

AGRoECOlogical FARMing Master Programme for a sustainable agriculture in West Africa



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1 ABBREVIATIONS

FAO	Food and Agriculture Organization of the United Nations
HEI	Higher Education Institutions
HLPE	High Level Panel of Experts on Food Security and Nutrition
HND	High National Diploma
IFAD	International Fund for Agricultural Development
ILCA	International Livestock Centre for Africa
MPhil	Master of Philosophy
MSc	Master of Science
ND	National Diploma
SDGs	Sustainable Development Goals
TVET	Technical and Vocational Education and Training
UENR	University of Energy and Natural Resources
UNICEF	United Nations Children's Fund
WFP	World Food Programme
WHO	World Health Organization





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2 EXECUTIVE SUMMARY

The path of our food systems is critically unsustainable, necessitating an urgent transition. Dominant food systems, with their reliance on specialization, uniformization, and mechanization, stand as major drivers of adverse effects within these systems. The impacts are profound and multifaceted, encompassing the degradation of natural resources, significant biodiversity loss, ongoing hunger and malnutrition, the proliferation of non-communicable food-related diseases, and increased vulnerability of small-scale farmers. These challenges are further compounded by climate change, which exacerbates water scarcity, alters growing seasons, and increases the frequency of extreme weather events, adding complexity to an already strained agricultural landscape. Furthermore, conflicts around the world, such as the acute crisis in Ukraine, the Middle East, numerous African countries, and other regions, have significantly exacerbated pressures on global food supply chains. Ukraine, as a crucial provider of grains and other agricultural outputs, has brought to light the vulnerability of food systems due to geopolitical unrest and conflict, highlighting an acute need for practices that bolster sustainability and resilience. This scenario has cast a light on the fragility of our food systems, underscoring the critical need for a shift towards agricultural models that are not only sustainable but are also robust enough to withstand the multifaceted challenges posed by climate change, biodiversity loss, and international conflicts. Those models require a holistic food system approach transcending isolated interventions and short-term solutions. They necessitate a comprehensive view that connects agriculture, environment, trade, health, and more, expanding the range of possibilities for achieving sustainability. Agroecology emerges as a transformative solution, offering benefits across all dimensions of sustainability, including food security. As a science, practice, and social movement, agroecology tackles the root causes of imbalances within food systems, fostering social, economic, and environmental resilience. It leverages natural synergies and diversity, enhancing ecosystem services, regenerating soils, and ensuring equitable and sustainable livelihoods for all food system actors.





Current trends indicate that agroecology is increasingly being included in curricula in academic institutions around the world, particularly in Europe and Latin America. However, despite the widespread adoption of agroecological practices by practitioners in West Africa, universities in the region¹ have not followed this path as closely, resulting in fewer master's courses and academic programs focused on agroecology. As a result, the AGRECOFARM project was developed to actively increase the relevance, quality and responsiveness of higher education institutions in Ghana, Nigeria and Sierra Leone. The project's objective is to introduce and advance the skills of the academic staff, students as well as agricultural extension staff in partner counties in Higher Education Institutions (HEIs) through the development of new curricula and MSc programmes that integrate theory and practice on the latest developments of applied research in agroecological practices and techniques for sustainable agricultural productions. Under the AGRECOFARM project, Work Package 2 (WP2) aims to survey and identify the existing HEI programmes in West Africa on sustainable farming and agroecological technologies and similar lifelong learning/Technical and Vocational Education and Training (TVET) programmes. Questionnaires were developed to gather information from academic institutions in Ghana, Nigeria and Sierra Leone and identify 217 master's and 65 TVET programmes, which are agroecology-related or have elements of agroecology.

The extent of compliance of programmes to the 10 elements of agroecology by FAO (2018) was assessed to help identify the gaps in the curricula across the three partner countries. Also, potential barriers and opportunities affecting current programmes were assessed. Despite the differences in the level of attention given to the elements of agroecology in the selected countries, it was found that the most common element of agroecology was the "Diversity of agroecological systems". However, elements such as "Circular and Solidarity Economy", "Synergies", "Responsible Governance", and "Recycling" received less attention in the master's programmes. In addition to these, "Cultural and food traditions" were identified as less prominent in the TVET programmes. These elements of agroecology master's/TVET curricula/modules. In addition, some barriers affecting HEIs and their programmes in the region were identified as poor funding from governments, inadequate availability of experts, poor laboratory equipment and machinery, weak ICT





infrastructure, limited scholar schemes and lack of employment after graduation. These barriers may equally undermine the new agroecology programme being considered in the sub-region. However, current trends in academic institutions in Africa such as institutionalized partnership, digital transformation, online learning, and internationalization are some of the few drivers that can potentially address many of the barriers identified and ensure a sustainable flow of resources to the HEIs in the West Africa sub-region.

3 INTRODUCTION

The path of our food systems is critically unsustainable, necessitating an urgent transition. Dominant food systems, with their reliance on specialization, uniformization, and mechanization, stand as major drivers of adverse effects within these systems. The impacts are profound and multifaceted, encompassing the degradation of natural resources, significant biodiversity loss, ongoing hunger and malnutrition, the proliferation of non-communicable food-related diseases, and the increased vulnerability of small-scale farmers (Armstrong, 2022; Wezel et al., 2020). These challenges not only threaten food security but also have severe negative impacts on the environment (Zeng & Wanger, 2023). For instance, it is estimated that the global food system is responsible for 21–37% of annual greenhouse gas (GHG) emissions (Mbow et al., in press), which further aggravates the effects of climate change, jeopardizing the ability of the planet to provide sufficient and nutritious food. It is argued that insufficient agricultural emission reductions will compromise our ability to limit global warming to 1.5°C global temperature increase as current trajectories for food system emissions threaten this target (Clark et al., 2020). Furthermore, conflicts around the world, such as the acute crisis in Ukraine, the Middle East, numerous African countries, and other regions, have significantly exacerbated pressures on global food supply chains. Ukraine, as a crucial provider of grains and other agricultural outputs, has brought to light the vulnerability of food systems due to geopolitical unrest and conflicts

These challenges are worrying as they undermine the resilience and sustainability of the global agricultural and food systems to guarantee adequate nutrition and food security for the increasing global population. In 2022, it was estimated that 691 to 783 million people lacked sufficient food, affecting 9.2% of the global population





compared with 7.9% in 2019. This is projected to increase to 600 million people by 2030 (FAO, IFAD, UNICEF, WFP and WHO, 2023). Africa's situation is very worrying because the proportion of the population facing hunger is relatively higher compared with the other regions of the world (ibid.). Particularly in West Africa where the farming systems are characterized by key challenges such as low soil fertility status, nutrient deficiency, weed pressure, salination via irrigation systems, and pest and disease, all together weaken the productivity of the farming systems (Mugwanya, 2019). Moreover, the African Union's Comprehensive African Agriculture Development Programme Biennial Review report (2019-2021) reveals that Africa is not able to meet its goal of ending hunger by 2025 (African Union, 2021). This scenario has cast a light on the fragility of our food systems, underscoring the critical need for a shift towards agricultural models that are not only sustainable but are also robust enough to withstand the multifaceted challenges posed by climate change, biodiversity loss, and international conflicts. Those models require a holistic food system approach that transcends isolated interventions and short-term solutions. They necessitate a comprehensive view that connects agriculture, environment, trade, health, and more, expanding the range of possibilities for achieving sustainability.

With a goal of the United Nation's second Sustainable Development Goal (SDG-2) aiming to "end hunger, achieve food security and better nutrition," and promote sustainable agriculture by 2030, there has been an urgency to transform the global food systems to guarantee access to healthy and affordable diets for all. Over the past decades, there has been an increasing interest in agroecology in response to the multiple crises in the food systems and problems encountered with conventional agriculture such as soil degradation, increasing emission of greenhouse gases, loss of genetic resources, and general health issues (Anderson et al. 2019). Agroecology emerges as a transformative solution, offering benefits across all dimensions of sustainability, including food security. As a science, practice, and social movement, agroecology tackles the root causes of imbalances within food systems, fostering social, economic, and environmental resilience. It leverages natural synergies and diversity, enhancing ecosystem services, regenerating soils, and ensuring equitable and sustainable livelihoods for all food system actors. It can contribute to the Sustainable Development Goals and address the twin challenge of climate change impacts and biodiversity loss (Zeng & Wanger, 2023). It seeks to develop agroecosystems with minimum dependence on synthetic inputs and





maximum emphasis on farms' biological components to enhance soil fertility, guarantee crop protection, and boost overall productivity (Altieri, 1983). Thus, it has become an innovation paradigm in agriculture, viewed as a sustainable and holistic approach to agriculture (Wezel et al., 2018).

One of the approaches to promoting agroecology is mainstreaming it in education. As such, this approach has gained ascendancy and recognition in the global north (Wezel et al.,2018; David & Bell, 2018). It is noteworthy to mention that an increasing number of colleges and universities around the world have introduced agroecological educational programmes. Examples are; the European MSc in Agroecology coordinated by ISARA, France, Université Libre de Bruxelles (ULB – Belgium) and NMBU (the Norwegian University of Life Sciences), the Graduate Programme in Sustainable Agriculture at Iowa State University, and the Sustainable Agriculture and Food Production at Green Mountain College, both in the USA. In West Africa, despite the widespread adoption of agroecological practices by practitioners, universities in the region have not followed this path as closely, resulting in fewer master's courses and academic programs focused on agroecology.

4 PROJECT CONTEXT

4.1 AGRECOFARM Project and its goal and objectives

The European Union (EU) seeks to promote a global transition to sustainable food systems within the framework of the *EU-Africa Partnership on Food and Nutrition Security and Sustainable Agriculture (FNSSA)*, a global initiative involving international research, innovation and training consortia. It is a strategic cooperation, implemented by supporting and mentoring mostly developing countries. With a poorly developed application of agroecological practices and knowledge systems in sub-Saharan Africa, the AGRECOFARM Project was developed as an initiative within this framework. The project aims to actively increase the relevance, quality and responsiveness of higher education institutions in Ghana, Nigeria and Sierra Leone.





The project's

objective is to

introduce and advance the skills of the academic staff, students, and agricultural extension staff in partner counties HEIs through the development of new curricula and MSc programmes that integrate theory and practice on the latest developments of applied research in agroecological practices and techniques for sustainable agricultural productions. The purpose is to provide staff, students and vocational trainees with knowledge, skills and competencies in the field of agroecological approaches and advanced technology in agricultural systems. This project responds to the needs of the sector for skilled personnel and state-of-the-art, sustainable practices creating new opportunities for employment and entrepreneurship for the students, particularly for those living in remote areas. The wider and long-term objective of the AGRECOFARM project is to make a viable contribution towards achieving sustainable agriculture in the project region, promoting a global transition to sustainable food systems.

4.2 Work Package 2, Objectives and Deliverables

Under the AGRECOFARM Project, the University of Energy and Natural Resources (UENR) is responsible for WP2, with the assigned task of identifying agroecologyrelated academic and training programmes in Higher Education Institutions in partner and other countries in West Africa. WP 2 aims to survey and identify the existing HEI programmes in West Africa on sustainable farming and agroecological technologies, as well as similar lifelong learning/VET training programmes.

Additionally, there will be an assessment of the employment needs of the agricultural industry in Ghana, Nigeria and Sierra Leone, for acquiring graduates from the proposed MSc programmes. In this way, the project will be in a position to better assess the availability of existing courses and labour needs in the region and thereby create truly new and innovative MSc programmes, that will also apply know-how, best practices and processes from European HEIs which have MSc programmes in agroecology, thus filling the gap and addressing the regions academic needs, as well as needs in specialized personnel. The specific objectives are to:

- i. Identify gaps and assess the academic needs that have to be tackled in new curricula.
- ii. Identify existing TVET programmes in the subject area and demand for internships in the African partner countries.





iii. Provide specific recommendations on how inputs can be incorporated into a new agroecology master's/TVET programmes.

5 BRIEF LITERATURE REVIEW

5.1 Conceptualization of Agroecology

The concept of agroecology was first coined by Bensin in 1928 as a purely scientific term. Over the years, agroecology has taken on different meanings in different parts of the world (Wezel et al., 2009). In the 1920s, it was concerned with the application of ecological principles to agriculture, with a focus on functional biodiversity and nutrient recycling. In the 1980s, it evolved into a recognized science, a set of practices, and a social movement led by farmers. By the 2020s, agroecology has been widely embraced by international institutions and is characterized by integrated approaches at four key levels:

- Farm: Integrated soil fertility and pest management.
- Landscape: Integrated management of land, vegetation, and water.
- Markets: Innovations to connect producers and consumers around nutritious, safe, affordable, and sustainably produced food as a standard for all.
- **Policy**: Regulations on seeds, bio-inputs, food security, subsidies, and incentives.

There is no single acknowledged definition of agroecology, reflecting the ongoing development within this field (Dalgaard et al., 2003). One definition used is agroecology as "the study of the interactions between plants, animals, humans, and the environment within agricultural systems" (Dalgaard et al., 2003, p.42). Also, Altieri (1995) defines it as "the application of concepts and principles of nature, of ecology for the design and management of sustainable food systems". Even though diverse definitions exist, there has been no universally agreed-upon definition since its inception. The concept has evolved from being a purely scientific discipline into a set of more ecologically sound agricultural practices and a movement that





incorporates food sovereignty, social justice, and the preservation of indigenous knowledge. (Wezel et al., 2009). Thus, despite the existence of multiple definitions, agroecology incorporates three dimensions: a science, a set of practices and an agrarian social movement (Gliessman, 2018; Wezel et al., 2009; Wezel et al., 2018).

As a science, it gives priority to action research, holistic and participatory approaches, and transdisciplinary including different knowledge systems. It involves: (i) the integrative study of the ecology of the entire food system, encompassing ecological, economic and social dimensions (Francis et al., 2003). (ii) the application of ecological concepts and principles to the design and management of sustainable food systems (Gliessman, 2007). (iii) the integration of research, education, action and change that brings sustainability to all parts of the food system: ecological, economic and social (Gliessman, 2018).

As a set of agricultural practices, agroecology seeks ways to improve agricultural systems by harnessing natural processes, creating beneficial biological interactions and synergies amongst the components of agroecosystems (Gliessman, 1990), minimizing synthetic and toxic external inputs and using ecological processes and ecosystem services for the development and implementation of agricultural practices (Wezel et al., 2014). According to Clément & Ajena (2021), agroecology is not only a set of agronomic practices but aims to redesign food systems to redress their current failures. It offers systemic long-term solutions to build social, economic, and environmental resilience.

As a social movement agroecology provides solutions to modern crises such as climate change and malnutrition, contrasting with the dominant industrial agricultural model based on the use of external inputs. The aim is to transform agriculture to build locally relevant food systems that strengthen the economic viability of rural areas based on short marketing chains, and both fair and safe food production. It supports diverse forms of smallholder food production and family farming, farmers and rural communities, food sovereignty, local knowledge, social justice, local identity and culture, and indigenous rights for seeds and breeds (Altieri & Toledo, 2011; Rosset et al., 2011).





5.2 Elements and Principles of Agroecology

As a result of the plethora of definitions and interpretations, the Food and Agriculture Organization (FAO) was inspired to operationalize the concept into a concrete set of 10 elements of agroecology as an integral part of its vision for sustainable food and agriculture. The purpose of these elements was to guide countries to use them as an analytical tool that can guide partner countries' work in support of agroecological transitions towards sustainable agriculture and food systems (FAO, 2018). The 10 elements (See Table 1) emanated from the FAO's global multi-stakeholder consultation process conducted between 2015-2019.

Table 1 Ten elements of agroecology

Component	Description of Elements
1. Diversity	Highly diverse, agroecological production systems such as agroforestry, silvopastoral systems, crop-livestock-aquaculture integration and polycultures contribute to a range of production, socioeconomic, nutrition and environmental benefits.
2. Cocreation and sharing of knowledge	Agroecology depends on context-specific knowledge. Knowledge plays a central role in the process of developing and implementing agroecological innovations to address challenges across food systems. Through the co-creation process, agroecology blends the traditional, indigenous, practical and local knowledge of producers with global scientific knowledge.
3. Synergies	Agroecological systems selectively combine the diverse components of farms and agricultural landscapes to build and enhance synergies.
4. Efficiency	Increased resource-use efficiency is an emergent property of agroecological systems. By optimizing the use of natural resources such as soil, air, solar energy, water, agroecology uses fewer external resources, reducing costs and negative environmental impacts.
5. Recycling	By imitating natural ecosystems, agroecological practices support biological processes that drive the recycling of nutrients, biomass and water within production systems.





6. Resilience	Enhancing ecological and socio-economic resilience, agroecological systems have a greater capacity to recover from disasters such as drought, floods or hurricanes, and to resist pest and disease attacks. Through diversification, producers reduce their vulnerability if a single crop or commodity fails. Reducing dependence on external inputs increases producers' autonomy and reduces their vulnerability to economic risk.
7. Human and social values	Agroecology places a strong emphasis on human and social values, such as dignity, equity, inclusion and justice, all contributing to sustainable livelihoods. It puts the aspirations and needs of those who produce, distribute and consume food at the heart of food systems. Agroecology seeks to address inequalities by creating opportunities for women and youth.
8. Culture and food traditions	By supporting healthy, diversified and culturally appropriate diets, agroecology values local food heritage and culture, contributing to food security and nutrition while maintaining the health of ecosystems.
9. Responsible governance	Transparent, accountable and inclusive governance mechanisms at different scales are necessary to create an enabling environment that supports producers to transform their systems. Equitable access to land and natural resources is not only key to social justice but also essential to providing incentives for long- term investments in sustainability.
10. Circular and solidarity economy	Agroecology seeks to reconnect producers and consumers through a circular and solidarity economy that prioritizes local markets and supports territorial development. Innovative markets that support agroecological production help respond to a growing demand from consumers for healthier diets.
Source: Dy FAU (2018).	

The 10 elements were later further expanded into 13 principles of agroecology consolidated by the international High-Level Panel of Experts on Food Security and Nutrition (HLPE 2019; Wezel et al., 2020). The 13 principles of Agroecology are shown in Table 2 below.





Table 2 Consolidated set of 13 agroecological principles and scale of application

13 Principles of	Description of the Principles	10 Elements	Scale
Agroecology		of FAO	application
1. Recycling	Preferentially use local renewable	Recycling	FI, FA
	resources and close as far as		
	possible resource cycles of		
	nutrients and biomass.		
2. Input	Reduce or eliminate dependency	Efficiency	FA, FO
reduction	on purchased inputs and increase		
	self-sufficiency.		
3. Soil health	Secure and enhance soil health		FI
	and functioning for improved		
	plant growth, particularly by		
	managing organic matter and		
	enhancing soil biological activity.		
4. Animal health	Ensure animal health and welfare.		FI, FA
5. Biodiversity	Maintain and enhance the	Part of	FI, FA
-	diversity of species, functional	Diversity	
	diversity and genetic resources		
	and thereby maintain overall		
	agroecosystem biodiversity in		
	time and space at field, farm and		
	landscape scales.		
6. Synergy	Enhance positive ecological	Synergy	FI, FA
	interaction, synergy,		
	integration and complementarity		
	among the elements of		
	agroecosystems (animals, crops,		
	trees, soil and water).		
7. Economic	Diversify on-farm incomes by	Part of	FA, FO
diversification	ensuring that small-scale farmers	Diversity	
	have greater financial		
	independence and value-addition		
	opportunities while enabling		
	them to respond to demands from		
	consumers.		
8. Co-creation of	Enhance co-creation and	Co-creation	FA, FO
knowledge	horizontal sharing of knowledge	and	
	including local and scientific	sharing of	
	innovation, especially through	knowledge.	
	farmer-to-farmer exchange.		





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9. Social values and diets	Build food systems based on the culture, identity, tradition, social and gender equity of local communities that provide healthy, diversified, seasonally and culturally appropriate diets.	Parts of Human and social values and culture and food traditions.	FA, FO
10. Fairness	Support dignified and robust livelihoods for all actors engaged in food systems, especially small- scale food producers, based on fair trade, fair employment and fair treatment of intellectual property rights.		FA, FO
11. Connectivity	Ensure proximity and confidence between producers and consumers through the promotion of fair and short distribution networks and by re-embedding food systems into local economies.	Circular and solidarity economy.	FA
12. Land and natural resource governance	Strengthen institutional arrangements to improve, including the recognition and support of family farmers, smallholders and peasant food producers as sustainable managers of natural and genetic resources.	Responsible Governance.	FA, FO
13. Participation	Encourage social organization and greater participation in decision-making by food producers and consumers to support decentralized governance and local adaptive management of agricultural and food systems.		FO

Source: FAO (2018)

*Scale application: FI = field; FA = farm, agroecosystem; FO = food system





6 STUDY LOCATION AND METHODS

6.1 Study Location

The West Africa Sub-Region is made up of 16 independent sovereign countries that stretch along a climate zone from the Sahel region in the north to the humid rain forests in the south. The region covers an area of about 7.3 million km² divided into four principal agroecological zones: Arid, semi-arid, sub-humid and humid (ILCA, 1987; Jahnke, 1982) based on plant growth days. The sub-region is home to a wide range of natural vegetation which includes savanna grasslands, dry forests and tropical humid forests. Tropical rainforests form a belt from the eastern border of Sierra Leone to Ghana. The tropical deciduous forests lie along the fringes of the tropical rainforests. The dry forest band stretches from northern Nigeria and Chad to Senegal. Dryer climate zones are also characterized by woodlands (tree and shrub savannah, parklands and bush fallows). The West African dry regions correspond to the transition zone of the Sahel as well as the regional centre of Sudanese endemism (Bellefontaine et al., 2000).



Figure 1 Agroecological zones in West Africa. Source : Fernández-Rivera et al. (2004)





The concept of agroecological farming is feasible in the context of specific agroecological zones. The prevailing climate and natural vegetation in a region determine the types of crops cultivated, livestock reared and the farming practices employed by farmers. The countries (Ghana, Nigeria and Sierra Leone) selected for the AGRECOFARM cover all the agroecological zones in the sub-region except for the extreme arid and desert regions (See Figure 1).



Figure 2 Map Map showing selected partner countries in West Africa.

Agriculture is crucial to livelihoods in the West African sub-region. It accounts for 35 percent of the region's gross domestic product (GDP). It is the main source of employment for over 290 million people who live in the region, employing 60 percent of the workforce (Jalloh et al., 2023).

6.2 Methods - Design of the Questionnaire and Analysis

The questionnaire (See Appendix VIII) for gathering information to perform the task under WP 2, was designed by DMTR Consulting in consultation with the University of Energy and Natural Resources (UENR) and circulated to all project partners for input. These inputs were used to refine the questionnaire and recirculated to the African partner institutions on the AGRECOFARM Project. These partners were also engaged in two online meetings to explain the 10 elements of agroecology in the





questionnaire. The FAO (2018) framework of the 10 Elements of Agroecology was used as an analytical tool (See Table 1).

The questionnaire was designed to capture relevant information required to assess the relatedness of Master (including MPhil, Postgraduate Diploma and MSc) (See Appendix I) and TVET (certificate, diploma, bachelor programmes) (See Appendix II) programmes related to agroecology or sustainable agriculture. The information gathered included programmes (See Appendix VI) taught and their degree of covering the 10 elements of agroecology, entry requirements, enrolment processes, sustainability of master's programmes, and topics among other relevant issues (See Appendices III, IV & V). The questionnaire also captured information on programmes at the Technical and Vocational Education and Training (TVET) level and Life-long learning (See Appendix VII).

Partners on the AGRECOFARM Project from Ghana, Nigeria and Sierra Leone (See Figure 2) administered the questionnaires to universities and technical institutions offering programmes identified to have agroecology elements in their curricula in their respective countries. The contents of courses in each programme were examined, including the learning objectives about the elements of agroecology. If the courses taught in a programme were agroecology-related and satisfied at least one of the elements of agroecology as defined by the FAO (2018), then that particular programme was marked as having satisfied that element of agroecology. This process was repeated for all the programmes included in the analysis. The information gathering started from January to April 2024. Table 3 below shows the number of master's and TVET programmes considered in the analysis. Details of these programmes are in appendices VI and VII.

Table 3 Number of master's and TVET programmes from partner countries in West Africa.

Countries	Number of Master's	Number of TVET Programmes
	Programmes	
Ghana	69	45
Sierra Leone	17	8
Nigeria	131	12





Using Excel, all master's/TVET programmes from HEIs in partner countries and their contents were evaluated in terms of compliance with the 10 elements of Agroecology. 1 was used when it was compliant and 0 when otherwise. The frequencies of all master and TVET agroecology-related programmes were summed up and percentages were determined for comparison purposes. These were then displayed in graphs. Also, "High Point" and "Low Point" in the graphs to illustrate more or less attention given to 10 elements of agroecology in the programmes by the three partner countries under consideration. This was used to show the extent of the gaps in the 10 elements of agroecology in the programmes in these countries and the African sub-region respectively. Included in the analysis are barriers and opportunities faced by Higher education institutions in West Africa. This was based on literature and information given by the HEI in the three partner countries.

7 COMPLIANCE OF ACADEMIC PROGRAMMES WITH THE ELEMENTS OF AGROECOLOGY

7.1 Compliance of Master's Programmes with the 10 Elements of Agroecology at Country Level.

At the country level, the results of the overall assessment of the compliance of the agroecology-related master's programmes with the 10 elements of agroecology are shown in Figure 3. The results show that all elements of agroecology receive considerable attention in the agroecology-related programmes in the partner countries (i.e., Ghana, Nigeria, and Sierra Leone).









As shown in Figure 3, Ghana captures considerably the "Diversity of Agroecological Systems", "Circular and Solidarity Economy", "Responsible Governance", "Culture and Food Traditions", "Human and Social Values", "Resilience", "Efficiency" and "Cocreation and Sharing of Knowledge" elements in its master's programmes. However, more attention is given to the "Efficiency", "Resilience", "Diversity of agroecological systems" and "Co-creation and Sharing of Knowledge" elements. As well, less attention is given to the "Responsible governance", "Recycling" and "Synergies" elements (See Table 4).

In the case of Sierra Leone, considerations are given to the "Diversity of Agroecological Systems", "Responsible Governance", "Human and Social Values", "Efficiency", "Synergies" and "Co-creation and Sharing of Knowledge". It, however, places a high premium on the "Diversity of Agroecological Systems", "Human and social values" and "Co-creation and

Sharing of Knowledge" elements. As well, low attention is given to the "Circular and solidarity economy" and "Recycling" elements (See Table 4).

Agroecology-related master's programmes in Nigeria capture the "Diversity of Agroecological Systems", "Responsible Governance", "Culture and Food Traditions", "Human and Social Values", "Recycling", "Efficiency" and "Co-creation and Sharing of





Knowledge" elements fairly in its programmes. However, it is found that more attention is given to the "Diversity of Agroecological Systems", "Culture and Food Traditions" and "Co-creation and Sharing of Knowledge" elements. It gives less attention to the "Responsible governance" and "Synergies" elements (See Table 4).

Table 4 Summary of results showing "More" and "Low" attention given to different elements of agroecology in the partner countries in West Africa.

Country	More Attention	Low Attention
1. Ghana	 Efficiency. Diversity of agroecological systems. Resilience "Co-creation and Sharing of Knowledge" 	Recycling.Synergies.Responsible governance
2. Sierra Leone	 Diversity of Agroecological Systems. Human and social values. "Co-creation and Sharing of Knowledge". 	 Circular and solidarity economy. Recycling.
3. Nigeria	 Diversity of Agroecological Systems. Culture and Food Traditions. "Co-creation and Sharing of Knowledge" 	Responsible governance.Synergies.

7.2 Compliance of TVET Agroecology-Related Programmes with the 10 Elements of Agroecology.

The results here show how programmes under Technical and Vocational Education and Training (TVET) comply with the 10 elements of agroecology. Again, the different programmes analyzed capture fairly all the 10 elements of agroecology in the TVET programmes in the three partner countries in West Africa.







Figure 4 Compliance of TVET agroecology-related programmes with the 10 elements of agroecology in the partner countries in West Africa.

As shown in Figure 4 above, agroecology-related TVET programmes in Ghana capture fairly the "Diversity of Agroecological Systems", "Culture and Food Traditions", "Resilience", "Efficiency" and "Co-creation and Sharing of Knowledge" elements. Here again, the country highlights only the "Efficiency" element but less attention is given to the "Circular and solidarity economy", "Responsible governance", "Human and Social Value", "Recycling" and Synergies" in their TVET programmes (See Table 5).

For Sierra Leone, on the other hand, programmes capture fairly the "Circular and Solidarity Economy", "Culture and Food Traditions", "Human and Social Value", "Efficiency", and "Synergies" in their programmes. However, it gives premium to the "Co-creation and sharing of Knowledge" and low attention to the "Diversity of agroecological systems", "Responsible governance", "Human and social values", "Resilience" and "Recycling" (See Table 5).

In the case of Nigeria, the most commonly featured elements in their TVET programmes are the "Diversity of agroecological systems", "Responsible governance" "Human and social values", "Resilience" and "Co-creation and sharing of Knowledge". It places high value on the "Diversity of agroecological systems", "Co-creation and sharing of knowledge" and "Efficiency" but less attention on the "Culture and food





traditions", "Recycling", and "Synergies" elements in its TVET programmes (See Table 5).

Table 5 Summary Summary of results showing "More" and "Low" attention given to different elements of agroecology in the TVET programmes in the partner countries in West Africa.

Country	More Attention	Low Attention
<i>1. Ghana</i>	• Efficiency.	 Circular and solidarity economy. Responsible governance. Human and Social Value. Recycling.
<i>2. Sierra Leone</i>	• <i>Co-creation and sharing of Knowledge.</i>	 Diversity of agroecological systems. Responsible governance. Human and social values. Resilience. Recycling.
3. Nigeria	 Diversity of agroecological systems. Co-creation and sharing of knowledge. Efficiency. 	 <i>Culture and food traditions.</i> <i>Recycling.</i> <i>Synergies.</i>

7.3 Compliance of Master's Programmes with the 10 Elements of Agroecology at the sub-regional Level.

At the West Africa sub-regional level, the results show fair representation and considerations given to all the 10 elements of agroecology as shown in Figure 5 below. More attention is given to the "Diversity of agroecological systems", "Culture and food traditions", "Efficiency" and "Co-creation and sharing of knowledge" elements of agroecology in the programmes. However, with the present analysis, it cannot be shown with which depth or extent the different elements of agroecology are integrated into the course in different countries, but just if they appear or not.







Figure 5 Extent of compliance of the master's programmes to the 10 elements of agroecology in the West Africa sub-region.

Comparatively, other elements such as "Circular and Solidarity Economy", "Responsible Governance", "Recycling" and "Synergies", receive less attention in curricula across the sub-region (See Table 6) below.

Table 6 Summary of results showing "More" and "Low" attention given to different elements of agroecology in the master's programmes at West Africa sub-regional level.

Sub-region	More Attention	Low Attention
	• Diversity of agroecological	Circular and Solidarity
West Africa	systems.	Economy.
	• Culture and food traditions.	• Responsible Governance.
	• Efficiency.	• Recycling.
	• Co-creation and sharing of	• Synergies.
	knowledge.	





7.4 Compliance of TVET Agroecology-Related Programmes with the 10 Elements of Agroecology at the sub-regional Level.

The compliance analysis of the TVET programmes to all the 10 elements of agroecology in the West Africa sub-region is shown in Figure 6 below, which shows fair representation and considerations given to all the 10 elements of agroecology. Relatively more attention is given to the "Diversity of agroecological systems", "Resilience", and "Co-creation and sharing of knowledge" elements. Interestingly "Efficiency" features more prominently in the programmes.



Figure 6 Extent of compliance of the TVET programmes to the 10 elements of agroecology in the West African sub-region.

The "Responsible governance", "Cultural and food traditions", "Recycling" and "Synergies" elements, relatively, received less attention (See Table 7).





Table 7 Summary of results showing "More" and "Low" attention given to different elements of agroecology in the TVET programmes at West Africa sub-regional level.

Sub-region	More Attention	Low Attention
West Africa	 Diversity of agroecological systems. Resilience. Co-creation and sharing of knowledge. 	 Responsible governance. Cultural and food traditions. Recycling. Synergies.

8 GAP ANALYSIS

8.1 Gaps in the Programmes in West Africa

The analyses show differences in the level of attention given to the different elements of agroecology in the programmes at the country level (See Table 3 and Table 4). These show peculiarities in the three partner countries which indicate how the different elements of agroecology should inform country-specific and customized curricula offered in HEIs in the sub-region. With our interest at the sub-regional level, we briefly discuss the elements of agroecology that generally warrant attention in developing new agroecology curricula across the sub-region. We proposed the following elements of agroecology for consideration because they are given less attention in master's and TVET programmes, including internship opportunities. These are; "Circular and Solidarity Economy", "Responsible Governance", "Recycling" and "Synergies" elements. In addition to these four elements of agroecology, "Culture and food traditions" were detected in the TEVET Curricula or programmes. These elements are described below.

8.2 Circular and Solidarity Economy

It is that aspect of agroecology that describes the linkage between producers and consumers, thus, the agricultural value chain. The curricula of HEIs in the sub-region show a lack of emphasis on this linkage. A weak representation of agricultural value chain dynamics has the potential to translate into a major obstacle to achieving sustainable agricultural development.





A weak connection between producers and consumers leads to waste and depletion of resources.

Circular and solidarity economy emphasizes approaches that promote fair solutions based on local needs, resources and capacities, creating more equitable and sustainable markets. It also seeks to strengthen short food circuits to increase the incomes of food producers while maintaining a fair price for consumers. These include new innovative markets, alongside more traditional territorial markets, where most smallholders market their products. The absence or weak representation of this dimension of agroecology in most curricula is unfortunate and may undermine agricultural sustainability in the sub-region. This is a major gap that needs to be addressed in the development of new curricula.

8.3 Responsible Governance

"Responsible governance" is one other element of agroecology that has received relatively less attention in the curricula of HEIs. Issues of effective and accountable governance especially regarding land administration, social equity programmes, markets and trade affect agricultural production immensely.

8.4 Recycling

"Recycling" as a concept is found to be missing or appearing rarely in many curricula. Recycling ensures optimal resource utilization and reduces waste. This topic is crucial to more included in future curricula development.

8.5 Synergies

"Synergies" was another element of agroecology that has received relatively less attention in the curricula. It describes the interaction between various components of agricultural systems and how these interactions can be harnessed to benefit each component. For example, it describes how to design diversified systems that selectively combine annual and perennial crops, livestock and aquatic animals, trees, soils, water and other components on farms and agricultural landscapes to enhance productivity and mutual benefit. This is a very critical element of agroecology which needs to be emphasized in a new curriculum.





8.6 Culture and Food Traditions

Culture and food traditions as an element of agroecology is less featured in the curricula of the TVET programme. This element emphasizes the linkage between food crop species that are taught in institutions and the food traditions and culture of the people. A rather high disconnect exists between these two crucial social realities as far as the teaching curricula in TVET institutions are concerned. This observation could be explained by the fact that catering and hospitality programmes run in TVET institutions tend to focus on foreign dishes and recipes. Cultural identity and sense of place are often closely tied to landscapes, food systems and food diets and this linkage is vital in the context of attaining sustainable agricultural production hence its relevance in agroecology programmes.

9 SUSTAINABILITY OF AGROECOLOGY-RELATED MASTER'S/TVET PROGRAMMES

9.1 Barriers to Sustainability of Current Programmes.

The education system in the sub-Saharan region is plagued with many barriers despite its recognition as a key force for modernization and development (Teferra & Altbachl, 2004). These barriers are inadequate funding, shortage of infrastructure, inadequate availability of experts, poor laboratory equipment and machinery, weak ICT infrastructure, limited scholar schemes and perceived lack of employment after graduation (Jowi, 2024; Teferra & Altbachl, 2004; Yussif & Mante, 2024). These barriers are persistent and undermine enrolment and the long-term sustainability of the academic programmes.

Inadequate funding is a major threat to HEI in Africa because of the high cost of running these institutions, including their programmes (Jowi, 2024; Yussif & Mante, 2024). Running the programmes is capital intensive, especially for programmes that require well-resourced infrastructure and equipment, including state-of-the-art laboratories. This serves as a major impediment to current HEI in specialized areas related to agroecology in the three partner countries in the West African sub-region. It is realized that the sustainability of these institutions and their programmes is





highly dependent on government financial support in the form of subventions (Yussif & Mante, 2024).

The academic institutions in Africa in general, including the three partner countries in the West Africa sub-region are of two categories. They are either public or private funded institutions. Public-funded institutions form the majority of academic institutions in the partner countries examined.

In these institutions, the master's and TVET programmes are offered either as full/part-time and/or fee-paying programmes. These full/part-time programmes are normally subsidized by the government. However, this major source of funding is inadequate and accounts for the poor infrastructure in the institutions (Brown & Majumdar,2020; Jowi, 2024; Yussif & Mante, 2024).

With increasing interest in online modes of instruction (Kotoua, Ilkan, & Kilic, 2015), such poor financial support from the governments in these partner countries has become a serious impediment to teaching and learning. They occur in different forms such as e-learning, cyber schools or distance learning, which are distinct from face-to-face traditional education. When online teaching and learning have become more important, institutions with weak ICT may fold up because of a lack of funding interventions from governments, undermining the Sustainable Development Goal 4: "Ensuring Inclusive, Equitable, and Quality Education and the Promotion of Lifelong Learning Opportunities for All". A lesson that was learnt during the COVID-19 pandemic was the need to embrace virtual learning so as not to halt education programmes.

With internet infrastructure improving in West Africa (Kotoua et al., 2015), online teaching and learning may offer students a reduction in tuition fees, materials and travel (Dung, 2020). The majority of African students have access to the internet and related educational content on their mobiles (Porter et al., 2016), as such, online education can potentially increase enrolment in academic programmes in HEIs. As such, this mode of instruction may need the necessary funding to enhance teaching and learning in HEI in West Africa, particularly when online education is predicted to become a mainstream mode of instruction by 2025 (Palvia et al., 2018).





Again, there are very few scholarship schemes are available to students in the three partner countries. Most scholarship schemes are offered by international organizations, the private sector and philanthropists but are limited. As well, scholarship schemes established by governments are available for students. For example, in Ghana, state institutions such as GETFUND and Ghana Scholarship Secretariat offer scholarships to poor but brilliant students to support their education. Also, schemes such as TETFUND exist in Nigeria. The number of students on these schemes is however very small and insignificant in comparison to the total number of financially-constrained students in the region (Jowi, 2024). As a result of limited access, most students are becoming self-financing by undertaking full or part-time jobs. Other schemes such as Student Loan Schemes exist to support students. In addition to limited access to scholarship schemes, employment opportunities have become narrower in these partner countries for students after graduation (Njifen, 2024).

9.2 Opportunities and Initiatives Supporting New Academic Programme

Despite of the barriers to education, academic institutions are undergoing major transformations and changes in their education and operations. Several influences driving these major changes include digital transformation, online learning, and internationalization. Central to the discussion here is the focus on partnership. Partnerships between Africa's academic institutions and major global players account for some of these transformations and changes (Jowi, 2024).

Africa's Agenda 2063 and the Continental Education Strategy for Africa (CESA) Partnerships form the underlying frameworks for engaging partners to address many of the challenges facing African universities and other institutions (Maringe & Ojo, 2017). For instance, one such arrangement is the Europe-Africa Forum, which has become the key platform for engagement between the two regions, with a focus on education, skills development and research. Also, such partnership resulted in the 5th African Union–European Union Forum held in 2017 to enhance investments in research and innovations in African universities through several priority areas, including research and mobility of African researchers.





One of the outcomes is an estimated number of 35,000 African researchers benefiting from the Erasmus-Plus programme in 2020, with the participation expected to rise to 105,000 by 2027 (Zygierewicz, 2019). Another example that reaffirmed these commitments and announced an Africa-Europe Investment Package to support the implementation of AU Agenda 2063, including the commitments made to education with a focus on scaling up mobility and employability of students, improving quality and enhancing access to the digital and data economies, is the 6th African Union–European Union Summit held in February 2022 in Belgium with the EU committing 970 million euros (Jowi, 2022). Of particular interest in educational scholarships and digital transformation is the Forum of China-Africa Cooperation (FOCAC).

Within this framework, China committed to supporting ICT and digitalization infrastructure in African universities (Zhu & Chikwa, 2021). The commitment included support for capacity building and research through scholarship programmes and exchanges (Ye, 2022).

Another initiative worth mentioning is intra-African collaborations or South-South higher education collaborations resulting in networks such as the African Research Universities Alliance (ARUA), the Regional Universities Forum for Capacity Building on Agriculture (RUFORUM), and the African Network for Internationalization of Education (ANIE), committed to building capacities, creating platforms for internationalization in Africa and fostering meaningful engagements between African universities. In effect, exploring these existing strategic partnerships for agroecological programmes would be worth pursuing in addressing many of our challenges.

10 Conclusion and Recommendations

10.1 Conclusion

In reviewing existing curricula across the three partner countries in the West African sub-region, gaps concerning the 10 elements of agroecology were identified. These elements were observed to have been given less premium or attention in the curricula. These elements were the "Circular and Solidarity Economy", "Synergies", "Responsible Governance", and "Recycling". They constitute the elements of agroecology given less attention in both the masters' and TVET curricula.





Particularly, the TVET curricula give less attention to "Culture and food traditions". These elements are proposed for consideration and mainstreaming in a new agroecology curriculum to give it a holistic orientation and create a fair representation of the 10 elements of agroecology. It presents an opportunity to build the requisite capacity and skills needed to facilitate the enhanced development of sustainable food systems across the sub-region.

In developing this new master's agroecology programme, certain barriers such as poor funding from governments, shortage of infrastructure, inadequate availability of experts, poor laboratory equipment and machinery, weak ICT infrastructure, limited scholar schemes and perceived lack of employment after graduation, must be addressed to ensure enrolment and financial sustainability of the new agroecology curricula. Considerations must be given to emerging opportunities such as institutionalized partnership, digital transformation, online learning, and internationalization, to support addressing many of the barriers identified and ensure a sustainable flow of resources to the academic institutions in the West African sub-region. Navigating these barriers requires a multi-stakeholder approach involving governments, farmers, researchers, consumers, civil society and international partners to create supportive policies, provide education and training, facilitate market access, and investments that can create sustainable agriculture to support the food systems in the region.

10.2 Recommendations

Based on the conclusions made and the gaps identified in the analysis, developing a new agroecology curriculum that captures the most essential components of agroecology requires careful planning.

The following suggestions can be of help in that direction.

1. An agroecology programme in West Africa should include a course that captures issues of agricultural value chain analysis and marketing. Value chain analysis deals with the linkage between producers and consumers, the social context within which the interaction is situated and the potential benefits accruing to each actor in the chain. The content of this course should also emphasize agricultural markets, trade and policies that affect agricultural trade in a particular country. This course will capture issues of about the elements of Circular and Solidarity Economy and Synergies.




- 2. A master's program in agroecology should include in its curricula field attachments where students are sent to farms in specific agroecological zones to learn the peculiar agronomic practices in the area that help to conserve the soil and the environment.
 - For example, in Ghana, the five agroecological zones can be grouped into two; the forest and savanna zones. Agronomic practices in these two broad zones differ and students learn the different agroecological practices for each zone. The purpose of these field attachments is to help students learn and find innovative ways of farming sustainably.
- 3. Land and resource use and ownership are issues that were observed to be absent in most agroecology-related programs in the sub-region. Sustainable agriculture cannot be attained without a deliberate concerted effort to ensure fair and equitable land access to arable land. This can only be attained if there are deliberately targeted policies addressing land tenure policies. An agroecology programme should include a course in land/resource use ownership and/or management.
- 4. Recycling of agricultural waste was also poorly represented in most curricula examined. Recycling is vital to ensuring efficient and sustainable resource usage. An agroecological course should address how to use and reuse resources and reduce wastage and damage to agricultural produce.
- 5. Organic farming should be central in courses or in the whole curricula of a future agroecology programme. Organic farming as a course effectively captures some key elements of agroecology such as soil management and agricultural waste recycling, indigenous knowledge among others.
- 6. A field practical (local or international) for students to experience and observe organic production will be a welcome addition to any agroecology programme.
- 7. The new agroecology master's programme should have core subjects and a wide range of elective courses that students can choose from to specialize. The allocated total credit hours may be informed by the pertaining credit policy in each partner country (See Appendices I & II).





- 8. There is a need to secure other sources of funding for the new agroecology programme. The current funding systems in the sub-region rely heavily on government subventions and student fees. This situation bars a lot of brilliant but needy students who cannot afford the fees from pursuing higher education in such programmes.
- 9. The challenges of financing academic programmes can be resolved if the government is committed to sponsoring this new agroecology programme and facilitating their operation and sustainability. International donor organizations can also play key roles in ensuring the financial sustainability of these programmes by donating financially to support programmes.
- 10. Supporting the training to create relevant experts that will teach such new and/or specialized fields of study will be a worthy cause.
- 11. Entrepreneurial knowledge and skills should be one of the central aspects of the training to facilitate its mainstreaming into agroecology programmes to enhance the self-employability of students after graduation.





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12 APPENDICES

12.1 Appendix I: University Institutions and Programmes

				Minimum
				Total
University Institutions and Academic			No. of	Credit
Programmes	Country	Language	months	Hours
MPhil Social Forestry and	Ghana	English	18	≥ 160
Environmental Governance				
MPhil/MSc Crop Science	Ghana	English	18/12	≥160
MPhil Agribusiness Management	Ghana	English	18	≥160
MPhil Environmental Planning &	Ghana	English	18	≥ 160
Development				
MPhil/MSc. Climate Change	Ghana	English	18/12	≥160
MPhil/MSc Environment, Water and	Ghana	English	18/12	≥ 160
Sustainability				
MPhil Agricultural & Resource	Ghana	English	18	≥160
Economics				
MPhil Animal Production	Ghana	English	18	≥160
MPhil/MSc Land Degradation	Ghana	English	18/12	≥160
Neutrality				
MPhil Agricultural Administration	Ghana	English	24	≥ 130
MPhil Agribusiness	Ghana	English	24	≥ 130
MPhil Agricultural Economics	Ghana	English	24	≥ 130
MPhil Agricultural Extension	Ghana	English	12/24	≥ 130
MPhil Animal Science	Ghana	English	12/24	≥ 130
MPhil Crop Science	Ghana	English	12/24	≥ 130
MPhil Soil Science	Ghana	English	12/24	≥ 130
MPhil Soil and Water Engineering	Ghana	English	24	≥ 130
MPhil Entomology	Ghana	English	24	≥ 130
MPhil Nuclear Agriculture	Ghana	English	24	≥ 130
MPhil/MSc. Climate Change &	Ghana	English	24	≥ 130
Sustainable Development				
MPhil/MSc Aquaculture	Ghana	English	24	≥ 130
MSc Biodiversity Studies	Ghana	English	12	≥ 130





	***	of the European Union		
MPhil Postharvest Technology	Ghana	English	24	≥ 130
MSc Extension & Livelihood Studies	Ghana	English	12	≥ 130
MSc Animal Science	Ghana	English	12	≥ 130
MPhil Agricultural Economics	Ghana	English	24	≥ 130
MPhil Agricultural Extension	Ghana	English	24	≥ 130
MPhil Animal Science (Animal	Ghana	English	24	≥ 130
Nutrition)				
MPhil Animal Science (Animal	Ghana	English	24	≥ 130
Breeding and Genetics)				
MPhil Crop Science	Ghana	English	24	≥ 130
MPhil Land Use and Environmental	Ghana	English	24	≥ 130
Science				
MPhil Aquaculture	Ghana	English	24	≥ 130
MPhil Pasture and Range	Ghana	English	24	≥130
Management				
MPhil Wildlife Management	Ghana	English	24	≥ 130
MPhil Soil Science	Ghana	English	24	≥130
MPhil Irrigation Technology	Ghana	English	24	≥ 130
MPhil Crop/Soil Science	Ghana	English	24	≥ 130
M.Ed. Agriculture	Ghana	English	12	≥ 130
MPhil Animal Science	Ghana	English	24	≥ 130
MPhil Agricultural Economics	Ghana	English	24	≥ 130
MPhil/MSc Soil and water	Ghana	English	24/12	≥ 130
conservation Management		_		
MPhil Post Harvest Technology	Ghana	English	24	≥ 130
MPhil/MSc Soil Science	Ghana	English	24/12	≥ 130
MPhil Crop Science	Ghana	English	24	≥ 130
MPhil/MSc Horticulture	Ghana	English	24/12	≥ 130
MPhil Environment and Resource	Ghana	English	24	≥ 130
Management		_		
MSc Irrigation and Drainage	Ghana	English	12	≥ 130
Engineering				
MPhil Agronomy	Ghana	English	24	≥ 130
MPhil Agriculture Science	Ghana	English	24	≥ 130
MPhil Agribusiness	Ghana	English	24	≥ 130
MPhil Animal Science	Ghana	English	24	≥ 130
MSc. Agricultural Extension &	Ghana	English	12	≥130
Development Communication		_		
MPhil/MSc. Agribusiness Management	Ghana	English	24/12	≥130
MPhil Agricultural Economics	Ghana	English	24	≥130
MPhil Agronomy	Ghana	English	24	≥ 130
MPhil Post Harvest Technology	Ghana	English	24	≥ 130
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	****	of the European Union		
MPhil Fruit Crop Production	Ghana	English	24	≥130
MPhil Vegetable Crops Production	Ghana	English	24	≥ 130
MPhil Agroforestry	Ghana	English	24	≥ 130
MPhil Aquaculture and Environment	Ghana	English	24	≥ 130
MPhil Watershed Management	Ghana	English	24	≥ 130
MPhil Entomology	Ghana	English	24	≥ 130
MPhil Organic and Natural Products	Ghana	English	24	≥ 130
MPhil Soil Science	Ghana	English	24	≥ 130
MSc. Agricultural Farm Power and	Ghana	English		≥ 130
Machinery			12	
MSc. Post-Harvest Engineering	Ghana	English	12	≥ 130
MSc. Crop science	Ghana	English	12	≥ 130
MSc. Animal Science	Ghana	English	12	≥ 130
MSc. Irrigation and Drainage	Ghana	English	12	≥ 130
Engineering				
MSc. Agricultural Farm Power and	Ghana	English	12	≥130
Machinery				
MSc. Agricultural Administration	Nigeria	English	24	≥140
MSc. Agricultural Economics	Nigeria	English	24	≥140
MSc. (Professional) in Gender	Nigeria	English	24	≥140
Development Studies				
MSc. Agricultural Communication and	Nigeria	English	24	≥140
Information Management				
M. Agric. Animal Nutrition	Nigeria	English	24	≥140
M. Agric. Animal Production and	Nigeria	English	24	≥140
Health				
M. Agric. in Pasture Production and	Nigeria	English	24	≥140
Utilization				
M. Eng. in Systems and Food Process	Nigeria	English	24	≥140
Engineering				
MSc Environmental Management and	Nigeria	English	24	≥140
Protection				24.40
MSC. Environmental Management	Nigeria	English	24	≥140
(Professional)		F 1 ¹ -1-	2.4	>1.10
MSc. Agrotorestry	Nigeria	English	24	≥140
MSC. Wildlife Management (Wildlife	Nigeria	English	24	≥140
Management and Conservation				
Option)	Niceria	Frank	24	>1.40
Model Resources Management	Nigeria	English	24	≈140
M. Agric, Crop Protection	Nigeria	English	24	≈14U >140
M. Agric. Horticulture	Nigeria	English	24	≈140
M. Agric. Crop Production	Nigeria	English	24	≶140





PGD Soil Management and Land Use	Nigeria	English	12/24	≥140
M. Agric. Land Use Planning and	Nigeria	English	24	≥140
M. Agric. Environmental Soil Science	Nigeria	English	24	≥140
M. AgSE Livestock Science and Sustainable Environment	Nigeria	English	24	≥140
M. AgSE Crop and Pasture Production and Sustainable Environment	Nigeria	English	24	≥140
M. AgSE Environmental Systems and Climate Change	Nigeria	English	24	≥140
M. AgSE Agricultural Mechanization and Sustainable Environment	Nigeria	English	24	≥140
PGD/MSc. Crop Science	Nigeria	English	12/24	≥140
MSc. Crop Production/Horticulture	Nigeria	English	24	≥140
MSc Crop Protection	Nigeria	English	24	≥140
PGD (Diploma) Animal Science	Nigeria	English	12	≥140
M. Agric. Animal nutrition and biochemistry	Nigeria	English	24	≥140
M. Agric. Animal genetics and breeding	Nigeria	English	24	≥140
MSc Animal production	Nigeria	English	24	≥140
MSc Physiology of reproduction in animals	Nigeria	English	24	≥140
MSc Soil Genesis, Survey and Classification	Nigeria	English	24	≥140
MSc Remote Sensing, Environmental Impact Assessment and Land Evaluation	Nigeria	English	24	≥140
MSc Soil Fertility Management	Nigeria	English	24	≥140
MSc Environmental Pollution Management	Nigeria	English	24	≥140
MSc Soil Physics and Conservation	Nigeria	English	24	≥140
PGD (Diploma) Agricultural Extension	Nigeria	English	12	≥140
MSc Agricultural Administration	Nigeria	English	24	≥140
MSc. Agricultural Extension Education	Nigeria	English	24	≥140
MSc. Agricultural Planning and	Nigeria	English	24	≥140
Evaluation				
MSc. Rural Sociology	Nigeria	English	24	≥140
PGD (Diploma) Agric Economics	Nigeria	English	12	≥140
PGD (Diploma) Agric Economics and Extension	Nigeria	English	12	≥140





	***	of the European Union		
MSC. Resource and Environmental	Nigeria	English	24	≥140
MSc Farm management and	Nigeria	English	24	>140
Production Economics	Nigena	Lingtisti	24	>140
MSc. Agricultural Extension	Nigeria	English	74	>140
Administration	Nigena	English	27	>140
MSc Agricultural Business	Nigeria	Fnalish	74	≥140
Management and Finance	Nigena	English	21	2110
MSc Agricultural Extension	Nigeria	Enalish	24	≥140
Administration		5		_
MSc Agricultural Extension	Nigeria	English	24	≥140
Communication		5		
MSc Agricultural Extension and Rural	Nigeria	English	24	≥140
Sociology	_	_		
MSc Woman Mobilization and Rural	Nigeria	English	24	≥140
Development				
MSc Human Ecology and Rural	Nigeria	English	24	≥140
Tourism				
PGD (Diploma) Animal Science and	Nigeria	English	12	≥140
Technology				
MSc Animal Production and	Nigeria	English	24	≥140
Management				
MSc Animal Nutrition and	Nigeria	English	24	≥140
Biochemistry				> 4 4 9
MSc Animal Physiology and	Nigeria	English	24	≥140
Biotechnology		Eve el l'ele	4.2	>1.40
PGD (Diploma) Food Chemistry /	Nigeria	English	12	≥140
Nutrition.	Nigoria	English	10	>140
PGD (Diptoma) Pood Microbiology /	Nigena	English	12	≥140
PGD (Diploma) Food Processing /	Nigeria	English	12	>140
Engineering	Nigena	Lingtisti	12	>140
MSc Food Microbiology	Nigeria	English	24	≥140
MSc Food Chemistry and Quality	Nigeria	English	24	≥140
Control	lingena			
MSc Food Processing and Storage	Nigeria	English	24	≥140
Technology		5		
MSc Food Engineering	Nigeria	English	24	≥140
PGD (Diploma) Botany	Nigeria	English	12	≥140
PGD Plant Anatomy	Nigeria	English	12	≥140
MSc Biosystematics/Taxonomy	Nigeria	English	24	≥140
MSc Ecology	Nigeria	English	24	≥140
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MSc Mycology/Plant Pathology	Nigeria	English	24	≥140
MSc Aquatic Botany	Nigeria	English	24	≥140
MSc Phytomedicine/Ethnomedicine	Nigeria	English	24	≥140
MSc Environmental Botany	Nigeria	English	24	≥140
PGD Zoology	Nigeria	English	12	≥140
MSc Animal Physiology	Nigeria	English	24	≥140
MSc Applied Fisheries and	Nigeria	English	24	≥140
Aquaculture				
MSc Biological Conservation and	Nigeria	English	24	≥140
Management				
MSc Ecology and Environmental	Nigeria	English	24	≥140
Biology				
PGD Environmental Management	Nigeria	English	12	≥140
MSc Mineral and Resources	Nigeria	English	24	≥140
Exploitation				
MSc Water Resources	Nigeria	English	24	≥140
MSc Geographic Information System	Nigeria	English	24	≥140
MSc Women and Development	Nigeria	English	24	≥140
MSc Waste Management Studies	Nigeria	English	24	≥140
MSc Impact Assessment Studies	Nigeria	English	24	≥140
MSc Pollution Studies	Nigeria	English	24	≥140
PGD Geography and Meteorology	Nigeria	English	12	≥140
MSc Applied Climatology &	Nigeria	English	24	≥140
Meteorology				
MSc Biogeography	Nigeria	English	24	≥140
MSc Hydrology and Water Resources	Nigeria	English	24	≥140
MSc Environmental Management	Nigeria	English	24	≥140
PGD Crop Production/Organic Farming	Nigeria	English	12	≥140
Technology				
PGD/MSC Crop Protection Technology	Nigeria	English	12/24	≥140
PGD Farming System Technology	Nigeria	English	12	≥140
PGD/MSC Farming System Technology	Nigeria	English	12/24	≥140
PGD/MSc Forestry and Wildlife	Nigeria	English	12/24	≥140
Technology				
MSc Agroforestry	Nigeria	English	24	≥140
PGD/MSc Fisheries and Aquaculture	Nigeria	English	12/24	≥140
PGD/MSc Soil Physics	Nigeria	English	12/24	≥140
PGD/MSc Soil Fertility	Nigeria	English	12/24	≥140
PGD/MSc Waste Management	Nigeria	English	12/24	≥140
PGD/MSc Land Use Planning	Nigeria	English	12/24	≥140
PGD Animal Science	Nigeria	English	12	≥140
MSc Animal Nutrition	Nigeria	English	24	≥140





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MSc Animal Product and Processing	Nigeria	English	24	≥140
MSc Animal Management and Health	Nigeria	English	24	≥140
MSc Pasture Management and	Nigeria	English	24	≥140
Utilization				
PGD Agric. Extension	Nigeria	English	12	≥140
MSc Agric. Extension Administration	Nigeria	English	24	≥140
MSc Programme Planning and	Nigeria	English	24	≥140
Evaluation				
MSc Indigenous Knowledge System	Nigeria	English	24	≥140
MSc Community and Rural	Nigeria	English	24	≥140
Development				
MSc Rural Sociology	Nigeria	English	24	≥140
PGD Agric. Economics	Nigeria	English	12	≥140
MSc Agribusiness and Management	Nigeria	English	24	≥140
MSc Farm Management and	Nigeria	English	24	≥140
Production Economics				
MSc Agricultural Policy and	Nigeria	English	24	≥140
Development				
MSc Agricultural Marketing	Nigeria	English	24	≥140
MSc Resource and Environmental	Nigeria	English	24	≥140
Economics				
MPhil Agricultural and Environmental	Nigeria	English	24	≥140
Engineering				
MPhil Agricultural Economics	Nigeria	English	24	≥140
MPhil Agricultural Extension and	Nigeria	English	24	≥140
Rural Development				
MPhil Aquaculture and Fisheries	Nigeria	English	24	≥140
Management				
MPhil/MSc Agronomy (Crop Sciences)	Nigeria	English	24	≥140
MPhil/MSc Crop Protection	Nigeria	English	24	≥140
MPhil/MSc Forest Biology and	Nigeria	English	24	≥140
Silviculture				
MPhil/MSc Soil Resources	Nigeria	English	24	≥140
Management				
MPhil/MSc Agricultural Economics	Nigeria	English	24	≥140
MPhil/MSc Animal Science	Nigeria	English	24	≥140
MPhil/MSc Production and Protection	Nigeria	English	24	≥140
MPhil/MSc Soil Science	Nigeria	English	24	≥140
MSc in Crop Science	Nigeria	English	24	≥140
	Sierra	English	24	≥140
MSc Agribusiness Management	Leone			





	Sierra	English	24	≥140
MSc Soil Science	Leone	5		
	Sierra	English	24	≥140
MSc Crop Science	Leone	_		
	Sierra	English	24	≥140
MSc Crop Protection	Leone	_		
	Sierra	English	24	≥140
MSc Agronomgy	Leone			
	Sierra	English	24	≥140
MSc Aquaculture and Fisheries	Leone			
MSc Agricultural Extension and Rural	Sierra	English	24	≥140
Sociology	Leone			
	Sierra	English	24	≥140
MSc Animal Science	Leone			
	Sierra	English	24	≥140
MSc Horticulture	Leone			
	Sierra	English	24	≥140
MSc Nutrition and Dietetics	Leone			
	Sierra	English	24	≥140
MSc Rural Development	Leone			
	Sierra	English	24	≥140
MSc Post-harvest processing	Leone			
	Sierra	English	24	≥140
MSc Agricultural Economics	Leone			
MSc Geography: Environment and	Sierra	English	24	≥140
Natural Resources	Leone			
	Sierra	English	24	≥140
MSc Geography: Food and Agriculture	Leone			
	Sierra	English	24	≥140
MSc Geography: Rural geography	Leone			
	Sierra	English	24	≥140
MA Sustainable Development	Leone			





12.2 Appendix II: Technical/Vocational Institutions and Programmes.

				Minimum
				Total
University Institutions and		Langua	No. of	Credit
Academic Programmes	Country	ge	months	Hours
B. Tech. Agricultural	Ghana	English	48	≥160
Engineering				
HND Irrigation Design and	Ghana	English	36	≥120
Water Management				
HND Ghanaian Agriculture,	Ghana	English	36	≥120
Economics & Farm Accounting				
HND Assessing Agricultural	Ghana	English	36	≥120
Technologies of Communities				
HND Land Reclamation	Ghana	English	36	≥120
Practices				
HND Entrepreneurship	Ghana	English	36	≥120
HND Horticultural Crops	Ghana	English	36	≥120
Production				
HND Principles of Livestock	Ghana	English	36	≥120
Production and Management				
HND Design and Maintenance	Ghana	English	36	≥120
of Greenhouse				
HND Agro-waste Management	Ghana	English	36	≥120
and Sanitation				
HND Agricultural Engineering	Ghana	English	36	≥120
BSc Engineering in	Ghana	English	48	≥160
Agricultural Mechanization				
Engineering				
BSc Agribusiness and	Ghana	English	48	≥160
Entrepreneurship				
Diploma Agribusiness and	Ghana	English	24	≥120
Finance				
HND Agribusiness and	Ghana	English	36	≥120
Entrepreneurship				
Bachelor of Technology Agro-	Ghana	English	48	≥160
Enterprise Development				
Bachelor of Technology	Ghana	English	48	≥160
Agricultural and				
Environmental Engineering				
HND Agricultural Engineering	Ghana	English	36	≥120





HND Agro-Enterprise	Ghana	Fnalish	36	≥120
Development	Griana	English	50	7120
Bachelor of Technology	Ghana	Enalish	48	≥160
Agricultural Engineering				
Bachelor of Technology Food	Ghana	Enalish	48	≥160
and Postharvest Technology				
Bachelor of Technology	Ghana	English		≥160
Agribusiness Management &		5		
Entrepreneurship			48	
Diploma in Food and	Ghana	English	24	
Postharvest Technology		_		≥120
Bachelor of Technology in	Ghana	English	48	≥160
Agricultural Engineering		_		
Bachelor of Technology in	Ghana	English	48	≥160
Sustainable Agriculture				
Bachelor of Technology in	Ghana	English	48	≥160
Natural Resource Management				
HND Agricultural Engineering	Ghana	English	36	≥120
HND Tropical Agriculture	Ghana	English	36	≥120
Bachelor of Technology in	Ghana	English	48	≥160
Ecological Agriculture				
Bachelor of Technology in	Ghana	English	48	≥160
Agricultural Engineering				
HND Agricultural Engineering	Ghana	English	36	≥120
HND Ecological Agriculture	Ghana	English	36	≥120
Diploma in Agricultural	Ghana	English		≥120
Engineering			24	
Bachelor of Technology in	Ghana	English	48	≥160
General Agriculture				
HND General Agriculture	Ghana	English	36	≥120
Bachelor of Technology in	Ghana	English	48	≥160
General Agriculture				
Diploma in General Agriculture	Ghana	English	24	≥120
Diploma in General Agriculture	Ghana	English	24	≥120
Certificate in General	Ghana	English	12	≥120
Agriculture				
Diploma in General Agriculture	Ghana	English	12	≥120
	Ghana	English	24	≥120
Diploma in Agronomy and				
Extension (Cocoa and Coffee)				
	Sierra	English	48	Unknown
BSc Education in Agriculture	Leone			





	Sierra	English	36	Unknown
Diploma in Agriculture	Leone			
	Sierra	English	36	Unknown
Diploma in Agriculture	Leone			
	Sierra	English	48	Unknown
BSc Agribusiness Management	Leone			
	Sierra	English	48	Unknown
BSc Agricultural Economy	Leone			
	Sierra	English	36	Unknown
Diploma in Agriculture	Leone			
	Sierra	English	36	Unknown
Diploma teacher training	Leone			
	Sierra	English	36	Unknown
Diploma in Agriculture	Leone			
Certificate in Agriculture	Nigeria	English	Unknown	Unknown
Certificate in Agriculture	Nigeria	English	Unknown	Unknown
HND/ND Agricultural and Bio-	Nigeria	English	24	Unknown
Environmental Engineering				
(Farm Option)				
ND Horticultural Technology	Nigeria	English	24	Unknown
HND Agricultural Extension	Nigeria	English	24	Unknown
and Management				
HND/ND Animal Health and	Nigeria	English	24	Unknown
Production Technology				
HND Pasture and Range	Nigeria	English	24	Unknown
Management				
HND Animal Production	Nigeria	English	24	Unknown
Technology	_	_		
HND Agricultural Extension	Nigeria	English	24	Unknown
and Management	_			
HND Crop Production	Nigeria	English	24	Unknown
Technology		_		
HND Pest Management	Nigeria	English	24	Unknown
Technology				
ND Horticultural Technology	Nigeria	English	24	Unknown





12.3 Appendix III: General Mode of Delivery in the Partner Countries for Master's/TVET Programmes

- 1. Lectures
- 2. Online
- 3. Full/Part-time
- 4. Practical field visits
- 5. Tutorials
- 6. Seminars
- 7. Thesis

12.4 Appendix IV: General Mode of Delivery in the Partner Countries for Master's/TVET Programmes

- 1. **Online a**pplications with letters of recommendation, transcript(s) and certified copies of certificates of previous tertiary academic degrees/diplomas.
- 2. A good first degree (at least a second-class lower division) in a relevant field of study from any recognized University.
- 3. Interview process.
- 4. Entrance examination in the case of mature or students with lower classes.

12.5 Appendix V: Admission Requirements in the Partner Countries for Master's/TVET Programmes

Ghana

1. Entry Requirement for Bachelor of Science

A. Senior Secondary School Certificate Examination (SSSCE) Candidates:

Passes (A-D) in six (6) subjects comprising three core subjects: Core English Language, Core Mathematics, and Integrated Science plus three (3) credit passes in any of the following elective subjects; Agricultural Science, Horticulture, Crop and Animal husbandry, Mathematics, Physics, Technical Drawing, Engineering Science, Chemistry, Metal Work, Auto Mechanic, Basic Electronics, Applied Electricity, and related subjects. Such applicants will be admitted in year one (1) of the programme.

B. West Africa Senior Schools Certificate Examination (WASSCE) Candidates:

Passes (A1-C6) in six subjects comprising three core subjects: Core English Language, Core Mathematics, and Integrated Science plus three credit passes in any of the following elective subjects; Agricultural Science, Horticulture, Crop Husbandry,





Animal Husbandry, Mathematics, Physics, Technical Drawing, Engineering Science, Chemistry, Metal Work, Auto Mechanic, Basic Electronics, Applied Electricity, and related subjects. Such applicants will be admitted in year one of the programme.

2. Entry Requirement for Bachelor of Technology Degree

a) Senior Secondary School Certificate Examination (SSSCE) Candidates:

Applicants with SSCE must have Passes (A–D) in three (3) core subjects including, English Language, Mathematics (core), and Integrated Science plus three (3) passes in relevant elective subjects with an aggregate not exceeding 24.

b) West Africa Senior Schools Certificate Examination (WASSCE) Candidates:

Applicants with WASSCE must have Credit Passes (A1–C6) in three (3) core subjects, English Language, Mathematics, Integrated Science plus three (3) relevant elective subjects with an aggregate not exceeding 36.

c) General Certificate of Education (GCE) Advanced Level:

Applicants with GCE A- level must have passes in three subjects (at least, one of the passes should be Grade D or better. Also, the applicant must have had credit passes (Grade 6) in five (5) GCE Ordinary Level subjects including English, Mathematics, and a science subject (for non-science students) and an Art subject for science students.

d) Applicants from Technical Institutes:

Applicants from Technical Institutes must have passes in the relevant elective courses. Applicants without Mathematics, English Language and Integrated Science may be admitted to an intensive two (2) month bridging (pre-degree) programme before formal admission to their programme of choice after passing a selection examination.

e) Mature Applicants:

Mature students have also been provided with the opportunity to further their education in this programme. The mature applicant must:

Be at least 25 years of old, Show proof of age with a birth certificate, baptismal certificate, or any legitimate documentary proof of date of birth.

Pass Mature Students' Entrance Examinations conducted by the University, moderated, and marked scripts vetted by the University. In line with the above, the applicant must show proof of credit passes in English and Mathematics in WASSCE





or any other

nationally

recognized standard High School level examination (for qualifications from countries outside WAEC's jurisdiction).

f) Foreign Applicants

All foreign qualifications will be referred to the National Accreditation Board (GTEC) for determination of equivalences and eligibility for admission into the programme in line with (GTEC Act, 2007 [Act 774 (2(2b)]

3. Entry Requirement for HND

a) SSCE and WASSCE

Senior Secondary School Certificate Examinations (SSSCE), and West African Senior School Certificate Examination (WASSCE)

The general requirements for admission of WASSCE, SSSCE and GBCE candidates to read HND Mechanical Engineering are three (3) credit passes in three core subjects and three (3) credit passes in three relevant elective subjects.

b) SSSCE Candidates

Credit Passes (A-D) in six (6) subjects comprising three core subjects, including English Language, Core Mathematics and Integrated Science, plus credit passes (A-D) in three (3) of the following elective subjects: Elective Mathematics, Physics, Technical Drawing and Chemistry.

c) WASSCE Candidates

Credit Passes (A1-D7) in six (6) subjects comprising three core subjects, including English Language, Core Mathematics and Integrated Science, plus Credit Passes (A1-D7) in three (3) of the following elective subjects: Elective Mathematics, Physics, Technical Drawing and Chemistry.

d) General Certificate of Education (GCE) Advanced Level Candidates

Passes in three (3) subjects (at least, one of the passes should be Grade D or better). Also, the applicant must have had credit passes (Grade 6) in five GCE Ordinary Level subjects including English Language, Mathematics and a Science subject.

e) Mature Students

I. Mature applicants shall not exceed 5% of the total admissions in a given academic year.





II. The

applicant must be

at least 25 years old, and show proof of age with a birth certificate or any legitimate documentary proof of date of birth which is at least 5 years old at the time of application.

III. Applicant must pass Mature Students' Entrance Examinations conducted by the Institution (English Language, Mathematics and an Aptitude Test).

f) Foreign Students

Entry Requirements:

All foreign qualifications will be referred to the Ghana Tertiary Education Commission (GTEC) for determination of equivalences and eligibility for admission into the programme in line with (GTEC Act, 2007 [Act 774 (2(2b)].

g) Technical School Applicants

Entry Requirements: Credit Passes in English Language, Mathematics, Integrated Science, plus Credit Passes in three of the following subjects: Mechanical Engineering Craft Practice, Industrial Mechanics, Welding, Auto Mechanics, Technical Drawing, Refrigeration and Agricultural Engineering.

h) Professional and other Applicants

All professional certificates and any other qualifications beyond the ones specified above will be referred to GTEC for the establishment of their equivalencies and to determine their eligibility for admission onto the programme.

Nigeria

1. Entry Requirement for Bachelor of Science

The University's requirements for the Degree Programmes are – **Either**

- Five (5) GCE 'O' Levels/WASSCE Credits including the English Language in not more than two sittings. In the case of the West Africa Examinations Council Examinations, only grades varying from 1-6 are recognized as GCE 'O' Level credit passes and Al-C6 for WASSCE. For the Associate Examinations Board (London GCE) only C grade or better is recognized, **Or**
- 2. Holders of HND/HTC with four (4) GCE 'O' Levels/WASSCE Credits including English Language and/or Mathematics in not more than two sittings. In addition, applicants must satisfy faculty and departmental requirements for admission into the various faculties and departments (please see specific entry





3. requirements for your proposed programme). Applicants should note that some faculties start their Honours Programmes in the 3rd Year.

All students are admitted into general programmes. To be eligible for the Honours Programme, a student must have a cumulative grade point average (CGPA) of at least 3.60 at the end of the second year.

2. Higher National Diploma Courses (HND)

- 1. Four (4) WASSCE/GCE 'O' Level Credits including English Language and/or Mathematics or 4 NVQ (with unit 5 or better) in not more than two sittings, **Or**
- 2. Diploma in the related field with 3 WASSCE/GCE 'O' Levels credits.

3. National Diploma Programme (ND)

Candidates must have a minimum of five (5) credit passes in WASC or GCE O'LEVEL or SSCE/NECO/NABTEB obtained at not more than two sittings. The five subjects must include Chemistry, Biology or Agricultural Science, plus three other subjects from Economics, English Language, Geography, Mathematics, Physics, or Statistics. Candidates must not score below the UTME cut-off mark for the institution

OR

Five Credit passes in NBTE-recognized Preliminary National Diploma (Pre-ND) course offered in a polytechnic or similar post-secondary institution. The five credit passes must be from subjects specified in (A) above. Candidates must not score below the UTME cut-off mark for the institution.

4. Higher National Diploma Courses (HND)

Candidates must have a minimum of Lower Credit in Cognate ND plus Five O'Level credits in relevant subjects obtained at WASC/GCE/NECO/NABTEB. Candidates must also have one year of Post-ND Industrial Training (IT) experience.

NCE holders (Agric. Double Major) are also eligible for HND programmes.

5. Certificate Programmes

JSS/SSS Certificate (Holders of the Primary Six Certificate may also be considered).





12.6 Appendix VI: Compliance of master's programmes with the 10 elements of Agroecology in partner countries in West Africa.

10 Elements of Agroecology	DV	CS	SY	EF	RC	RE	HS	CF	RG	CE
Ghana										
University of Energy and										
Natural Resources (UENR)										
MPhil Social Forestry and	1	1	0	1	0	0	1	0	1	0
Environmental Governance										
MPhil/MSc Crop Science	1	1	1	0	0	0	1	0	0	1
MPhil Agribusiness	0	0	0	0	0	0	0	0	0	1
Management										
MPhil Environmental Planning	1	0	0	0	0	0	0	0	1	0
& Development										
MPhil/MSc. Climate Change	0	1	0	0	0	1	0	0	0	0
MPhil/MSc Environment, Water	0	1	0	1	0	1	1	0	0	0
and Sustainability										
MPhil Agricultural & Resource	0	0	0	1	0	0	0	0	0	1
Economics										
MPhil Animal Production	1	1	0	1	1	0	0	1	0	1
MPhil/MSc Land Degradation	0	0	0	0	0	0	1	0	1	0
Neutrality										
University of Ghana (Legon)										
MPhil Agricultural	0	1	0	1	0	0	0	0	1	0
Administration										
MPhil Agribusiness	0	0	0	1	0	0	0	0	1	1
MPhil Agricultural Economics	0	0	0	1	0	0	0	0	1	1
M. Agric./MPhil Agricultural	0	1	0	0	0	1	1	1	1	0
Extension										
M. Agric./MPhil Animal Science	1	1	1	0	1	1	0	1	1	0
M. Agric./MPhil Crop Science	1	1	1	1	0	1	0	1	0	0
M. Agric./MPhil Soil Science	1	0	0	1	1	1	0	0	0	0
MPhil Soil and Water	0	0	0	1	0	0	0	0	0	0
Engineering										
MPhil Entomology	1	1	1	1	0	1	1	0	0	1
MPhil Nuclear Agriculture	1	1	0	1	0	1	0	0	0	0
MPhil/MSc. Climate Change &	1	1	0	1	0	1	1	0	0	0
Sustainable Development										





				OT U	ne Europear	1 Union				
MPhil/MSc Aquaculture	1	1	1	1	1	1	1	1	1	1
MSc Biodiversity Studies	1	1	0	0	0	1	0	0	0	0
MPhil Postharvest Technology	1	0	0	1	0	1	0	0	0	1
MSc Extension & Livelihood	1	1	1	1	1	1	1	1	1	1
Studies										
University of Cape Coast										
MSc Animal Science	1	1	1	1	1	0	1	1	1	1
MPhil Agricultural Economics	0	0	0	0	0	0	0	1	1	1
MPhil Agricultural Extension	1	1	1	1	1	1	1	1	1	1
MPhil Animal Science (Animal	1	0	0	0	0	0	0	0	0	0
Nutrition)										
MPhil Animal Science (Animal	1	1	0	0	0	0	0	1	0	0
Breeding and Genetics)										
MPhil Crop Science	1	1	1	1	1	1	1	1	1	1
MPhil Land Use and	0	1	0	0	0	1	0	0	0	0
Environmental Science										
MPhil Aquaculture	1	1	1	0	0	1	0	1	0	0
MPhil Pasture and Range	0	0	0	0	0	0	0	0	0	0
Management										
MPhil Wildlife Management	0	0	0	0	0	0	0	0	0	0
MPhil Soil Science	0	0	0	1	0	1	0	0	0	0
MPhil Irrigation Technology	1	0	0	1	0	0	0	0	0	0
University of Education,										
Winneba										
MPhil Crop/Soil Science	1	1	1	1	1	1	1	1	1	1
M.Ed. Agriculture	1	1	0	0	0	0	0	0	0	0
MPhil Animal Science	1	1	0	1	1	1	1	1	0	0
University of Development										
Studies (UDS)										
MPhil Agricultural Economics	0	0	0	0	1	0	0	0	1	1
MPhil/MSc Soil and Water	0	1	0	1	1	0	1	0	1	0
Conservation Management										
MPhil Post Harvest Technology	0	0	0	0	0	1	0	0	0	0
MPhil/MSc Soil Science	1	0	0	1	0	0	0	0	0	0
MPhil Crop Science	1	1	1	1	1	1	1	1	1	1
MPhil/MSc Horticulture	1	1	0	1	0	1	1	0	1	1
MPhil Environment and	1	1	1	1	0	0	0	1	1	1
Resource Management										
MSc Irrigation and Drainage	1	0	0	1	0	1	0	0	0	0
Engineering										
MPhil Agronomy	1	0	1	1	0	1	1	1	1	1
MPhil Agriculture Science	1	1	1	1	0	1	1	0	0	1





			*	** of t	ne Europear	u Union				
MPhil Agribusiness	0	0	0	0	0	0	0	0	0	1
MPhil Animal Science	0	0	0	1	0	1	0	0	0	0
University of Science &										
Technology										
MSc. Agricultural Extension &	0	1	1	0	0	1	1	0	0	0
Development Communication										
MPhil/MSc. Agribusiness	0	0	0	0	0	0	0	0	0	1
Management										
MPhil Agricultural Economics	0	0	0	0	0	0	0	0	0	1
MPhil Agronomy	1	0	1	1	0	0	0	0	0	0
MPhil Post Harvest Technology	0	0	1	0	1	0	0	0	0	0
MPhil Fruit Crop Production	1	1	1	0	0	1	0	0	1	1
MPhil Vegetable Crops	1	1	1	1	0	1	1	0	0	1
Production										
MPhil Agroforestry	1	1	1	1	0	1	0	1	0	0
MPhil Aquaculture and	0	0	1	1	1	1	0	0	0	1
Environment										
MPhil Watershed Management	0	0	1	0	0	1	0	0	0	0
MPhil Entomology	0	0	0	1	0	1	0	0	0	0
MPhil Organic and Natural	1	1	1	1	1	1	1	1	0	1
Products										
MPhil Soil Science	0	0	0	1	0	1	0	0	0	0
Bolgatanga Technical										
University										
MSc. Agricultural Farm Power	1	1	0	0	0	0	1	0	0	0
and Machinery										
MSc. Post-Harvest Engineering	0	1	1	0	0	1	1	1	1	0
MSc Crop science	1	1	0	1	1	1	1	1	1	1
MSc Animal Science	0	1	0	1	0	0	0	1	0	1
MSc. Irrigation and Drainage	1	1	0	1	1	1	1	1	1	0
Engineering										
MSc. Agricultural Farm Power	1	1	0	0	0	0	0	0	0	1
and Machinery										
Sierra Leone										
Njala University, Njala Campus										
MSc Agribusiness Management	1	1	1	1	0	0	1	0	1	1
MSc Soil Science	1	1	1	1	0	0	1	0	0	0
MSc Crop Science	1	1	1	1	0	0	1	1	0	0
MSc Crop Protection	1	1	1	1	0	0	1	0	0	0
MSc Agronomy	1	1	0	1	0	0	1	0	0	0
MSc Aquaculture and Fisheries	1	1	1	1	0	0	1	1	0	0
i ise Aquacattare and Fisheries	-	-	-	-	0	v	-	-	0	v





MSc Agricultural Extension and				ort						
Rural Sociology	1	1	1	1	0	0	1	0	1	0
MSc Animal Science	1	1	0	1	0	0	1	1	1	0
MSc Horticulture	1	1	0	0	1	0	1	1	0	0
MSc Nutrition and Dietetics	1	1	0	0	0	0	1	0	0	0
MSc Rural Development	1	1	0	0	0	0	1	0	1	0
MSc Post-harvest processing	0	1	0	0	0	0	1	0	0	0
MSc Agricultural Economics	1	1	1	1	1	0	1	0	1	1
Ernest Bai Koroma University of										
Science and Technology										
MSc Geography: Environment										
and Natural Resources	1	0	1	0	1	1	0	1	1	0
MSc Geography: Food and										
Agriculture	1	0	1	0	0	1	1	1	0	0
University of Makeni										
MA Sustainable Development	0	0	0	0	0	1	1	1	1	0
Nigeria										
Federal University of										
Agriculture Abeokuta										
MSc. Agricultural										
Administration	1	1	0	0	0	0	1	0	1	1
MSc. Agricultural Economics	1	1	0	0	0	0	1	0	0	1
MSc (Professional) in Gender										
Development Studies	1	1	0	0	0	0	1	0	0	0
MSc. Agricultural										
Communication and										
Information Management	1	1	0	0	0	0	1	0	0	1
M. Agric. Animal Nutrition	1	1	1	1	1	0	1	1	0	1
M. Agric. Animal Production										
and Health	1	1	1	1	1	0	1	1	0	1
M. Agric. in Pasture Production										
and Utilization	1	1	0	1	1	0	1	1	1	1
M. Eng. in Systems and Food										
Process Engineering	0	1	0	0	0	0	1	0	0	0
MSc Environmental										
Management and Protection	1	1	0	0	1	1	1	0	0	0
MSc. Environmental			_				-		_	
Management (Professional)	1	1	0	0	1	1	1	0	0	0
MSc. Agroforestry	1	1	0	0	1	0	1	0	0	0
MSc. Wildlife Management										
(Wildlife Management and			_	_	_	_	_	_	_	
Conservation option)	1	1	0	0	1	0	1	0	0	0



Synopsis of Curricula in agroecology



MSc. Water Resources				OIT	ic Europear	T ONION				
Management	0	1	0	0	1	1	1	0	0	0
M. Agric Crop Protection	1	1	1	1	1	0	1	1	0	1
M. Agric Horticulture	1	1	1	1	1	0	1	1	0	1
M. Agric Crop Production	1	1	1	1	1	0	1	1	0	1
PGD Soil Management and										
Land Use Planning	1	1	0	1	1	0	1	0	0	0
M. Agric Land Use Planning										
and Management	1	1	0	1	1	0	1	0	1	0
M. Agric Environmental Soil										
Science	1	1	0	1	1	0	1	0	0	0
M. AgSE. Livestock Science and										
Sustainable Environment	1	1	1	1	1	1	1	1	1	1
M. AgSE. Crop and Pasture										
Production and Sustainable										
Environment	1	1	1	1	1	1	1	1	0	1
M. AgSE Environmental										
Systems and Climate Change	1	1	0	1	1	1	1	0	1	1
M. AgSE. Agricultural										
Mechanization and Sustainable										
Environment	1	1	0	1	1	1	1	0	0	0
The University of Nigeria										
Nsukka										
PGD/MSc. Crop Science	1	0	1	1	1	1	0	1	0	0
MSc. Crop										
Production/Horticulture	1	0	1	1	1	1	0	1	0	0
MSc Crop Protection	1	0	1	1	1	1	0	1	0	0
PGD (Diploma) Animal Science	1	0	0	0	0	0	0	1	1	1
M. Agric. Animal nutrition and										
biochemistry	1	0	0	0	0	0	0	1	0	0
M. Agric. Animal genetics and										
breeding	1	0	0	0	0	0	0	1	1	0
MSc Animal production	1	0	0	0	0	0	0	1	0	0
MSc Physiology of										
reproduction in animals	1	0	0	0	0	0	0	0	1	0
MSc Soil Genesis, Survey and										
Classification	0	0	0	0	0	0	0	0	0	0
MSc Remote Sensing,										
Environmental Impact										
Assessment and Land										
Evaluation	0	0	0	0	0	0	0	0	0	0
MSc. Soil Fertility Management	1	0	0	1	1	1	1	0	0	0





MSc Environmental Pollution				UT I						
Management	0	0	0	0	0	1	0	0	0	0
MSc Soil Physics and										
Conservation	1	0	0	1	0	1	0	0	0	0
PGD (Diploma) Agricultural										
Extension	0	1	0	0	0	0	1	1	1	1
MSc Agricultural										
Administration	0	1	0	0	0	0	1	1	1	0
MSc. Agricultural Extension										
Education	0	1	0	0	0	0	1	1	1	0
MSc. Agricultural Planning and										
Evaluation	0	1	0	0	0	0	1	1	1	0
MSc. Rural Sociology	0	0	0	0	0	0	0	1	1	1
PGD (Diploma) Agric Economics	0	0	0	0	0	0	0	0	0	1
The university of Uyo										
PGD (Diploma) Agric Economics										
and Extension	0	0	0	0	0	0	1	0	0	1
MSC. Resource and										
Environmental Economics	0	0	0	0	0	0	1	0	0	1
MSc. Farm Management and										
Production Economics	0	0	0	0	0	0	1	0	0	1
MSc. Agricultural Extension										
Administration	0	0	0	0	0	0	1	0	0	1
MSc Agricultural Business										
Management and Finance	0	0	0	0	0	0	1	1	0	0
MSc Agricultural Extension										
Administration	0	1	0	0	0	0	1	1	0	1
MSc Agricultural Extension										
Communication	0	1	0	0	0	0	1	1	0	0
MSc Agricultural Extension and										
Rural Sociology	0	1	0	0	0	0	1	1	0	0
MSc Woman Mobilization and										
Rural Development	0	1	0	0	0	0	1	1	0	0
MSc Human Ecology and Rural										
Tourism	0	1	0	0	0	0	1	1	0	0
PGD (Diploma) Animal Science										
and Technology	1	0	1	0	1	0	0	1	1	0
MSc. Animal Production and										
Management	1	1	1	1	1	0	0	1	1	0
MSc Animal Nutrition and										
Biochemistry	1	1	1	1	0	0	0	1	1	0
MSc Animal Physiology and										
Biotechnology	1	1	1	0	0	0	0	1	0	0





PGD (Diploma) Food Chemistry				U U U		onion				
/ Nutrition.	0	1	0	0	1	0	0	0	0	1
PGD (Diploma) Food										
Microbiology / Quality Control	0	1	0	0	1	0	0	0	0	1
PGD (Diploma) Food Processing										
/ Engineering	0	1	0	1	1	0	0	0	0	1
MSc Food Microbiology	0	1	0	1	1	0	0	0	0	1
MSc Food Chemistry and										
Quality Control	0	1	0	1	1	0	0	0	0	1
MSc Food Processing and										
Storage Technology	0	1	0	1	1	0	0	0	0	1
MSc Food Engineering	0	1	0	1	1	0	0	0	0	1
PGD (Diploma) Botany	1	1	0	0	0	0	0	1	0	0
PGD Plant Anatomy	1	0	0	0	0	0	0	1	0	0
MSc Biosystematics/Taxonomy	1	0	0	0	0	0	0	1	0	0
MSc Ecology	1	0	0	0	0	0	0	1	0	0
MSc Mycology/Plant Pathology	1	0	0	0	0	0	0	1	0	0
MSc Aquatic Botany	1	0	0	0	0	0	0	1	0	0
MSc										
Phytomedicine/Ethnomedicine	1	0	0	0	0	0	0	1	0	0
MSc Environmental Botany	1	0	0	0	0	0	0	1	0	0
PGD Zoology	1	0	0	0	0	0	0	1	0	0
MSc Animal Physiology	1	0	0	0	0	0	0	1	0	0
MSc Applied Fisheries and										
Aquaculture	1	0	0	0	0	0	0	1	0	0
MSc Biological Conservation										
and Management	1	0	0	0	0	0	0	1	0	0
MSc Ecology and										
Environmental Biology	1	0	0	0	0	0	0	1	0	0
PGD Environmental										
Management	0	0	0	0	1	1	0	0	0	0
MSc Mineral and Resources										
Exploitation	0	0	0	0	1	1	0	0	0	0
MSc Water Resources	0	0	0	0	0	1	0	0	0	0
MSc Geographic Information										
System	0	0	0	0	0	1	0	0	0	0
MSc Women and Development	0	0	0	0	0	1	1	0	0	0
MSc Waste Management										
Studies	0	0	0	0	0	1	0	0	0	0
MSc Impact Assessment										
Studies	0	0	0	0	0	1	0	0	0	0
MSc Pollution Studies	0	0	0	0	0	1	0	0	0	0





PGD Geography & Meteorology	1	0	0	0	<u>1</u>	1	0	0	0	0
MSc Applied Climatology &										
Meteorology	1	0	0	0	1	0	0	0	0	0
MSc Biogeography	1	0	0	0	1	1	0	0	0	0
MSc Hydrology and Water										
Resources	1	0	0	0	1	0	0	0	0	0
MSc Environmental										
Management	1	0	0	0	1	0	0	0	0	0
Federal University of										
Technology Owerri										
PGD Crop Production/organic										
farming Technology	1	0	1	1	0	1	0	1	0	0
PGD/MSC Crop Protection										
Technology	1	0	1	1	0	1	0	1	0	0
PGD Farming System										
Technology	1	0	1	1	0	1	0	1	0	0
PGD/MSC Farming System										
Technology	1	0	1	1	0	1	0	1	0	0
PGD/MSc. Forestry and Wildlife										
Technology	1	0	0	0	0	0	0	1	0	0
MSc Agroforestry	1	0	0	1	0	1	0	1	0	0
PGD/MSc Fisheries and										
Aquaculture	1	0	1	0	0	0	0	1	0	0
PGD/MSc Soil Physics	0	0	0	1	0	0	0	0	0	0
PGD/MSc Soil Fertility	0	0	0	1	0	0	0	0	0	0
PGD/MSc Waste Management	0	0	0	1	0	1	0	0	0	0
PGD/MSc Land Use Planning	0	0	0	0	0	0	0	0	0	0
PGD Animal Science	1	1	1	0	0	0	0	1	0	0
MSc Animal Nutrition	1	1	1	0	0	0	0	1	0	0
MSc Animal Product and										
Processing	1	1	1	0	1	0	0	1	0	1
MSc Animal Management and										
Health	1	0	1	0	0	0	0	1	0	0
MSc Pasture Management and										
Utilization	1	0	1	0	0	0	0	1	1	0
PGD Agric Extension	0	0	0	0	0	0	0	0	0	0
MSc Agric Extension										
Administration	0	0	0	0	0	0	0	0	1	0
MSc Programme Planning and										
Evaluation	0	0	0	0	0	0	0	0	1	0
MSc Indigenous Knowledge										
System	0	1	0	0	0	0	0	1	0	0





Development 0 1 1 1 0 0 1 <th< th=""><th>MSc Community and Rural</th><th></th><th></th><th></th><th>OIT</th><th></th><th>T ONION</th><th></th><th></th><th></th><th></th></th<>	MSc Community and Rural				OIT		T ONION				
MSc Rural Sociology 0 1	Development	0	0	0	0	0	0	0	1	0	0
PGD Agric Economics 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	MSc Rural Sociology	0	0	0	0	0	0	0	0	0	0
MSc Agribusiness and Image of the second	PGD Agric Economics	0	0	0	0	0	0	0	0	0	1
Management 0 1 1 1 1 0 1 <th1< td=""><td>MSc Agribusiness and</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th1<>	MSc Agribusiness and										
MSc Farm Management and Production Economics 0 1 1 1 0 0 0 1 1 1 0 0 0 1	Management	0	0	0	0	0	0	0	0	0	1
Production Economics 0 0 0 0 0 0 0 0 0 0 0 0 1 MSc Agricultural Policy and Development 0 0 0 0 0 0 0 0 1 0 1 1 MSc Agricultural Marketing 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 MSc Agricultural Marketing 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 <t< td=""><td>MSc Farm Management and</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	MSc Farm Management and										
MSc Agricultural Policy and Development Image: Marketing Image: M	Production Economics	0	0	0	0	0	0	0	0	0	1
Development 0 0 0 0 0 1 0 1 1 MSc Agricultural Marketing 0 1	MSc Agricultural Policy and										
MSc Agricultural Marketing 0 1 MSc Resource and 0 0 0 0 0 0 0 0 0 0 0 1 Environmental Economics 0 1 1 1 1 1 0 1	Development	0	0	0	0	0	0	1	0	1	1
MSc Resource and Image: style of log of the style of the	MSc Agricultural Marketing	0	0	0	0	0	0	0	0	0	1
Environmental Economics 0 0 0 0 0 0 0 0 0 0 0 0 0 1 University of Ibadan Image: Construct of Ibadan Ima	MSc Resource and										
University of Ibadan Image: Mark and Bar and B	Environmental Economics	0	0	0	0	0	0	0	0	0	1
MPhil Agricultural and Image: MPhil Agricultural Engineering 0 1 1 1 1 0 0 0 MPhil Agricultural Economics 0 1 0 1 1 1 0 1 0 1 1 0 0 0 0 MPhil Agricultural Extension -	University of Ibadan										
Environmental Engineering 0 1 1 1 1 0 0 0 0 MPhil Agricultural Economics 0 1 0 1 1 0 1 0 1 1 0 1 0 1 1 1 0 1 1 1 0 1 1 1 0 1 1 1 1 1 1 1 0 1 1 1 1 0 1	MPhil Agricultural and										
MPhil Agricultural Economics 0 1 0 1 0 1 0 1 1 MPhil Agricultural Extension 0 1 1 1 0 1 0 1 1 and Rural Development 0 1 1 1 0 0 1 0 1 1 MPhil Aquaculture and -	Environmental Engineering	0	1	1	1	1	1	0	0	0	0
MPhil Agricultural Extension Image: Marcial Development 0 1 1 1 0 0 1 1 1 MPhil Aquaculture and Image: Marcial Development 0 1 1 1 0 0 1 0 1 1 1 MPhil Aquaculture and Image: Marcial Development 0 1 1 1 1 0 0 1 1 1 Fisheries Management 0 1 1 1 1 0 0 1 0 1 1 0 1 0 1 1 0 1 0 1 1 1 1 1 1 0 1 0	MPhil Agricultural Economics	0	1	0	1	1	0	1	0	1	1
and Rural Development 0 1 1 1 0 0 1 0 1 1 MPhil Aquaculture and -	MPhil Agricultural Extension										
MPhil Aquaculture and Image: Constraint on the image of the ima	and Rural Development	0	1	1	1	0	0	1	0	1	1
Fisheries Management 0 1 1 1 1 0 0 1 0 1 MPhil/MSc Agronomy (Crop 5 1 1 1 1 1 0 1 0 0 1 0 0 1 Sciences) 1 1 1 1 1 0 1 0 0 0 MPhil/MSc Crop Protection 1 1 1 1 1 0 1 0 0 MPhil/MSc Forest Biology and -<	MPhil Aquaculture and										
MPhil/MSc Agronomy (Crop I </td <td>Fisheries Management</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>1</td>	Fisheries Management	0	1	1	1	1	0	0	1	0	1
Sciences) 1 1 1 1 1 0 1 0 0 MPhil/MSc Crop Protection 1 1 1 1 1 1 0 1 0 0 MPhil/MSc Forest Biology and Silviculture 1 1 1 1 0 1 0 0 0 MPhil/MSc Soil Resources 1 1 1 1 0 1 0 0 0 0 Management 0 1 1 1 1 1 1 1 0 0 0 0 MPhil/MSc Agricultural 0 1 1 1 1 1 0 1 1 1	MPhil/MSc Agronomy (Crop										
MPhil/MSc Crop Protection 1 1 1 1 1 0 1 0 0 MPhil/MSc Forest Biology and <t< td=""><td>Sciences)</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td></t<>	Sciences)	1	1	1	1	1	1	0	1	0	0
MPhil/MSc Forest Biology and SilvicultureII	MPhil/MSc Crop Protection	1	1	1	1	1	1	0	1	0	0
Silviculture 1 1 1 1 0 1 0 0 0 0 MPhil/MSc Soil Resources -	MPhil/MSc Forest Biology and										
MPhil/MSc Soil ResourcesImage: Constraint of the second secon	Silviculture	1	1	1	1	0	1	0	0	0	0
Management01111000Obafemi Awolowo UniversityIIIIIIIIIIMPhil/MSc AgriculturalIIIIIIIIIII	MPhil/MSc Soil Resources										
Obafemi Awolowo UniversityImage: Constraint of the second sec	Management	0	1	1	1	1	1	0	0	0	0
MPhil/MSc Agricultural 0 1 1 1 1 1	Obafemi Awolowo University										
	MPhil/MSc Agricultural										
	Economics	0	1	1	1	1	1	1	0	1	1
MPhil/MSc Animal science 0 1 1 1 0 1 0 <td>MPhil/MSc Animal science</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td>	MPhil/MSc Animal science	0	1	1	1	1	1	0	1	0	0
MPhil/MSc Production and	MPhil/MSc Production and										
Protection 1 1 0 1 1 0	Protection	1	1	0	1	1	1	0	0	0	0
MPhil/MSc Soil science 1 1 1 1 0 0 0 0	MPhil/MSc Soil science	1	1	1	1	1	1	0	0	0	0
MSc in Crop Science 1 1 0 1 1 0	MSc in Crop Science	1	1	0	1	1	1	0	0	0	0

NB: DV: Diversity of Agroecological Systems; CS: Co-creation and sharing of knowledge; SY: Synergies; EF: Efficiency; RC: Recycling; RE: Resilience; HS: . Social Values; CF: Culture and Food Traditions; RG: Responsible Governance; CE: Circular and Solidarity Economy.





12.7 Appendix VII: Compliance of TVET programmes with the 10 elements of Agroecology in partner countries in West Africa.

10 Elements of Agroecology	DV	CS	SY	EF	RC	RE	HS	CF	RG	CE
Ghana										
Dr. Hilla Limann Technical										
University										
BSc Agricultural Engineering	0	0	0	1	0	0	0	0	0	0
HND Irrigation Design and										
Water Management	0	1	0	1	1	1	0	0	1	1
HND Ghanaian Agriculture,										
Economics & Farm Accounting	1	0	0	0	0	0	1	1	1	0
HND Assessing Agricultural										
Technologies of Communities	0	1	0	0	0	0	0	0	0	0
HND Land Reclamation										
Practices	1	0	0	1	0	1	0	0	0	0
HND Entrepreneurship	0	0	0	0	0	0	0	1	0	1
HND Horticultural Crops										
Production	1	0	1	1	0	0	0	0	0	0
HND Principles of Livestock										
Production and Management	1	0	0	1	0	1	0	0	0	0
HND Design and Maintenance										
of Greenhouse	0	0	0	1	0	0	0	0	0	0
HND Agro-waste Management										
and Sanitation	0	0	1	1	1	1	0	0	0	0
HND Agricultural Engineering	0	0	0	1	0	0	0	0	0	0
Kumasi Technical University										
BSc Engineering in Agricultural										
Mechanization Engineering	0	0	0	1	0	0	0	0	0	0
BSc Agribusiness and										
Entrepreneurship	0	0	0	0	0	0	0	0	0	1
Diploma Agribusiness and										
Finance	0	0	0	0	0	0	0	0	0	1
HND Agribusiness and										
Entrepreneurship	0	0	0	0	0	0	0	0	0	1
Ho Technical University										





Bachelor of Technology Agro.				UT I		onion				
Enterprise Development	1	1	0	1	0	1	1	1	0	1
Bachelor of Technology										
Agricultural and Environmental										
Engineering	0	0	0	1	0	0	0	0	0	0
HND Agricultural Engineering	0	0	0	1	0	0	0	0	0	0
HND Agro. Enterprise										
Development	1	1	0	1	0	1	1	1	0	1
Cape Coast Technical										
University										
Bachelor of Technology										
Agricultural Engineering	0	0	0	1	0	0	0	0	0	0
Bachelor of Technology Food										
and Postharvest Technology	0	0	0	1	0	1	0	0	0	0
Bachelor of Technology										
Agribusiness Management &										
Entrepreneurship	0	0	0	0	0	0	0	0	0	1
Diploma in Food and										
Postharvest Technology	0	0	0	1	0	0	0	0	0	0
Tamale Technical University										
Bachelor of Technology in										
Agricultural Engineering	0	0	0	1	0	0	0	0	0	0
Bachelor of Technology in										
Sustainable Agriculture	1	1	1	1	0	1	1	1	1	0
Bachelor of Technology in										
Natural Resource Management	1	0	0	1	0	1	1	0	1	0
HND Agricultural Engineering	0	0	0	1	0	0	0	0	0	0
HND Tropical Agriculture	1	1	1	1	1	1	1	1	0	0
Bolgatanga Tamale Technical										
University										
Bachelor of Technology in										
Ecological Agriculture	1	1	1	1	1	1	1	1	1	0
Bachelor of Technology in										
Agricultural Engineering	0	0	0	1	0	0	0	0	0	0
HND Agricultural Engineering	0	0	0	1	0	0	0	0	0	0
HND Ecological Agriculture	1	1	1	1	0	1	1	1	0	0
Diploma in Agricultural										
Engineering	0	0	0	1	0	0	0	0	0	0
Sunyani Tamale Technical										
University										
Bachelor of Technology in										
General Agriculture	1	1	1	1	1	1	0	0	0	0
HND General Agriculture	1	1	1	1	1	1	0	0	0	0





				• of t	ne European	Union				
<u>Kwadaso Agricultural College</u>										
Bachelor of Technology in										
General Agriculture	1	1	0	1	1	1	0	0	0	0
Diploma in General Agriculture	1	1	0	1	1	1	0	0	0	0
Ohawu Agricultural College										
Diploma in General Agriculture	1	1	1	1	1	1	0	0	0	0
Certificate in General										
Agriculture	1	1	1	1	1	1	0	0	0	0
Ejura Agricultural College and										
Mechanization Centre										
Sierra Leone										
Freetown Teaching Polytechnic										
BSc Education in Agriculture	0	0	0	0	0	0	1	0	0	1
Government Technical										
Institute (GTI) Freetown										
Diploma in Agriculture	1	1	1	1	1	0	0	1	1	1
SLOIC/BVTC BO										
Diploma in Agriculture	0	1	0	0	0	0	0	1	0	0
Eastern Technical University,										
Kenema										
BSc Agribusiness Management	0	1	0	0	0	0	0	0	0	0
BSc Agricultural Economy	0	1	0	0	0	0	0	0	0	0
Government Technical										
Institute, Kenema										
Diploma in Agriculture	1	1	1	1	1	0	0	1	1	1
Freetown Polytechnic - Kono										
Branch										
Diploma teacher training	0	1	1	1	0	0	1	1	1	1
Milton Margai Technical										
University										
Diploma in Agriculture	0	1	1	0	0	0	0	0	0	0
Nigeria										
Federal University of										
Agriculture Abeokuta										
Work, Earn and Learn										
Programme,	1	1	0	1	0	1	1	1	1	1
Organic Agropark- HortiNigeria	1	1	0	1	0	0	1	1	1	1
Federal College of Agriculture,										
Akure										
HND/ND Agricultural and Bio-										
Environmental Engineering										
(Farm Option)	1	1	0	1	0	0	0	0	0	0





			· ^*	** of t	he Europear	Union				
ND Horticultural Technology	1	1	0	1	0	0	0	0	0	0
HND Agricultural Extension										
and Management	1	1	0	1	1	1	1	0	0	0
HND/ND Animal Health and										
Production Technology	1	1	0	1	0	1	0	0	0	1
HND Pasture and Range										
Management	1	1	1	1	1	1	1	0	0	0
Federal College of Agriculture,										
Ibadan										
HND Animal Production										
Technology	1	1	0	1	0	0	0	0	0	1
HND Agricultural Extension										
and Management	1	1	0	0	0	0	1	0	0	1
HND Crop Production										
Technology	1	0	0	1	0	0	0	0	0	0
HND Pest Management										
Technology	0	0	0	0	0	1	0	0	0	0
ND Horticultural Technology	1	1	0	1	0	0	0	0	0	0





12.8 Appendix VIII: Questionnaire

1 Introduction

1.1 Purpose of the document

This document constitutes part of the activities envisaged in WP2 which aims to survey and identify existing HEI programs in West Africa on sustainable farming and agroecological technologies, as well as similar lifelong learning/Technical and Vocational Education Training (TVET) programs.

The following reporting template developed by P2-DMTR aims to support the African HEIs in reporting the existing HEIs (Section 2) and VET courses (where available) (Section 3) as well as their regions' needs in terms of required professional skills in the sustainable farming sector.

This reporting template should be filled in by all partner HEIs in West Africa, with information regarding their universities. Where possible, information should be sought also beyond the partnership, including other HEIs and TVET providers at the country/region level.

2 Courses at Academic level (Masters level)

2.1 HEIS OFFERING SUBJECTS RELATED* TO AGROECOLOGY/SUSTAINABLE FARMING MASTER. Please fill in according to the current situation in your HEI (If more than 1 Copy/Paste the table)

*Related: not specific Agroecology master but containing subjects on agroecology/sustainable farming (e.g.: Agrotechnology; Agrobusiness; Sustainable Agriculture; Sustainable Farming, etc.)

Title of Master Program	
Department or faculty responsible	
Language/s	
Duration	
Year of master implementation	
Course starting and ending	
(example: from 15 October to 30	
June)	
Number of hours per week	




	of the European Union
Which of the 10 Elements of	□ Diversity of Agroecological
Agroecology as identified by FAO	Systems
(2018) ² are present in the master	□ Co-creation and sharing of
program? (refer to Annex 1 for	knowledge
description of each element)	□ Synergies (Integrated farming
	systems)
	Efficiency (Farm productivity
	(organic
	farming/irrigation/fertilizers)
	\Box Recycling
	Circular and Solidarity Economy
Teaching techniques (traditional,	
online, blended)	
AGRECOFARM professors involved	
Number of students last edition	
What are the entry requirements for	
the students to be enrolled in	
program?	
Internship (YES/NO)	
If your master offers internships,	
explain how it works (duration,	
place)	
Is the MSc part of a joint degree or a	
regional and/or international	
Program?	
Other comments	

Copy/paste the table if there is more than one Master Course offering subjects related to Agroecology.

2.2 Which is your HEI strength related to the agroecology field?

² FAO (2018): The 10 elements of agroecology: guiding the transition to sustainable food and agricultural systems. http://www.fao.org/3/i9037en/i9037en.pdf





2.3 Enrolment process: How do you recruit students for a Master's programme?

2.4 How many students are necessary to start/continue a Master's programme?

2.5 Sustainability of the Master's programme (present): describe the current financing mechanisms (tuition fees, private sponsors, international programmes,)

2.6 Sustainability of the Master's programme (future): describe the sustainability challenges/issues and provide suggestions on how to reach/overcome them.

2.7 Accreditation/recognition/acceptance procedures. 1) Please explain your HEI procedures and the timing required to add a new course to an existing master's programme.

2.8 Accreditation/recognition/acceptance procedures II. Please explain your HEI procedures and timing to modify a subject included in an existing master's programme (e.g.: new topics, new learning procedures...)

2.9 Accreditation/recognition/acceptance procedures III. Please explain your HEI procedures and timing to create a new master's programme.





2.10 Credit/subjects/titles recognition between African countries. Please explain the recognition mechanisms when receiving students from other African HEIs countries

3.0 Courses at TVET level and lifelong learning

3.1 Does your institution currently offer courses on topics related to AGROECOLOGY/SUSTAINABLE FARMING at TVET or lifelong learning level?

□ YES □NO If yes, fill in question 3.2.

3.2 List names of curricula currently offered at a non-academic level including aspects or related to AGROECOLOGY/SUSTAINABLE FARMING (e.g.: Agrotechnology; Agrobusiness; etc.)

Title of the course program	
Language/s	
Duration	
Number of credits/workload ³ of course,	
addressing specifically	
Agroecology/sustainable farming issue	
Number of lecturers	
Number of hours and/or credits	
Which of the 10 Elements of	Diversity of Agroecological Systems
Agroecology as identified by FAO	
(2018) ^₄ are present in the TVET/life-long	

³ Workload refers to how many hours of study per week (including lecture time, self-study time, etc.)

⁴ FAO (2018): The 10 elements of agroecology: guiding the transition to sustainable food and agricultural systems. http://www.fao.org/3/i9037en/i9037en.pdf



	of the European Union
learning course? (refer to Annex 1 for	□ Co-creation and sharing of
description of each element)	knowledge
	□ Synergies (Integrated farming
	systems)
	Efficiency (Farm productivity (organic
	farming/irrigation/fertilizers)
	□Recycling
	□Resilience
	□Human and Social values
	□Culture and food traditions
	□Responsible Governance
	□Circular and Solidarity Economy
Teaching techniques (normal classes	
during the semester and exam at	
the end, project-based learning, etc.)	
Final examination (written	
examination, presentation, oral exam,	
essay, etc.)	
Funding means of sustaining the VET	
courses	
AGRECOFARM professors involved	
Number of students last edition	
Other comments	

3.3 What are the minimum requirements to start the course?

3.4 Qualification level

- 3.5 Age (please specify min and max age)
- 3.6 Entry exam

3.7 Professional situation

 \Box employed





unemployed

3.8 Other (please, specify)

3.9 Does the TVET programme provide qualifications?

- \Box Yes, after successful completion⁵ of the program;
- □ Yes, during the program, regardless of its successful completion (e.g.: modular program⁶);
- \Box No, it does not.

3.10 Is there any practical training in the programme?

□ Yes □ No

3.11 How is the programme divided between practical vocational training and general academic TVET?

3.12 How is practical training delivered?

(Please respond by choosing the relevant answer. If during the program practical training is delivered in different ways, please specify, e.g.: during the first year of the program, general academic TVET and practical training take place together, and in the second-year practical training is delivered on a block release basis.) □ General academic TVET and practical training take place together

⁶ Modular program – program divided into separated learning modules/units, each associated with a certain amount of learning and leading to some kind of qualifications (credits, part of qualifications). Modularized courses allow people to choose between different course options, and can provide some freedom in the sequencing and speed at which the modules required for a qualification can be completed. Within the framework defined for each qualification, young people can compose their own profiles rather than complete a fully prescribed set of courses according to a prescribed schedule.



⁵ Successful completion of a program – The student has fulfilled requirements (e.g.: as regards attendance, grades, number of credits, etc.) necessary to complete the program that may be formally recognized with qualifications (awarding diplomas, credentials, certificates).



Separate module

within a modular programme

□ Day release basis

- Block release basis
- Full practical training
- \Box Other (please specify)
- 3.13 Where does practical vocational training take place?

(Please respond by choosing the relevant answer. More than one answer is possible.)

- Educational institutions
- \Box Workplaces
- \Box Other (please specify)

3.14 Are there any entry requirements to practical training (other than entry requirements to the program)?

(Please respond by choosing the relevant answer. More than one answer possible.)

□ Yes, age criteria (please specify)

□ Yes, qualification level (please specify)

□ Yes, work experience (please specify)

□ Yes, other (please specify)

□ No, there are no specific entry requirements to practical training

3,15 Sustainability of the TVET courses (present): describe the current financing mechanisms (tuition fees, private sponsors, international programmes)





3.16 Sustainability of the TVET courses (future): describe the sustainability challenges/issues and suggestions on how to reach/overcome them

3.17 Please add any other information you think is relevant for AGRECOFARM TVET Courses

ANNEX

10 Elements of Agroecology

Elements	Description
Diversity.	Highly diverse, agroecological production
<u>Elements attributed to</u>	systems such as agroforestry, silvopastoral
<u>diversity:</u>	systems,crop-livestock-aquaculture integration
-Crop Production (mixed	and polycultures contribute to a range of
cropping)	production, socio-economic, nutrition and
-Agroforestry	environmental benefits.
-Livestock Production	
(multiple species)	
-Silvo-pastoral Systems	
-Crop-livestock-aquaculture	
-Polycultures	
Co-creation and sharing of	Agroecology depends on context-specific
knowledge	knowledge. Knowledge plays a central role in
Elements attributed to Co-	the process of developing and implementing
<u>creation and sharing of</u>	agroecological innovations to address
<u>knowledge:</u>	challenges across food systems. Through the co-
- Indigenous/Traditional/Local	creation process, agroecology blends the
Knowledge	traditional, indigenous, practical and local
- Scientific Knowledge	knowledge of producers with global scientific
 Practical Knowledge 	knowledge
 Integrated Practical 	
Synergies	Agroecological systems selectively combine the
<u>Elements attributed to</u>	diverse components of farms and agricultural
<u>synergies:</u>	landscapes to build and enhance synergies.
- Integrated farming systems	





Efficiency Elements attributed to efficiency:	Increased resource-use efficiency is an emergent property of agroecological systems. By optimizing the use of natural resources such as
- Farm productivity (organic farming/irrigation/fertilizers)	fewer external resources, reducing costs and negative environmental impacts.
Recycling <u>Elements attributed to</u> <u>recycling:</u> - Agro-wastes reuse	By imitating natural ecosystems, agroecological practices support biological processes that drive the recycling of nutrients, biomass and water within production systems.
Human and social values <u>Elements attributed to human</u> <u>and social values</u> - Participatory approach - Gender/women empowerment - Youth empowerment	Agroecology places a strong emphasis on human and social values, such as dignity, equity, inclusion and justice, all contributing to sustainable livelihoods. It puts the aspirations and needs of those who produce, distribute and consume food at the heart of food systems. Agroecology seeks to address inequalities by creating opportunities for women and youth.
Culture and food traditions <u>Elements attributed to culture</u> <u>and food traditions</u> - Cultivation of indigenous local crop - Indigenous animal species	By supporting healthy, diversified and culturally appropriate diets, agroecology values local food heritage and culture, contributing to food security and nutrition while maintaining the health of ecosystems.
Responsible governance <u>Elements attributed to</u> <u>responsible governance</u> - Secure land tenure - Mobility of pastoralists	Transparent, accountable and inclusive governance mechanisms at different scales are necessary to create an enabling environment, that supports producers to transform their systems. Equitable access to land and natural resources is not only a key to social justice, but also essential to providing incentives for long- term investments in sustainability
Circular and solidarity economy <u>Elements attributed to circular</u> <u>and solidarity economy</u> - Agricultural marketing - Value chain - Agric. Resource economics	Agroecology seeks to reconnect producers and consumers through a circular and solidarity economy that prioritizes local markets and supports territorial development. Innovative markets that support agroecological production help respond to a growing demand from consumers for healthier diets.





Partnership of the Project



The AGRECOFARM Project is funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

