SOKOINE UNIVERSITY OF AGRICULTURE

COLLEGE OF AGRICULTURE

PhD AGROECOLOGY
(PhD AGRo-ECO)

Programme Handbook
First edition
2019

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BUILDING STRONGER UNIVERSITIES
IN DEVELOPING COUNTRIES

Acknowledgement

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1.0 PREAMBLE

The PhD Agroecology programme has been developed by Sokoine University of Agriculture (SUA) in Tanzania, in partnership with Universities in Denmark (Aarhus University and University of Copenhagen). The programme development process was predominantly consultative involving a wide range of stakeholders in the public and private sectors in Tanzania.

2.0 RATIONALE FOR DEVELOPMENT OF THE PROGRAMME

In many developing countries, conventional agricultural technologies are, in many cases, beyond the circumstances and socio-economic capabilities of large numbers of resource-poor farmers (Reyes Tirado, 2015)[1]. As a result, farmers face numerous challenges ranging from degraded natural resources, shrinking farm sizes, poverty, and, unavoidably, the consequences of climate variability.

While the quick fix to declining farm productivity is often given as adoption of modern agricultural production technologies which are heavily dependent on external industrial inputs, such practices often promote environmental degradation and eroded environmental sustainability (Reyes Tirado, 2015). In the agricultural arena, the challenges global challenges are not merely technical but also include social-economic issues manifested by declining crop and livestock productivity, population increases, population shifts and the movement of people and livestock leading to conflicts between different land user groups (Flora, 2001)[2]. These developments have impacted not only farmers, but also many other actors involved in different agricultural value chains.

The implication of this realization is that agricultural production issues cannot be considered separately from environmental issues. In fact,

1 *Reyes Tirado. 2015. Ecological Farming. The seven principles of a food system that has people at its heart. GreenPeace International. 67 pp. www.greenpeace.org*

2 *Flora, C.B. 2001. Internation Between Agroecosystems and Rural Communities. CRC Press, boca Raton, FL. USA.*

Terraces for soil and water conservation

the situation calls for a new technological and developmental approach to provide for agricultural needs of present and future generations without depleting the natural resource base and damaging the environment. Adoption of agroecology, "the science of applying ecological concepts and principles to the design and management of sustainable food systems" (Gliessman, 1998)[3] can contribute towards building resilient production and marketing systems. Agro-ecology provides a framework whereby ecological theory can be applied to the management of agro-ecosystems according to specific resource and socio-economic realities. Consequently, agroecology is considered a viable option due to its broad performance criteria that include properties of ecological sustainability, food security, economic viability, resource conservation, social equity, as well as increased productivity and production (WhyHunger, 2015)[4].

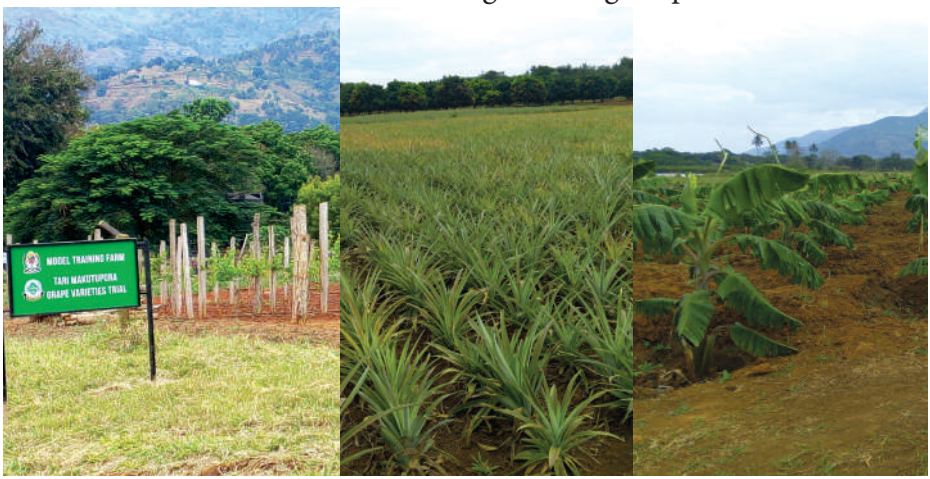
3 *Gliessman, S. 1998. Agroecology: Ecological Processes in Sustainable Agriculture. Boca Raton, Florida: CRC Press.*

4 *WhyHunger, 2015. Agroecology – Putting Food Sovereignty into Action. http://whyhunger.org*

The PhD Agro ecology is therefore intended to provide an opportunity for scientists and researchers in the region to undertake coursework and later conduct research and write a dissertation. SUA has experience in running PhD programmes with course work and research (two PhD programmes of this nature are currently running). In the case of the PhD in Agroecology programme, all key staff earmarked to teach in the programme are employees of the institution which also has sufficient facilities for theoretical and practical training. Where appropriate, guest lecturers and/or speakers shall be invited to enrich student experiences.

3.0 PROGRAMME OBJECTIVES AND PHILOSOPHY

The purpose of the proposed PhD programme in Agro-ecology is to develop human resource capacity that can utilize agro-ecological approaches to address the needs of farmers, traders and consumers. Emphasis will be on building capability to develop and utilize eco-friendly technologies for the management of soil health while also reducing the impact of biotic and abiotic stresses in order to increase agricultural productivity. The programme also emphasizes on developing skills and mindset change to facilitate the integration of farm biosystems and households into value chains of agro-ecological products.



Model Training Farm

The programme is therefore intended for persons who should be able to contribute towards improving farm productivity while increasing resilience to climate change and environmental sustainability. Graduates from the programme should be able to address technical as well as social-economic challenges of agriculture using contemporary theoretical knowledge and practical skills related to the science and practice of agro-ecology to design, produce, manage and/or market agro-ecological products from crop, livestock and/or acquaculture bio-systems.

Agro-ecology provides a methodology to make the required interdisciplinary connections. However, putting agro-ecological technologies into practice requires technological innovations, agriculture policy changes and socio-economic changes blended with a deeper understanding of the complex long-term interactions among resources, people and their environment. To attain this understanding, training under this programme will adhere to an interdisciplinary framework that shall integrate the biophysical sciences, ecology, social sciences, environment and climate change complemented by the required soft skills.

Delivery of the programme shall be based on a problem-based approach to help make the required interdisciplinary connections. On the understanding that agro-ecology is wider than agriculture, the programme will be flexible to accommodate students from a wide range of disciplines such as agriculture, livestock sciences, crop and soil sciences, forestry and agroforestry, agricultural and natural resource economics, ecology, agronomy, range management, and other biological and social sciences.

The overall objective of the proposed PhD Agro-ecology is to develop human resource capacity in agro-ecology and at the same time strengthen SUA institutional capacity in impact-oriented training and research in Agro-ecology.

The specific objectives of the programme are to:

Screen houses for research & production

i. Develop skills and scientific orientation to characterize, monitor, and predict changes in the quality of the environment and their interactions with environmental factors in specific agro-ecological zones;
ii. Harness synergies among candidates and professionals with different backgrounds, and link with academic and research initiatives in agro-ecology;
iii. Train human resource to have the technical competence that can address problems related to agro-ecology and management of natural resources so as to alleviate food insecurity and improve livelihoods, and economic situation of the smallholder farming community;
iv. Develop frontier actors in advancement of knowledge and innovations in agro-ecology;
v. Promote partnership with regional and international institutions and cultivate interest with other stakeholders in regional collaboration and resource sharing and mobilization for training, research and outreach in agro-ecology; and
vi. Develop technical capacity with marketing skills and advocacy in agro-ecology.

3.1 Entry Arrangement

Application and entry into this programme shall be channelled through the Directorate of Postgraduate Studies, Research, Technology Transfer and Consultancy (DPRTC) of Sokoine University of Agriculture (SUA) and shall follow the general procedures and requirements as detailed in the DPRTC webpage at the SUA website (www.sua.ac.tz)

and the SUA Regulations and Guidelines for Higher Degrees, (Sixth Edition, 2018).

Horticulture building block

3.2 Who Can Apply

The programme is flexible and welcomes applications from a wide range of disciplines. Applicants must be holders of a Masters' degree in Agriculture, Horticulture, Agronomy, Crop and Soil Sciences, Livestock Sciences, Forestry, Agroforestry, General Science, Ecology, Range Management, Agricultural Economics, Natural Resources Management, Economics, and other biological and social sciences.

Applicants holding other qualifications may also be accepted but may be required to take additional remedial courses and relevant examinations. Candidates can apply on full time or part time basis.

4.0 PROGRAMME STRUCTURE

4.1 Programme duration

The duration for the degree programme for full time students is four (4) years comprising one year (two semesters) of course work and three (3) years of research and writing a thesis. Part time students will also be admitted to the programme for a duration of five (5) years. Students admitted on part time basis must complete the coursework prior to assuming the part time status.

4.2 Coursework and research

The programme shall consist of two semesters of coursework which shall be completed within one academic year. Each candidate shall be required to take all core courses and choose at least three other courses, from amongst elective courses, so as to a attain a minimum of 60 credits in each semester. The minimum credits to be earned from course work

is 120. All courses shall be offered in modular form and shall emphasize on participatory learning comprising a mixture of lectures, practicals, individual and group works and hands-on experiences.

The research component, culminating in the production of a thesis, shall be conducted in the remaining three academic years. 15 credits for development of concept note and 30 credits for full proposal, 240 from research work and 135 credits from thesis to make the total minimum of 540 credits required foe the award of PhD under the programme.

4.3 Internship

Each candidate is eligible for an optional internship programme for a period not exceeding six (6) months within the country or abroad, in the 2nd or 3rd year of study. Processing for an internship period shall be initiated by a proposal by the student. The proposal shall indicate, amongst other things, where the candidate shall be attached for the entire duration of the internship, the deliverables from the internship period and the source of funds. Students can only proceed to implement the internship programme after the proposal has been approval by the University following detailed guidelines that shall be provided to all candidates.

4.4 Exit levels and qualification for award of PhD

The duration for the degree programme for full time students shall be four (4) years comprising one-year (two semesters) of course work and three (3) years of research culminating in the preparation of a thesis. Fulltime students can be allowed to extend the study period to a maximum period of 6 years provided there are compelling reasons for extension. Part time students will also be admitted to the programme for a duration of five (5) years which can be extended to a maximum seven (7) years. Students admitted on part time basis must complete the coursework prior to assuming the part time status. There will be two exit levels.

4.4.1 Postgraduate Diploma: All candidates, who shall have completed course work successfully, shall be eligible for the award of a Postgraduate Diploma (PGD) in Agro-ecology. Such candidates shall have passed all core courses and the elective courses required to make a minimum of 120 credits. Post Graduate Diploma graduates shall be eligible to continue with the research component. However, graduates who are unable to continue with the research component immediately may resume studies to complete the research component of the PhD within two years after attainment of the PGD beyond which candidates would be required to re-take the course work.

4.4.2 PhD: A candidate who shall have successfully completed both the course work and research shall be awarded the PhD Agro-ecology (Total 540 credits comprising of 120 credits for course work + 30 credits for research proposal development + 390 credits for research and thesis)

5.0 PROGRAMME CONTENT

5.1 Course work

All candidates shall be required to take pass all six core courses as follows

Core course modules for semester 1:

Module	Core course	Credits
i.	Holistic Systems Thinking and Analysis	10
ii.	Agro-ecology and Sustainable Resource Management	12
iii.	Integrated Crop-Livestock-Aquaculture Bio-systems	13

Core course modules for semester 2:

Module	Core course	Credits
i.	Research Methods and Data Management	12
ii.	Agro-ecosystems and Climate Change	13
iii.	National Laws and International Agreements in Agro-ecology	11

To earn the minimum 60 credits, candidates can elect other courses from amongst 17 elective courses which have been developed and designed to cover a wide range of subjects ranging from biophysical, social sciences and soft skills.

5.2 Programme Assessment Strategy (Formative and Summative Assessment)

Assessment strategies for individual course modules are indicated in the description of the modules. However, general guidelines on examination moderation, practical assessment, weights of components in the final assessment and continuation and discontinuation of students pursuing the PhD Agro-ecology shall follow all rules and regulations as stipulated in "Regulations and Guidelines for Higher Degrees" and "Guidelines for Preparing Dissertations / Thesis and other Publications" of Sokoine University of Agriculture.

5.3 Examination general format and examination regulation.

Examinations shall comprise of theory and practical (where applicable) papers, term papers and seminars and shall be conducted as per General University Examination Regulations and Guidelines of Sokoine University of Agriculture. Moderation of examinations and dissertation shall involve internal and external examiners who are competent in Agro-ecology and/or related fields.

5.4 Examination moderation, practical and thesis assessment where applicable

The overall quality of SUA programmes is guided by the Quality Assurance Policy. The Quality Assurance Bureau provides general guidelines on ensuring that all programmes adhere to quality standards and guidelines provided in the Quality Assurance Good Practices Handbook. Examination papers shall be moderated by a departmental committee.

5.5 Condition for continuation and discontinuation

Conditions for continuation and discontinuation of student shall be as per Sokoine University of Agriculture Regulations and Guidelines for Higher Degrees.

5.6 Learner Support Services

There is a wide range of learner support services available to all SUA students for teaching and research. These include:

i. **Accommodation** – The SUA Housing and Students Accommodation Bureau (SUAHAB) which manages student hostels and/or can assist students to secure accommodation;

Main campus new hostels

ii. **Library** - The Sokoine National Agricultural Library (SNAL) is a designated National Repository for resources on agriculture and other related sciences with the main Library is located at the main campus and a branch of the same at the Solomon Mahlangu Campus (SMC),

iii. **Health services** - A fully fledged hospital at Solomon Mahlangu Campus (SMC), a sister campus of SUA located 12 km apart, and a Health Centre at the main campus.

iv. **Food services** - Four cafeteria/restaurants at the main campus and another four cafeteria/restaurants at SMC

v. **Sports** - Play grounds for various games at both campuses and

vi. **Worship** - Worship places are available at both campuses.

vii. **Counselling services** - Needy students can access counselling services offered by designated persons in the office of the Dean of Students (DOS)

SUA Business centre

viii. **Specialized Laboratories/ Facilities**

The University has subject laboratories located in different departments. However, additional laboratories are also available for use by the general student body and staff. A selection of such laboratories include the following:

APOPO detection rats laboratory

a) Sokoine University of Agriculture Laboratory for Interdisciplinary Statistics Analysis (SUA-LISA);
b) Geographical Information Systems (GIS) laboratory;
c) The Hydrological Modelling laboratory;
d) The African Seed Health laboratory;

The African Seed Health laboratory

e) Information and Communication Technologies (ICT) - There is wide access to internet through provision of wireless connectivity in both campuses. SUA is also connected to the National Fibre optic network for easy access globally.

5.7 Teaching and learning

Teaching and learning is guided by the Expected learning Outcomes (ELO) using student-centred approaches. The principle approaches are Research-based Teaching (RBT) complemented by Problem-based Learning (PBL). The teaching staff are drawn from relevant departments' within the University and all staff shall be periodically updated on RBT and PBL and/or any new teaching and learning approaches as necessary.

5.8 Programme management

The programme shall be managed by the Department of Crop Science and Horticulture in the College of Agriculture.

5.9 Programme evaluation procedures

Evaluation procedures of the PhD Agroecology programme shall feed

into the curriculum review process Hence, the first stage of programme evaluation shall involve assessment of teaching by students as itemized in section 3.1.6 of the SUA Quality Assurance good Practices handbook (2017). This level of assessment is aimed at improving course delivery by academic staff, whereby using a Teaching Evaluation instrument used by all students in the University, students can assess the general delivery of the course based on the course learning outcomes, teaching and learning facilities.

For further information contact:
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Directorate of Postgraduate Studies, Research, Technology Transfer and Consultancy Sokoine University of Agriculture, P.O. Box 3151 SUA, Morogoro. Tanzania. Tel/Fax +255 23 264 0013 Email: drpgs@sua.ac.tz

Fees

Payable fees for postgraduate programmes are published on the SUA website (www.sua.ac.tz) and the rates are revised from time to time. Prospective candidates are encouraged to visit the website for the most current information.