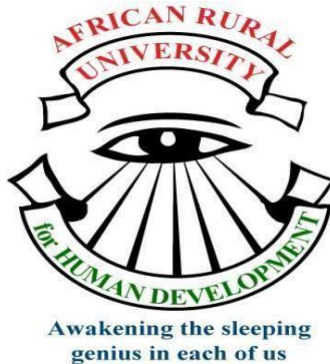


AFRICAN RURAL UNIVERSITY



FACULTY OF TECHNOLOGY FOR RURAL TRANSFORMATION

END OF YEAR TWO FIELD ATTACHMENT ONE REPORT CONDUCTED AT
RWEBITABA ZONAL AGRICULTURAL RESEARCH AND DEVELOPMENT INSTITUTE
IN KYEMBOGO VILLAGE, BUSORO SUB-COUNTY KABAROLE DISTRICT

BY

ARINITWE LOYCE

21/ARU/BSSA/002.

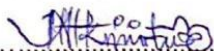
A ONE-MONTH FIELD ATTACHMENT ONE REPORT SUBMITTED TO THE FACULTY
OF TECHNOLOGY FOR RURAL TRANSFORMATION IN PARTIAL FULFILMENT FOR
THE AWARD OF A BACHELOR OF SCIENCE IN SUSTAINABLE AGRICULTURE OF
AFRICAN RURAL UNIVERSITY

NOVEMBER, 2023.

Declaration

I ARINITWE LOYCE declare that this report is an original copy of activities done during a field attachment conducted at Rwebitaba Zonal Agricultural Research and Development Institute (RWEBITABAZARDI). It has never been submitted to any University or Institution for the award of a Bachelors Degree, Diploma or any other qualification.

Signature

.....

ARINITWE LOYCE

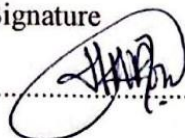
Date 19/11/2023.....

Approval

This is to certify that ARINITWE LOYCE had a one month of field attachment training at Rwebitaba Zonal Agricultural Research and Development Institute and this is a true record of what she was able to be involved in under my supervision.

Agency Supervisor

Signature



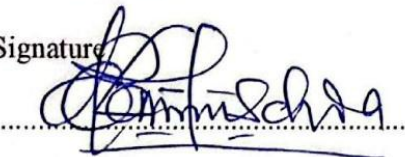
Mugume Ronald



Date... 23.11.2023

University Supervisor

Signature



Dr. Moses Kanyambindwa

Date... 23/11/2023

Dedication

This work is dedicated to my fellow students of Bachelors of Science in Sustainable Agriculture both incoming first, second, third and fourth years, my friends of Bachelors of Rural Development among other academicians of African Rural University, my parents, brothers and sisters, relatives and lecturers.

Acknowledgment

First and foremost, I thank the Almighty for the gift of love, mercy, favor and life still portraying to me.

Secondly, I convey my sincere appreciations to my beloved mother Ms. Tumusiime Scovia who has always supported in all ways especially financially, material and guidance and counselling. My brothers and sisters Mr. Asiimwe Apollo, Mr. Matsiko Boaz, Ms. Kyalisiima Novia, Tumushelure Fortunate, Niwasiima Joyce and Tayebwa Joshua for the support in all ways.

University Supervisor Dr. Kanyambindwa Moses for the educational guidance, corrections where I would go wrong and educative criticism in the course of my one-month field attachment.

I also thank the staff and management of African Rural University for the financial support and the mode of education always provided to me that has enabled me complete this field attachment.

My field supervisor (apiculture scientist) Mr. Mugume Ronald for the knowledge and skills he offered, guidance and time spared for me during my field attachment one, I thank you so much.

My fellow students Atuhairwe Kevina and Bukirwa Dimitria for the love, care, advice and cooperation throughout the course of my field attachment, I thank you so much for that heart.

The staff and management of Rwebitaba ZARDI especially Mr. Dominic and Mr. Agaba Hannington the HRM for the warm welcome to the institution, Mr. Jjemba Douglas, Mr. Mununuzi David, Mr. Gumoshabe Innocent, Mr. Mugenyi Lawrance to mention but a few for the love and hospitality that was portrayed to me as well as guidance, corrections where necessary, and their time, may the almighty God continue blessing you abundantly.

Last but not least, I acknowledge the government of Uganda for setting up such research institutes which have helped in the smooth running of different people at different levels especially the students and farmers.

List of acronyms abbreviations

RWEZARDI:	Rwebitaba Zonal Agriculture research and development institute.
MAAIF:	Ministry of Agriculture, animal husbandry and Fisheries.
FAO:	Food and Agriculture Organization
EAC:	East African Community
WHZ:	Western highlands Agro-ecological Zone
HRM:	Human Resource Manager.
ARU:	African Rural University.
URDT;	Uganda Rural Development and Training Institute.
DAP:	Di-ammonium Phosphate.
NPK:	Nitrogen phosphorus potassium

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Abstract

The aim of this supervised field attachment was to put the theoretical work into practice so as to acquire technical and professional agricultural experience and skills in the operation and management of different agricultural enterprises thus the preparation for a career in Agricultural extension worker. The areas covered at while at Rwebitaba ZARDI were crop production which comprised of bananas, maize, rice, cassava, tomatoes and Agroforestry, with animal production areas covered included livestock management, aquaculture, and Apiculture. In the above areas covered, I gained knowledge and skills in identification of animal diseases like mastitis, the effect of weather to bees, how to prepare a banana planting material. However, while at Rwebitaba ZARDI I encountered few challenges which include; excessive use of chemicals which did not fit well with my programme and I was able to them adopt integrated pest management practices and organic farming, limited time with my supervisor this was mitigated by involving me in some activities available with the casual workers and also used to delicate someone to take me through. In addition, I recommended that the Rwebitaba ZARDI should adopt organic farming as this ensures conserves the environment, the supervisor should always fix enough time for the interns.

CHAPTER ONE

GENERAL INTRODUCTION

1.0 Introduction

This chapter explains the background of African Rural University, course, field attachment, purpose of field attachment, objectives of field attachment and the background of the organization where internship was organized Rwebitaba ZARDI as shown below.

1.1 Background of African Rural University

African Rural University is an all-Women's University fully accredited by National Council of Higher Education (U1/PL/017). It was founded by Uganda Rural Development and Training Programme. The University is located 1.5km along Kagadi-Hoima Road, Kagadi Town Council, Kagadi District in Mid-western Uganda. It runs two programmes which include Bachelor of Science in Sustainable Agriculture and Bachelor of Rural Development.

The University offers an integrated curriculum that creates a pool of female professionals capable of promoting socio-economic empowerment of the marginalized and less advantaged through the provision of rigorous scientific input into the design and practice of rural development. The is buttressed in ARU's Education Model which is a conduit for societal wide, systemic and structural change. It's based on the University philosophy, vision, mission, values and working premises. The model 's philosophical foundation calls for a fundamental shift in life orientation from the problem solving to the creative orientation. People in the creative orientation understand and develop commitment on what they truly want to achieve in life. Not only through visioning, but also in action. It permits genuine democratic participation and improves ownership and leadership qualities. This is the basis of sustainable human and rural development.

1.2 Vision

To be a leading Centre in providing transformational education that creates effective change agents and makers within an African development context.

1.3 Mission

African Rural University applies theoretical learning, innovative instruction and field practice, so that ARU graduates can create conditions for people to improve their lives, transform their communities, awaken inherent leadership and increase their capacity for self-generating and sustainable change.

1.4 Background of the course

The Bachelors of Science in Sustainable Agriculture is a program combining technical, natural, economic, and social disciplines of science. The program introduces students to the management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. It focuses on producing graduates with thorough knowledge on use of environmentally friendly agricultural practices. It intends to address the increasing global demand for food while conserving the ecosystems. Bachelor of Science in Sustainable Agriculture program graduates will have knowledge, skills, and experiences in sustainable soil, land and water management to enhance agricultural production and productivity. The degree program will familiarize students with the science and practice of sustainable farming based on fundamentals of the creative process.

After completing the Bachelor's degree in sustainable agriculture, students will have a thorough practical knowledge of agro-biodiversity management, integrated pest and disease management and the interconnectedness among agro-systems. Each student will then fulfill course requirements by doing fieldwork during recess terms and research and completing an internship.

1.5 Background of field attachment.

At the end of year two and year three study, students who successfully complete four/six semesters are sent to the field during which they are introduced to various farms and organization to learn practical skills in the modern technologies, extension work, program development and farm management at different levels. The learners are expected to apply the acquired knowledge in project related activities as they take part in all activities of the organization/farm where they are attached. Outreach will acquaint learners with interpersonal relationship with the farming communities and rural sociological principles and approaches. This

is done in the fulfillment ARU's method of teaching where 60% is theory and 40% practical. The 40% was done at Rwebitaba ZARDI Kyembogo station, Kabarole district fort portal tourism city for one month (150 hours) supervised by Mr. Mugume Ronald the field supervisor and Mr. Kanyambindwa Moses the university supervisor with the help of Ms. Nampewo Josephine the epicenter manager.

1.5.1 Purpose of field attachment

To transfer theory work into hands-on practical skills.

1.5.2 Objectives of field attachment

To develop skills in the application of theory to practical work situations

To develop skills and techniques directly applicable to my career

To enable acquire good work habits

To enable the learner a systematic needs assessment of a farm and identify real life problems in the local farming communities

To acquire skills and knowledge to devise a sustainable farming technology that will be disseminated for adoption by the local farmers to address their needs

To be equipped with a hands-on practical farming to appreciate and transform theory into practice

1.6 Background of Rwebitaba ZARDI

NARO Rwebitaba ZARDI is one of the nine zonal agricultural research and development institutes established under the act parliament of 2005 and the policy guidance of NARO as a way of addressing agricultural challenges in western highlands of agro-ecological zone.

RwebitabaZARDI operates in nine districts of Kabarole, Kasese, Kamwenge, Ntoroko, Bundibugyo, Kitagwenda, Bunyangabo, Kyegegwa, Kyenjojo. Rwebitaba as a ZARDI started its operations in October 2011 to serve as a zonal entity that undertakes applied and adaptive agricultural technology development and dissemination to different stakeholders in the Western Highlands Agro-ecological Zone. The study area is characterized by bimodal rains with two seasons; first season: March to June, second season: August to December with average rainfall of

1,623mm. The average temperature is 20.2 C° with humidity of 77% (Rwebitaba Meteorological Weather Station, 2021). The other eight ZARDIS in different agroecological zones and these include; MbaZARDI in Mbarara, KachwekanoZARDI in Kabale, BuZARDI in Hoima, MuZARDI in Mukono, NgeZARDI in Lira, NabwinZARDI in Moroto, BugiZARDI in Bulambuli.

1.6.1 Location

Rwebitaba ZARDI is located in Kyembogo village, Busoro sub-county, Kabarole district, Kijura road 8km from Fort portal tourism city.

1.6.2 Map showing the area of study

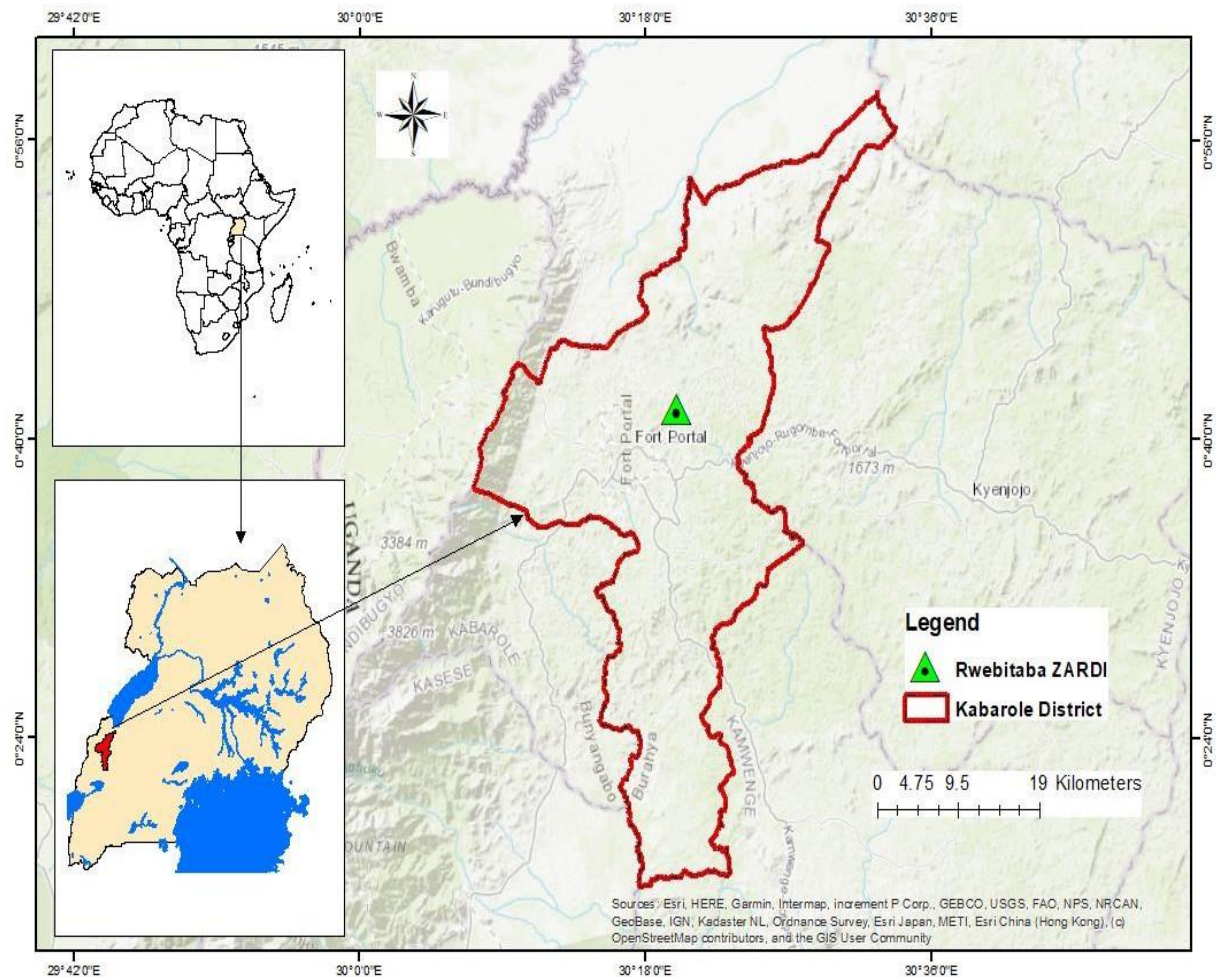


Figure 1. Map of Kabarole District showing the location of RwebitabaZARDI.

1.6.3 Mandate

To conduct driven and market responsive applied and participatory adaptive research in crops. Aquaculture, livestock, apiculture to develop appropriate knowledge of dissemination to uptake ways by the farmers.

1.6.4 Goal.

To respond and contribute to sustainable agricultural productivity by conducting relevant research that will enhance economic growth, food security and poverty eradication in the WHZ.

1.6.5 Vision

To improve livelihoods and income of resourceful poor farmers through generating the disseminating profitable and sustainable technologies for improved productivity of the farming systems in the WHZ.

1.6.6 Mission

To improve agricultural productivity of farming communities of WHZ by conducting and disseminating appropriate, demand driven market responsive strategic and adaptive research while enabling sustainable natural resource management.

1.6.7 Objectives

To comprehend constraints, opportunities and component interactions in the farming system of western highlands Agro-ecological Zone.

To conduct basic, applied and participatory adaptive research and generate appropriate technologies for dissemination to uptake path-ways.

To provide and process feedback between farmers, researchers, extension staff and other partners in order to identify and respond to zonal specific and immerging production and marketing constraints.

To contribute to multiplication of foundation seed for distribution to farmers and other research partners.

To generate and disseminate tea technologies country wide.

To establish and strengthen collaboration and linkages in order to exploit synergy in research and uptake of technologies.

1.6.8 Target population

Rwebitaba ZARDI is operating in nine districts of Kabarole, Kasese, Kyenjojo, Kamwenge, Ntoroko, Bundibugyo, Kyegegwa, Kitagwenda and Bunyangabo and one city that is fort portal.

1.6.9 products offered by Rwebitaba ZARDI include;

Quality seeds

NARO Honey

Coffee yoghurt

Propolis

NHL feeds

NACOFE

T16, T32, T32S

NARO face and body scrub

1.6.10 Products and Services offered by RwebitabaZARDI

The products offered by the organization are got from different enterprises and they include honey, propolis from bee keeping, well improved and planting materials and breeds plus technical back stopping and that under takes applied and adaptive agricultural technology development and dissemination to different stakeholders in the western highlands agro-ecological zone.

1.6.11 Source of funding

RwebitabaZARDI is funded by the government of Uganda, and competitive proposal writing and grants and from the nontax revenue collected and then ploughed back.

1.6.12 Research programs at RwebitabaZARDI

Crop and Natural Resources Research Programme

Livestock Resources Research Programme

Technology Promotion and outreach Programme

Description of Research programs.

1.6.12.1 Crops and Natural Resources Programme.

Crops project.

Under this section, research on crop varieties is done together with seed multiplication. Research in crop section covers; cassava evaluation/multiplication, evaluation of different rice varieties for adaptability, multiplication of beans, maize, potatoes, different vegetables different banana cultivars and different techniques of banana farming among others. The section is headed by an Agronomy scientist supported by Agronomy technician and volunteer is attached on to this project.

Agro-forestry project.

Under this unit, research is basically in natural resource conservation and interactions, the tree crop, animal and insect interactions, natural species conservation/utilization of plant materials, fruits like; mangoes, oranges, apples, grapes, pawpaw, quavers. Activities such as grafting of fruit trees, tree nursery activities and data collection on apple fruit performance are carried out among others in this section. The section is headed by the Agro-forestry scientist and supported by an Agro-forestry technician.

Tea program.

This unit has national mandate of conducting research on tea at national level. The team investigates the susceptibility of tea clones on certain diseases like *Xyleria* and *armyleria*, leaf blight diseases and pests like nematodes, thrips, adaptability of different tea clones in different parts of the country, evaluating cup quality of different tea clones, breeding different clones, blending different clones, extracting and evaluating different tea clones among other research

activities. The unit is headed by an a genetist/scientist, this unit has more five scientists and two technicians.

1.6.12.2 Animal research resources Programme

Apiculture project.

Research in apiculture carried out at RWEBITABA ZARDI aims to explore suitable technologies to enhance the production of both honeybees and stingless bees in the designated zone. The study assesses the efficiency of various bee hive types, including KTB, Langstroth, Log, and Weaved hives, with a focus on colonization success and honey yield in terms of quality and quantity. This evaluation takes place both on experimental stations and on-farm locations across different districts within the WHAZ.

Additionally, the research delves into the suitability of different bee forage options such as calliandra calothyrsus, ocimum species, and citrinus carlistermons. The assessment considers factors like nectar and pollen production, as well as the survival of these forage types in the local environment. Notably, the project places a particular emphasis on stingless bees, with an ongoing research project titled "Domestication of Stingless Bees in Uganda." This initiative seeks to identify, propagate, domesticate, and characterize stingless bee species. Furthermore, it aims to develop high-value products derived from stingless bees, design suitable hive technologies, establish harvesting protocols, and ultimately commercialize both stingless bees and their products in Uganda. The apiculture section, led by the apiculture technician, actively involves a volunteer who dedicates a significant amount of time to the project.

Fisheries and aquaculture project.

Research activities in the WHAZ focus on basic, applied, and adaptive approaches to develop technologies aimed at enhancing fish production. Ongoing efforts include data collection on feeding strategies, fish breeding, and the establishment of a foundational population of pure lines of Nile tilapia and catfish in earthen ponds to boost overall fish production in the region.

On-station fish breeding in earthen ponds is a key component of seed multiplication, ensuring the availability of high-quality seeds for fish farmers who lack access to superior stock in the zone. Simultaneously, there is a commercial pond dedicated to fish production for sale, generating

income for the institute through non-tax revenue. Additionally, a hatchery is in the process of being established to further support fish breeding initiatives.

The Aquaculture Scientist leads this section, with support from the Aquaculture Technician, both operating under the Livestock Research Resources Program.

Livestock project.

Research is underway to enhance pasture quality, focusing on legumes such as mucuna, lab lab, *stylothensis*, crotalaria ternate, and calliandra carthorses, alongside grasses like rhodes grass, brachiaria spp, and kakamega. The goal is to improve milk production in the WHZ through high-yield forage. The research also includes the development of feeding regimes and supplements for animals.

Additionally, the section is actively involved in studying cattle, pigs, chickens, and goats, examining their breeds and characteristics. The research encompasses the identification and enhancement of desirable traits in these animals.

The research officer, who also serves as an animal health scientist and head of the Programme for Animal Resources Research, leads the section. Support is provided by an animal health technician and a dedicated volunteer. The overarching aim is to develop technologies and management practices, particularly in the control of ticks, to benefit farmers in the WHZ.

1.6.12.3 Technology Promotion and outreach Programme

This program plays a crucial role in disseminating developed technologies to the end-users for adoption. It conducts comprehensive assessments of socio-economic and socio-cultural aspects within communities in the WHAZ. This involves analyzing the impact of technologies and staying informed about trends in the region.

The program serves as a connector, facilitating collaboration among various stakeholders engaged in agricultural socio-economic activities. This encompasses areas such as policy formulation, gender considerations, social dynamics, marketing of agricultural produce, market trends, value chain analysis, and the conduct of farming systems and livelihood surveys across all units.

The leadership of this program is held by a socio-economist scientist, with support from a rural sociologist. Together, they work to bridge the gap between research and practical implementation, ensuring that the developed technologies align with the social and economic realities of the communities in the WHAZ.

1.6.13 Core function of Rwebitaba ZARDI

To comprehend constraints, opportunities and component interactions in the farming systems of Western Highlands Agro-ecological Zone.

To conduct basic, applied and participatory adaptive research and generate appropriate technologies for dissemination to uptake path-ways.

To contribute to multiplication of foundation seed for distribution to farmers and other research partners.

To establish and strengthen collaboration and linkages in order to exploit synergy in research and uptake of technologies.

To provide and process feedback between farmers, researchers, extension staff and other partners in order to identify and respond to zonal specific and emerging production and marketing constraints.

1.6.14 Organizational and Management structure of Rwebitaba ZARDI

The management structure comprises 35 staff members. Among them include 12 research scientists, 9 research technicians, and 14 support staff (Plate: 1).

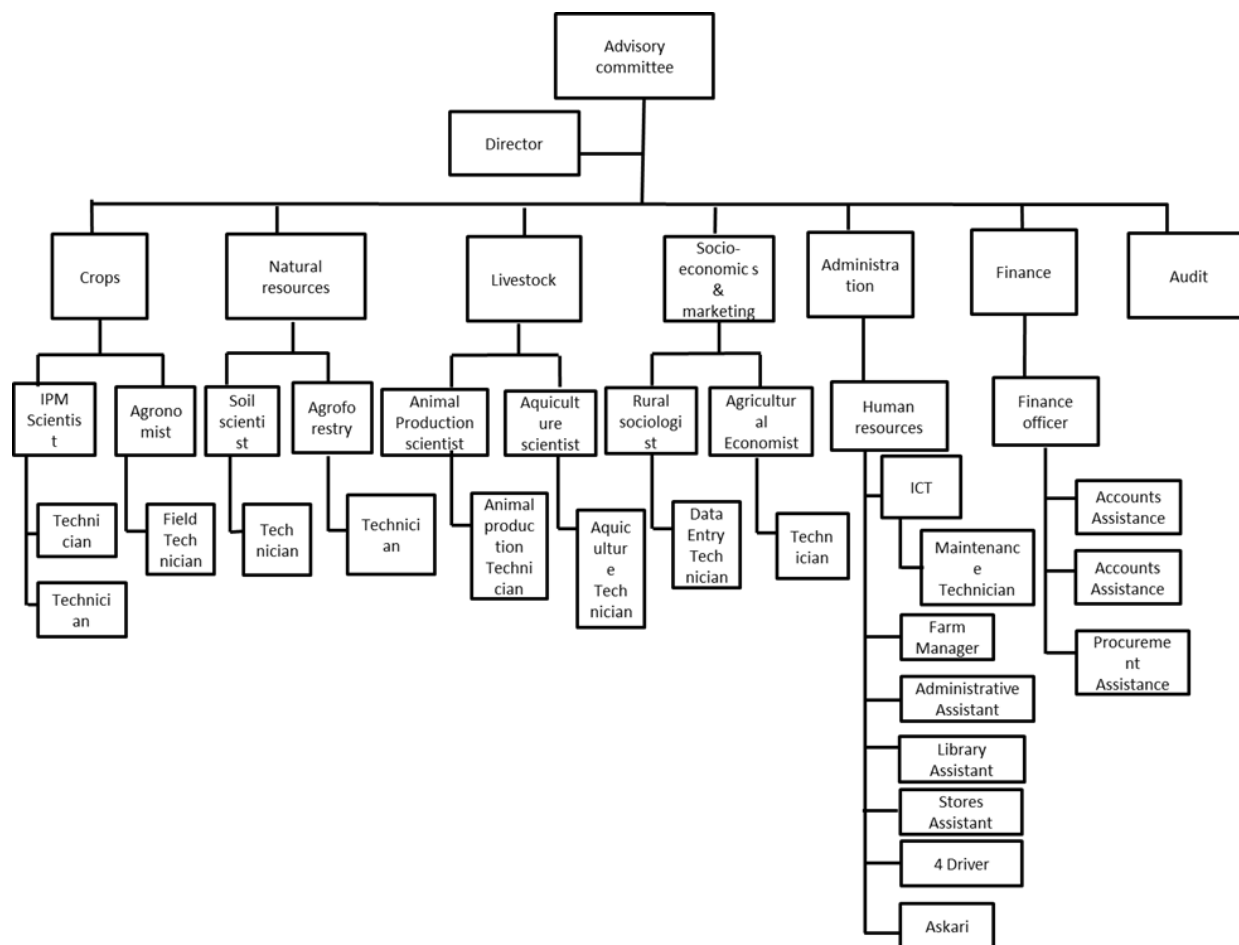
Human Resource and Administration section

Human resources.

This section coordinates planning of human resource and administrative activities like; staff recruitment, training of workers, welfare, corporate responsibility, and ethics required as per job description and specification, among others issues. It is headed by the human resource and administrative officer. Human resource and administration include the finance officer, accounts

assistants, cashier, procurement, internal auditor, inventory officer and locally recruited staff as illustrated below;

figure 2. Organization structure of RwebitabaZARDI



CHAPTER TWO

MANAGEMENT OF THE FIELD ATTACHMENT EXERCISE.

2.0 Introduction

This chapter comprises of the organization and its roles, the roles of the supervisors and students as explained below;

2.1 Roles played by the organization (RwebitabaZARDI)

Carry out applied and adaptive research on different projects.

Set demonstrations for farmers and students to learn different improved farming technologies.

They do on-farm and off-farm trainings on agricultural technologies.

In addition, the farm also ensured that the student in a number of activities under different enterprises to gain hands-on practical skills. The enterprises had the following lead persons as the facilitators for instance Mr. Mugume Ronald who took me through apiculture, Mr. Mununuzi David took me through Aquaculture, Ms. Faith took me through potato production, Mr. Gumoshabe took me through livestock, Mr. Ssenyonga Peter who also took me through rice production among others. This enabled me learn and acquire knowledge and skills especially in milking, identification of animal diseases, preparation of banana planting materials to mention but a few.

2.2 Roles of the field supervisor (the head of research in apiculture)

Briefing the student about the field work expectations.

The supervisor formulated and harmonized the time table.

Follow up reminders on a timetable during the internship period.

Correction and guidance on how to relate with the farmers and organization staff.

He linked me to other field staff (facilitators).

Supervision on field report writing.

2.3 Roles of the University supervisor.

Briefing the learner and guidance on good conduct during field attachment one.

Linking student with agency supervisor.

Making supervisory visits during field attachment one

The University Supervisor ensured that the student was attached to a good farm and did continuous mentorship and monitoring of the student which guided me achieve my objectives throughout the field attachment one.

2.4 Roles of a student

Attending to the activities as per the time table including attending to emerging activities

Timely daily reporting to the station.

Consulting the supervisor and field staff.

Documenting daily activities in a final field report.

CHAPTER THREE

ACTIVITIES CARRIED OUT

3.0. Introduction

This chapter comprises of a number of farm enterprises, that were engaged in, their description and the activities carried out during field attachment. While at RwebitabaZARDI, different methods were used to acquire knowledge and skills and these methods include observation, hands-on and lectures in enterprises of potato production, rice production, banana production, tomatoes production, livestock production, aquaculture, apiculture, farm layout, maize production, cassava and agroforestry to mention. The activities carried out include the following;

3.1. Potato planting

Potato fruits are a succulent but inedible spherical, yellow-green berry, up to 4cm across. Underground, the edible root forms a tuber that can be a range of colors, sizes and shapes, depending on the cultivated variety. Potato belongs to the Solanaceae family and it takes four months to grow.

3.1.1 Steps in potato growing at Rwebitaba ZARDI include;

Seed selection; this refers to the process of identifying healthy, viable and disease-free seeds for growing crops to produce higher yields.

Characteristics of good potato seeds.

- They should have many eyes (buds) so as to bring many shoots.
- A good seed should be of an egg size
- They should be disease free and resistant

Site selection; This is the identification the area where to grow potatoes, with required elements and the factors considered include;

Soil type; the soil of the area should be fertile.

Topography; the area should be a gentle slope to allow easy flow of water.

History of the area; the areas should have spent 2-3 years without the growth of any Solanaceae family crop.

Land preparation; this is done by slashing, primary tillage and secondary tillage until the land is ready for receiving the seeds. Primary tillage ensures soil conservation by reducing erosion and maintaining soil fertility and secondary cultivation turns the rotten organic matter and brought near the surface for plant use.

Field marking and pegging; this is done using a measuring tape and pegs to ensure accuracy in spacing, easily estimate the seeds needed for a certain field and estimate the expected output.

Pitting and Planting; potatoes are planted in ridges with the spacing of 75cm by 30cm and a tuber is placed at 15cm deep. On planting, a bottle soda top of NPK 17 17 17 fertilizer is applied to each tuber (seeds) which boosts leaf and tuber formation.

Weeding and earthing-up; weeding is the removal weeds in order to reduce competition between weeds and plants for growth requirements like sunlight, nutrients, water air and sometimes space. Earthing up also involves the piling soil up around the base of the plant. It is done two weeks after full emergency and when properly done, ensures the stolons found above the ground are covered well to provide necessary conditions for formation of new tubers thus leading to increased yields.

Spraying; this done with recommended contact fungicides especially M45 using a spray pump to prevent diseases like bacterial wilt, late and early blight that affect potatoes that may reduce their productivity.

Dehaulming; this involves detaching of the vegetative parts of the potato plant found above the ground from the root tubers. It is one of the pre-harvesting handling practices that is done nearly 10-15 days before harvesting aimed hardening the skin of the potatoes to reduce injuries during the postharvest handling.

Harvesting; this refers to the removal of the potatoes from the garden using hand hoes to uproot the tubers.



pegging potato field



pegging potato field

3.2.0 Rice growing

Rice is a cereal crop in the poaceae family (the grass family) that requires deep fertile soil that are well drained. The maturity rate depends on weather conditions of the place.

At RwebitabaZARDI, rice is grown in two districts of Bunyangabo and Kasese districts. During this activity rice variety Namuche5 that takes 4months to mature was planted. It was noted that in Bunyangabo district, temperatures are lower compared to Kasese district therefore, Kasese is the favorable district for growing rice due its high temperatures ensure low gestation period.

3.2.1 Planting

Cleaning the field; this was done by removing dry grasses to enhance easy planting and germination of rice.

Marking and pegging; this was done in the field to ensure accurate spacing and easy field operation practices in rice growing

Line making (furrows) where seeds are placed at a depth of 2cm using a planting fork.

Planting; Rice is planted in lines with the spacing of 30cm by 30cm from one line to another and 2cm by 2cm from one plant to another.



field mapping in rice



cleaning rice field



planting rice



making lines for planting rice

3.2.2 Fertilizer Application

This is done to replace the essential nutrients for plant growth to the soil after they been detected to be depleted. This was done in Kasese district at Mubuku irrigation where Nerica4 variety is planted in furrows for easy for flow of water in the field. Its maturity rate is 3months and 15 days.

Fertilizer application was done at tillering stage by broadcasting method following furrows and the fertilizer applied was DAP (Di-ammonium Phosphate)



Fertilizer application

Identified pests and diseases that affect rice and these include cutworms, milk suckers, leaf miners and ball worms and rice blast respectively.

Weeding; the removal of unwanted plants in the garden to reduce competition for factors like moisture, nutrients and sunlight.



Weeding rice

3.2.2.1 Importance of DAP application in rice growing

- Boosts plants overall growth and development.
- Increases soil nutrient absorbing capacity.
- Increases soil water and nutrient retention.

3.3.0 Maize production

Maize is a cereal crop also grown at RwebitabaZARDI on large scale for commercial purposes. It's an edible grain that belongs to the poaceae family and the varieties promoted by the institutes include Bazooka, Panna, Longe5, longe6, DK90-89, DKC777 and kipeke. Maize requires deep and well drained fertile soils with nitrogen, phosphorus and potassium. The spacing of maize is 75cm by 50cm from one plant to another with the depth of 5.7cm.

3.3.1 Gap filling

The replanting of fresh seeds in gaps where the previously planted seeds failed to germinate. This was done on 3acres that were divided into 7 blocks with seven maize varieties planted respectively.

I observed that DKC 777 has the highest germination rate than any other variety and kipeke has the lowest germination rate. The most pests that affect maize at RwebitabaZARDI is army worm.



Making holes for gap filling maize



Maize gap filling

3.4.0 Banana production

A banana is an elongated, edible fruit botanically a berry produced by several kinds of large herbaceous flowering plants in genus *Musa*. Banana is one of the major crops that promote food security and household incomes. Most of the banana and its bi-products are consumed domestically. There are different types of bananas which include; beer bananas, food bananas and dessert bananas.

At RwebitabaZARDI, different banana types are grown for different purposes and the varieties include Mpologoma, Kibuzi, Mbwarzirume, Musakala, Kitika, Bishop and kisansa bananas for food and other varieties, however other varieties for deserts are also grown

3.4.1 The management practices in banana production are;

Pruning; this is where the dry and old leaves are removed to avoid competition for growth factor.

Weeding; This is also done to remove unwanted weeds in the garden as it reduces competition for growth factors and regulate the spread of diseases.

Thinning; This is the removal of less effective plants to allow the productive plants to grow well without competition.

Mulching; This the covering the soil with dry grasses to control weeds by suppressing them and regulate water runoff.

De-suckering;

This is the removal of excess suckers from the banana plant area to maintain the appropriate plant density and reduce competition for growth factors such as sunlight, soil nutrients and space. This is done to enable the remaining plants bear a reasonable banana bunch. Only three plants are recommended to be left on each banana stool.

In another way, suckers are removed from their mother plants to act as planting materials and there are two types of suckers which include sword and water suckers. The sword suckers are the suitable recommended suckers for planting because they have obtained all the required nutrients from the mother plant where they are located closely to the mother plant and therefore are resistant to pests and diseases. The water suckers are not recommended because they grow

independently (far from the mother plant) and therefore, they lack parental care, lack nutrients and they are prone to diseases.



De-suckering

De-suckered sucker

Sucker Paring.

That is the cutting away one inch or more of all the external surface and removing also the external leaf- sheaths of its stem, this was done to eliminate all the eggs and the newly hatched larvae which have not yet tunneled deeply into the sucker to cause diseases like bacterial wilt, Fusarium among others.



Sucker paring

Pared Sucker

Planting.

This is the putting of seeds or suckers into the soil. Banana is planted using suckers that are well prepared

Procedure of planting bananas;

- Open up the land by slashing, primary and secondary tillage. Plant legumes to add nitrogen into the soil which support vegetative growth.
- De-suckering and sucker paring is done and suckers left under shade for one week to harden.
- The hole of 2 feet deep and 3feet side was dug where the dark soil is placed separately from the deep soil (brown) in the spacing of 3m by 3m or 4m by 4m depending on the fertility of the soil, however, at RwebitabaZARDI 4m by 4m was used as the spacing

because soil is highly fertile.



Digging a hole



looking for a direction of placement



planting a banana sucker

3.5.0 Tomatoes

The tomato fruit is globular or ovoid. Botanically, the fruit exhibits all the common characteristics of berries; a simple fleshy fruit that encloses its seed in the pulp. The outer skin is a thin and fleshy tissue that comprises the remainder of the fruit wall as well as the placenta. Tomatoes are in the family of Solanaceae and the variety at RwebitabaZARDI was padema f1.

3.5.1 Nursery bed management practices

Shade construction onto the nursery bed.

This was done to protect the seedlings from harsh conditions like direct sunlight and rainfall that may destruct their growth.

The size of the nursery was 1m by 5m, the spacing was 2cm by 2cm from one seedling to another and the maturity rate 21 days.

Weeding the tomato nursery bed.

This is removal of unwanted crops from the garden. This was done with the help of Mr. Jjemba Douglas to reduce the competition between weeds and seedlings for growth factors like moisture, sunlight and nutrients.



Shade construction



Shade constructed

Transplanting

The process by which the seedlings are moved from a nursery bed to the main garden. At 21 days, tomato seedlings of padema f1 were transplanted to the main garden. This was done in the evening when the temperatures are low.



Transplanting tomatoes



Tomatoes transplanted

3.6.0 Livestock production

This refers to the raising and maintaining livestock, primarily for the purposes of producing meat, milk and eggs. At RwebitabaZARDI, is engaged in dairy production and the breeds are the Friesian crosses.

3.6.1 Milking

This refers to the letting down of milk from the animal's mammary glands using either hands or machines. At RwebitabaZARDI milking is done twice a day that is morning at 6:00am and evening at 3:00pm. The animals being milked were Rweb18 (Amooti), Rwebkettie, RwebNyangoma and RwebMarion. Each milking cow was producing four (4) litres for every milking.

Procedure of milking

- Assemble the cows that are supposed to be milked.
- Call one at a time to the milking parlor.
- Provide supplement feeds to the animal to keep it in mood of letting down milk.
- Wash the hands with clean water to eliminate germs that may affect the animal.
- Wash the udder with clean water

- Add the milking salve onto the teats to prevent the Udder from cracking, the teats from cracking and chapping, and keeps the skin soft and healthy.
- Wipe dry the teats with a clean towel.
- Let the milk down by squeezing the teats.



Milking

3.6.2 Disease identification

While milking in the evening, I realized a change in color of the milk from Rweb18 also known as Amooti which had changed from normal color to abnormal with blood stain. This was observed from the hind left rear of the udder and I suspected mastitis because of the signs.

Mastitis detection

Milk was drawn onto a clean black gumboot to easily identify the blood stains and color change. The first milking showed yellowish color due to the puss and the second milking showed up with blood stains confirming mastitis.



Mastitis confirmed

Mastitis treatment.

On the first day of treatment, penicillin was administered using the intramammary tubes into the infected teats. The following day, an injection of 17ml containing kx-gentamy that is 10% gentamicine sulphate was administered every after milking that is both in the morning and evening. this was done for three (3) days until the milk normalized and was given a withdraw period of seven (7) days.

Procedure of treating mastitis

- The sick cow was milked like usual on a uniform schedule from the milking parlor and in a different container.
- Allocate the cow into the crush for medication.
- Insert the intra mammary tubes into the teats or administer an injection.
- Massage the cow's hide strongly to avoid chances of swelling.
- Let the cow out of the crush.

- Dig a hole away from the cattle kraal, crush and milking parlor.
- Pour the milk into the hole and cover thoroughly.
- Wash the container thoroughly with clean water and soap and pour the substance away.
- Repeat the procedure until the color of the milk normalizes.



Inserting the drug into the syringe



Disposing off milk with mastitis



Injecting the cow (Reb18)

Regular monitoring was done every after 6 hours and the animal was treated using kx-gentamy which is a gentamicin sulphate 10% injection with a withdraw period of seven days and 17ml were used every day after milking.

3.7.0 Aquaculture

This refers to the controlled keeping and rearing of aquatic organisms like fish, crocodiles and crustaceans.

3.7.1 Factors considered while selecting a suitable site for pond construction

- Topography; the flood prone areas especially low land areas which may cause flooring of water ponds.
- Source of water; the water source should be nearly available to provide water to the pond in case of need.
- Soil types; the soil should be well drained, deep and fertile to encourage the growth of planktons that act as food for fish.
- Accessibility; the site should be accessible interns of safety, market and the operation practices like feeding.

3.7.2 Hinderances of fish farming

- Technological know-how; farmers have inadequate knowledge and skills on how to manage farming.
- Seed quality and quantity; the quantity and quality of seeds is low which leads to low production thus hindering fish farming.
- Feed quality and quantity; inadequate feeds which are of low quality have also hindered fish farming.

3.7.3 Feeds of fish

Pellets; these are feeds typically made from a mixture of fish meal, plant proteins, vitamins, and minerals, and they can be floating or sinking pellets. Floating pellets are ideal for surface-dwelling fish while sinking pellets are better for bottom-feeders.

Zoo planktons and phytoplankton's; these are cultured to feed bivalve mollusks (all life stages), the early larval stages of crustaceans, and the zooplankton (e.g., rotifers, cope- pods) that are

used as live food in fish hatcheries. Flagellates and diatoms are two important types of phytoplankton at the base of the food chain.

Forage; these are small species such as herring, menhaden, and sardines that swim in big schools and feed on plankton.

3.7.4 Life cycle of fish

Eggs ► embryo ► hatchery ► fingerling ► juvenile ► adult

3.7.5 Fish species at RwebitabaZARDI

Nile Tilapia;

This species is bronze to brownish-gray dorsally and laterally, and white ventrally. They have a small head with a short snout and a slightly protractile mouth that is located at the front of the head.

Characteristics Nile tilapia fish

- It has a deep-bodied, compressed shape.
- It is bronze to brownish-gray dorsally and laterally, and white ventrally.
- It has a truncated caudal fin that has many thin black bands and a pinkish-red posterior margin.
- Adult fish can reach up to 60 cm body length and up to 4.3 kg body weight.
- But in commercial production, they are generally grown up to 400-500 grams.

Behavior

- Nile Tilapia Fish are known to be very social animals and regularly form schools. They are active swimmers and can be found near the water surface during the day but tend to move deeper during the night.
- They can tolerate a wide range of water temperatures, salinity, and oxygen levels, making them highly adaptable to different environments.

Cat fish

Catfish are so-named because of their whisker-like barbels, which are located on the nose, each side of the mouth, and on the chin.

Characteristics of catfish

- Catfish are scaleless
- Most catfish possess leading spines in their dorsal and pectoral fins
- They have highly developed sensory organs
- They are capable of laying up to 50000 eggs
- They can thrive in both hot and warm water
- Most of them are nocturnal

3.7.6 Pond cleaning

This was done with the supervision of Mr. Mununuzi David. Algae was collected from the breeding nets (happer) to ensure pond hygiene and proper supply of oxygen and sunlight for the fish.



Fish pond cleaning

3.7.7 Determining the fertility of the pond;

This was done using cecchi disc with two backgrounds of grey and black tied on the marked rope in centimeters to show whether water is decreasing or increasing water when the water level is below 25cm, it means the water is very fertile and when the water is above 30cm it means the water is infertile and when the water level is between 25-30cm, the water is fertile and favorable for fish growth. On measuring I found out that the water level is 55cm implying that the water is infertile.



Determining the fertility of the pond

3.7.8 Feeding

This is the provision of different types of feeds to the fish at different stages of growth to facilitate their growth and development. This was done with the guide of Mr. Mununuzi David where we fed pellets to fish which contains all feed nutrients like proteins derived from silver fish, soybean and other feed nutrients.

3.8.0 Apiculture

Apiculture is the keeping and rearing of bees for different purposes like tourism, research and development. There are two types of bees which include honey bees and stingless bees though they all produce honey and some other products. Under honey bees there two bee species in Uganda which include; *Apis mellifera Andasoni* which are small, dark and aggressive and they

live in dry areas and *Apis mellifera Scutelata* are big, brown and docile, they live in areas with low temperatures, the rest with see with variations are crosses.

3.8.1 Meliponiculture

This refers to the rearing and domestication of stingless bees that make honey in pots and they are stingless. They are characterized by small size with a brown color and they lack stingers. The stingless bees have several bee species over 550 described meliponines species in the world, in Uganda so far what's domesticated and especially at RwebitabaZARDI are *Melipona bucinide*, *hypotrigona gribodoi* and *Melipona feruginea*.

3.8.2 Importance of apiculture

- Source of income to the farmers
- Research and education
- Source of medicine like ape-therapy
- Apiculture balances the ecosystem
- Increases crop production through pollination

3.8.3 Factors to consider when siting an apiary

- The distance between the site and public places should be 200m and 100m from the forested area to avoid inconveniences.
- Availability of bee forage plants for nectar.
- The site be free from noise like vibrations
- The site should be away from intruders.
- The availability of water to regulate temperatures in the hive, keeping the brood moist and larvae out of desiccation.
- The site should be free from pests, predators and vermin's since they may attack and kill bees.

- Topography, the site should be on the gentle slope
- Should have shade or shade should be established

3.8.4 Bee castes and their roles in the bee hive

A bee hive consists of three castes which include queen, drone and workers where there is 1:1: many respectively.

Queen bee

This is the only one female bee in the hive with well-developed reproductive system, spermathecal for carrying sperms and a medium thoracic area. It mates with the drone in the drone congregation area after taking a mating flight.

Roles of the queen bee

- Lays eggs that are both fertile and infertile
- Mother of the colony
- Mates with the drone.

Drone bee

These are few in a bee colony, males and big in size.

Roles of the drone bees

- Father of the colony.
- Mate with the queen

Worker bees

These are the thousands seen in most bee colonies, females with poorly developed reproductive systems.

Roles of the worker bees to the colony

- They collect nectar and pollen

- Collect Propolis
- They ventilate the hive
- They clean and repair the hive
- Brood nursing,
- They attend to the queen
- They build the comb
- Foraging for food and water
- They create and store honey
- They guard the hive from intruders

3.8.5 Communications in bees

- Use of pheromone; bees use different pheromones for different type of communication for instance, Alarm pheromone is used to recruit bees to defend the colony, while Nasonov pheromone is used for aggregation (during swarming or if bees are displaced from the colony)
- Use of dances; bees use the famous waggle dance to send messages throughout the colony locate nearby food source and communicate other information.

3.8.6 Types of bee hives

- Traditional bee hive.

These are hives that are made in locally available materials such as box hive, log hive, pot hive, weaved hive.

Advantages of traditional bee hive

- They are cheap to acquire or make because they are made of locally available raw materials
- They house large number of bees.

- They provide large quantities of bee's wax
- When occupied, they are difficult to be stolen.
- They are movable

Disadvantages

- They are difficult to work with.
- Removal of the comb for inspect is difficult.
- They are hard to circulate smoke through.
- They produce low quality honey.

Semi-modern type of bee hives

- Kenyan top bar
- Tanzanian top bar

Advantages of semi-modern bee hives

- They are movable
- They produce good quality honey
- They are durable
- Harvesting is easy and possible to select the sealed combed (ripe).
- Easy to inspect to know the conditions of the colony.
- Control of swarming is easy.

Disadvantages

- They are expensive for ordinary farmers to afford.
- They require technical knowledge.
- Production is limited as it cannot be expanded.

- Combs can easily break while in the transit

Modern bee hives

- Langstroth hive

Advantages of modern bee hives

- They are durable
- They produce good quality honey
- Produce more honey
- Allow many colony management practices
- Use of modern equipment's and technologies

Disadvantages of modern bee hives

- Production is limited as it cannot be expanded.
- They are expensive
- They require technical knowledge

3.8.7 Bee forage plants

These are plants where bees get their nectar and pollen and other products of botanic origin. These plants include the diurnal plants which flower during day and have flowers and smell that attract bees, nocturnal plants which flower at night and smell bad, repellants and carnivorous plants. Bees normally visit diurnal plants like *calliandra calothyrsus*, *leuucina leucocephala*, *phaseolus vulgaris*(beans), *ocimum*, *musa spp*, *cordia africana* and others since they are active during the day and secrete products liked by bees. Different plants secrete pollen and nectar at different time during day or night hours depending also on the prevailing weather to achieve the optimum performance as well.

3.8.7.1 Table1. showing examples of bee forage plants, their common and scientific names and what they produce for the bees

S.no	Common name	Scientific name /botanic	pollen	nectar	resin
1	Bottle brush	<i>Citrus carlistermon</i>			x
2	Beans	<i>Phaseolus vulgaris</i>			x
3	Eucalyptus	<i>Eucalyptus cadagie</i>			x
4	Cariandra	<i>calliandra calorthysus</i>			x
5	Ocimum	<i>Ocimum gratissimum</i>			x

3.8.8 Identification of bee castes

This was done with the help of Mr. Mugume Ronald where we identified and observed that the drone is small and hairy, pale in color, the queen bee is big with well-developed reproductive system and workers' bees are many female bees that are small in size with undeveloped reproductive system.



Identification of stingless bee castes



Stingless bee castes identified

3.8.9 Estimating the number of bees on a forage plant

This was done to determine the number of bees visiting the plant for both nectar and pollen at that very time, or to count pollinators or different bee species at a time, can also be used to determine the available bees at a flower in the optimal time. This is because the bees visit different forage plants at different time as some visit in the morning, in the afternoon and some visit in the evening at around 4:00pm. It was done using the stick by placing it onto the ocimum plant horizontally in four squares and then counted 17 bees on spot. This is done to find out the bee forage plant that is most liked and attractive to bees and when found, more of it is planted which will increase production.



Determining the number of bees on ocimum forage plant

3.8.10 Inspection of the stingless bee hive

These are the preventative maintenance of Meliponiculture. Its conducted properly and include all the necessary checks to ensure that all is well now and will be until the next inspection and if not well, take action.

This was done to find out whether there are pests and diseases that affect bees, to find out whether there are any queen bee cells on the comb surface and bottom side of the comb and if present, remove to reduce swarming potential. During inspection, we observed no signs of pests and diseases, no queen bee cells and the honey was not yet ready for harvesting.



Inspecting stingless bee hives



Inspected stingless bee hive

3.9.0 Agroforestry

Agroforestry refers to the cultivation and use of trees and shrubs with crops and livestock in sustainable agricultural systems. Agroforestry seeks positive interactions between its components, aiming to achieve a more ecologically diverse and socially productive output from the land than is possible through conventional agriculture.

3.9.1 Coffee nursery bed management

Weeding of coffee nursery.

This is the removal of unwanted crop from the garden. It was done to reduce the competition between coffee seedlings and weeds for growth factors like nutrients, moisture and sunlight.



Weeding coffee nurseries

Weeded coffee nurseries

Pruning of coffee seedlings.

This is the cutting off of the grown-up leaves and roots that are not productive. This was done in mango seedlings where the roots were pruned to prevent them from growing firmly into the soil before being transplanted to the main garden. After pruning, the seedlings should be provided with water to avoid wilting.



Root pruning of mango seedlings



Watering pruned mango seedlings

3.9.2 Potting

This is the process of preparing a planting medium for tree seeds. This is where soil is mixed with sand and decomposed organic manure in the ratio of 4:1:1 respectively

Procedure of potting

- Four wheelbarrows of soil were sieved to eliminate the foreign materials and trash such as plant debris, large soil rocks until fine soil particles were obtained.
- Sandy soil was also collected and sieved.
- Organic manure was obtained and sieved.
- Soil, sand and organic manure were mixed in a ratio of 4:1:1 respectively.
- Sand was added to improve to improve the soil texture and structure so as to improve factors such as aeration, water filtration and percolation to the deeper layers after being incorporated into the pot bags.
- The organic manure was to improve soil fertility and boost nutrient availability in the pot soil.

- The mixture of soil, Sand and manure was incorporated into the potting bags



Potting

3.10 Farm layout

This involves the location of the fields with respect to the farmstead and public highways, the size, shape and number of fields, and the location of hog-lots, feed yards among others.

3.10.1 Field mapping and pegging.

This is the marking out of the boundaries and indicate the points and positions of the site depending on the size shape and the number fields (blocks) required. Under supervision of Mr. Gumoshabe Innocent, the pasture field was measured and pegged using a measuring tape, rope and pegs. The field was measured using the method of Pythagoras theorem to the right angle where 3,4,5 was used as base, height and hypotenuse respectively.

An area of the field is measured by length x width.

$$A=LXW$$

$$A=35X47$$

$$A=1645$$

3.10.2 Importance of measuring the land before planting;

- Makes the field operations easy.

- It ensures accuracy especially in spacing.
- Helps in the construction of water conservation reservoirs.
- It also portrays beauty at the farm.



Pasture field mapping

3.11 Cassava production

Cassava, (*manhot esculenta*) is a tuberous edible plant of the spurge family (Euphorbiaceae) from the American tropics. It is cultivated throughout the tropical world for its tuberous roots, from which cassava flour, breads, a laundry starch, and an alcoholic beverage are derived.

Cassava probably was first cultivated by the Maya in Yucatán.

At RwebitabaZARDI, cassava is grown purposely for stems production where they are provided to the farmers and the varieties grown are NAROCASS 1, NAROCASS 2, Njule red, Aladolado, Mkumba.

Gap filling.

The replanting of fresh seeds in gaps where the previously planted seeds failed to germinate. NAROCASS 1 was gap filled with the help of Mss. Acio Elizabeth in seven (7) blocks and this

was done at three months after planting. The stems were placed into the soil upright following the nodes on the stem to facilitate quick establishment and ensure uniformity in field.



Cassava gap-filling

3.12 Community Action Planning. (CAP)

This was done with the community members of Kyembogo village who were the cheerleaders of the meeting and they were left to free express their feelings and share their ideas. This was done through the use of the visionary approach as tool of creating which has three elements including Vision, Current Reality and Action steps.

A vision.

This is a clear compelling mental picture of what one wants in future perceived as if it is already achieved.

The community members were introduced to the concept that when you work for the happiness of

Structural Tension Chart (STC).

The community members assessed the current reality and envisioned the community they want in 5years.

VISION: Kyembogo village has enough food, educated children, homes have peace, better roads and good health by 2028.

Table 2. vision of Kyembogo Village

Accountable	Action steps	Due date
Morning Zulfah	Educate parents and children about the importance of education	17/06/2028
Murangi Ibrahim	Get knowledge in better and sustainable farming methods	03/04/2026
Morning Zulfah	Holding community assessment meetings and visiting each other	20/12/2024
Tukundane Bonney	Grow enough food and start projects	15/12/2024
Robert	Start saving and credit co-operatives (SACCOs)	20/11/2023

CURRENT REALITY: Food is not enough, most children are not going to school, parents do not have money to cater for school fees, there is violence in most homes, and roads are in a poor condition, most homes are in a poor condition, the road is on program to be constructed, schools are very far.



Community Action Planning

3.13 Field work evaluation

3.13.1 Self-assessment

During my field attachment one at RwebitabaZARDI, which started on 27/09/2023 where Mr. Twesige Dominic welcomed me at the institute and Mr. Agaba Hannington took me through orientation and told about the enterprises at the farm. I got involved in different enterprises like bananas, rice tomatoes, livestock among others. This enabled me acquire both knowledge and hands-on practical skills in different enterprises. I also interacted with different people in their dignities which created more connections.

3.13.2 Assessment of The Organization

Strength

- Adequate land to facilitate the existence of many enterprises especially cattle, apiculture, aquaculture, banana, cassava among others thus ensuring expansion of the farm for increased production.
- Efficient supply of hydroelectricity power from national power grid which ensures the supply of electricity to the institute for running electric offices like computers and printers that make office work simplified.
- Presence of external funds from non-government organizations to enhance research activities done in different departments especially research on stingless bees in the apiculture which also results into the increased agricultural production.
- The presence of good and experienced administration with a director, responsible human resource manager, internal auditor heads of department, and the support staff who run the institutional programmes hence its development.
- The availability of water supply that is sufficient pumped from a nearby swamp and river Mpanga for domestic and industrial use especially for animals to drink and mixing of feeds, irrigation during the dry planting and for human consumption.

- The institute have abundant of internet to ease research.

Weaknesses

There is over dependency on synthetic agro-chemical which a threat to the environment.

Lack of well-equipped library which hinders research by the intern students and staff in the long run.

The institute lack laboratories in different departments for carrying out research experiments and analysis thus making research very expensive.

3.13.3 Experiences, knowledge and skills gained from the field activities

- I acquired the skill of planting rice and how to make lines for rice planting.
- I also learnt that rice is planted in a very clean field.
- I acquired the skills in milking
- I learnt how to identify diseases like mastitis in milking cows.
- I learnt the effect of weather on bees, most of the bees are active in the afternoon and evening than in the morning hours.
- I got experience in de-suckering and sucker paring in preparation for a planting material.
- I acquired the skill of planting rice and how to make lines for rice planting.

3.13.4 Relevancy of the theories learnt during lectures to the field work activities

The theory that I had in lecture was put into practice by engaging into practical activities like milking, animal disease control, desuckering, determining the number of bees on a bee forage plant and inspection of stingless bee hives. This has enabled me acquire knowledge and skills especially in milking, preparing a banana planting material to mention but a few.

3.13.4 Special contribution of persons to the organization

- I planted bananas of Mpologoma as this contributes to the expansion of the banana enterprise.

- I cleaned the coffee nurse beds by weeding them since they were very bushy, this contributed to their growth without completion from weeds for growth requirements like moisture, sunlight and nutrients.

3.13.5 Challenges encountered during field attachment

- Limited engagement in outreach programs hence less opportunity to interact with the farmers who are the key stake holders in agriculture.
- The farm that I was attached to was over depending on the use of agro-chemicals which did not suit my programme. However, I encouraged them adopt the use of organic farming and they promised to do so.

CHAPTER FOUR

CONCLUSIONS AND RECOMMENDATIONS

4.0 Introduction

This chapter comprises of the conclusion of what I learnt during my field attachment one and recommendations as discussed below

4.1 CONCLUSION

This field attachment one has been a success and has helped me to relate and apply most of my theoretical work to practical's through engaging in activities like rice planting, de-suckering, milking, bee hive inspection, transplanting tomatoes, fish pond cleaning, determining the fertility of the fish pond among others and these have enabled me learn and acquire knowledge and hands-on practical skills in disease identification, milking, bee hive inspection, determining the fertility among others which fulfilled my objectives.

4.2 RECOMMENDATIONS

4.2.1 Recommendations to the University

The University should engage students in practical's by including them in the time table to equip students with some knowledge on practical's before being attached to farm as this will enable them leave some knowledge and projects at the farm attached to.

The University should prove the importance of sustainable agriculture in its programs through training students in environmentally friendly farming practices by setting up demonstrations and experiments that promote long-term sustainability with high production.

4.2.2 Recommendations to Fellow Students

Rwebitaba ZARDI is one of the farms where students can acquire hands-on practical knowledge and skills in all aspects of agriculture, therefore, as a student should utilize the time effectively whenever attached to this farm.

Students should always get time and visit this farm for purposes of learning.

4.2.3 Recommendation to the organization

The organization should adapt the use of organic farming practices such as the mulching, use of organic manure to improve soil fertility to regulate the over dependency of inorganic fertilizers as this is harm to the environment.

The organization should also implement the use of integrated pest, vector, disease, virus, fungal, management system to avoid the excessive use of agrochemicals as they affect the biological activities in the by killing the living organisms in the soil and also affects the people's health through food chain and in the process of applications.

The organization should also have an organized timetable for the students to avoid inconveniences in the course of training as this led to leave some areas un tackled.

The meals for students especially breakfast and lunch should always be provided at the station for proper organization and time management.

The arrangements for extension services should be included in the program such that the students can be able to interact with the farmers since they are the key stakeholders in agriculture.

Figure 3. A map of Kabarole District showing the area of study



AFRICAN RURAL UNIVERSITY (ARU)

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Kagadi, Kagadi District,
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Tel: 256-793-150990/1/2



.....
25/9/2023

Dear Sir/Madam

RE: REQUEST TO HOST OUR STUDENT FOR FIELD ATTACHMENT FOR THE PERIOD
OF ONE MONTH ON YOUR FARM/ORGANIZATION

I hereby request your farm/ organization to host our student by names of Arinitwe Loyce
registration number 21/ARU/BSSA/002 who is currently in year two of study. She is offering
Bachelor of Science in sustainable agriculture (BSSA) of African Rural University.

The field attachment will enable our students to learn practical skills in the modern agricultural
technologies, extension work, program development and farm management at different levels
thus enabling ARU to graduate rural transformation specialists with the necessary knowledge
and skills to meet the demands of both rural and urban farmers.

Thank you in advance for accepting my request. Together we can transform our communities
from subsistence agriculture to sustainable market oriented agriculture.

Yours faithfully,

.....

Ssengonzi Bagenda Jerome (D.Eng.)

Faculty Dean

NATIONAL AGRICULTURAL RESEARCH ORGANISATION

RWEBITABA ZONAL AGRICULTURAL RESEARCH AND DEVELOPMENT INSTITUTE

P.O.BOX 96 FORT PORTAL

Telephone (Office): 0483 427 520

Email: rwebitabadirector@gmail.com

Website: www.naro.go.og



Time Table for training Interns – September 2023

Date	Topics/courses	Resource persons
27/09/2023	Orientation	Mr. Agaba Hannington/Mr. Twesige Dominic
28/09/2023	Field lay out for pasture establishment	Mr. Gumaoshabe innocent
29/09/2023	Soya bean trial establishment	Mr. Turyahebwa Veleriano
02/10/2023	Vegetable production	Mr. Asimwe Hillary
03/10/2023	Cassava production	Ms. Asio Elizabeth
04/10/2023	Irish potato production	Ms. Aharinta Faith
05/10/2023	Vegetable production	Mr. Mutebi Douglas Jjemba
06/10/2023	Vegetable production	Mr. Mutebi Douglas Jjemba
10/10/2023	Maize production/Banana production	Mr. Mutebi Douglas Jjemba / Mr. Kazigye Francis
11/10/2023	Rice production	Mr. Ssenyonga Peter / Ms. Alituha Maureen
12/10/2023	Agroforestry	Mr. Mwesigwa Boaz

13/10/2023	Soil and water conservation	Ms. Namutebi Vivian / Mr. Mugenyi Lawrence
16/10/2023	Apiculture	Mr. Mugume Ronald
17/10/2023	Aquaculture	Mr. Mununuzi David
18/10/2023	Livestock production	Mr. Gumaoshabe innocent

Date	Topics/courses	Resource persons
19/10/2023	Report writing	Dr. Suubi Godfrey/Ms Namwase Agnes
20/10/2023	Creative life orientation	Mr. Twesige Dominic
23/10/2023	Tea production	Mr. Kawooya Ronald / Mr. Mugisa Charles/ Mr. Veleriano
24/10/2023	Agric machinery	Mr. Mutebi Douglas Jjemba / Mr. Wasswa Kasib
25/10/2023	Submission of the draft reports	Dr. Suubi Godfrey
26/10/2023	Review of the draft reports	Dr. Suubi Godfrey
27/10/2023	Final report submission	Mr. Mutebi Douglas Jjemba





