained high (70.3 percent based on the 1.90 US dollars threshold) (World Bank, 2020). The country

is struggling with food and nutrition challenges. Food security, availability and accessibility of nutritious food, and dietary diversity remain low, and levels of childhood chronic malnutrition in under-5 children, such as stunting, remain high (37% national prevalence), and alarmingly higher in the rural (39%) than in urban (25%) areas (NSO and ICF, 2017).

The World Bank (2008) and the New Partnership for Africa's Development (NEPAD) pinpointed agriculture as central to poverty alleviation, food and nutrition security, and attainment of development goals in Africa. The Comprehensive Africa Agriculture Development Program (CAADP) was therefore conceived in 2010 to provide a common framework for stimulating and guiding national, regional, and continental initiatives on enhanced agriculture productivity. Agricultural growth provides opportunities for rural entrepreneurs to establish small businesses that grow value chains and take advantage of modern communications to link town and country markets. Evidence from successful cases in Asia suggests that a 1% acceleration in agrarian growth can generate up to 1.5% in non-agricultural growth (FAO, 2017).

Despite the recognition of the potential of agriculture to create jobs, increase food and nutrition security, and enhance economic, social, and environmental development in Sub-Saharan Africa, the sector's performance is affected by a complex combination of factors. Agricultural productivity has been impaired by declining soil fertility, degradation of natural resources, inefficient markets, and weak institutions and policies. In addition, prolonged drought periods and low precipitation are common characteristics of climate variability and change in the region that compound the problem of low productivity. For instance, an average farmer in Sub-Saharan Africa produces only 1 ton of cereal per hectare. This level of productivity is less than a half, a fourth and a fifth of the production of an Indian, Chinese, and Latin American farmer, respectively (Chauvin et al., 2012; World Bank, 2008). The productivity challenge is aggravated by widespread gender inequalities that disadvantage specific sections of the population such as women, youth, and elderly adults. The marginalized groups living in rural areas face increasing food insecurity, declining landholding, and deteriorating natural-resource bases. Gender inequalities also play a significant role in accounting for the region's poor agricultural growth and poverty reduction performance (McIntyreet al., 2009).

1.6 Justification and Research Questions

Agri-food system transformation and improved productivity in Sub-Saharan Africa depend mainly on the delivery of agricultural extension services to smallholder farmers and other food system actors (Danso-Abbeam et al., 2018). This is accomplished by providing research-based educational and informational programs to the rural populations. Extension professionals are key to effective agricultural development programs and service delivery. They are fundamental players who enhance farmers' knowledge, skills, and attitudes by communicating adequate and well-timed information appropriate for making informed decisions (Tesso, 2016). Additionally, extension professionals support several other value chain actors engaged in food processing and distribution. To carry out these functions, extension professionals are expected to be up-to-date with emerging technologies, and competent at addressing

challenges and leveraging opportunities (Nwaogu and Akinbile, 2018). Proficiency requires a set of core process skills and functional competencies: basic sets of knowledge, skills, abilities, and behaviors that agricultural extension professionals need to conduct their tasks effectively. For instance, extension staff must, of necessity, be trained in technical subject-matter areas across various value chains, the management and operation of extension service delivery mechanisms, gender issues, the dynamics of human resource management and development, project planning and appraisal, program development coordination and process, instructional and knowledge-sharing skills, communication strategies, and evaluation techniques (Suvedi et al., 2018).

Agricultural training institutions are in charge of producing agricultural development experts and administrators who can carry out the imperative of advancing sustainable agri-food systems and reducing poverty for rural populations worldwide (Kanu et al., 2014). Besides delivering technical skills, these training institutions must provide training on process skills and competencies that address the global changes that have affected agricultural development (Johanson and Adams, 2004). Yet the agricultural training institutions in Africa have not changed much from their incipiency and continue to be rigid to change (Eicher, 2006). This results in the institutions employing learning methods and materials that are inconsistent with present agriculture demands for the local contexts (FAO, 2017). Generally, there is a mismatch between the skills demanded by the private sector, industry, NGOs, and government sectors supporting local innovation, extension, and food systems, and the programs offered in universities and vocational education institutions (Hayward and Ncayiyana, 2014). The current programs rarely focus on sustainable agri-food systems and inclusive growth, and they fail to integrate various disciplines that are key to rural innovation, extension, and agri-food systems transformation such postharvest management, nutrition, food processing and safety and ICT. The shortage of extension professionals who are able to design, implement, and evaluate local innovation processes, as well as agricultural extension programs that support sustainable food systems and rural economies, thus remains a challenge in SSA countries, including Malawi.

To address this challenge, the agricultural extension curriculum needs continual updating to develop a critical mass of innovative and transformative graduates with core process skills and competencies to transform the agri-food and nutrition systems for improved food, nutrition, and livelihood security. Although there have been few studies on core competencies of agricultural extension professionals in sub-Saharan Africa (Davis and Terblanche, 2016; Nwaogu and Akinbile, 2018; Olorunfemi et al., 2020), a systematic assessment of agricultural extension training in Malawi is lacking. This calls for a systematic assessment of agricultural extension training in Malawi to help agricultural universities and colleges develop the broadly competent extension professionals needed for contemporary agricultural development in the country. Therefore, this study was conducted to solicit views and perspectives of faculty members, extension professionals, employers of extension workers and related industries, and farmers about the current agricultural extension undergraduate curriculum, the gaps, and ways to improve the curriculum.

The study hence addressed the following 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?

d) What are the barriers to effectively training extension workers with required core competencies, and how can these barriers be removed?

1.7 Objectives of the Study

This study addressed the following objectives:

a) Review agricultural extension curricula currently in use at AAP member universities at the undergraduate level.

b) Identify critical process skills and competencies of agricultural extension professionals, process skills gaps, and areas of potential curricular reform.

c) Recommend improvements/reforms of agricultural extension curricula to prepare the next generation of agricultural extension professionals to competently handle extension service delivery.

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

1.8 Organization of the Report

Chapter one presents a synopsis of the agricultural sector and the history of agricultural extension and advisory services in Malawi, an organ gram of the Department of Agricultural Extension Services and challenges in agricultural extension and advisory services, study background, significance of the study and research questions, and objectives of the study. Chapter two discusses theoretical orientation, process skills and competency gaps in undergraduate agricultural extension curricula. The methodology of the study is presented in chapter three. Chapter four presents study findings from online survey and focus group discussions. Conclusions and recommendations are given in chapter five. References and data collection instruments are presented at the end.

CHAPTER 2 : THEORETICAL ORIENTATION *PROCESS SKILLS AND COMPETENCY GAPS IN AGRICULTURAL EXTENSION CURRICULA*

2.1 Agricultural Extension and Advisory Services in Malawi

2.1.1 Agricultural extension services in colonial era

Malawi was formerly known as Nyasaland protectorate under the British colonial Government. The country was formally declared as a British Protectorate in 1891. In 1964, the country attained independence status and changed its name to Malawi. Agricultural extension has continuously evolved since its first traceable roots from the country's colonial period around the 1890's largely owing to the then Nyasaland's perceived dismal economic prospects due to frequent droughts, epidemics and locust plagues exacerbated by the practiced shifting cultivation method (Masangano and Mthinda, 2012).

In 1903, the colonial government endeavored to institute some form of systematized agricultural extension that focused on disseminating information to farmers on improved husbandry practices for cotton production. Coercion to follow recommended practices was used when it became necessary to increase the productivity of smallholder farmers to produce raw materials for export (GoM, 2006). Failure to follow the rules often led to meting out fines or short prison sentences (Kettlewell 1965; Dequin, 1970). In 1946 colonial government enacted a Natural Resources Ordinance in the following farming practices: early recommended soil conservation, early land preparation, planting dates, correct plant spacing and uprooting old stocks by a prescribed date.

The period 1948/49 is regarded as a turning-point in the history of agricultural extension in Malawi because there was no organized extension system before this era. It was immediately after this time that extension practice was somehow systematically organized. Furthermore, the 1948/49 growing season is the time when Malawi faced the terrible drought and famine in living memory. The current extension service in Malawi was found around 1949/50 as an immediate reaction to the grave drought and famine that took place in the country in the previous season. Due to the calamitous nature of the famine, the government was compelled to review the policies that existed at the time pertaining to agricultural production basically and extension specifically.

Establishment of Agricultural Policy Objectives

The colonial government decided to re-examine the policies to prevent a recurrence of the famine. For that reason, six agricultural policy objectives, as well as those affecting extension, were formulated in 1950 as presented in Box 1.1 below:

Box 2.1 : Agricultural policy objectives in colonial period

i. Establishment of a national agricultural extension and training system;
ii. Establishment of a national soil and water conservation programme;
iii. Provision of credit and subsidies to farm inputs;
iv. Introduction of regulations governing marketing of agricultural produce/products;
v. Establishment of agricultural projects and/or settlement schemes; and
vi. Establishment of new and strengthening of existing agricultural research institutions that focused on applied research;

Extension Organizational Structure

Apart from formulating the six policy objectives above, from 1949/50, the government formed a more coherent national extension and training system that had transparent structures. The system was fundamentally arranged at five ranks namely: National, Regional, Divisional, Area and Section levels virtually as is the current situation.

Agricultural Extension Service Implementation Approaches

The extension system that was developed in 1950 embraced a four-pronged methodology in order to attain improved agricultural production as outlined below:

i. Master Farmer

Primarily, the colonial government introduced the master farmer program or approach. In this approach, the extension system identified and promoted the development of a group of smallholder farmers who were regarded as early adopters or very receptive to adoption of improved farming technologies. The extension strategy was that all extension efforts and other logistical support services such as farm planning, soil and water conservation; input supply and credit provision, marketing should be focused on the selected farmers. In so doing, it was anticipated that the Master Farmers would succeed in increasing crop and livestock production and enhance prosperity of their families. It was thus inferred that, in the long term, other smallholder farmers would emulate by adopting improved farming technologies resulting in huge increases in overall agricultural production in the country (Masangano and Nthinda, 2012).

Altogether, the Master Farmer Program accomplished its clear-cut objective of enhancing agricultural production of the Master Farmers and prospering them. Notwithstanding, majority of the rest of the smallholders did not imitate the master farmers by adopting improved farming methods contrary to what had been envisioned essentially for two reasons. Firstly, most smallholder farmers were jealous of the master farmers' prosperity and secondly, the program was politicized in that the master farmers were regarded as stooges of the colonial government. Consequently, agricultural production was still low as the majority of smallholders were not part of the program.

ii. Staff and Farmer Training

Besides setting up a national extension system, a network of national, regional and district institutions was formed for staff pre-service and farmer training programs. Regarding staff training, Colby School of Agriculture was established in 1956 at Chitedze Research Station in Lilongwe district which was to become the current Natural Resources College (NRC). With respect to farmer training, the government initiated some training institutes across the country and notable among them are Thuchila, Likuni and M'Mbelwa Farm Institutes each with boarding facilities of 100 trainees at any particular time. Likuni and M'mbelwa Farm Institutes were established in the same year as Colby School of Agriculture while Thuchila Farm Institute was established in 1954.

iii. Public Relations Unit

The Public Relations Unit (PRU), presently known as the Agricultural Communication Branch (ACB), was established in 1958 to augment the efforts of the extension and training service programs mentioned above. The Unit concentrated on disseminating technical messages to farming communities through the radio and also producing and distributing printed media as is currently done.

iv. National Soil and Water Conservation Program

Organization and implementation of soil and water conservation programs were pretty much a component of an extension worker's duty particularly at the village level. Primarily, the soil conservation programs consisted of the following: Construction of contour bunds by farmers followed by realignment of all the ridges along the contour bund; Implementation of ridge cultivation in all areas of the country including those with low terrain; and compulsory planting of crops on ridges and not on mounds. The physical soil and water conservation measures were implemented by force backed by legislation. Many farmers were reluctant to take on ridge realignment cultivation, not to mention contour bund construction, for three reasons. Firstly, it was a very strenuous and laborious job using hand tools; secondly farmers did not realize quick paybacks to their crop yields; and lastly farmers opposed the use of coercion, which now and again led to imprisonment. In this respect, the span between 1950 and 1960, when the different soil and water conservation programs were employed, is branded as the darkest period in the history of agricultural extension service in Malawi.

2.1.2 Agricultural extension and advisory service after independence

Shortly after acquiring independence in 1964, the directorate of agriculture was restructured and an extension and training system for smallholder farmers emerged. The development of extension service gave rise to the establishment of the Department of Agricultural Extension and Training (DAET) that was responsible for extension, training, land husbandry, livestock, irrigation, crops, credit and settlement schemes. Down the line, DAET has undergone varied phases of agricultural extension development consistent with the vagaries of Government policies periodically. The key developments of agricultural extension after the independence are given in the Box 1.2 below.

Box 2.2 : Key developments in agricultural extension after independence

i. Regional Agricultural Office (RAO)/ Major Projects from 1964-1980
   a. Lilongwe Land Development Project (LLDP) in the Central Region(1968)
   b. Shire Valley Agricultural Development Project (SVADP) in the Southern Region(1969)
   c. Karonga Rural Development Project (KRDP) in the Northern Region (1972)
   d. Lakeshore Rural Development Project (LRDP) in the Central Region (1968)

ii. National Rural Development Program (NRDP) from 1981 to 1993

iii. Agricultural Services Project (ASP) from 1994 to 2000

Smallholder agricultural extension policy formulation commenced when DAET was created and became functional in the country in 1964. Initially, the policy stipulated that extension effort be centered on individual approach with the aim of developing progressive smallholder farmers[1]. These would, in turn, act as focal points for disseminating extension massages to the rest of the farmers for the general development of smallholder agriculture sector to accomplish self-sufficiency in food supply at household and national levels as well as commercial crops for sale.

Unfortunately, the individual approach was found to be discriminating and favouring a relatively rich minority of progressive farmers who later dominated the *Achikumbi* Program introduced by Ministry of Agriculture (MoA), ostracizing the majority of resource-poor farmers. Recognizing the marginalization of the resource-poor farmers, MoA determined to instigate reforms to the extension policy by changing from individual to group approach in order to permit extension programs espouse as many smallholder farmers as possible(Masangano and Mthinda, 2012).The group approach thus became popular in both regional agricultural offices (RAO) and major project areas for effective dissemination of extension messages to the majority of smallholder farmers. DAET decided to release an official policy guide in 1981 to the effect that the group extension methods be given more emphasis by all agricultural development divisions (ADDs) than the individual ones.

From 1964 to 1980 MoA assumed the conventional agricultural extension system ordinarily used in most developing countries. The major weakness of the conventional extension system was the development of unrealistic programs and their failure to reach all smallholder farmers of different categories. Those who were responding to the programs

1 The progressive farmers were called *Achikumbi* which means farmersThis approach was inherited from the Master Farmer Programme of the pre-independence period.

happened to be resource-rich progressive farmers organized into farmer groups/clubs. The Block Extension System (BES)[2] was introduced in 1981 in order to improve upon the conventional extension system, which had been in practice since independence in 1964 (GoM, 2006). In this approach, trainings were conducted for a group of farmers and individual farm visits would be conducted to farmers by the extension worker (Nankumba, 1981). The extension policy of 1981 expounded on how the BES should be implemented and monitored to support the group approach. Succinctly, BES emphasized group approach, scheduled visits, systematic staff and farmer training, and proper supervision of extension program(Nankumba, 1981).

While this approach was very effective, the downside was the limited farmer coverage by extension workers and "blind targeting" of farmers[3] causing loss of interest and resulting in absenteeism among farmers (GoM, 1994). The block extension system evolved to the group extension system which is currently being practiced. While the block extension system blindly targeted farmers, the group extension system is based on farmer interest groups. For instance, farmers interested in cotton production are grouped together and extension services provided to them as a group. The group extension system has developed alongside the progressive farmer approach in the name of "Lead Farmers". The BES was operational from 1981 to the year 2000.

2.1.3 Agricultural extension services after the multiparty democracy 2000-to date

The country's political, economic and public health evolution has had an impact and to a large extent shaped the practice and delivery of agricultural extension. Political pluralism ushered attendant liberties including freedoms of choice and association, market liberalization and new ways of organization governance including decentralization. With this, there was also an emergence of private voluntary organisations (PVOs) working in several areas including agriculture (Chingaipe and Msukwa, undated). The late 1980s also saw the rapid spread and increased mortality of productive age farmers and extension workers due to HIV & AIDS. For agricultural extension, this meant a radical rethink of both the organization of agriculture extension as well as its provision (Nankhuni, 2016). With the introduction of multiparty democracy in 1994, Malawi went, and is still going through some major changes in its approach to service delivery. Up to that time, extension services were mainly provided in a top-down manner, with the major decisions made at a central level. This was no longer consistent with democratic principles of government. The country therefore changed towards a more participatory and pluralistic approach to service delivery

Therefore, in 2000, the Ministry of Agriculture through the Department of Agricultural Extension Services (DAES) came up with a new extension policy which was meant to counter the challenges presented by democratization and governance reorganization; the emergency of HIV and AIDS; coupled with a shrinking public coffer and the opportunities presented by the

2 Block Extension System was a modified Training and Visit System.
3 This is the targeting of all farmers (practically whole villages) whether a farmer is growing the crop or not.

emergency of PVOs (non-governmental organizations) and for-profit organizations dealing in agricultural extension. The policy was titled "Agricultural Extension in the New Millennium: "Towards Pluralistic and Demand Driven Services in Malawi" (Government of Malawi, 2000). The 2000 Agriculture extension policy is hinged on seven principles. These principles are meant to guide the implementation of the policy to achieve the three main provisions of the policy. These principles are: Demand-Driven Extension Services; Accountability; Those who benefit pay (Service at cost); Resource Sustainability; Equalization; Promotion of Pluralism and Decentralized Coordination (Government of Malawi, 2000).

The policy forms the basis for coordinating all players providing extension services in the agricultural sector. DAES implements the policy through the Decentralized Agricultural Extension Services System (DAESS), based on Model Village Approach (GoM, 2020). The DAESS provides a structure for coordinating the delivery of agricultural extension services in the country. Several hierarchal and multi-stakeholder committees are established in each of the 28 districts in the country. The committees include District Agriculture and Natural Resources Committee (DANRC), District Agriculture Extension Coordinating Committee (DAECC), District Stakeholder Panel (DSP), Area Stakeholder Panel (ASP) and the Village Agriculture Committee (VAC). These committees are given the responsibility of mobilizing farmers' extension demands and then identifying the right players to respond to the demands. The DAESS structure is observed to have focused on the district level with no clear linkage to the actors at the national level (GOM, 2020). This poses challenges of coordination and harmonization between national based structures and district-based on services provision more especially priorities and needs of farmers in different districts. This gap results in delivery of top-down service delivery because of lack of understanding of farmers issues and lack of feedback from farmers. Table 2.1 below summarizes the roles played by various actors in the provision of extension service. These include among others non-governmental organizations (NGOs), academia, the commercial private sector and farmer organizations, these play different roles.

Table 2.1 : Summarized roles played by actors in Agricultural Extension

Key Actor	Roles and responsibilities
National Stakeholder Panel (NSP)	provide a forum for dialogue among all stakeholder thus providing agenda for demand and feed-back to which the agriculture extension and advisory services system as a whole has to respond.
District Agriculture and Natural Resources Committee (DANRC)	Support implementation of agriculture extension services strategies at district council during budgetary discussions and commitments.
District Agriculture Extension Coordinating Committee (DAECC)	Provide technical leadership for regulating and coordinating agriculture extension and advisory services and particularly responses to farmer demands

District Stakeholder Panel (DSP)	Forum for dialogue among all stakeholders thus providing agenda for demand and feed-back to which the agriculture extension and advisory services system as a whole has to respond
Area Stakeholder Panel (ASP)	Forum for dialogue among all stakeholders thus providing agenda for demand and feed-back to which the agriculture extension and advisory services system as a whole has to respond
Village Agriculture Committee (VAC)	Provide a forum for farmers to articulate their demands at village level.
Ministry of Agriculture (MoA)	Enhance coordination, collaboration and stronger linkages among extension providers and other actors of the innovation system.
Ministry of Local Government	provide guidance on agriculture extension and advisory service delivery under the decentralized arrangements in various districts of the country.
Private sector	Private sector such as private companies, NGOs and farmer organizations is to finance agriculture extension and advisory service delivery at different level in line with their interests and those of farmers
Development Partners	Provide technical assistance for agriculture extension and advisory services. Mobilize financial resources for agriculture extension and advisory service interventions in Malawi.
Academia	Capacity development of agriculture extension and advisory service providers including specialized training for agriculture extension and advisory service professionals Provision of research services for agriculture extension and advisory service

The DAESS replaced the BES and provided a structure and guidelines for operationalizing the envisioned pluralistic and demand driven extension services. Recently, Malawi has adopted a new extension strategy NAEASS which will guide the implementation of extension service delivery from 2020 to 2024. The strategy document also recognizes the demand driven extension services, the role of multiple players in the delivery of quality extension services as well as the need to embrace the agriculture innovations systems thinking. Figure 2.1 below shows how DAESS platforms (Centre in pink) align with Malawi Forum for Agricultural and Advisory Services (MaFAAS), Ministries of Local Government (MoLG Left in Blue) and supported by Ministry of Agriculture (MoA, Right in Green).

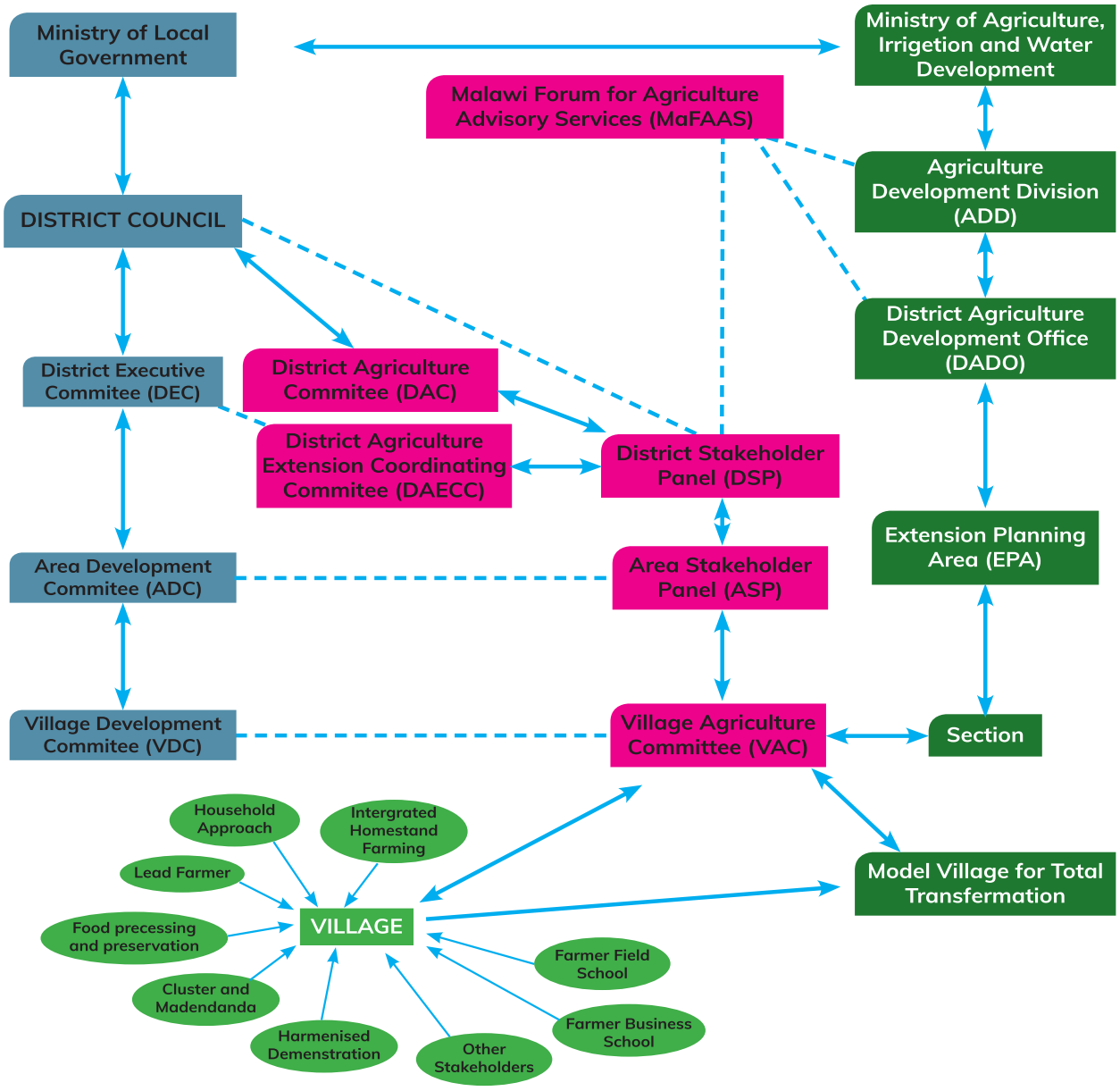

Figure 2.1 : DAESS structure in Malawi

The new extension strategy NAEASS has recognized the implications of cross-cutting issues on the delivery of quality extension services and stipulated the need to reform the extension system and approaches of providing services from predominantly interpersonal engagements to embrace Information and Communication Technologies (ICTs). Furthermore, it recognizes heterogeneity of clientele of extension services, hence calls for the provision of services that address needs and wants of both smallholder and commercial farmers of all gender groups, particularly women, and all ages, including the youth, and all actors across agriculture value chains. Apart from strengthening the collaboration of multiple actors, the strategy also recognizes acceptable standards and professionally trained agriculture extension personnel for agriculture commercialization and transformation in Malawi as key to managing the crosscutting issues.

Recently, several policy instruments developed in different sub-sectors have recognized and called for supporting agriculture extension and advisory services in the country. These include: National Agriculture Policy, National Agriculture Investment Plan, Agriculture Extension Policy, Agriculture Sector Gender, HIV and AIDS Strategy, Agriculture Sector Food and Nutrition Strategy, Decentralization Policy, National Youth Policy, Gender Policy, National Multi-Sector Nutrition Policy.

2.2 Agricultural Extension Curriculum at Undergraduate Level

2.2.1 Overview of agriculture education in Malawi

Agriculture education in Malawi dates back to 1950's when Colby college of agriculture was established. The need for agriculture education was emphasized in 1964 when Malawi recognized agriculture as the backbone of the country's economy (Kanyama-Phiri, 2012). As such, different institutions both public and private offer agriculture education in Malawi. These include Mwimba College of Agriculture, Lilongwe University of Agriculture and Natural Resources (Bunda and Natural Resources Colleges) and Malawi Adventist University. In all the universities, demand for enrolment keeps increasing each subsequent year. Government universities operate as subverted institutions under the ministry of education.

Curriculum of the institutions are managed by the individual institutions and change depending on demand. For instance, Mwimba college was initially established as Mwimba Farm Institute in 2001 by Agricultural Research and Extension Trust (ARET) in order to offer short term courses on tobacco production, tailor-made to the needs of their clientele (Kabuye and Mhango, 2006). However, due to the increase in demand for enrolment the institution upgraded its curriculum to not be limited to tobacco production and upgraded to start offering two and half a year diploma course in Agriculture. Furthermore, Bunda was initially established to train graduates to fill positions at the ministry of government. As such, first admitted 15 students into a diploma course focused on practical training which occupied about 30 percent of the curriculum (Kanyama-Phiri, 2016). However, students were later trained for both public and private sector. In addition to that in 1970s, Bunda included tobacco estate management training in its curriculum because then, Malawi's agriculture was characterized by expansion of the tobacco industry which created demand for trained tobacco estate managers (Mughogho, 2016; Kanyama-Phiri, 2016).

2.2.2 Evolution of agriculture extension education in Malawi

Agricultural extension education has evolved over time from training field instructors to facilitators. In the 1950s during the colonial era, extension education was offered in isolated institutions like Colby College of Agriculture and farm institutes such as Likuni and Thuchira. In the 1960s during the one-party era saw the new independent Malawi government establishing the University of Malawi with Bunda College of agriculture as one of its constituent colleges. During its inception phase, Bunda College was offering university diplomas which were later upgraded to five-year degree programs. In the 1980s,

the government opened the Natural Resources College which led to the closure of Colby college and Likuni farm institute. NRC was offering certificates in agriculture during that time until its closure in 1996.

The democratic era (from 1993) witnessed significant changes in extension education in Malawi. The Natural Resources College was re-opened in 2000 and upgraded from certificate to diploma programs. Bunda College introduced the mid-career extension program in 2004 with support from the Sasakawa Africa fund for Extension Education (SAFE). This program introduced the Supervised Extension Projects (SEPs). The SEP is an action research-oriented research which forms the pillar of the current BSc in Agricultural Extension program. From 2004 to 2015, the college was offering two extension programs namely the BSc in agriculture with an option in extension for generic students and the mid-career program with emphasis on SEPs targeting mid-career professionals (Majority were diploma graduates from Bunda College and the Natural Resources College).

In 2012, Bunda College was de-linked from the University of Malawi to form the Lilongwe University of Agriculture and Natural Resources (LUANAR). Bunda College and Natural Resources College became constituent colleges of LUANAR. The extension option phased out in 2015 hence the college now offers a BSc in agricultural extension with SEPs targeting both generic and mature entry students. The SEPs form the pillar of the program with the aim of exposing students to practical extension before they graduate.

2.2.2.1 A Focus on Bunda Extension Programme

The current BSc. Agricultural Extension offered at Bunda College which started in 2015 is a four-year program. This program is offered using the traditional approach of taught courses combined with action-oriented research dubbed Supervised Extension Projects (SEPs). The students start the SEPs in second through to fourth year. The BSc in agricultural Extension aims at preparing graduates with technical and professional competencies in agricultural extension and rural development.

Objectives of the BSc in Agricultural Extension

a) To plan, implement and evaluate agricultural extension and rural development programs

b) To design and conduct research in agricultural extension and rural development

c) To design and conduct outreach in agricultural extension and rural development

d) To develop and conduct training in agricultural extension and rural development

Entry requirements

The program admits two groups of candidates. First are those that have passed Malawi School Certificate of Education and the University Entrance Examination. Candidates in this group are required to meet the following requirements:

a) Six credits including English and 3 science subjects (Biology, Mathematics, General Science, Agriculture, Home Economics, Geography)

The second group is for those with a university diploma or its equivalent, with the following minimum requirements for admission into the programme:

a) University Diploma in Agriculture or agricultural related subjects, extension and rural development or an equivalent of a university diploma in the prescribed fields.

b) A minimum grade point average of 2.5 at the end of the diploma programme

2.2.2.2 Focus on NRC Extension programme

The NRC Diploma is a three-year program which was introduced in 2017. This program is offered using the modular training approach. The NRC diploma aims at developing the capacity of agricultural extension staff in the management of agricultural resources to achieve sustainable food and income security at household and national level.

Objectives of the NRC Diploma programme

a) Enhance knowledge in community mobilisation and participation in the agricultural activities.

b) Develop special skills on crop and livestock production.

c) Expose learners to modern farming to mitigate the challenges of climate change.

Entry qualifications

Candidates are required to have Malawi School Certificate of Education (MSCE), IGCSE 'O' level or its equivalent with credit passes in English, Mathematics, Biology and Physical Science (or General Science) OR at least 3 passes with grade "C" in Biology, Mathematics and Chemistry at A-Level or any comparable qualification. Candidates who were withdrawn from LUANAR or any other Public University on academic grounds and those already registered with LUANAR, or any comparable university are not eligible for admission.

2.3 Gaps in Curricula for Training of Extension Professionals

The evolution of Agriculture Extension and Advisory Services, guiding policies and strategies as well as the literature presented in this paper signifies the need for enhancing competences for extension professional to deliver quality extension services. However, enhancing the competencies requires identifying the training needs and gaps that must be filled. In order to identify existing gaps in the current curricula, both Bunda and NRC curricula were reviewed against the competences required by extension workers. The review followed the items identified in the framework presented in the earlier section of this paper (Table 2.2) below. Tables 3.2 and 2.4 give a summary of the gaps in the curricula for Bunda and NRC. In the Tables, the five types of competences (technical, organizational, facilitation, research and cross-cutting) are presented. For each competence, the examples and number of courses are then presented. Finally, a color scale is used to highlight the concentration of courses within a specific competence. The scale ranges from red (meaning there is no course to address the competence) to green (meaning there are many courses that address the competence).

Table 2.2 : Policy instruments reviewed, and competences identified

Policy Document	Competencies Needed
– Extension Policy (2000) – DAESS (2006) – Agricultural policy (2011) – Malawi Export Strategy (2012) – National Agriculture Investment Plan (2018) – National Agricultural Extension and Advisory Services Strategy (2020) – MGDS III (2017) – Malawi Vision 2063 (2020)	– Technical skills (agriculture and development) – Organizational and teamwork skills – Facilitation skills – Research skills – Cross-cutting

Results in Table 2.3 show that the Bunda College curriculum has a focus on organizational skills (i.e., community mobilization, communication and reporting), facilitation skills (i.e., extension methods, policy and participatory methods) as well as skills for conducting action research. Generally, there are only a few courses that are designed to address technical, research and crosscutting competencies.

Table 2.3 : Training gaps in Bunda curriculum

Type of competence	Examples	Number of courses (n=53)
Technical	Crops: field crops, horticulture, floriculture (exotic and indigenous)	1
	Land resources management	1
	Livestock: cattle, small ruminants, poultry, fish, bees,	2
	Product post-harvest management and storage	0
	Nutrition, food processing and safety	0
	Farm mechanization, irrigation and biofuels	1
	Industrialization and Entrepreneurship	1
	Value addition, marketing and business management	2
	Economics, poverty and sustainable livelihoods analysis	3
Organizational	Community mobilization and engagement (including women and youth)	5
	Organizational management	2

	Resource mobilization and management (human and finances)	0
	Communication and reporting	3
	Governance: lobbying and advocacy skills	0
Facilitation	Extension, Training and workshop design, implementation and evaluation	5
	Policy processes (agenda setting, formulation, implementation and evaluation)	4
	Brokerage, networks and partnership building	0
	Participatory program/project design and implementation	3
	Participatory monitoring, evaluation and learning	2
Research	Participatory Action Research	4
	Quantitative methods	2
	Qualitative methods	1
Cross-cutting issues	HIV AIDS, gender and social differentiation	2
	Climate change and environment, disaster preparedness and management,	1
	Information Communication Technology	2

The results in Table 2.4 show that the NRC curriculum is similar to the Bunda curriculum in terms of focusing on community mobilization. However, in contrast to the Bunda curriculum, NRC has more courses focusing on technical competencies (i.e., crop management, land resources, livestock, farm mechanization and irrigation. Likewise, the focus on research is on quantitative methods unlike the action research of the Bunda curriculum. Generally, the NRC curriculum has few courses that focus on organizational and facilitation competencies.

Table 2.4 : Training gap in NRC curriculum

Type of competence	Examples	Number of courses (n=47)
Technical	Crops: field crops, horticulture, floriculture (exotic and indigenous)	7
	Land resources management	4
	Livestock: cattle, small ruminants, poultry, fish, bees,	7
	Product post-harvest management and storage	0
	Nutrition, food processing and safety	2
	Farm mechanization, irrigation and biofuels	6
	Industrialization and Entrepreneurship	1

	Value addition, marketing and business management	2
	Economics, poverty and sustainable livelihoods analysis	0
Organizational	Community mobilization and engagement (including women and youth)	3
	Organizational management	1
	Resource mobilization and management (human and finances)	0
	Communication and reporting	1
	Governance: lobbying and advocacy skills	0
Facilitation	Extension, Training and workshop design, implementation and evaluation	1
	Policy processes (agenda setting, formulation, implementation and evaluation)	0
	Brokerage, networks and partnership building	0
	Participatory program/project design and implementation	2
	Participatory monitoring, evaluation and learning	2
Research	Participatory Action Research	0
	Quantitative methods	3
	Qualitative methods	0
Cross-cutting issues	HIV AIDS, gender and social differentiation	1
	Climate change and environment, disaster preparedness and management,	2
	Information Communication Technology	1

2.3.1 Gaps in BSc CurriculumGaps

The curriculum review exercise revealed that the BSc program is weak in technical skills as evidenced by the missing of some courses such as postharvest management, nutrition, food processing and safety. The assignment further uncovered the missing link in that the program does not address the current soft skills needed for systems approach for instance resource mobilization, advocacy and lobbying, robust research skills, emerging issues such as climate change and disaster management. Furthermore, the content in the current courses does not address commercialization and industrialization which the current development agenda is pushing for.

2.3.2 Gaps in Diploma Curriculum

The current curriculum was also found lacking in areas such as organization, facilitation and participatory action research skills. Facilitation skills remain aligned to participatory approaches and less on systems approaches. Content in cross-cutting issues courses is not integrating emerging issues such as Information Communication Technology (ICT).

The results of this review demonstrate the gaps that exist in the current curricula of extension programs. There is need for institutions that train extension professionals in Malawi (i.e., Bunda and NRC) to enrich their curricula in order to align to the needed skills.

CHAPTER 3 : METHODOLOGY

3.1 Study Population and Sampling

The research was carried out in Malawi between August 2021 and April 2022. Malawi, a country located in southern Africa covers an area of 118,500 km2 with an estimated population of 17.2 million (GoM, 2017). Malawi comprises of four geopolitical regions (Southern, Central, Northern and Eastern) which consist of 28 districts in total.

The study population was made up of extension professionals in the public sector, private sector academia and civil society organizations in Malawi. This study adopted a mixed method approach which balances the examination of different phenomena including perceptions, language and statements with quantitative numerical data. Mixed methods research is defined as "the collection or analysis of both quantitative and qualitative data in a single study in which the data are collected concurrently or sequentially, are given a priority, and involve the integration of the data at one or more stages in the process of research" (Creswell et al., 2003). Online survey was employed to collect quantitative data using Qualtrics software. WhatsApp and email invitations were sent to over 200 extension professionals in Malawi to respond to the online survey. Nevertheless, 40 respondents completed the online questionnaire. Furthermore, qualitative data for the study was gathered through two focus group discussions (FGD) which were conducted at Lilongwe University of Agriculture and Natural Resources (LUANAR) on 19th November 2021.

3.2 Operationalization and Measurement of Variables

The aim of the study was to identify process skills and competency gaps in the undergraduate agricultural extension curriculum in Malawi, Nigeria, South Africa, Kenya and Uganda. Considering the changing environment within which agricultural extension professionals work, they need to be equipped with adequate process skills and competencies to effectively execute their functions and address clientele needs in a satisfactory manner.

3.2.1 Demographic and institutional characteristics

The questionnaire sought to profile respondent's age (in years), gender (male, female and prefer not to respond), highest educational level (HND/Bachelor's, Master's and PhD degrees), current position(extension staff in a university, extension researcher, private sector extension professional, extension graduates working for NGOs and/or private sector companies, postgraduate students in extension, public sector extension professional and NGO extension professional), number of years in extension profession or agriculture related fields, university(ies) with deep knowledge of undergraduate education in agriculture or allied subjects and familiarity with current undergraduate level agricultural extension curriculum (familiar and not familiar).

3.2.2 Process skills and core competencies

The study defined process skills and core competencies as the critical sets of knowledge, skills, abilities, and behaviors that agricultural extension professionals need to effectively complete

their tasks in the following eleven areas: (i) Program planning; (ii) Program implementation; (iii) Communication; (iv) Information and communication technologies (ICTs); (v) Program monitoring and evaluation; (vi) Personal and professional development; (vii) Diversity and gender; (viii) Marketing, brokering and value chain development; (ix) Soft skills; (x) Health and Nutrition and Sanitation Skills and Competencies; (xi) Technical subject matter expertise.

These eleven broad areas of competencies required by agricultural extension professionals were identified and incorporated in the online questionnaire survey taking cognizance of the present extension roles and responsibilities.

3.2.3 Program planning skills and competencies

Program planning skills and competencies was operationalized as the direction and intensity of agricultural extension efforts to bring about desirable change among clients in view of national agricultural development strategies, programs, and policies. Six items in the questionnaire assessed this area of skill and competency.

3.2.4 Program implementation skills and competencies

Extension program implementation skills and competencies was operationalized as the ability of agricultural extension professional to coordinate extension programs, demonstrate teamwork and negotiation skills, engage diverse local stakeholders, delegate responsibilities, and follow participatory decision making in extension work, among others. Nine questionnaire items assessed this skill and competency.

3.2.5 Communication skills and competencies

Communication skills and competencies was operationalized as ability of agricultural extension professionals to select appropriate communication methods, establish communication with different stakeholders, respect local culture while communicating with clients, prepare required progress report, share success stories and lessons learned with stakeholders through various media, use extension methods to disseminate information about important extension activities and programs, and demonstrate good listening, presentation and public speaking skills. Eight questionnaire statements were administered to assess this area of skill and competency.

3.2.6 Information and communication technologies (ICTs) skills and competencies

ICTsskills and competencies was operationalized as ability of extension professionals to use computers, audiovisual aids, mass media, mobile phones, and social media for communication, teaching, and learning. The questionnaire used eleven items to assess this skill and competency.

3.2.7 Program monitoring and evaluation skills and competencies

Program monitoring and evaluation skills and competencies was operationalized as the ability of agricultural extension professionals to understand the theories of monitoring and evaluation, conduct online surveys for monitoring and evaluation of extension programs, develop data

collection instruments, apply qualitative and quantitative tools to collect evaluation data, analyze data, interpret data, write evaluation reports, and share results with stakeholders. Eleven questionnaire items were administered to assess this skill and competency.

3.2.8 Personal and professional development skills and competencies

Personal and professional development skills and competencies was operationalized as the ability of agricultural extension professionals to apply principles of good governance, show commitment to career advancement, apply professional ethics in work, follow organizational policies and directives, and demonstrate honesty and positive attitudes toward extension work. Five questionnaire items were administered to assess this skill and competency.

3.2.9 Diversity and gender skills and competencies

Diversity and gender skills and competencies was operationalized as ability of agricultural extension professionals to understand diversity within and among clients and stakeholders, identify the needs of small-scale farmers, develop extension programs to benefit women and youths, engage marginalized and vulnerable groups in extension programs and do teamwork with diverse staff members at various levels. The questionnaire included six items to assess this skill and competency.

3.2.10 Marketing, brokering and value chain development skills and competencies

Marketing, brokering and value chain development skills and competencies was operationalized as the ability of extension professionals to have basic knowledge of agri-business development, apply brokering / advisory skills in agri-business development, have knowledge on different agricultural markets and linkages, demonstrate knowledge of value chain logistics and input-output linkages in the value chain, facilitate entrepreneurship development among extension clientele and be able to link farmers producers' organizations / cooperatives / agri-business companies with extension. Six questionnaire items were administered to assess this skill and competency.

3.2.11 Soft skills and competencies

Soft skills and competencies was operationalized as the ability of extension professionals to develop skills and competencies in the areas of critical thinking, problem solving, time management, stress management, leadership, team work, flexibility, self-motivation, interpersonal skills, positive work attitude, collaboration, conflict management, group formation and development, negotiation, networking, facilitation and creativity/innovativeness. The questionnaire included seventeen items to assess this skill and competency.

3.2.12 Health and nutrition and sanitation skills and competencies

Health and Nutrition and Sanitation Skills and Competencies was operationalized as the ability of extension professionals to demonstrate basic human nutrition knowledge, understand lifecycle nutrition needs of different household members, advise families on what crops and livestock to be produced to ensure balanced diets, advise families to improve gender

relations for increased agriculture production and nutrition, demonstrate postharvest handling technologies that conserve nutrients and food safety, have basic knowledge about food labeling and advise on healthy diet. Seven questionnaire items were administered to assess this skill and competency.

3.2.13 Technical subject matter expertise/skills and competencies

Technical subject matter expertise / skills and competencies was operationalized as the capacity of agricultural extension professionals to express technical knowledge in their basic discipline, comprehend adult learning principles and have practical skills required to teach improved farming practices, understand the new technology being promoted, help farmers access inputs and services, train community members about climate change and climate smart agriculture and various types of risks and uncertainties, cite and make use of publications, generate knowledge or produce research reports / journal publications, harness, document, validate and integrate local/indigenous knowledge and understand social system under which farming takes place. Ten questionnaire items assessed this skill and competency.

Recognizing their experience in agricultural extension work and undergraduate extension curriculum, the respondents were asked to rate the importance of the above eleven process skills or competencies on a five-point Likert scale with options of 1 = not important; 2 = somewhat important; 3 = moderately important; 4 = important; and 5 = very important. The respondents were also required to rate how well their undergraduate extension curriculum addresses/covers the various skills or competencies on a five-point Likert scale with options, 1 = not at all covered; 2 = minimally covered; 3 = moderately covered; 4 = well covered; and 5 = very well covered.

3.3 Strategies for Improving Undergraduate Agricultural Extension Curriculum

This was operationalized as the perceptions of extension professionals regarding the approach to strengthen undergraduate agricultural extension curriculum training and they include providing practical and contemporary skills, such as soft skills in extension curriculum, business management concepts and practices in extension curriculum, exposing students to market opportunities, linking farmers with service providers and developing entrepreneurship, grooming students with broad-based general agriculture courses etc. The respondents were asked to indicate if each strategy already existed, does not exist, but essential to have and does not exist, but fine to leave out.

3.4 Appropriate Ways to Acquire Process Skills or Core Competencies

This was operationally defined as the perceptions of agricultural extension professionals on the acquisition of the skills or competencies through pre-service training by revising or updating the undergraduate curricula; internship in various work environments during the undergraduate programs; basic induction training at the beginning of a job; in-service training; and opportunities to attend trainings, seminars, workshops, webinars, etc. The respondents were requested to rate them on a four-point Likert-type scale of (1) not appropriate, (2) somewhat appropriate, (3) appropriate, and (4) very appropriate.

3.5 Main Barriers to Effective Implementation of Undergraduate Extension Curriculum

This was operationally defined as the perceptions of extension professionals on the major barriers to effective implementation of their training curriculum. These include: Development of an effective extension curriculum, quality faculty to teach extension courses, quality text books and/or manuals, classroom and demonstration farms or facilities, accreditation of curriculum, time constraint, and others. The respondents were asked to indicate their responses by marking their perceived barriers to effective implementation of undergraduate extension curriculum.

3.6 Focus Group Discussions: Process and Outcomes

FGDs were conducted to collect qualitative data on process skills and competency gaps in the undergraduate extension curriculum at Bunda College, LUANAR.Two face-to-face FGDs were organized: one for the extension professionals and another for the farmers. In total, 14 participants attended the FGDs from academia, public sector extension professional employers, private sector agricultural extension employers, NGOs and the farming community. At the beginning of each FGD, the moderator stated the aim of the study to the participants and obtained their verbal consent, including consent for recording the proceedings and taking pictures. Written informed consent was also obtained from the FGD participants. The FGDs were conducted in English for the extension professionals and in vernacular language (Chichewa) for the farmers.

Data from the FGDs were recorded using digital voice recorders and notes were also taken during the discussions. The recorded interviews were transcribed, and the researchers double-checked to verify that the interviews were transcribed accurately. Data from the focus groups were analyzed using thematic framework analysis, developed by Ritchie and Spencer. This involved analyzing the content of the transcribed interviews by examining the underlying themes in the text material that contain information related to the particular themes of the research. In the analysis, data were sifted, charted, and sorted according to the key research issues and themes using five steps: familiarization; identification of a thematic framework; indexing; charting, and mapping; and interpretation. This systematic framework analysis allows methodical treatment of data and demonstrates a high degree of flexibility to allow the researcher to conduct data analysis during or after the collection process (Ritchie and Spencer, 1994). To actualize this process, the transcribed documents were coded and saved in Word documents. The study used the procedure of a “long table” approach developed by Krueger and Casey (Krueger and Casey, 2000) for cutting, pasting, sorting, arranging, and rearranging data by means of comparison and contrast of the relevant information.

The objectives of the FGDs were to collect qualitative data on the current gaps in the undergraduate agricultural extension curriculum, critical job skills or core competencies required by agricultural extension workers in their jobs and solicit recommendations for

the modification of the undergraduate agricultural extension curriculum from the study participants.

3.7 Design and Development of the Survey Instrument

The online survey questionnaire with all the above variables was developed after careful review of literature and past survey instruments. It was formatted using the Qualtrics software and pretested with the 11 team members of the PIRA project. On the basis of the pretesting, the questionnaire was modified and finalized for data collection. The Institutional Review Board (IRB) approval for human subject's research was obtained from Michigan State University (MSU).

3.8 Data Collection and Analysis

Email lists of agricultural extension professionals in Malawi were obtained from the Malawi Forum for Agricultural and Advisory Services and contacting focal persons in the departments of agricultural extension and research services, private and public universities, NGOs, and private sector companies. The mailing lists were merged, and duplicate emails were removed. Invitation to postgraduate students were sent through the head of extension department at LUANAR. Using the Qualtrics software, the online survey questionnaire was administered to 210 agricultural extension professionals in Malawi. The online survey link was also shared with the participants of all the FGDs. The filled in questionnaires were checked for completion, and incomplete surveys were excluded from the analysis.

The demographic and institutional characteristics of the respondents were analyzed using frequency, percentage and mean. The process skills and core competencies and appropriate ways to acquire skills and core competencies were analyzed using mean scores. Finally, the strategies for improving undergraduate agricultural extension curriculum and major barriers to effective implementation of UG extension curriculum were analyzed using frequency and percentage. The statistical package for service solution (SPSS) version 20 was the software used for the statistical analysis.

3.9 Limitations of the Study

The response rate of the online survey was very low (sample size of 40) and presents some limitation to the external validity of the findings. Nevertheless, a major strength of mixed methods is the chance to employ different sources of evidence (data collection methods). These methods were used to substantiate information thus improving the validity and reliability of the research (Creswell et al., 2003).The methods used in the study were: FGDs, online survey and document reviews.

CHAPTER 4 : RESULTS AND DISCUSSION

This chapter presents the findings of the study. Firstly, the chapter presents results from the online survey followed by findings from FGDs. The chapter ends with discussions of the results.

4.1 Demographics of Agricultural Extension Professionals in Malawi

The results in Table 4.1, show the demographic characteristics of agricultural extension professionals who responded to the questionnaire in Malawi. Results show diverse demographic characteristics of the respondents. However, majority (62%)of the respondents were within the productive age category of 31 to 50 years, whereas a few of the respondents represented the youth group of 21 to 30 years (22%) and the elderly with over 60 years (15%). The results in the Table also show that majority (80%) of the respondents were men. Nearly half (40%) owned a bachelor's degree and nearly half of them (40%) were master's degree graduates.

Table 4.1 : Demographics of agricultural extension professionals in Malawi

1. Age (In Years) (N=40)		
Category (In Years)	*Frequency*	*Percent*
21-30	9	22.50
31-40	10	50.00
41-50	15	37.50
51-60	6	15.00
above 60	0	0
Total	40	100.00
2. Gender (N=40)		
Category	*Frequency*	*Percent*
Male	32	80.00
Female	8	20.00
Total	40	100.00
3. Education (N=40)		
Category	*Frequency*	*Percent*
Bachelor's degree/HND	16	40.00
Master's degree	16	40.00
Doctoral (Ph.D.) degree	4	10.00
Other	4	10.00
Total	40	100.00

4.2 Institutional Characteristics of Agricultural Extension in Malawi

The respondents were asked about the institutional characteristics of agricultural extension in Malawi. Results in Table 4.2 show that majority of the respondents(80%) were knowledgeable of the undergraduate agricultural extension curriculum in the country, and the majority (92.8%) recognized only one university as having deep knowledge in undergraduate agricultural extension. This means that much as a lot of professionals in Malawi are aware of the undergraduate curriculum in agricultural extension, the number of universities offering the program in Malawi are limited. The results in the same table show that almost half of the respondents are from the private sector and other civil society institutions (47.5%). This means that the views captured in this study represent the private sector, apart from the views of government and NGO agencies that dominate extension delivery in the country.

Table 4.2 : Institutional characteristics of agricultural extension professionals in Malawi

Familiarity with UG Agricultural Extension Curriculum (N=45)		
Category	*Frequency*	*Percent*
Familiar	36	80
Unfamiliar	9	20
Total	45	100.00
Familiar With How Many Universities' UG Agriculture Extension Curriculum (N=42)		
Number of Universities	*Frequency*	*Percent*
1	39	92.86
2 -3	3	7.14
4 or more	0	0
Total	42	100.00
Current Position (N=40)		
Category	*Frequency*	*Percent*
University Extension Staff	6	15.00
Public Sector Extension Professionals	15	37.50
Private Sector Extension Professionals and Others	19	47.50
Total	40	100.00
Experience in Extension Profession / Agriculture Related Fields (In Years) (N=38)		
Category	*Frequency*	*Percent*
0-5	10	26.32
6-10	3	7.89

11-15	6	15.79
16-20	9	23.68
above 20	10	26.32
Total	38	100.00

4.3 Process Skills and Core Competencies

4.3.1Program planning skills and competencies

During the study, data was collected on program planning skills and competencies for the agricultural extension professionals. The results in Table 4.3 show that overall, the respondents regarded the listed program planning skills and competencies such as familiarity with the national extension service goals, ability to conduct needs assessment and baseline, resource mobilisation, engagement with local stakeholders and familiarity with administrative and financial rules as essential for extension workers (mean=4.6). The results also reveal that almost all of the program planning skills and competencies were covered very well by the extension curriculum. However, the mean for resource mobilisation (mean=3.1) and administrative and financial rules (mean=3.2) indicate that the respondents felt that these items were moderately covered in the undergraduate extension curriculum. The capacity of extension workers in terms of mobilising resources, administration and financial management is critical for coverage and sustainability of extension services delivery.

Table 4.3 : Program planning skills and competencies among agricultural extension professionals in Malawi

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD) (N=42)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD) (N=33)
Familiar with the vision, mission and goals of National /State (sub-national) extension service and agricultural development strategies, programs, and policies.	4.84 (0.53)	3.76 (0.78)
Able to conduct needs assessment and engage stakeholders to prioritize local needs.	4.86 (0.41)	3.62 (0.78)
Able to conduct baseline or benchmark studies.	4.53 (0.63)	3.65 (0.95)
Able to mobilize resources/funds to address priority needs.	4.26 (0.98)	3.06 (1.01)

Able to engage local stakeholders (e.g., NGOs, cooperatives, local agro-dealers) in extension program planning.	4.72 (0.59)	3.71 (0.91)
Familiar with administrative and financial rules of their respective organizations (to utilize human and financial resources in extension programs).	4.43 (0.74)	3.21 (1.02)
Index	4.63 (0.41)	3.50 (0.68)

* *Scale for Importance: 1 = Not important, 2 = somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for Coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

4.3.2 Program implementation skills and competences

Table 4.4 presents the results on program implementation skills and competencies. The results indicate that most of the listed program implementation skills and competencies (coordination of local extension programs, teamwork skills, formulation of farmer groups, engaging local stakeholders, negotiation skills, participatory decision making, engaging minority groups and integrating private and public partnerships) were considered as essential to the work of agricultural extension professionals (mean=4.6). Also, delegation was looked at as important (mean=4.1). The same table shows that all the program implementation skills and competencies listed are covered well in the undergraduate extension curriculum (mean=3.7). This means that undergraduate students studying agricultural extension in Malawi are getting the sufficient knowledge and skills on program implementation for use in their career.

Table 4.4 : Program implementation skills and competencies among agricultural extension professionals in Malawi

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD) (N=41)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD) (N=32)
Coordinate local extension programs and activities.	4.81 (0.55)	3.61 (0.93)
Demonstrate teamwork skills to achieve extension results.	4.83 (0.38)	4.03 (0.73)
Able to form farmers' groups and support them.	4.71 (0.60)	3.82 (1.01)
Engage local stakeholders (e.g., NGOs, Self Help Groups, Cooperatives) in implementing extension programs.	4.67 (0.65)	3.73 (0.91)

Demonstrate negotiation skills to reach consensus and resolve conflicts.	4.50 (0.77)	3.52 (0.80)
Follow participatory decision-making in extension work.	4.69 (0.56)	4.06 (0.83)
Delegate responsibilities to staff as needed.	4.12 (1.04)	3.64 (0.78)
Be able to engage minority groups (e.g., Female farmers and youth development groups) in extension work.	4.61 (0.74)	3.56 (0.91)
Integrate private or public-private partnerships in extension service provision.	4.52 (0.74)	3.45 (1.09)
Index	4.62 (0.40)	3.71 (0.65)

* *Scale for Importance: 1 = Not important, 2 = somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for Coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

4.3.3 Communication skills and competencies

The results on the importance of communication skills and competencies among agricultural extension professionals show that the respondents considered these skills and competencies as essential to the work of extension workers (mean=4.7). In terms of coverage the results show that all the communication skills and competencies listed in the table below were covered very well in the curriculum except for the preparation of progress reports and success stories for sharing with stakeholders, which were regarded as moderately covered (mean=3.4).

Table 4.5 : Communication Skills and Competencies among Agricultural Extension Professionals in Malawi

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD) (N=40)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD) (N=31)
Select appropriate communication methods.	4.85 (0.36)	3.84 (0.81)
Establish communication with different stakeholders.	4.76 (0.49)	3.75 (0.92)
Respect local culture while communicating with clients.	4.80 (0.40)	4.00 (0.95)
Prepare required progress reports.	4.61 (0.67)	3.39 (1.17)
Share success stories and lessons-learned with stakeholders through various media.	4.55 (0.71)	3.39 (0.92)

Use extension methods (e.g., individual, group and mass contact methods) to disseminate information about extension activities and programs.	4.85 (0.36)	4.16 (0.81)
Demonstrate good listening skills and listen to all clients and stakeholders.	4.59 (0.67)	3.88 (1.01)
Demonstrate good public speaking and presentation skills.	4.80 (0.46)	3.88 (0.91)
Index	4.73 (0.32)	3.78 (0.70)

* *Scale for Importance: 1 = Not important, 2 = somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for Coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

4.3.4ICT Skills and Competencies

Respondents were asked about the importance and coverage of ICT skills and competencies in the undergraduate extension curriculum. Table 4.6 provides the results that indicate that all the ICT skills and competencies listed in the table were considered as essential to the work that extension workers do (mean=4.6). In-terms of coverage, the results show very good coverage of skills related to Microsoft word, data entry and analysis, Microsoft power point, audio visual aids and emails plus internet. However, there was moderate coverage for Radio and TV mass media (mean=3.4), mobile phone services (mean=3.2), social media (mean=2.9), ICT tools to improve access to information (mean=3.1), ICT tools to enhance partner collaboration (mean=3.1), ICT tools for data collection, monitoring and evaluation (mean=3.0). This generally reveals several shortfalls in the undergraduate extension curriculum on the coverage of ICT skills and competencies. These results suggest that the extension graduates that are produced at undergraduate level are not sufficiently equipped with ICT skills and competencies.

Table 4.6 : ICTs Skills and Competencies among Agricultural Extension Professionals in Malawi

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD) (N=40)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD) (N=31)
Microsoft Word for word processing (e.g., typing, editing, printing) and designing graphics.	4.70 (0.52)	3.74 (1.09)
Data entry and analysis software such as Excel, SPSS etc.	4.65 (0.62)	3.58 (1.23)
Microsoft Power Point for making presentations.	4.75 (0.44)	4.06 (1.12)
Audio-visual aids such as charts, graphs, and puppet show for teaching and learning.	4.65 (0.53)	3.58 (1.39)

Mass media like FM radio stations and television channels for communication.	4.50 (0.68)	3.39 (1.17)
Computers (email, Internet) for communication.	4.78 (0.42)	3.55 (1.12)
Mobile phone services (e.g., texting, SMS service) for communication.	4.60 (0.67)	3.29 (1.24)
Social media (WhatsApp, Facebook, Twitter, Instagram, etc.) for communication.	4.48 (0.85)	2.94 (1.12)
ICT tools to improve access to information, knowledge, technologies and other innovations.	4.70 (0.52)	3.06 (1.18)
ICT tools to enhance collaboration and partnerships.	4.53 (0.72)	3.13 (1.12)
ICT tools for collecting data, monitoring, and evaluation of extension programs.	4.68 (0.47)	3.03 (1.17)
Index	4.64 (0.34)	3.40 (0.92)

** Scale for Importance: 1 = Not important, 2 = somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

*** Scale for Coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

4.3.5 Program monitoring and evaluation skills and competencies

Table 4.7 presents results on program monitoring and evaluation skills and competencies among agricultural extension professionals in Malawi. The results indicate that all the program monitoring and evaluation skills and competencies listed in the table were reported as essential to extension services delivery (mean=4.7). The results in the table also show that generally the undergraduate curriculum covers very well topics related to the program monitoring and evaluation (mean= 3.5). However, there are some areas that are moderately covered in the curriculum. These areas that are not covered fully include online surveys for M&E (mean=3.1), evaluation report sharing with stakeholders (mean=3.4) and application of evaluation findings in scaling up programs (mean=3.2).

Table 4.7 : Program monitoring and evaluation skills and competencies among agricultural extension professionals in Malawi

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD) (N=38)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD) (N=28)
Understand theories and principles of monitoring and evaluation.	4.55 (0.85)	3.66 (0.90)

Conduct monitoring and evaluation of extension programs.	4.54 (0.79)	3.52 (0.91)
Develop data collection instruments - interview schedules / questionnaires- for monitoring and evaluation of extension programs.	4.54 (0.82)	3.90 (0.84)
Conduct online surveys for monitoring and evaluation of extension programs.	4.56 (0.64)	3.07 (1.11)
Apply qualitative tools and techniques (e.g., focus group discussion, case study etc.) to collect evaluation data.	4.72 (0.51)	3.67 (1.03)
Apply quantitative tools and techniques (e.g., survey, interview, farm data, etc.) to collect evaluation data.	4.66 (0.63)	3.76 (0.87)
Analyze data (qualitative and quantitative).	4.62 (0.75)	3.60 (0.97)
Interpret data (qualitative and quantitative).	4.67 (0.66)	3.60 (0.89)
Write evaluation report.	4.68 (0.57)	3.55 (0.95)
Share evaluation reports within their organizations and with stakeholders.	4.72 (0.69)	3.40 (0.97)
Apply the evaluation findings in replicating/ scaling-up of extension programs.	4.77 (0.48)	3.20 (1.00)
Index	4.67 (0.48)	3.49 (0.73)

* *Scale for Importance: 1 = Not important, 2 = somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for Coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

4.3.6 Personal and professional development skills and competencies

Results on personal and professional development skills and competencies have been provided in Table 4.8. The results show that overall, personal and professional development skills and competencies are looked at as essential (mean=4.8) to the delivery of extension services. However, the undergraduate extension curriculum covers this aspect moderately (mean=3.3). Undergraduate extension workers in Malawi are not fully coached on personal and professional development skills such as principles of good governance, career advancement, professional ethics, compliance to policies and directives and the demonstration of honesty and positive attitude as listed in the table below.

Table 4.8 : Personal and professional development skills and competencies among agricultural extension professionals in Malawi

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD) (N=38)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD) (N=29)
Apply principles of good governance (e.g., client's participation, accountability and transparency) in extension work.	4.68 (0.57)	3.31 (0.85)
Show commitment to career advancement (participate in lifelong learning, in-service training, professional development events and conferences).	4.71 (0.52)	3.38 (1.05)
Apply professional ethics in extension work i.e., promote research-based recommendation or technology.	4.68 (0.57)	3.31 (1.07)
Follow organizational policies and directives for professional development.	4.50 (0.69)	3.21 (0.94)
Demonstrate honesty and positive attitude towards extension work.	4.68 (0.57)	3.41 (1.02)
Index	4.65 (0.42)	3.32 (0.83)

* *Scale for Importance: 1 = Not important, 2 = somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for Coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

4.3.7 Diversity and gender skills and competencies

Table 4.9 presents the results on diversity and gender skills and competencies. Based on the findings, the respondents indicated that skills and competencies on diversity and gender are of essence to the extension worker (mean=4.8). Results in the same table reveal that these skills are generally well covered by the undergraduate extension curriculum (mean=3.5). However, there are some gaps in the curriculum specifically for the development of youth focused extension programs (mean= 3.2) and the engagement of marginalised groups in extension programs (mean= 3.2). These results suggest that that there are shortfalls in the capacities of extension workers graduating at undergraduate level in developing youth focused extension programs and engagement of marginalised and vulnerable groups in Malawi.

Table 4.9 : Diversity and gender skills and competencies among agricultural extension professionals in Malawi

Extension professionals should be:	**How important is this skill or competency for an extension worker?* Mean (SD) (N=37)**	**How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD) (N=28)**
Understand that diversity exists within and among clients and stakeholders.	4.71 (0.52)	3.66 (1.01)
Identify the needs of small-scale farmers.	4.82 (0.46)	3.79 (1.05)
Identify the needs of minority groups.	4.78 (0.48)	3.46 (0.92)
Develop extension programs to benefit women farmers.	4.68 (0.57)	3.45 (0.91)
Develop extension programs to benefit youth.	4.71 (0.52)	3.24 (1.12)
Engage marginalized and vulnerable groups in extension programs (e.g., disabled, resource poor farmers).	4.79 (0.53)	3.24 (0.91)
Do teamwork with diverse staffs.	4.82 (0.46)	3.66 (0.94)
Index	4.78 (0.38)	3.51 (0.82)

* *Scale for Importance: 1 = Not important, 2 = somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for Coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

4.3.8 Marketing, brokering and value chain development skills and competencies

Table 4.10 shows results on marketing, brokering and value chain development skills and competencies among agricultural extension professionals in Malawi. The results indicate that skills and competencies on marketing, brokering and value chain development are regarded as essential to the extension workers. However, these skills are moderately covered in the undergraduate agricultural extension curriculum in Malawi (mean=3.4).

Table 4.10 : Marketing, brokering and value chain development skills and competencies among agricultural extension professionals in Malawi

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD) (N=38)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD) (N=29)
Have basic knowledge of agribusiness development.	4.82 (0.46)	3.55 (0.78)
Apply brokering / advisory skills in agribusiness development.	4.61 (0.55)	3.24 (0.87)
Have knowledge on different agricultural markets and linkages.	4.71 (0.65)	3.34 (0.97)
Demonstrate knowledge of value chain logistics and input-output linkages in the value chain.	4.74 (0.55)	3.31 (0.97)
Facilitate entrepreneurship development among extension clientele.	4.71 (0.52)	3.24 (0.83)
Be able to link farmers producers' organizations/ cooperatives/agribusiness companies with market.	4.79 (0.53)	3.52 (0.95)
Index	4.73 (0.41)	3.37 (0.73)

* *Scale for Importance: 1 = Not important, 2 = somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for Coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

4.3.9 Soft skills in extension

Respondents were also asked about the importance and coverage of soft skills among agricultural extension professionals in Malawi. The results in table 4.11, show that the respondents indicated that soft skills are essential attributes for extension workers to facilitate their work (mean=4.7). The results also revealed that the soft skills are well covered in the undergraduate extension curriculum in Malawi (mean=3.6).

Table 4.11 : Extension soft skills among agricultural extension professionals in Malawi

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD) (N=36)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD) (N=26)
Critical thinking	4.74 (0.64)	3.41 (0.95)
Problem solving	4.66 (0.63)	3.66 (0.81)
Time management	4.68 (0.63)	3.54 (0.92)
Stress management	4.50 (0.80)	3.24 (1.12)
Leadership	4.81 (0.46)	3.71 (0.85)
Teamwork	4.79 (0.47)	3.62 (0.90)
Flexibility	4.55 (0.69)	3.52 (0.87)
Self-motivation	4.63 (0.54)	3.59 (0.87)
Interpersonal skills	4.74 (0.50)	3.62 (0.94)
Positive work attitude	4.66 (0.58)	3.45 (1.02)
Collaboration	4.63 (0.59)	3.72 (0.80)
Conflict management	4.62 (0.68)	3.56 (0.97)
Group formation and development	4.82 (0.39)	4.03 (0.82)
Negotiation skills	4.71 (0.52)	3.62 (0.94)
Networking skills	4.66 (0.58)	3.66 (0.86)
Facilitation skills	4.86 (0.35)	3.93 (0.66)
Creativity / Innovativeness	4.74 (0.45)	3.66 (0.94)
Index	4.69 (0.43)	3.64 (0.66)

* *Scale for Importance: 1 = Not important, 2 = somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for Coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

4.3.10 Nutrition Skills and Competencies

Table 4.12 provides the results on nutrition skills and competencies among agricultural extension professionals in Malawi. The results show that nutrition skills and competencies are essential to the duties of extension workers (mean=4.6). The results also reveal that most of the skills and competencies on nutrition are well covered in the undergraduate curriculum for agricultural extension (mean=3.5). However, the topic related to healthy diet was reported as moderately covered in the curriculum (mean=3.3).

Table 4.12: Nutrition Skills and Competencies among Agricultural Extension Professionals in Malawi

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD) (N=38)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD) (N=28)
Demonstrate basic human nutrition knowledge (e.g., food composition, balanced diet, supplements, nutritional composition of various foods, nutrition deficiency symptoms etc).	4.47 (0.73)	3.57 (0.96)
Understand lifecycle nutrition needs of different household members (e.g., children of various age groups, pregnant and breastfeeding mothers, elderly).	4.45 (0.65)	3.69 (0.76)
Able to advise families on what crops and livestock to be produced to ensure balanced diets.	4.66 (0.58)	3.72 (0.70)
Advise families to improve gender relations for increased agriculture production and nutrition.	4.68 (0.53)	3.72 (0.80)
Demonstrate postharvest handling technologies that conserve nutrients and food safety (e.g. food storage, freezing fruits and vegetables, making pickles, jams, jellies).	4.68 (0.57)	3.55 (0.99)
Have basic knowledge about food labelling (e.g., organic foods).	4.55 (0.72)	3.48 (0.99)
Able to advise on healthy diet (e.g., for fitness and sports, diabetes, cancer and AIDS/HIV, heart health, kidney disease, osteoporosis; weight loss and obesity).	4.55 (0.69)	3.31 (1.11)
Index	4.58 (0.51)	3.54 (0.63)

* *Scale for Importance: 1 = Not important, 2 = somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

*** Scale for Coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 =Very well covered, 5 = Extremely well covered.*

4.3.11Technical subject matter skills and competencies

Respondents were also asked of the importance and coverage of technical subject matter expertise in the curriculum for agricultural extension professionals in Malawi. The results in Table 4.13 reveal that skills and competencies on technical subject matter expertise are considered as essential for an extension worker (mean=4.6). The same table also shows that except for the topics related to integration of indigenous knowledge and different types of risks and uncertainties, which were reported as moderately covered (mean= 3.3 and 3.4

respectively), most of the skills and competencies on technical subject matter expertise were reported as very well covered in the undergraduate extension curriculum.

Table 4.13 : Technical Subject Matter Expertise among Agricultural Extension Professionals in Malawi

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD) (N=37)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD) (N=27)
Demonstrate technical knowledge in their basic discipline (e.g., field crops/livestock/ fishery/horticulture, etc.).	4.68 (0.71)	3.89 (1.07)
Understand adult learning principles and hold practical skills required to teach improved farming practices.	4.71 (0.65)	4.07 (0.96)
Understand the new technology being promoted, i.e., what it is, why, and how it works.	4.68 (0.66)	3.79 (0.94)
Facilitate farmers to access inputs and services (e.g., credit, seed, fertilizers, feed, artificial insemination, etc.)	4.61 (0.68)	3.45 (1.18)
Be able to educate community members about different types of risks and uncertainties (e.g., due to market fluctuations, natural disasters, etc.).	4.55 (0.72)	3.38 (1.24)
Be able to educate community members about climate change and climate smart agriculture.	4.63 (0.71)	3.55 (1.02)
Refer to and make use of publications--journals, research reports, etc.	4.47 (0.89)	3.48 (1.09)
Generating knowledge or producing research reports / journal publications.	4.42 (0.86)	3.52 (1.02)
Able to harness, document, validate and integrate local / indigenous knowledge.	4.50 (0.92)	3.32 (1.16)
Understand social system under which farming takes place (e.g., rural sociology knowledge).	4.61 (0.72)	3.55 (1.15)
Index	4.58 (0.64)	3.56 (0.85)

* *Scale for Importance: 1 = Not important, 2 = somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for Coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

4.3.12 Additional process skills or competencies

The additional process skills or competencies that extension professionals need as indicated by the respondents includes understanding policy formulation, interpretation and implementation

4.3.13 Strategies to make extension curriculum robust and practical

Respondents were also asked on how the agricultural extension curriculum can be made robust and practical. Table 4.14 below shows the results that indicate that the respondents viewed all the proposed interventions listed in the table, as either "already existing in the curriculum" or "they did not exist but were essential to have in the curriculum". For each intervention, a few respondents (usually less than 10%) felt that "It did not exist in the curriculum and was not essential to be incorporated in the curriculum". The interventions that the majority of respondents reported as not existing in the curriculum but were essential to agricultural extension include provision of practical and contemporary skills (51.28%), exposing students to market opportunities (61.54%), Incorporation of youth development, gender issues, urban/sub-urban agriculture, and climate change concepts (51.28%) and offering training of trainer workshops for extension faculty members (54%).

The interventions that the majority of the respondents reported as well framed and incorporated in the curriculum to ensure robust and practical extension service delivery included soft skills (50%), business management (61.11%), general agriculture courses (55.26%), research and data analysis (65.79%) and recruitment of highly qualified staff (65.79%). These highlight how the undergraduate extension curriculum in Malawi is multi-faceted with areas of strength and weaknesses. Hence in order to strengthen its robustness and practicability, the weak areas that have been signaled by the majority of respondents in this survey need to be further developed in order to create a more vibrant extension curriculum.

Table 4.14 : How to make agricultural extension curriculum robust and practical in Malawi

Intervention	N	Already exists F (%)	Does not exist, but essential to have F (%)	Does not exist, but fine to leave out F (%)
Provide practical and contemporary skills (e.g., through mentored internship or attachment to a progressive farmer in a crop season).	39	18 (46.15%)	20 (51.28%)	1 (2.56%)
Include various soft skills in extension curriculum.	40	20 (50.00%)	18 (45.00%)	2 (5.00%)
Include business management concepts and practices in extension curriculum.	36	22 (61.11%)	14 (38.89%)	0 (0.00%)

Expose students to market opportunities, linking farmers with service providers, and develop entrepreneurship.	39	15 (38.46%)	24 (61.54%)	0 (0.00%)
Grooming students with broad-based general agricultural courses (e.g., crop and animal production, postharvest, marketing, and joint ventures) along with extension training.	38	21 (55.26%)	15 (39.47%)	2 (5.26%)
Incorporate youth development, gender issues, urban/sub-urban agriculture, and climate change concepts in extension curriculum.	39	16 (41.03%)	20 (51.28%)	3 (7.69%)
Recruit highly qualified extension staff or faculty.	38	25 (65.79%)	11 (28.95%)	2 (5.26%)
Include research and data analytical skills.	38	25 (65.79%)	13 (34.21%)	0 (0.00%)
Offer training of trainer workshops for extension faculty members.	37	17 (45.95%)	20 (54.05%)	0 (0.00%)
Develop cutting-edge and practical teaching learning resources – extension textbooks, practical handbooks, training manual, etc.	38	17 (44.74%)	18 (47.37%)	3 (7.89%)
Undergraduate extension curriculum/ pedagogy should be more ICT oriented	37	8 (21.62%)	25 (67.57%)	4 (10.81%)

4.3.14 Various ways of acquiring process skills and competencies

Table 4.15 below highlights results on the various ways of acquiring process skills and competencies in agriculture extension. The respondents indicated that all the ways listed in the table below were appropriate ways for acquiring process skills and competencies i.e. pre-service training (mean=3.2), internship (mean=3.3), basic induction training (mean=3.2), in-service training (mean=3.3), workshops or seminar(mean=3.3). According to the results, all the aforementioned ways are suitable for helping agricultural extension workers to acquire the necessary process skills and competencies needed for their job, with of cause internship and preservice training topping the list.

Table 4.15 : Ways to acquire the process skills and competencies in Malawi

Ways	Total	Not appropriate F(%)	Somewhat appropriate F(%)	Appropriate F(%)	Very appropriate F(%)	Mean (Sd)*
Through Preservice Training by revising or updating the curriculum.	39	1 (2.56%)	3 (7.69%)	21 (53.85%)	14 (35.90%)	3.23 (0.71)
Requiring Internship at various work environments (i.e., Public Institutions, NGOs, Private Companies, Farmer Organizations, Cooperatives, etc.) during undergraduate programs.	38	0 (0.00%)	1 (2.63%)	23 (60.53%)	14 (36.84%)	3.34 (0.53)
Through Basic Induction Training (e.g., job orientation training at the beginning of job)	36	0 (0.00%)	4 (11.11%)	22 (61.11%)	10 (27.78%)	3.17 (0.61)
Through Inservice Training (e.g., training offered during the employment at Universities, Training Institutes/Centers, etc.)	38	0 (0.00%)	2 (5.26%)	24 (63.16%)	12 (31.58%)	3.26 (0.55)
Providing opportunities to attend Trainings, Seminars, Workshops, Webinars, etc.	38	1 (2.63%)	3 (7.89%)	18 (47.37%)	16 (42.11%)	3.29 (0.73)

* *Scale for appropriateness: 1 =Not appropriate; 2=somewhat appropriate; 3 =Appropriate; 4 = Very appropriate*

4.3.15 Additional appropriate ways to acquire process skills or competencies in Malawi

The additional appropriate ways to acquire process skills or competencies as indicated by the respondents includes exposure to field schools where both farmers and students/extension workers engage on a hands-on learning process.

4.3.16 Major barriers to effective implementation of extension worker training curriculum

When asked about the barriers to implementation of the extension curriculum in Malawi, results in Table 4.16 show various barriers that were indicated by the respondents. The common barriers mentioned by more than half of the respondents included the lack of quality faculty members to teach extension courses and failure to develop an effective extension curriculum. A good proportion (over a third) of the respondents also mentioned the lack of

budget support to practical learning experience (e.g., filed visits and demonstrations), low motivation among students to study extension, as well as time constraint among the faculty members to deliver quality training.

Table 4.16 : Major barriers to effective implementation of extension worker training curriculum in Malawi

Barrier	Frequency	Percentage
Budget to support practical learning experience (e.g., filed visits and demonstrations)	20	44
Classroom and demonstration farms or facilities	8	18
Student motivation to study extension and in practical extension work	16	36
Development of an effective extension curriculum	23	51
Teacher motivation to teach required process skills and competencies	2	4
Quality textbooks and/or manuals	11	24
Quality faculty to teach extension courses	32	71
Time constraint	17	38
Accreditation of curriculum	10	22

4.3.17 Other barriers to effective implementation of extension worker training curriculum

The other barriers to effective implementation of extension worker training curriculum are recruitment of lecturers with no extension specialisation, lecturers being pre-occupied with private consultancies and COVID-19 restricted farmer meetings and staff meetings.

4.4 Findings from Focus Group Discussions

4.4.1 General perceptions of community about agricultural extension service in Malawi

Box 4.1 : General perceptions of community about agricultural extension

NGOs	Public sector extension Professionals	Private sector extension Professionals	Farmers
• Inadequate numbers of extension workers • Conflicting messages from extension workers	• Inadequate staff motivation • Unqualified extension staff providing services	• Non-functional extension system except where there are projects that support it	• Poor transportation of extension staff • Dissemination of unsuitable technologies

• Inadequate capacity among frontline extension workers to deliver extension messages through ICT (such as radio and phones) • Inadequate capacity among frontline extension workers to implement extension approaches such as the Farmer Field School (FFS) and Farmer Business School (FBS) • Extension messages and technologies not properly targeting specific categories of farmers, such as youth, the elderly, women, and urban farmers, • Inadequate staff motivation • Non-functional extension system except where there are projects that support it • Failure by farmers to demand extension services of their choice	• Poor coordination of extension actors at the district level • Failure by farmers to demand extension services of their choice	• Poor coordination of extension actors at district level • Failure by farmers to demand extension services of their choice • Farmers' poor access to agricultural inputs • Low market prices for the various agricultural commodities • failure to sustain value addition by some farmer groups	• Extension workers failing to assist in pest control

4.4.2 One activity that extension service is doing particularly well

Box 4.2 : Areas that extension service is doing well in Malawi

Public sector extension professionals	NGOs professionals	Private sector extension professionalss	Faculty staff
• Increased productivity. • Increased numbers of cooperatives that are trying to improve on value addition. • Agricultural Extension Planning Areas (EPAs) mounting demonstration plots. Provision of extension messages to farmers.	• Developing policies and strategies on extension and agriculture. • Provision of information through radio programs, both national and community radio. • FFS approach has led to the improvement of livelihoods.	• The coming in of ICTs that are catering to the various needs of farmers and reaching many farmers. • Extension staff dedicated to provide extension services.	• Farmers have choice on various technologies and practices. • Training variety of technologies to farmers for them to choose which best suit them. • The pluralistic approach has helped many farmers access extension advisory services.

4.4.3 Major recommendations to improve agricultural extension services and program delivery in Malawi

Participants were requested to draw main recommendations for improving extension services and program delivery in Malawi. Participants mentioned 21 recommendations, which have been organized around five areas, as shown in Figure 4.1 below. The first recommendation, with six entries, was made by the public extension professionals, private companies' practitioners, and extension faculty staff to improve the working conditions of frontline extension workers to motivate them. They proposed that government should increase the number of extension workers to match the population of farmers and support provision of resources needed for their work, such as protective clothing, motorbikes, computers, trainings, housing, and well-maintained offices.

The second recommendation, with five entries, was proposed by the civil society extension professionals, private companies' practitioners, and extension faculty staff to enhance the undergraduate extension curriculum by including: digital extension approaches so that

students have hands-on skills for using ICT tools; hands-on experience by linking students with the industry to complement theory; and knowledge management to address the current gap. One female participant from the civil society extension professionals lamented that Malawi has a lot of indigenous knowledge that is working but not documented.

The third recommendation was made by the public extension professionals, private companies'practitioners, and extension faculty staff, with five entries, to address strengthening the DAESS extension system. The participants indicated that there is need to strengthen coordination and linkages among extension actors, promote demand-driven extension, and harmonize messages to make DAESS effective.

The fourth recommendation, with four entries, was made by private companies' practitioners, civil society extension professionals, and extension faculty staff to improve market access by farmers. The participants proposed that, to industrialize farming, there is need to: link farmers to manufacturers to understand the types of products they would produce; improve rural infrastructure, roads, storage, and transportation; incorporate urban farmers, who are resource-rich and have commercialization drive; and restrict imports of agricultural products to boost local production.

Lastly, the fifth recommendation, with two entries, was made by civil society extension professionals and public extension professionals, who pushed for an improvement in the uptake of technologies by farmers by offering practical demonstrations to farmers and proper targeting of farmers with innovations.

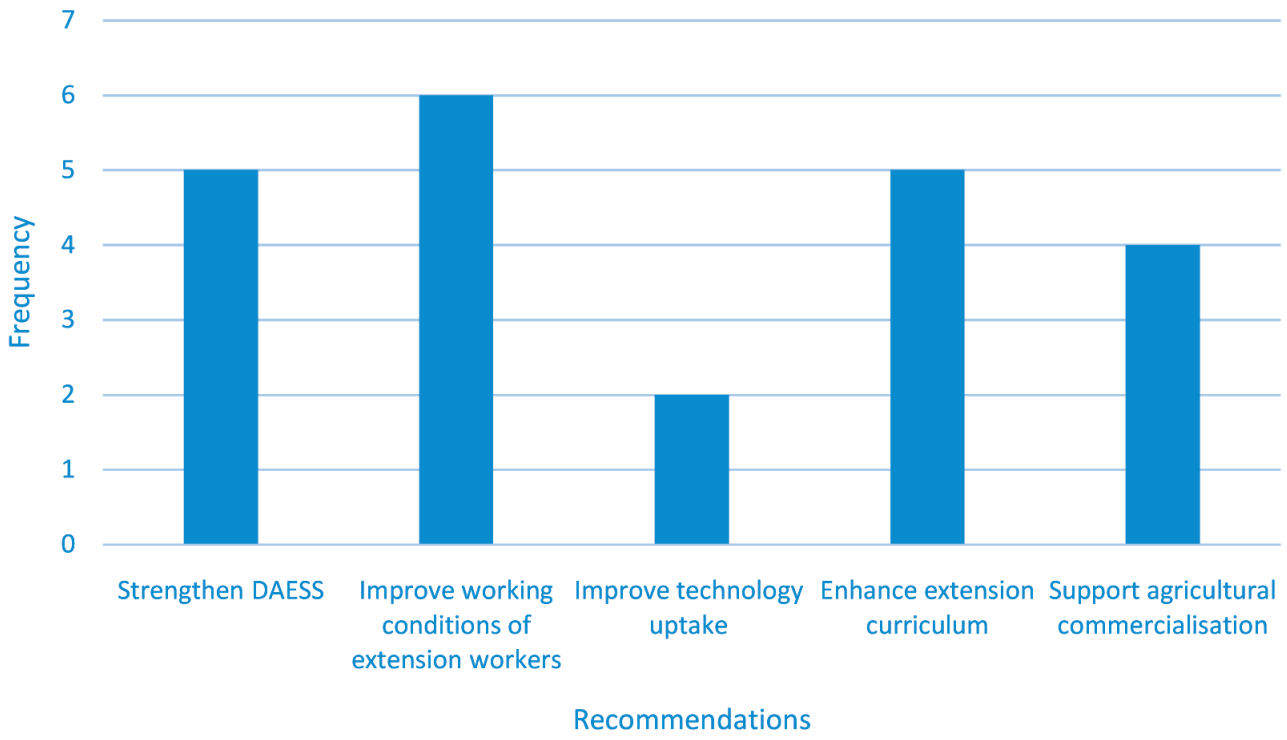

Figure 4.1 : Recommendations to improve agricultural extension services delivery

4.4.4 Criticaljob skills / core competencies required of agricultural extension workers

Critical skill	Frequency
Articulative, public speaking and communication skills	24
Interactive and facilitation skills	22
Well knowledgeable of the sciences	22
ICT skills	21
Entrepreneurship/ marketing skills	19
Value chain addition	18
Resource mobilization	13
Documentation and knowledge management	11
Leadership skills	6
Networking skills	4
Participatory Rural Appraisal (PRA) skills	3
Conflict management	3
Able to listen to and learn from farmers	3
Analyzing problems from different perspectives (avoiding bias and prejudice)	2
Extension worker must be empathetic, respectful, polite, and humble	1

4.4.5 Coverage of job skills / core competencies in UG curriculum in Malawi

In general, all the participants were of the view that the current curriculum is not helping to produce hands-on, well-grounded extension graduates. They suggested that LUANAR should train general practitioners at the undergraduate level, not specialized graduates, as is currently the situation, because this limits their knowledge to their areas of specialization. They added that university students should be trained to be flexible by giving them basics in the university and let the industry help them specialize. They reported that currently there is no interface between the university and the industry, and that this needs to improve if the university is to produce the hands-on graduates needed by the industry. Research on school education has revealed that curricula are often not appropriate or relevant to the needs of rural areas, particularly agriculture, and are biased toward theoretical academic knowledge rather than offering practical experience or recognizing indigenous knowledge (Bates et al, 2009). One participant from the private companies' practitioners had this to say:

> *"...Let them be general practitioners and specialize in the industry. Specialization should come from the industry. For example, one can be trained as a general practitioner at Bunda College, but when they get employed by ILOVO, they will specialize in sugar cane..."*

4.4.6 Barriers to effectively train UG students in required core competencies

All the participants agreed that universities face barriers to effectively train graduates with required skills and competencies. They mentioned that universities receive inadequate support from stakeholders to train graduates with required skills in Malawi. The inadequate support was seen to emanate from, among other things, poor networking of the university with relevant stakeholders. Poor networking also results in the universities failing to understand the needs of the industry and training graduates that are not needed by the market. Overspecializing was also mentioned as another barrier to training students with required skills and competencies because it left students with a very narrow area of focus, resulting in challenges to work on areas that they never covered during their training. This, participants added, made them irrelevant at work.

4.4.7 Broad modifications suggested in agricultural extension curriculum and its transaction

Participants absolutely agreed that the current extension curriculum requires modification if it is to produce undergraduate students with skills and competencies required by the industry. They reported that there is need to enhance student placement in attachments (where they work in an organization) and incubations (where they try out and develop a new idea with support from an organization) to give students practical experience in their program. These attachments and incubations, they stated, should be done between academic sessions so students could work with the industries close to their areas of residence. A caution was raised to ensure that students work with industries that have activities running on the ground to allow them to have real time experience. They also mentioned that students need to work with a variety of actors apart from smallholder farmers to allow them to learn diverse skills including report writing and facilitation. Participants emphasized the need for curriculum that strengthens students' ability to facilitate establishment and work with cooperatives. Agricultural marketing was mentioned as another area that the extension curriculum should include. Participants further stated that entrepreneurship should be part of the curriculum where partnerships and joint ventures among students should be emphasized. For example, students from extension, animal science, agribusiness, and other disciplines could form a partnership and start their own business tapping their various skills. This would help to produce students that do not rely solely on employment but can venture into businesses that even create employment. Another suggested area of change in the curriculum was the recruitment of extension students. Both extension practitioners and farmers submitted that there was need to recruit only those students who have interest in extension work. They pointed out that students should have an idea about what extension work entails before committing to training. This point was raised because participants reported that they noticed lack of interest and passion among extension graduates to work with farmers in rural areas. One female farmer commented about her experience with a fresh extension graduate who was deployed to work in her community:

> *"I want an extension worker who can demonstrate what they are teaching. Not the one who just stands there, with hands in their pockets, looking at us as helpless*

people telling us what to do. An extension worker must love their job. Let them get dirty also, not just telling farmers what to do.... For example, if maize is to be spaced at 25cm, let them enter the field and demonstrate the spacing, not just telling us..."

The participants suggested several actors to be further consulted in efforts to improve the extension curriculum, apart from them. Such actors included cooperatives, processors of various agricultural produce, and DAESS structures and extension workers themselves (AEDOs).

4.5 Discussions of Findings

4.5.1 Demographics of agricultural extension professionals

The finding that majority of the respondents were men whose age was above 30 years reveal how the delivery of agricultural extension services in Malawi continues to be biased against women and the youth. Previous studies have also established the dominance of men in the number of extension workers in the country (Masangano and Mthinda, 2012; Cai and Davis, 2017). The dominance of men who are older has implications on the extent to which issues that affect participation and performance of agricultural enterprises run by women and the youth are addressed. Generally, men would not be in a position to affectively recognize and help combat the challenges faced by other gender categories (Quisimbing and Pandofelli, 2010).

Simpson et al. (2012) reported an increase in the number of undergraduate students that are recruited at Bunda College and Natural Resources College. The findings of this study that nearly half of the respondents were B.Sc. holders confirm the observation by Simpson and associates. However, the high number of master's degree holders can be explained by the increase in the in-take of MSc. students at Bunda college (MSc. Extension and Rural Development program), that has largely been a result of government scholarships offered to middle level extension managers (the Agriculture Sector Wide Approach-ASWAp program-GoM, 2016). The online survey method used to collect the data might have also contributed to the high number of respondents with master's degrees. Most of the master's level graduates have been recruited or promoted to middle-level management positions where they have frequent access to internet (emails) and are also members of online extension platforms (e.g., WhatsApp group for the Malawi Forum for Agricultural Advisory Services-MAFAAS). The study questionnaire was mainly shared through emails and online platforms.

4.5.2 Process Skills and Core Competencies

a. Program planning

On skills and competencies related to program planning, this study has revealed coverage of key aspects such as vision, mission, and goals of agricultural extension services, identifying and prioritizing farmer needs, baseline studies and participatory planning, as well covered in the recent undergraduate programs. These skills and competencies are covered in several courses offered in the extension curricula. For example, the Supervised Extension Project (SEP), a participatory action research-oriented course offered at Bunda College, requires students to carry out in collaboration with extension organizations and farmers,

a needs assessment exercise as well as a development project to address the identified and prioritized needs. Bunda college also offers a course in management of extension that covers topics on human resources management as well as budgeting. However, this course is delivered through lectures in class with minimal hands-on sessions. In addition, the course does not cover other key topics related to financial literacy (e.g., savings and investment, debt management). This could be the reasons why the findings of this study show that issues of administration and financial rules as well as resource mobilization are not well covered in the curricula. The lack of capacity among extension workers to mobilize resources was also reported as one of the gaps that affected operationalization of agricultural innovation platforms in the country (FAO, 2021). Generally, extension organization depend on government funding (which is not enough) and development partners "donors" (which tend to be periodic) as sources of resources.

b. Program implementation

Findings from the survey showed that program implementation skills and competencies are being covered very well by the undergraduate agricultural extension curriculum. These skills and competencies are delivered through courses related to community mobilization and participatory program implementation. For example, the curriculum at Bunda College requires that students design a development and research project that they implement together with the community and relevant stakeholders (e.g., government extension workers) from third to fourth year of their studies. Likewise, NRC offers courses (e.g., working with rural communities; participatory tools and techniques) that enable agricultural extension workers to apply adult learning principles and participatory approaches when implementing extension programs. The survey findings agree with the opinions expressed by participants during the focus group discussions, that extension workers are able to implement activities (e.g., demonstrations) that help farmers to access information on modern farming practices.

c. Communication

The study findings reveal that communication skills and competencies are important for extension workers and that they are well covered by the undergraduate curriculum except for topics on preparation of progress reports and sharing success stories. The design of the programs at Bunda and NRC emphasize that students write an end of project report, which is then presented to a panel of academic staff, orally. The structure of the report and presentation does not give space for case studies or success stories. As such, students tend to ignore the narrative stories shared by farmers or observed by themselves whilst in the field. Instead, they focus on presenting statistics such as frequencies of farmers with knowledge or adopting a promoted agricultural practice. The development and sharing of success stories and lessons to stakeholders using various media platforms is also not emphasized, with most of such information important to improving extension services delivery in Malawi being shelved in the university library. Findings from the focus group discussions also highlighted the need for the extension curriculum to strengthen communication skills such as public speaking.

d. Information and communication technologies (ICTs)

Results of the survey confirm the findings reported by Agunga and Manda (2014) that extension workers in Malawi were not proficient in computer literacy and ICT skills. Much as they felt that ICT was important to support their work, they lacked the capacity to utilize it. Similarly, the discussants in the focus group discussions stressed on limited ICT related capacities as a challenge to knowledge management and effective delivery of extension services to the wider farming community. The limited competence in ICT may arise from inadequate coverage of ICT related topics in the undergraduate extension curriculum. Some of the topics not sufficiently covered include developing extension programs on radio and television, mobile phone services and social media, as well as ICT tools for networking, research, monitoring and evaluation. This has implications on the improving delivery of accessible and quality extension services in Malawi, especially in the contemporary digital world. It also undermines the efforts to achieve the country's vision of embracing Science Technology and Innovation as enabling factor to become a middle-income country (GoM, 2020).

e. Monitoring and evaluation

According to the study findings, the undergraduate extension curriculum generally covers the monitoring and evaluation thematic area well. The BSC in extension degree program at Bunda and the Diploma program at NRC have an entire course on monitoring and evaluation of extension and rural development. However, a review of the course content expose that both courses fail to provide students with practical skills and focus on theoretical topics such as key principles, concepts and philosophies of M&E. There is little coverage of new skills required in M and E such as use of online platforms (ODK, KOBO collect) to gather information, as well as use of mixed methods (qualitative and quantitative data collection techniques). Further, the current M&E course does not sufficiently help build extension workers' skills to share evaluation findings with stakeholders (e.g., through policy briefs, journals and stakeholder engagement workshops). The discussants in the focus group discussions also highlighted the need for extension workers to have skills in managing the knowledge generated through activities such as M and E.

f. Personal and professional development

The findings of the study show under-coverage in terms of personal and professional development for extension workers in the curriculum. A review of the undergraduate agriculture extension curriculum in Malawi shows that the curriculum is indeed more biased towards building the technical capacities of the extension workers with little effort in grooming their personal and professional development skills and competencies. The implication being that whilst extension workers may have the required technical skills, they may not be motivated to carry out their job requirements due to lack of clear personal development path. With no professional development, the extension workers may fail to deliver quality services that in large part hinge on leadership qualities, teamwork, ethics and a positive mindset.

g. Diversity and gender

On diversity and gender, the study findings reveal that there is generally good coverage on the subject by the undergraduate extension curriculum. However, some short-falls exist in the curriculum on topics related to the development of youth focused extension programs and the engagement of marginalized groups in extension programs. This indeed provides a true reflection of the curricula, much as they are specific courses that support the programming of women inclusive extension programs as well as programs that accommodate the needs of small-scale farmers. For example, the gender and development course offered both at NRC and Bunda or the needs assessment courses offered at Bunda (SEP II and III). There are no specific courses that profoundly build the skills and competencies of extension workers in developing youth centered extension programs or ways in which they should engage marginalized groups to ensure their participation in extension programs.

h. Marketing, brokering and value chain development

The study findings reveal that marketing, brokering and value chain development skills and competencies are important. However, there is still room for improvement in terms of their coverage in the undergraduate extension curriculum for Malawi. This could be because whilst both NRC and Bunda offer some courses on marketing and value chain development such as principles of marketing (Bunda), market-oriented extension (Bunda), entrepreneurship (Bunda), agriculture marketing (NRC), farm business management (NRC). Neither NRC nor Bunda offer courses that deeply cover brokering. For the marketing courses offered at NRC, much emphasis is put on principles of marketing and market-oriented farming with little focus on market linkages and value chain development. The issue of the curriculum putting more emphasis on production than entrepreneurship and market related courses was also highlighted during the focus group discussions. Chowa et al, (2013) also observed that extension services delivery in Malawi was biased towards production stages of the value chain.

i. Soft skills

Based on the study results, it was found that soft skills are critical for the successful implementation of extension work and that the undergraduate curriculum in Malawi covers them very well. This could be because the delivery of soft skills to extension workers is usually cross-cutting for all the courses offered by the undergraduate extension program. Most of the soft skills e.g., critical thinking, stress management, time management, problem solving, team work, leadership, interpersonal skills, flexibility, conflict management etc. are not only acquired from classroom sessions but largely from a range of other activities associated with the various courses in the program such as individual assignments, exams, group tasks, learning tours, and practical sessions.

j. Nutrition

The findings of the study show that nutrition is generally well covered by the undergraduate extension curriculum with only the topic on healthy diets being moderately covered. This

may particularly be true for NRC since it offers a full course on community nutrition. The course equips extension workers with essential knowledge and skills on nutrition problems identification and analysis, how to address nutrition issues, food types, their nutrition value and selection, storage, preparation, processing and nutrition needs for various vulnerable groups. Bunda on the other hand offers no course on nutrition for extension workers which is something that may need to be considered if the curriculum is to be revised. Extension work that supports farmers with nutrition knowledge is critical to aid utilization of the farm food produce "from farm to folk". It also undermines the country's vision to have a healthy population with improved life expectancy working towards the socioeconomic transformation (GoM, 2020).

k. Technical subject matter expertise

Technical subject matter expertise findings for this study reveal that these skills and competencies are important for the delivery of extension work and that overall, the curriculum covers them well. However, topics on different types of risks and uncertainties and the integration of indigenous knowledge were moderately covered. Lack of skills in indigenous knowledge integration for extension workers, could be in part the reason for the continued transfer of technology extension approach in Malawi. As highlighted in the study by Masangano et al. (2017), which states that the extension approach in Malawi is pre-dominantly top down with most of the knowledge on new technologies coming externally from researchers through extension workers to farmers. The disadvantage of this approach however being that it fails to support farmers needs based on their context. The incompetence of extension workers in harnessing, documenting, validating and integrating local knowledge, therefore paves way for the transfer of technology approach to continue dominating. As it serves as the only extension approach option that the extension workers can competently and are comfortable to use. The findings from the focus group discussions also shed light on how the current BSc program has focused on facilitation skills, whilst neglecting the technical skills that extension workers need to help farmers identify practical solutions to their farming problems in field crops, horticulture, floriculture, livestock, aquaculture and apiculture (bee keeping).

l. Appropriate ways to acquire core competencies

The study found that pre-service training, internship, basic induction training, in-service training and workshops or seminars appropriate were appropriate ways of acquiring process skills and competencies. Internship and pre-service training came first and second on the list respectively. Based on these findings, much as all the ways mentioned above were highlighted as good for extension workers to acquire skills and competencies, the in-school training opportunities such as Internship and preservice training stood out as the best ways for imparting knowledge and skills on extension work. This therefore means that compromising standards on how these two are delivered (i.e., Internship and preservice training), is a missed opportunity on the best ways in which extension workers could acquire knowledge, skills and competencies. Hence the need for a well-developed extension curriculum that supports an effective preservice training and internship program.

4.5.3 Major Barriers to Effective Implementation of Agricultural Extension Curricula

The study findings have revealed that implementation of extension curriculum in Malawi is not as smooth as one could imagine. There are several operational and institutional barriers at affect its effective implementation. For example, the curriculum fails to achieve its goals mainly because of the lack of quality faculty members to develop and deliver an effective curriculum; limited budget support and insufficient time for faculty members to deliver the course content. The discussants in the focus group discussions also mentioned several reasons why implementation of curriculum may fail. Generally, it was observed that universities receive inadequate support from stakeholders, probably because of poor networking of the university with relevant stakeholders. The drive to specialize the extension curriculum as also seen as causing problems since it made it difficult to implement an extension curriculum that address diverse and complex issues affecting agriculture in Malawi. These barriers have implications for implementing future curriculum. It means that no matter how good the extension curriculum could be designed, failure to address the barriers identified in this study will lead to minimal achievements.

CHAPTER 5 : CONCLUSIONS AND IMPLICATIONS FOR POLICY

5.1 Conclusions

The findings have revealed that overall,the respondents regarded all skills and competencies discussed in this study as essential for agricultural extension professionals i.e., program planning, program implementation, communication, ICT, M&E, personal and professional development, diversity and gender, marketing brokering and value chain development, soft skills, nutrition and technical subject matter expertise. On the one hand, the study has revealed that the respondents considered current undergraduate extension curricula as having a good coverage of some of the skills and competencies, especially the topic related to program implementation and soft skills needed by extension workers. On the other hand, there are several areas that the respondents perceived as not adequately covered in the curricula. The areas with gaps that need to be filled include resource mobilisation, administrative and financial management, ICT, progress reports, documentation of success stories, online surveys for M&E, evaluation report sharing with stakeholders and application of evaluation findings in scaling up programs, personal and professional development, development of youth programs, engagement of marginalised groups, marketing, brokering and value chain development, healthy diet, integration of indigenous knowledge, different types of risks and uncertainties. The study has also established areas that were not listed in the study tools, but were suggested by respondents to be included in the curricula of the undergraduate extension program. The suggested topic areas are related to policy formulation, interpretation and implementation.

The gaps identified in the current extension curricula have implications on the capacity of extension professionals to deliver quality services that respond to and satisfy the needs and demands of the clientele at all levels (from smallholder to large-scale farmers, as well as help the farming community to cope with and address the contemporary issues affecting agricultural development and rural livelihoods e.g., climate change, social and economic injustice, global pandemics (e.g., COVID-19) and climate change.

The study also established several barriers that affect implementation of the extension curriculum in Malawi. The barriers include the lack of quality faculty members to develop and deliver an effective curriculum; limited budget support and insufficient time for faculty members to deliver the course content; poor networking between the university and stakeholders (private, NGOs and government); and the drive to specialize extension programs whilst dropping the general agricultural and rural development topics.

5.2 Implications for Policy

Based on the findings of this study the following policy recommendations are put forward:

1. Improve Pre-service Education at Agricultural Colleges and Universities

Higher education institutions (Bunda and NRC) should revise their curricula for extension programs by incorporating the gaps identified in this study, mainly in areas related to resource mobilisation, administrative and financial management, ICT, knowledge management, ME&L, marketing, brokering and value chain development, as well as facilitating dialogues with diverse stakeholders (e.g., policy engagement). The new curricula should also prepare students to adapt to emerging issues that will potentially affect their capacity to deliver quality extension services (e.g., COVID-19 pandemic, climate change and economic and social-cultural shocks). Such complex issues faced in developing countries like Malawi, demands a shift from developing a highly theory-focused and specialised extension curricula (with emphasis on facilitation skills) to a more practical and generalised programme that embraces crossdisciplinarity (i.e., hard, soft and organisational skills combined with an understanding of diverse sectors that affect agricultural development and livelihoods).

2. Strengthen Agricultural Extension as a Field of Study

There is need to make agricultural extension an attractive and influential field of study and profession. The finding of this study that extension workers are not able to document and communicate their experiences and observations from activities such as M and E, means that the field fails to inform policy, practice and theory. It is not surprising that the field of extension has relied on other fields such as economics to shape the narrative about the performance and significance of extension to agricultural and rural development. Often, the outsiders' narrative is narrow and linear, and in some cases sympathetic and not empathetic or even misleading. To address these shortfalls, extension workers must take up the responsibility of documenting own case studies and shaping narratives about the performance of extension services, by communicating through diverse media, for example, policy briefs, short communicate, social media, blogs, websites and peer reviewed journals. This will make the profession known and attractive to students. It will also enable the professional to attract and justify for funding from government and development partners.

3. Improve In-service Training and Professional Development

The world is always changing, with new developments emerging in every sector including agriculture. These changes require the availability of extension professionals who can respond and adapt to new developments. Often, the skills acquired from the university tend to become irrelevant (even if the university curriculum that one went through was perfectly designed and implemented). Moreover, the demanded skills in the work places tend to change and hence one's training from the university is rendered irrelevant. This is why in-service training organized within the employing organization or a refresher program at the university should be strengthened. In addition, the university should not only have long term degree programs (e.g., four years), but also introduce short courses/modules that should be regularly updated in consultation with stakeholders. Sending extension workers to in-service training sessions has potential to increase their motivation and contribute to their professional development (e.g., their ability to take up new roles and solve problems at work and promotions in the organizational structure).

4. Capacity Building of University Extension Faculty

When the faculty members responsible for training extension workers do not have the needed exposure and competences in the field of extension, efforts to develop a good curriculum fail to yield desired outcomes. Poorly trained extension workers are one of the main reasons why an extension system could fail to respond to the demands of the clientele with quality services. Therefore, apart from increasing the number of faculty staff, it is of essence that investment in capacity building of those responsible for training extension workers must be prioritized. Some of the capacity building investments include:

- Long term postgraduate programs (i.e., minimum of PhD for lecturer, and MSc for technicians)
- Short courses within faculty, in the country, region and across the continent (at least twice in a year)
- Mentorship programs (mentors coming from with faculty and partner organizations)
- Linkages with the industry (faculty members learn from industry, and staff from the industry help to deliver content for some course offered by the university)
- Support visiting lecturers/professors from other partner universities within the region and across the continent (e.g., Michigan State University)

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Strengthening Agricultural Extension Training

Process Skills and Competency Gaps in Undergraduate Agricultural Extension Curriculum in Malawi

Dear Colleagues,

We are conducting an online survey under the 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. You are invited to participate in this study because you have experience with skills and competencies required for effective extension work.

Process skills and core competencies are basic sets of knowledge, skills, abilities, and behaviors that agricultural extension professionals require to perform their tasks well and respond to contingencies, change, and the unexpected. Please keep this definition in mind while you answer the survey questions. The skills and competencies we are researching are categorized as follows in the questionnaire:

1. Program planning
2. Program implementation
3. Communication
4. Information and communication technologies
5. Program monitoring and evaluation
6. Personal and professional development
7. Diversity and gender
8. Marketing, brokering and value chain development
9. Extension soft skills
10. Nutrition skills and competencies
11. Technical subject matter expertise

The findings will be shared with all important stakeholders of agricultural extension education/ training for undergraduate curricular revitalization in Nigeria, Malawi, Kenya, Uganda, and South Africa in specific, and other African countries in general.

The Institutional Review Board approval for human subjects research for this study was obtained from Michigan State University. Please know that your participation in this study is completely voluntary and the information you provide will be treated with strict confidentiality

and will only be used for research purposes. You can withdraw at any time or refuse to answer any questions.

It will take approximately 25 minutes to complete this survey. We recommend that you take this survey on a Desktop or Laptop computer. As a token of appreciation, all respondents will receive a soft copy of the research report. If you have any questions regarding the study, please do not hesitate to contact us.

Please follow this link to the Survey: Take the Survey

Or copy and paste the URL below into your internet browser:

https://msu.co1.qualtrics.com/jfe/preview/SV_eA7j51dpEPqrBau?Q_CHL=preview

Follow the link to opt out of future emails:

Click here to unsubscribe

Thank you for your time and cooperation.

Sincerely,

Research Partners from USA

- Prof. Murari Suvedi, Michigan State University, suvedi@msu.edu
- Prof. Saweda Liverpool-Tasie, Michigan State University, lliverp@msu.edu

Research Partners from Nigeria

- Prof. Agwu Ekwe Agwu, University of Nigeria, ekwe.agwu@unn.edu.ng
- Prof. Mabel Dimelu, University of Nigeria, mabel.dimelu@unn.edu.ng
- Dr. Ifeoma QuinetteAnugwa, University of Nigeria, ifeoma.irohibe@unn.edu.ng

Research Partners from Malawi

- Prof. Charity Chanza, Lilongwe University of Agriculture and Natural Resources, cchanza@luanar.ac.mw
- Dr. Frank Tchuwa, Lilongwe University of Agriculture and Natural Resources, ftchuwa@luanar.ac.mw

Research Partner from Uganda

- Prof. Margaret Mangheni, Makerere University, mnmangheni@gmail.com

Research Partner from Kenya

- Dr. Agnes Oywaya-Nkurumwa, Egerton University, aoywaya@egerton.ac.ke

Research Partners from South Africa

- Dr. Kristin Davis, IFPRI; University of Pretoria, K.Davis@cgiar.org
- Ms. Lindie von Maltitz, University of the Free State, vonmaltitzl@ufs.ac.za

Research Partner from India

- Prof. P.V.K. Sasidhar, Indira Gandhi National Open University, pvksasidhar@ignou.ac.in

Strengthening Agricultural Extension Training

Process Skills and Competency Gaps in Undergraduate Agricultural Extension Curriculum in Malawi

1. Primarily which country's extension system do you represent? (Check one)
   - Nigeria
   - Malawi
   - Uganda
   - South Africa
   - Kenya
   - Others (Please specify the other country not listed above) _____)
2. Which university (ies) do you have deep knowledge of undergraduate education in agriculture or allied subjects? (Please write the university name(s)_____)
3. What is your current position? (Check one)
   - Extension Staff in a University
   - Extension Researcher
   - Public Sector Extension Professional
   - Private Sector Extension Professional
   - NGO Extension Professional
   - Employer of Agriculture Graduates
   - Any other (Please specify) ----------
4. Are you familiar with current undergraduate level agricultural extension curriculum in the country or institution in questions 1 and 2?
   - Familiar
   - Not familiar

Instructions: Questions A through K have two components: first you will rate the importance of each competency, and the second, you rate how well the undergraduate extension curriculum covers this competency. Please rate the importance and the level of competency on each statement on a 1 to 5 scale as explained below.

How important is this skill or competency for an extension worker?	Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?
1. Not Important 2. Somewhat Important 3. Moderately important 4. Important 5. Very Important Please check a box (✓) for each statement that best represents your opinion.	1. Not at All Covered 2. Minimally Covered 3. Moderately Covered 4. Well Covered 5. Very Well Covered Please check a box (✓) for each statement that best represents your opinion.

A. Program Planning Skills and Competencies:

Job skills and competencies: Extension professionals should be:		A01					A02				
		How important is this skill or competency for an extension worker?					Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Familiar with the vision, mission and goals of National /State (sub-national) extension service and agricultural development strategies, programs, and policies.										
2	Able to conduct needs assessment and engage stakeholders to prioritize local needs.										
3	Able to conduct baseline or benchmark studies.										
4	Able to mobilize resources / funds to address priority needs.										
5	Able to engage local stakeholders (e.g. NGOs, cooperatives, local agro-dealers) in extension program planning.										

Job skills and competencies: Extension professionals should be:		A01 How important is this skill or competency for an extension worker?					A02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
6	Familiar with administrative and financial rules of their respective organizations (to utilize human and financial resources in extension programs).										

B. Program Implementation Skills and Competencies:

Job skills and competencies: Extension professionals should:		B01 How important is this skill or competency for an extension worker?					B02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Coordinate local extension programs and activities.										
2	Demonstrate teamwork skills to achieve extension results.										
3	Able to form farmers groups and support them.										
4	Engage local stakeholders (e.g., NGOs, Self Help Groups, Cooperatives) in implementing extension programs.										
5	Demonstrate negotiation skills to reach consensus and resolve conflicts.										

Job skills and competencies: Extension professionals should:		B01 How important is this skill or competency for an extension worker?					B02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
6	Follow participatory decision-making in extension work.										
7	Delegate responsibilities to staff as needed.										
8	Be able to engage minority groups (e.g. Female farmers and youth development groups) in extension work.										
9	Integrate private or public-private partnerships in extension service provision.										

C. Communication Skills and Competencies:

Job skills and competencies: Extension professionals should be able to:		C01 How important is this skill or competency for an extension worker?					C02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Select appropriate communication methods.										
2	Establish communication with different stakeholders.										
3	Respect local culture while communicating with clients.										
4	Prepare required progress reports.										

Job skills and competencies: Extension professionals should be able to:		C01 How important is this skill or competency for an extension worker?					C02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
5	Share success stories and lessons-learned with stakeholders through various media.										
6	Use extension methods (e.g., individual, group and mass contact methods) to disseminate information about extension activities and programs.										
7	Demonstrate good listening skills and listen to all clients and stakeholders.										
8	Demonstrate good public speaking and presentation skills.										

D. Information and Communication Technologies (ICTs) Skills and Competencies:

Job skills and competencies: Extension professionals should be able to use:		D01 How important is this skill or competency for an extension worker?					D02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Microsoft Word for word processing (e.g., typing, editing, printing) and designing graphics.										
2	Data entry and analysis software such as Excel, SPSS etc.										

3	Microsoft Power Point for making presentations.										
4	Audio-visual aids such as charts, graphs, and puppet show for teaching and learning.										
5	Mass media like FM radio stations and television channels for communication.										
6	Computers (email, Internet) for communication.										
7	Mobile phone services (e.g., texting, SMS service) for communication.										
8	Social media (WhatsApp, Facebook, Twitter, Instagram, etc.) for communication.										
9	ICT tools to improve access to information, knowledge, technologies and other innovations.										
10	ICT tools to enhance collaboration and partnerships.										
11	ICT tools for collecting data, monitoring, and evaluation of extension programs.										

E. Program Monitoring and Evaluation Skills and Competencies:

Job skills and competencies: Extension professionals:		E01					E02				
		How important is this skill or competency for an extension worker?					Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Understand theories and principles of monitoring and evaluation.										

Job skills and competencies: Extension professionals:		E01 How important is this skill or competency for an extension worker?					E02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
2	Conduct monitoring and evaluation of extension programs.										
3	Develop data collection instruments - interview schedules / questionnaires- for monitoring and evaluation of extension programs.										
4	Conduct online surveys for monitoring and evaluation of extension programs.										
5	Apply qualitative tools and techniques (e.g., focus group discussion, case study etc.) to collect evaluation data.										
6	Apply quantitative tools and techniques (e.g., survey, interview, farm data, etc.) to collect evaluation data.										
7	Analyze data (qualitative and quantitative).										
8	Interpret data (qualitative and quantitative).										
9	Write evaluation report.										
10	Share evaluation reports within their organizations and with stakeholders.										

	Job skills and competencies: Extension professionals:	E01 How important is this skill or competency for an extension worker?					E02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
11	Apply the evaluation findings in replicating/scaling-up of extension programs.										

F. Personal and Professional Development Skills and Competencies:

	Job skills and competencies: Extension professionals should:	F01 How important is this skill or competency for an extension worker?					F02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Apply principles of good governance (i.e., clients participation, accountability and transparency) in extension work.										
2	Show commitment to career advancement (participate in lifelong learning, in-service training, professional development events and conferences).										
3	Apply professional ethics in extension work i.e., promote research-based recommendation or technology.										
4	Follow organizational policies and directives for professional development.										
5	Demonstrate honesty and positive attitude towards extension work.										

G. Diversity and Gender Skills and Competencies:

	Job skills and competencies: Extension professionals should:	G01 How important is this skill or competency for an extension worker?					G02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Understand that diversity exists within and among clients and stakeholders.										
2	Identify the needs of small-scale farmers.										
2	Identify the needs of minority groups.										
3	Develop extension programs to benefit women farmers.										
4	Develop extension programs to benefit youth.										
5	Engage marginalized and vulnerable groups in extension programs (e.g. disabled, resource poor farmers).										
6	Do teamwork with diverse staffs.										

H. Marketing, Brokering and Value Chain Development Skills and Competencies

	Job skills and competencies: Extension professionals should:	H01 How important is this skill or competency for an extension worker?					H02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Have basic knowledge of agri-business development.										
2	Apply brokering / advisory skills in agri-business development.										

Job skills and competencies: Extension professionals should:		H01 How important is this skill or competency for an extension worker?					H02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
3	Have knowledge on different agricultural markets and linkages.										
4	Demonstrate knowledge of value chain logistics and input-output linkages in the value chain.										
5	Facilitate entrepreneurship development among extension clientele.										
6	Be able to link farmers producers' organizations / cooperatives / agri-business companies with extension.										

I. Extension Soft Skills and Competencies

Job skills and competencies: Extension professionals possess the other soft skills like:		I01 How important is this skill or competency for an extension worker?					I02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Critical thinking										
2	Problem solving										
3	Time management										
4	Stress management										
5	Leadership										
6	Teamwork										
7	Flexibility										
8	Self-motivation										

Job skills and competencies: Extension professionals possess the other soft skills like:		I01 How important is this skill or competency for an extension worker?					I02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
9	Interpersonal skills										
10	Positive work attitude										
11	Collaboration										
12	Conflict management										
13	Group formation and development										
14	Negotiation skills										
15	Networking skills										
16	Facilitation skills										
17	Creativity /Innovativeness										

J. Nutrition Skills and Competencies

Job skills and competencies: Extension professionals should:		J01 How important is this skill or competency for an extension worker?					J02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Demonstrate basic human nutrition knowledge (e.g., food composition, balanced diet, supplements, nutritional composition of various foods, nutrition deficiency symptoms etc).										
2	Understand lifecycle nutrition needs of different household members (e.g ., children of various age groups, pregnant and breastfeeding mothers, elderly).										

Job skills and competencies: Extension professionals should:		J01 How important is this skill or competency for an extension worker?					J02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
3	Able to advise families on what crops and livestock to be produced to ensure balanced diets.										
4	Advise families to improve gender relations for increased agriculture production and nutrition.										
5	Demonstrate postharvest handling technologies that conserve nutrients and food safety (e.g. food storage, freezing fruits and vegetables, making pickles, jams, jellies).										
6	Have basic knowledge about food labeling (e.g., organic foods).										
7	Able to advise on healthy diet (e.g., for fitness and sports, diabetes, cancer and AIDS/HIV, heart health, kidney disease, osteoporosis; weight loss and obesity).										

K. Technical Subject Matter Expertise/Skills and Competencies

Job skills and competencies: Extension professionals should:		J01 How important is this skill or competency for an extension worker?					J02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Demonstrate technical knowledge in their basic discipline (e.g., field crops / livestock/ fishery/ horticulture etc).										

Job skills and competencies: Extension professionals should:		J01 How important is this skill or competency for an extension worker?					J02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
2	Understand adult learning principles and hold practical skills required to teach improved farming practices.										
3	Understand the new technology being promoted, i.e., what it is, why, and how it works.										
4	Facilitate farmers to access inputs and services (e.g., credit, seed, fertilizers, feed, artificial insemination, etc.)										
5	Be able to educate community members about different types of risks and uncertainties (e.g., due to market fluctuations, natural disasters, etc.).										
6	Be able to educate community members about climate change and climate smart agriculture.										
7	Refer to and make use of publications--journals, research reports, etc.										
8	Generating knowledge or producing research reports / journal publications.										
9	Able to harness, document, validate and integrate local / indigenous knowledge.										
10	Understand social system under which farming takes place (e.g., rural sociology knowledge).										

L. Additional Information about Competencies: If you feel there are additional job skills and competencies that extension professionals need, but are not listed above, please write them in the spaces below:

1.

2.

3.

4.

M. How can we make agricultural extension curriculum robust and practical? Please rate the following strategies:

Strategies for Improvement	Already exists	Good to have	Important	Essential
Provide practical and contemporary skills (e.g., through mentored internship or attachment to a progressive farmer in a crop season).				
Include various soft skills in extension curriculum.				
Include business management concepts and practices in extension curriculum.				
Expose students to market opportunities, linking farmers with service providers, and develop entrepreneurship.				
Grooming students with broad-based general agricultural courses (e.g., crop and animal production, postharvest, marketing, and joint ventures) along with extension training.				
Incorporate youth development, gender issues, urban/sub-urban agriculture, and climate change concepts in extension curriculum.				
Recruit extension faculty carefully.				
Include research and data analytical skills.				
Offer training of trainer workshops for extension faculty members.				
Develop cutting-edge and practical teaching learning resources – extension textbooks, practical handbooks, training manual, etc.				
Undergraduate extension curriculum/pedagogy should be more ICT oriented				

N. What are the appropriate ways to acquire the above-mentioned core competencies? Please rate each way or mechanism on a scale given below:

Ways to acquire core competencies:	Not appropriate	Somewhat appropriate	Appropriate	Very appropriate
Through **Preservice Training** by revising or updating the curriculum.				
Requiring **Internship** at various work environments (i.e., Public Institutions, NGOs, Private Companies, etc.) during UG, PG, or PhD programs.				
Through **Basic Induction Training** (e.g., job orientation training at the beginning of job)				
Through **In-service Training** (e.g., training offered during the employment at Universities, Training Institutes/Centers, etc.)				
Providing opportunities to attend **trainings,** seminars, workshops, webinars, etc.				

O. If you feel there are additional appropriate ways to acquire process skills or competencies but are not listed above, please write them in the space below.

P. What are the major barriers to effective implementation of extension training curriculum in your country? Please check all that apply.

- Development of an effective extension curriculum
- Quality faculty to teach extension courses
- Quality textbooks and/or manuals
- Classroom and demonstration farms or facilities
- Accreditation
- Time constraint
- Budget to support practical learning experience (e.g. filed visits and demonstrations)

- Student motivation to study extension and in practical extension work
- Teacher motivation to teach requited process skills and competencies
- Other (please specify) _____

Q. What is your age now (in years)? _____

R. What is your gender?

____ Woman

____ Man

S. What is your highest level of education? Select (P) one that applies.

____Bachelor's degree

____Master's degree

____Doctoral (Ph.D.) degree

____Other (please specify_____)

T. How long have you served in extension profession extension or agriculture related fields? (Write total number of years you have worked in extension). _____

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

Thank you for taking the time to complete this survey!

Strengthening Agricultural Extension Training

Process Skills and Competency Gaps in Undergraduate Agricultural Extension Curriculum in Malawi

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)

Sample of Introductory Page & FGD Questions

Strengthening Agricultural Extension Training

Process Skills and Competency Gaps in Undergraduate Agricultural Extension Curriculum in Malawi

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 Focus Group 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!

Table 1: Program Planning Skills and Competencies among Agricultural Extension Professionals in Malawi (N=33)

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD)	Mean difference	t-value (2-tailed sig)
Familiar with the vision, mission and goals of National /State (sub-national) extension service and agricultural development strategies, programs, and policies.	4.82 (0.58)	3.76 (0.78)	1.06	6.28 (0.00)
Able to conduct needs assessment and engage stakeholders to prioritize local needs.	4.85 (0.44)	3.62 (0.78)	1.24	7.80 (0.00)
Able to conduct baseline or benchmark studies.	4.62 (0.55)	3.65 (0.95)	0.97	5.21 (0.00)
Able to mobilize resources/funds to address priority needs.	4.26 (0.96)	3.06 (1.01)	1.21	5.52 (0.00)
Able to engage local stakeholders (e.g., NGOs, cooperatives, local agro-dealers) in extension program planning.	4.68 (0.64)	3.71 (0.91)	0.97	4.96 (0.00)
Familiar with administrative and financial rules of their respective organizations (to utilize human and financial resources in extension programs).	4.42 (0.66)	3.21 (1.02)	1.21	6.27 (0.00)
Index	4.64 (0.40)	3.50 (0.68)	1.14	8.10 (0.00)

* *Scale for Importance: 1 = Not important, 2 = somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for Coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

Table 2: Program Implementation Skills and Competenciesamong Agricultural Extension Professionals in Malawi(N=32)

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD)	Mean difference	t-value (2-tailed sig)
Coordinate local extension programs and activities.	4.85 (0.36)	3.61 (0.93)	1.24	7.13 (0.00)
Demonstrate teamwork skills to achieve extension results.	4.82 (0.39)	4.03 (0.73)	0.79	6.12 (0.00)
Able to form farmers' groups and support them.	4.76 (0.44)	3.82 (1.01)	0.94	4.83 (0.00)
Engage local stakeholders (e.g., NGOs, Self Help Groups, Cooperatives) in implementing extension programs.	4.79 (0.42)	3.73 (0.91)	1.06	5.46 (0.00)
Demonstrate negotiation skills to reach consensus and resolve conflicts.	4.67 (0.54)	3.52 (0.80)	1.15	7.30 (0.00)
Follow participatory decision-making in extension work.	4.82 (0.39)	4.06 (0.83)	0.76	5.02 (0.00)
Delegate responsibilities to staff as needed.	4.36 (0.78)	3.64 (0.78)	0.73	4.28 (0.00)
Be able to engage minority groups (e.g., Female farmers and youth development groups) in extension work.	4.66 (0.48)	3.56 (0.91)	1.09	6.22 (0.00)
Integrate private or public-private partnerships in extension service provision.	4.58 (0.66)	3.45 (1.09)	1.12	5.29 (0.00)
Index	4.72 (0.25)	3.71 (0.65)	1.01	8.05 (0.00)

* *Scale for Importance: 1 = Not important, 2 = somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for Coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

Table 3 : Communication Skills and Competencies among Agricultural Extension Professionals in Malawi (N=31)

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD)	Mean difference	t-value (2-tailed sig)
Select appropriate communication methods.	4.84 (0.37)	3.84 (0.81)	1.00	5.95 (0.00)
Establish communication with different stakeholders.	4.78 (0.49)	3.75 (0.92)	1.03	5.34 (0.00)
Respect local culture while communicating with clients.	4.78 (0.42)	4.00 (0.95)	0.78	4.25 (0.00)
Prepare required progress reports.	4.74 (0.51)	3.39 (1.17)	1.35	6.02 (0.00)
Share success stories and lessons-learned with stakeholders through various media.	4.65 (0.61)	3.39 (0.92)	1.26	6.07 (0.00)
Use extension methods (e.g., individual, group and mass contact methods) to disseminate information about extension activities and programs.	4.91 (0.30)	4.16 (0.81)	0.75	5.28 (0.00)
Demonstrate good listening skills and listen to all clients and stakeholders.	4.63 (0.61)	3.88 (1.01)	0.75	3.56 (0.00)
Demonstrate good public speaking and presentation skills.	4.84 (0.37)	3.88 (0.91)	0.97	5.48 (0.00)
Index	4.77 (0.30)	3.78 (0.70)	0.99	7.01 (0.00)

* *Scale for Importance: 1 = Not important, 2 = somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for Coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

Table 4: ICTs Skills and Competencies among Agricultural Extension Professionals in Malawi(N=31)

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD)	Mean difference	t-value (2-tailed sig)
Microsoft Word for word processing (e.g., typing, editing, printing) and designing graphics.	4.71 (0.53)	3.74 (1.09)	0.97	4.61 (0.00)
Data entry and analysis software such as Excel, SPSS etc.	4.74 (0.58)	3.58 (1.23)	1.16	5.89 (0.00)
Microsoft Power Point for making presentations.	4.81 (0.40)	4.06 (1.12)	0.74	4.00 (0.00)
Audio-visual aids such as charts, graphs, and puppet show for teaching and learning.	4.74 (0.51)	3.58 (1.39)	1.16	5.21 (0.00)
Mass media like FM radio stations and television channels for communication.	4.61 (0.62)	3.39 (1.17)	1.23	5.81 (0.00)
Computers (email, Internet) for communication.	4.77 (0.43)	3.55 (1.12)	1.23	5.67 (0.00)
Mobile phone services (e.g., texting, SMS service) for communication.	4.61 (0.56)	3.29 (1.24)	1.32	6.32 (0.00)
Social media (WhatsApp, Facebook, Twitter, Instagram, etc.) for communication.	4.45 (0.89)	2.94 (1.12)	1.52	7.33 (0.00)
ICT tools to improve access to information, knowledge, technologies and other innovations.	4.81 (0.40)	3.06 (1.18)	1.74	8.86 (0.00)
ICT tools to enhance collaboration and partnerships.	4.65 (0.55)	3.13 (1.12)	1.52	6.84 (0.00)
ICT tools for collecting data, monitoring, and evaluation of extension programs.	4.71 (0.46)	3.03 (1.17)	1.68	7.48 (0.00)
Index	4.69 (0.33)	3.40 (0.92)	1.30	8.92 (0.00)

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Table 5 : Program Monitoring and Evaluation Skills and Competencies among Agricultural Extension Professionals in Malawi(N=28)

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD)	Mean difference	t-value (2-tailed sig)
Understand theories and principles of monitoring and evaluation.	4.62 (0.62)	3.66 (0.90)	0.97	5.11 (0.00)
Conduct monitoring and evaluation of extension programs.	4.59 (0.78)	3.52 (0.91)	1.07	5.40 (0.00)
Develop data collection instruments - interview schedules / questionnaires- for monitoring and evaluation of extension programs.	4.63 (0.72)	3.90 (0.84)	0.73	4.43 (0.00)
Conduct online surveys for monitoring and evaluation of extension programs.	4.60 (0.62)	3.07 (1.11)	1.53	7.39 (0.00)
Apply qualitative tools and techniques (e.g., focus group discussion, case study etc.) to collect evaluation data.	4.70 (0.53)	3.67 (1.03)	1.03	5.15 (0.00)
Apply quantitative tools and techniques (e.g., survey, interview, farm data, etc.) to collect evaluation data.	4.69 (0.60)	3.76 (0.87)	0.93	5.67 (0.00)
Analyze data (qualitative and quantitative).	4.60 (0.77)	3.60 (0.97)	1.00	4.35 (0.00)
Interpret data (qualitative and quantitative).	4.73 (0.58)	3.60 (0.89)	1.13	6.62 (0.00)
Write evaluation report.	4.76 (0.51)	3.55 (0.95)	1.21	6.20 (0.00)
Share evaluation reports within their organizations and with stakeholders.	4.80 (0.55)	3.40 (0.97)	1.40	7.39 (0.00)
Apply the evaluation findings in replicating/ scaling-up of extension programs.	4.77 (0.50)	3.20 (1.00)	1.57	7.18 (0.00)
Index	4.69 (0.49)	3.49 (0.73)	1.20	7.74 (0.00)

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Table 6 : Personal and Professional Development Skills and Competencies among Agricultural Extension Professionals in Malawi(N=29)

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD)	Mean difference	t-value (2-tailed sig)
Apply principles of good governance (e.g., client's participation, accountability and transparency) in extension work.	4.62 (0.62)	3.31 (0.85)	1.31	6.79 (0.00)
Show commitment to career advancement (participate in lifelong learning, in-service training, professional development events and conferences).	4.72 (0.53)	3.38 (1.05)	1.34	6.17 (0.00)
Apply professional ethics in extension work i.e., promote research-based recommendation or technology.	4.79 (0.49)	3.31 (1.07)	1.48	7.12 (0.00)
Follow organizational policies and directives for professional development.	4.66 (0.55)	3.21 (0.94)	1.45	7.39 (0.00)
Demonstrate honesty and positive attitude towards extension work.	4.72 (0.53)	3.41 (1.02)	1.31	6.79 (0.00)
Index	4.70 (0.43)	3.32 (0.83)	1.38	8.21 (0.00)

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Table 7 : Diversity and Gender Skills and Competencies among Agricultural Extension Professionals in Malawi(N=28)

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD)	Mean difference	t-value (2-tailed sig)
Understand that diversity exists within and among clients and stakeholders.	4.76 (0.44)	3.66 (1.01)	1.10	5.87 (0.00)
Identify the needs of small-scale farmers.	4.86 (0.35)	3.79 (1.05)	1.07	5.99 (0.00)
Identify the needs of minority groups.	4.82 (0.39)	3.46 (0.92)	1.36	6.76 (0.00)
Develop extension programs to benefit women farmers.	4.72 (0.53)	3.45 (0.91)	1.28	6.90 (0.00)
Develop extension programs to benefit youth.	4.79 (0.41)	3.24 (1.12)	1.55	7.06 (0.00)
Engage marginalized and vulnerable groups in extension programs (e.g., disabled, resource poor farmers).	4.79 (0.49)	3.24 (0.91)	1.55	7.68 (0.00)
Do teamwork with diverse staffs.	4.79 (0.49)	3.66 (0.94)	1.14	6.43 (0.00)
Index	4.82 (0.31)	3.51 (0.82)	1.31	8.11 (0.00)

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Table 8 : Marketing, Brokering and Value Chain Development Skills and Competencies among Agricultural Extension Professionals in Malawi(N=29)

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD)	Mean difference	t-value (2-tailed sig)
Have basic knowledge of agribusiness development.	4.79 (0.49)	3.55 (0.78)	1.24	8.50 (0.00)
Apply brokering / advisory skills in agribusiness development.	4.66 (0.55)	3.24 (0.87)	1.41	7.48 (0.00)
Have knowledge on different agricultural markets and linkages.	4.76 (0.51)	3.34 (0.97)	1.41	7.23 (0.00)
Demonstrate knowledge of value chain logistics and input-output linkages in the value chain.	4.79 (0.49)	3.31 (0.97)	1.48	7.33 (0.00)
Facilitate entrepreneurship development among extension clientele.	4.76 (0.51)	3.24 (0.83)	1.52	8.00 (0.00)
Be able to link farmers producers' organizations/cooperatives/agribusiness companies with market.	4.90 (0.31)	3.52 (0.95)	1.38	7.08 (0.00)
Index	4.78 (0.38)	3.37 (0.73)	1.41	9.16 (0.00)

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Table 9 : Extension Soft Skills and Competencies among Agricultural Extension Professionals in Malawi(N=26)

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD)	Mean difference	t-value (2-tailed sig)
Critical thinking	4.79 (0.62)	3.41 (0.95)	1.38	7.59 (0.00)
Problem solving	4.62 (0.68)	3.66 (0.81)	0.97	6.68 (0.00)
Time management	4.64 (0.68)	3.54 (0.92)	1.11	6.39 (0.00)
Stress management	4.52 (0.83)	3.24 (1.12)	1.28	4.87 (0.00)
Leadership	4.79 (0.50)	3.71 (0.85)	1.07	7.40 (0.00)
Teamwork	4.76 (0.51)	3.62 (0.90)	1.14	6.19 (0.00)
Flexibility	4.66 (0.61)	3.52 (0.87)	1.14	6.43 (0.00)
Self-motivation	4.62 (0.56)	3.59 (0.87)	1.03	5.90 (0.00)
Interpersonal skills	4.76 (0.51)	3.62 (0.94)	1.14	5.61 (0.00)
Positive work attitude	4.62 (0.62)	3.45 (1.02)	1.17	5.41 (0.00)
Collaboration	4.66 (0.61)	3.72 (0.80)	0.93	5.67 (0.00)
Conflict management	4.59 (0.75)	3.56 (0.97)	1.04	5.73 (0.00)
Group formation and development	4.83 (0.38)	4.03 (0.82)	0.79	4.54 (0.00)
Negotiation skills	4.69 (0.54)	3.62 (0.94)	1.07	5.40 (0.00)
Networking skills	4.59 (0.63)	3.66 (0.86)	0.93	4.70 (0.00)
Facilitation skills	4.86 (0.36)	3.93 (0.66)	0.93	7.41 (0.00)
Creativity / Innovativeness	4.72 (0.45)	3.66 (0.94)	1.07	5.57 (0.00)
Index	4.69 (0.48)	3.64 (0.66)	1.05	7.89 (0.00)

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Table 10 : Nutrition Skills and Competencies among Agricultural Extension Professionals in Malawi(N=28)

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD)	Mean difference	t-value (2-tailed sig)
Demonstrate basic human nutrition knowledge (e.g., food composition, balanced diet, supplements, nutritional composition of various foods, nutrition deficiency symptoms etc.).	4.54 (0.64)	3.57 (0.96)	0.96	4.93 (0.00)
Understand lifecycle nutrition needs of different household members (e.g., children of various age groups, pregnant and breastfeeding mothers, elderly).	4.48 (0.57)	3.69 (0.76)	0.79	4.74 (0.00)
Able to advise families on what crops and livestock to be produced to ensure balanced diets.	4.69 (0.54)	3.72 (0.70)	0.97	6.32 (0.00)
Advise families to improve gender relations for increased agriculture production and nutrition.	4.76 (0.44)	3.72 (0.80)	1.03	7.16 (0.00)
Demonstrate postharvest handling technologies that conserve nutrients and food safety (e.g., food storage, freezing fruits and vegetables, making pickles, jams, jellies).	4.69 (0.54)	3.55 (0.99)	1.14	5.30 (0.00)
Have basic knowledge about food labeling (e.g., organic foods).	4.69 (0.66)	3.48 (0.99)	1.21	5.52 (0.00)
Able to advise on healthy diet (e.g., for fitness and sports, diabetes, cancer and AIDS/HIV, heart health, kidney disease, osteoporosis; weight loss and obesity).	4.55 (0.69)	3.31 (1.11)	1.24	5.04 (0.00)
Index	4.62 (0.45)	3.54 (0.63)	1.08	7.67 (0.00)

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Table 11 : Technical Subject Matter Expertise among Agricultural Extension Professionals in Malawi(N=27)

Extension professionals should be:	How important is this skill or competency for an extension worker?* Mean (SD)	How well does the undergraduate extension curriculum cover this skill or competency?** Mean (SD)	Mean difference	t-value (2-tailed sig)
Demonstrate technical knowledge in their basic discipline (e.g., field crops/ livestock/fishery/horticulture, etc.).	4.75 (0.65)	3.89 (1.07)	0.86	5.35 (0.00)
Understand adult learning principles and hold practical skills required to teach improved farming practices.	4.72 (0.65)	4.07 (0.96)	0.66	4.33 (0.00)
Understand the new technology being promoted, i.e., what it is, why, and how it works.	4.69 (0.66)	3.79 (0.94)	0.90	5.36 (0.00)
Facilitate farmers to access inputs and services (e.g., credit, seed, fertilizers, feed, artificial insemination, etc.)	4.66 (0.67)	3.45 (1.18)	1.21	5.67 (0.00)
Be able to educate community members about different types of risks and uncertainties (e.g., due to market fluctuations, natural disasters, etc.).	4.59 (0.73)	3.38 (1.24)	1.21	5.14 (0.00)
Be able to educate community members about climate change and climate smart agriculture.	4.59 (0.73)	3.55 (1.02)	1.03	5.30 (0.00)
Refer to and make use of publications--journals, research reports, etc.	4.59 (0.87)	3.48 (1.09)	1.10	5.19 (0.00)
Generating knowledge or producing research reports / journal publications.	4.52 (0.83)	3.52 (1.02)	1.00	5.04 (0.00)
Able to harness, document, validate and integrate local / indigenous knowledge.	4.54 (0.96)	3.32 (1.16)	1.21	5.23 (0.00)

Understand social system under which farming takes place (e.g., rural sociology knowledge).	4.59 (0.73)	3.55 (1.15)	1.03	5.48 (0.00)
Index	4.64 (0.64)	3.56 (0.85)	1.08	7.53 (0.00)

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About This Document

Although there have been few studies on core competencies of extension professionals in sub-Saharan Africa, a systematic assessment of undergraduate (UG) agricultural extension curriculum, the gaps, and ways to improve the curriculum in Malawi was lacking. This AAP-PIRA research project assessed the process skills and competency gaps in UG agricultural extension curriculum in Malawi 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? Overall, the findings revealed that, the current UG extension curricula have a good coverage of program implementation and soft skills, but there is a significant gap between existing level of importance and level of coverage of other core competencies. The study also established several barriers that affect curriculum implementation. The authors identify and recommend 11 process skills and core competencies with 97 subcompetencies to improve pre-service education at agricultural colleges and universities in Malawi.

Lead Researchers

Charity Chanza
Malawi • Lilongwe University of Agriculture and Natural Resources • cchanza@luanar.ac.mw

Frank Tchuwa
Malawi • Lilongwe University of Agriculture and Natural Resources • ftchuwa@luanar.ac.mw

Ifeoma Quinette Anugwa
Nigeria • University of Nigeria, Nsukka • ifeoma.irohibe@unn.edu.ng

Saweda Liverpool-Tasie
USA • Michigan State University • lliverp@msu.edu

Dimelu Mabel Ukamaka
Nigeria • University of Nigeria, Nsukka • mabel.dimelu@unn.edu.ng

Agwu Ekwe Agwu
Nigeria • University of Nigeria, Nsukka • ekwe.agwu@unn.edu.ng

Murari Suvedi
USA • Michigan State University • suvedi@msu.edu

P.V.K. Sasidhar
India • Indira Gandhi National Open University • pvksasidhar@ignou.ac.in

Alliance for African Partnership
Michigan State University
International Center
427 N. Shaw Lane, Room 202
East Lansing, Michigan 48824
aap@msu.edu • aap.isp.msu.edu

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