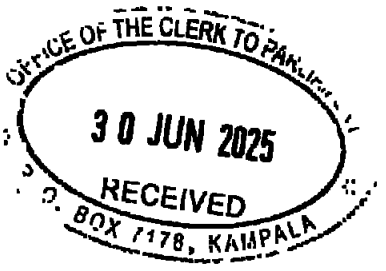

PARLIAMENT OF UGANDA

REPORT OF THE COMMITTEE ON SCIENCE TECHNOLOGY AND INNOVATION ON THE OVERSIGHT FIELD VISITS IN REGARD TO RESEARCH AND DEVELOPMENT IN ZONAL AGRICULTURAL STATIONS (ZARDIs) UNDER THE STEWARDSHIP OF NARO

Office of the Clerk to Parliament

Parliament Building

March 2025

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Acronyms

ZARDI - Zonal Agricultural Research and Development Institute

NGO - Non-Governmental Organization

MbaZARDI - Mbarara Zonal Agricultural Research and Development Institute

KaZARDI - Kachwekano Zonal Agricultural Research and Development Institute

STI - Science, Technology and Innovation

NARO - National Agricultural Research Organization

MoSTI - Ministry of Science Technology and Innovation

STI-OP - Science, Technology and Innovation – Office of the President

PARI - Public Agricultural Research Institute

MUST - Mbarara University of Science and Technology

NPK - Nitrogen, Phosphorus and Potassium

NARRI - National Agricultural Research Resources Institute

MAAIF - Ministry of Agriculture Animal Industries and Fisheries

SWAEZ - South Western Agro-ecological Zone

NAR (Act) - National Agricultural Research Act

U'SEAEZ Uganda's South Eastern Agro-Ecological Zone

BSFL Black Soldier Fry Larvae

1.0 INTRODUCTION

The Committee on Science, Technology and Innovation conducted field visits to the Zonal Agricultural Research and Development Institutes (ZARDIs) in MbaZARDI in Mbarara, KaZARDI and Kalengyeri in Rubanda, Bugongi in Kabale, Ikulwe in Mayuge, and Buginyanya in Bulambuli. The purpose of the oversight field visits was to gather information regarding the research conducted by the zonal agricultural stations, under the stewardship of the National Agricultural Research Organisation (NARO), and how it has been utilized for socio-economic development and developing prototypes in line with innovation.

ZARDI's are semi-autonomous Public Agricultural Research Institutes (PARI's) under policy guidance of the National Agricultural Research Organisation (NARO) which is an agency of the Ministry of Agriculture, Animal Industries and Fisheries (MAAIF) with the mandate to coordinate and oversee all aspects of publicly funded agricultural research in Uganda.

The Committee compiled a report on this activity and now presents it to the House, in accordance with Rule 35 of the Rules of Procedure of Parliament of Uganda, for consideration.

1.1 RATIONALE

The Standing Committee on Science Technology and Innovation derives its mandate from Article 90 of the Constitution of the Republic of Uganda and Rule 193 of the Rules of Procedure of Parliament of Uganda. These provisions enjoin;

the Committee with the authority and power to, among others, research, investigate and carry out oversight functions with respect to the Ministries, Departments and Agencies (MDAs) under its purview.

Pursuant to Rule 193 (a) and (c) of the Rules of Procedure of the Parliament of Uganda, the Committee on STI conducted the field visits in oversight in line with the mandate as highlighted hereunder;

(a) review, discuss and make recommendations on scientific and technological content of Bills laid before Parliament;

(c) monitor, evaluate or assess activities of public institutions and any other bodies engaged in national science, technology and innovation development;

1.2 SCOPE

This report concerns the Zonal Agricultural Research and Development Institutes (ZARDIs) located in Mbarara, Rubanda, Kisoro, Mayuge, and Bulambuli. The projects visited included MbaZARDI, KaZARDI, Kalengyeri, Ikulwe, and Buginyanya. The Committee's focal concern was research and development.

1.3 OBJECTIVES

The Committee's objectives for the oversight field visits were;

i. To establish the research carried out and how it has impacted the development of the prototypes and various innovations.
ii. Evaluate the structural integrity and overall condition of the ZARDIs
iii. To assess the impact of the research and development on the livelihood of the intended beneficiaries and the Ugandan economy as a whole;
iv. To ascertain the challenges faced and how the implementing agents have endeavored to address them.
v. To propose recommendations to enable efficiency and effectiveness in the operations of the sampled ZARDIs.

1.4 METHODOLOGY

While undertaking this oversight, the Committee adopted the following methodology;

i. Field inspections of the various ZARDI projects.
ii. Reviewed the submitted written memoranda from the stakeholders.
iii. Conducted desk review research
iv. Triangulated research of existing data about the ZARDIs and NARRIs.

2.0 ZONAL AGRICULTURAL RESEARCH AND DEVELOPMENT INSTITUES VISITED IN OVERSIGHT

2.1 Mbarara Zonal Agricultural Research and Development Institute (MbaZARDI)

MbaZARDI is one of the 16 Public Agricultural Research Institutes (PARIs) under the policy guidance of the National Agricultural Research Organization (NARO). It began as a Livestock Breeding Centre for Western Uganda, established in 1926 as a Stock Farm. In 1996, the Stock Farm was handed over to NARO by the Ministry of Agriculture, Animal Industry and Fisheries, and it has since become a fully-fledged agricultural research institute.

It is one of the nine Zonal Agricultural Research and Development Institutes (ZARDIs) and is responsible for identifying constraints while developing and disseminating appropriate agricultural technologies in the South Western Agro-ecological Zone (SWAEZ). This has been achieved through the seamless efforts of 31 staff members, including 11 scientists, 8 technicians, and 12 support staff. However, out of the approved staff establishment of 45, there is a deficit of 14.

MbaZARDI covers 16 districts and a City and these include; Mbarara City, Mbarara District, Sheema, Bushenyi, Mitooma, Rubiriizi, Buhweju, Ibanda, Kazo, Kiruhura, Lyantonde, Sembabule, Kyotera, Rakai, Isingiro, Rwampara and Ntungamo.

2.1.1 Achievements of MbaZARDI

The Committee was informed that MbaZARDI had registered the following achievements in line with livestock research and its utilisation;

i. Incubating Mbarara ZARDI prototype starter cultures for enhancing productivity and safety of fermented milk products in cottage industries in Uganda.
ii. Improving the Cost-effectiveness of Corn Silage through Variety Selection and Microbial Inoculation for Improved Dairy Productivity in the South Western Agro Ecological Zone, Uganda
iii. Feed resources for adaption of "Rumen 8" software in development of appropriate dairy cattle rations in South Western Uganda
iv. Evaluation of the efficacy of indigenous herbal extracts in the control of ticks in South Western Uganda.
v. Evaluation of the Safety, Efficacy and Effectiveness of the Subolesin Based Anti-Tick Vaccine: A Randomised Double Blind Multisite Confined Field Trial.
vi. Local Solutions for Global Challenges: A Case of a Locally Formulated Feed Detoxifier in Uganda that reduces mycotoxins to undetectable levels in livestock products.
vii. Progress on the field trial of ACARINOR® and AMITRANOR in tick control in Uganda (Ref. VTC 05/2024)
viii. Improving pastures in open grazing systems.
ix. MbaZARDI has scored highly in disseminating information to beneficiaries by working with Local Governments, NGO's and through radio programs.

2.1.2 Committee observations and findings

The committee observed that;

i. The structural condition of the infrastructure was dilapidated and needed renovation of the substandard facilities such as laboratories, green houses, animal experimental structures and screen houses.

ii. In the official documents, MbaZARDI had 1300 acres although the Director Research identified only 800 acres. The committee was informed that some part of the land was taken as a buffer zone and some was being encroached upon.

iii. The Director further informed the committee that all land is in use. Though most of the land was registered and a certificate of title was issued, part of the land was unregistered.

iv. The director of Research informed the Committee that they have done fairly well in the design of products that can ferment milk to make yoghurt.

v. The banana and coffee plantations were thriving and the members were informed that the fertilizer produced by MbaZARDI was being used.

vi. Further, MbaZARDI successfully produced a 3 in 1 bio fertilizer consisting of the vital nutrients Nitrogen, Phosphorus and Potassium (NPK).

vii. MbaZARDI had successfully planted a variety of Napier grass which feeds the livestock on their stock farm. The Napier grass varieties include; NARO Napier1; NARO Napier 2; NARO Napier 3; Kakamega and Pakchong (Super Napia).

Fig 1: *Members inspecting the Napier grass plantation.*

x. The MbaZARDI offers locals in the area free testing of samples from their cows for the presence of disease-causing germs or infections to help them raise healthy animals.

xi. MbaZARDI carried out a study on improving the cost-effectiveness of corn silage through varietal selection and microbial inoculation for improved dairy productivity in the South Western Agro Ecological Zone (SWAEZ).

xii. MbaZARDI and Mbarara University of Science and Technology (MUST) have made efforts to develop a herbal acaricide to manage ticks. The extract removes ticks at a rate of 73.8% based on the dose given. However, there is need for further optimisation of the dose to reach the set standard of 80%.

xiii. The process of evaluation of the efficacy of indigenous herbal extracts in the control of ticks in South Western Uganda was still work in progress. As such, the committee inquired why the anti-tick vaccine trial process had taken so long to be accomplished.

xiv. MbaZARDI has been able to come up with local solutions formulated locally to reduce mycotoxins to undetectable levels in livestock products.

xv. MbaZARDI has achieved improved pasture production through biomass and species diversity coupled with removing invasive species.

xvi. Banana wine production and training of 10 wineries is another notable achievement of MbaZARDI. Further, disease free planting materials for local varieties has been availed. Among the availed species include; Kibuzi, Mbwazurume, Ntalagaza, Nshasha/Kasansa, Mpologoma, Musakala, Nakitembe and M9.

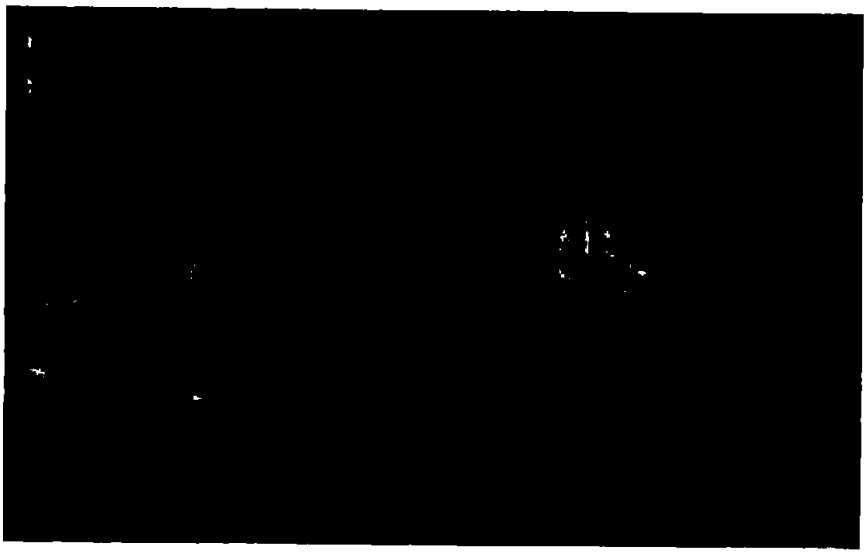

Fig 5: Members being shown banana wine

xvii. A modern piggery unit is one of the achievements of MbaZARDI, designed for nutrition and breeding, and also the rearing of pigs for experimental and commercial purposes.

xviii. A Freeze drier used to freeze milk into powder, meant for incubating Mbarara ZARDI prototype starter cultures is one of the achievements as it enhances productivity and safety of fermented milk products, in cottage industries in Uganda. The machine prolongs the shelf life of the powdered milk to about 4 months without need of refrigeration.

xix. The committee found out that MbaZARDI is meant to benefit 16 districts and 1 city. As such, the delegation required to know how the beneficiaries accessed service delivery. Were outreach sessions carried out by MbaZARDI to the farmers?

2.1.3 Challenges

MbaZARDI faced a diversity of challenges which include;

i. Low staffing levels whereby there were 31 staff out of an establishment which is meant to comprise of 45 staff.

ii. Inadequate transport facilitation due to the majority of vehicles being very old, and therefore, in need of constant repairs which is costly.

iii. Inadequate laboratory facilities have caused the underutilisation of the staff's potential.

iv. Increasing power costs due to increased research work, yet the resources allocated are inadequate.

v. A challenge of water with chlorine which is unsuitable for aquaculture, and has negative effects on the breeding process.

vi. Some of the research work is incomplete due to financial constraints.

vii. There is still an issue of ticks in the area affecting cattle both at the ZARDI and the local area.

viii. The Committee was informed that the facility doesn't have a PCR machine that looks at bacteria DNA. Products have to be sent to South Africa to check the DNA which is costly and time consuming.

2.1.4 Committee recommendations

i. The government should prioritize the purchase of a PCR machine to reduce on costs incurred to test the bacteria DNA from South Africa.

ii. The government should ensure maximum utilization of the land in order to deter encroachers and maximum productivity.

iii. The government should provide funding for improving the structural integrity and acquiring efficient equipment in the laboratories.

iv. The Government should direct the project implementers of the anti-tick vaccine project to put more effort in order to ensure improvement of the anti-tick vaccine, so as to achieve the set standard of 80%.

2.2 Kachwekano Zonal Agricultural Research and Development Institute (KaZARDI)

KaZARDI is located in Rubanda District in South Western Uganda. The institute is composed of three stations, Kachwekano (which is an administrative seat), Kalengyere, and Bugongi (which are field stations). Kachwekano ZARDI spearheads agricultural research and development work in Uganda's south western highlands, which is an agro-ecological zone (SWHAEZ). This agro-ecological zone administratively comprises of Kabale, Kisoro, Kanungu, Rukungiri, Rubanda and Rukiga Districts.

Kachwekano was established by the British in 1937 for experimentation and demonstration of crops, pastures, and livestock of temperate origin.

KaZARDI's mission is to improve farming systems and livelihoods in the SWHAEZ through conducting strategic, applied and adaptive research on priority commodities. Further, KaZARDI conducts agricultural research of strategic importance for knowledge generation and development; provides technical back-stopping and capacity building for the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and other ZARDIs, not forgetting other agencies dealing in agricultural research.

2.2.1 Achievements of KaZARDI

The institute operates under three programmes and these include Crop and Natural Resources Research, Animal Resources Research and Technology Promotion and Outreach. It has had a diversity of achievements among which are;

i. Generating up-to-date information that reflects research and development needs of the people and farming systems in the zone. Such

information is then used for re-designing the agricultural research agenda to cater for the dynamism in people's interests, constraints and emerging enterprise market issues.

ii. Developing technologies, practices, and tools for use by producers, processors and traders in order to continuously improve the farming systems productivity and its agro-enterprise competitiveness.

iii. Developing technologies, practices, and tools for use by producers, processors and traders in order to continuously improve the farming systems productivity and its agro-enterprise competitiveness.

iv. Building and promoting partnerships with other NARO institutes, CBO's, local government and private sector organizations for generating and implementing research agenda to enhance quick technology development, adoption and dissemination.

v. Production of foundation "seed" (planting and stocking materials) of priority crop types, varieties and livestock species.

vi. Promotion, through uptake pathways (e. g NAADS, conventional extension, NGOs, CBO's) of proven technologies and research products.

vii. Development of multi-stakeholder innovation platforms on various technologies in the zone.

2.2.2 Committee observation and findings;

The Committee observed some matters and on other instances, it was informed by the Director of KaZARDI;

i. The Director informed the committee that Kachwekano delivers outputs for Kigezi region and that their research is aimed at semi-temperate conditions.

ii. He further informed the Committee that Uganda as a country is currently importing apples and pears, yet they can ably be grown in the Kigezi region due to the existing conducive climatic conditions.

iii. The Director also informed the Committee that the Kigezi region grows 60% of the irish potatoes Uganda consumes.

iv. The Committee was also informed by the Director that, due to land shortages, the facility had moved away from growing sorghum, which is deemed to be a low-value crop and opted to focus on high value crops.

v. The committee was informed that mountain slopes in the Kigezi region are being rendered unproductive due to landslides and soil erosion. This is being addressed by terracing (adding of bench-like designs on the slopes).

vi. KaZARDI is practicing *"rejuvenative agriculture"* - Planting trees along mountain slopes (agroforestry). These trees trap Nitrogen and place it in the soil since they have deep roots that pick phosphorous from deep layers, bringing it nearer to the roots of plants which in turn makes slope land productive.

Fig 8: Terracing in Kigezi Region (rejuvenative agriculture)

2.2.3 Challenges (emerging issues)

The Committee was informed by the management of what KaZARDI needs to have in place in order to carry out its mandate effectively:

i. Need for a national seed potato hub to reduce national demand gap for quality potato seed.
ii. Deploy climate smart technologies.
iii. Increase participation of farming communities in money economies.
iv. Needs equipment totalling to UGX 11.8 billion to generate 50,000 tons of quality seeds worth Ugx 101 billion per year.
v. Must establish reverse bench terraces.
vi. Need Ugx 7.6 billion for climate smart practices to reverse productivity decline in Kigezi highlands.
vii. Need for additional human resource.
viii. Fragile agricultural land use systems. Landslides are very severe as valuable nutrients from the hill tops are eroded to the valley bottoms, leaving the mountain tops infertile.
ix. Need for a bigger laboratory to facilitate increased seed production to be able to reach and cover all those who need them (farmers).

2.2.3 Committee recommendations

The Committee recommends that;

i. Government invests in climate smart agricultural practices with a keen emphasis on regions highly affected by weather events like landslides and drought.

ii. Government provides funding for the setup of improved facilities like laboratories to enhance research done.

iii. Government addresses Staffing level deficiency as soon as possible to ensure smooth running of activities at the station.

2.3 Kalengyeri Zonal Agricultural Research and Development Institute - (Field Station)

The Committee embarked on a self-guided tour of Kalengyeri field station. While at Kalengyeri field station, the members observed that the station was deserted/ abandoned and was dysfunctional. There was no staff at the station, not even a security officer to provide security for the equipment at the station. This site was meant for temperate fruits, irish potatoes and sheep. It was equally meant to test soils to determine which irish potatoes variant best fits the given soil types. Kalyengyeri is strategically located to deal in irish potatoes. It has about 300 acres of land with at least 30 acres being used for seed testing.

Fig 7: Members at the abandoned Kalengyeri Field Station

2.3.1 Committee recommendations

i. Government should carry out a feasibility study to ascertain whether this facility still offers relevance before making a decision to rehabilitate/revamp it.

ii. MAAIF should give an explanation as to why such a facility is abandoned, later on the equipment left without proper custody. It can easily be vandalised

iii. MAAIF should direct NARO which is directly in charge of ZARDIs come up with a functional work plan for Kalengyeri field station as soon as possible.

2.4.1 Buginyanya Zonal Agricultural Research Development Institute (BugiZARDI)

Buginyanya ZARDI (BugiZARDI) is a semi-autonomous Public Agricultural Research Institute (PARI) under policy guidance of the National Agricultural Research Organisation (NARO); an agency of the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) with the mandate to coordinate and oversee all aspects of publicly funded agricultural research in Uganda.

BugiZARDI was operationalised on 1st July 2008 in compliance with the National Agricultural Research Act Cap 197. The institute is composed of Buginyanya (95.0 ha) as the main station located in Masira Sub County, Bulegeni (47.8 ha) in Kamu Sub County, Bulambuli District. BugiZARDI spearheads Agricultural Research and Development work in Uganda's South Eastern Agro-Ecological Zone (U'SEAEZ) that administratively comprises the districts of; Bukwo, Kween, Kapchorwa, Bulambuli, Sironko, Mbale, Bududa, Manafwa, Budaka, Kibuku, Pallisa, Tororo, Busia, Butaleja, Iganga, Bugiri, Namutumba, Mayuge, Jinja, Kamuli, Luuka, Buyende, Namayingo, Kaliro, Namisindwa, Butebo and Bugweri.

BugiZARDI's mandate involves conducting both applied and adaptive agricultural research on priority enterprises of importance in U'SEAEZ. In addition, it conducts basic research on strategic highland enterprises and enables innovations, management practices, and cross-cutting issues. Notable also is that BugiZARDI is meant to conducts skills development programs for intermediary agricultural research service providers, and to provide them with technical backstopping.

Furthermore, BugiZARDI is intended to ensure that early-generation seed breeding stock is made available to uptake pathways that include public and private sectors for multiplication and dissemination to end users.

2.4.2 Achievements of BugiZARDI;

BugiZARDI has realised some achievements among which are;

i. Developed suitable substrates formulation for mass culture of the Black soldier fry Larvae BSFL) as key ingredients in animal feeds.
ii. Has determined the toxicity levels LD_{50} of two plant extracts for control of worms in livestock.
iii. BugiZARDI is conducting research into making various byproducts in response to emerging market demands. These products have the potential for import substitution and use in the cottage industry.
iv. Animal resource research program; BugiZARDI has realised sustainable productivity, profitability, value added and competitiveness in livestock and fisheries products in the zone.

Livestock farm

v. Buginyanya ZARDI is meant to churn out Technology Promotion and Outreach Program. This has not been achieved to full potential, though effort is seen on the ground. Effort to scale up utilization of sustainable land management, with a landscape approach in target areas and developing strategic partnerships for agriculture development in the zone was ensuing.

2.4.3 Challenges;

BugiZARDI has experienced various challenges among which are;

i. Need for funding to roll out the achievements/ outputs of BSFL project to benefit the end-users (especially the private sector, commercial farmers, animal feed producers and traders).

ii. Lack of funds to progress the Black Soldier fry Larvae (BSFL) to commercialisation level. The project received partial funding from MoSTI before it was disbanded in 2021. The project has since been stalled.

iii. Limited funding hindering research activities, infrastructure development, and staff capacity building.

iv. Inadequate infrastructure such as laboratories, greenhouses and equipment.

v. Changing climate conditions such as droughts, floods and temperature fluctuations.

vi. Human Resource Constraints; Limited staff capacity, brain drain and inadequate training have caused some disruptions, too.

vii. Land Degradation; Soil erosion, soil fertility decline, and land degradation has impacted agricultural productivity and sustainability.

viii. Limited access to technology such as precision agriculture and biotechnology has hindered research and development.

2.4.4 Committee observation and findings;

i. Upscaling suitable substrates for mass production and commercialization of Black soldier fly larvae (BSFL)- based animal feeds and organic fertilizer in Uganda has hit a stalemate.

ii. The BSFL project seems to be totally abandoned. There was nothing at Buginyanya, save for few dried black soldier flies in Jinja and larvae seen.

iii. Jinja site where the soldier flies were is also abandoned and not well kept. The equipment there is non-functional.

iv. The infrastructure in Buginyanya is well kept; buildings are renovated.

v. The coffee gardens around the headquarter didn't seem to be thriving.

vi. The area MPs complained of lack of out-reach and that the neighbouring communities have not been well impacted.

vii. There seemed to be no new innovations and no prototypes.

viii. There are many designations unfilled in the establishment; human resource was light on the ground, and retainability was reported as staggering.

ix. The land was well secured as there were no land conflicts

2.4.5 Committee Recommendation;

i. The Committee recommends that the projects which received partial funding, such as the Black Soldier Fly, be facilitated, so that the money invested doesn't go to waste. The set objectives were not achieved.

ii. Recruitment of scientists to fill the vacant designations should be effected as soon as possible. This eases the execution of the entity's mandate

iii. Information dissemination needs to be intensified. BugiZARDI needs to do more work on outreach.

iv. BugiZARDI needs to put more effort in achieving the core objective and goal of improving agricultural production in Uganda's South-eastern agro-ecological zone (U'SEAEZ) through research, technology development, and dissemination.

v. BugiZARDI should respond to Secretariat for STO-OP call for proposals. This will enable utilisation of the research done for development.

2.4.6 Ikulwe Agricultural Research Station – Mayuge

Ikulwe Agricultural Satellite Station is a research station located in Mayuge District, Uganda. It is part of the National Agricultural Research Organisation (NARO). Its focus is on

- **Research:** Conducting experiments and studies on various crops and farming practices to improve agricultural productivity.
- **Farmer Training:** Hosting events like the Seeds of Gold Farm Clinic, which teaches farmers modern farming techniques, such as: Crop Management and best practices for growing crops like cassava, upland rice and coffee.

- **Livestock Management:** Pasture management and climate-smart objectives.
- **Agricultural Financing:** Providing information on financing options, such as the Agricultural Credit Facility (ACF) to support farmers.
- **Community Engagement:** Collaborating with local farmers, experts and stakeholders to promote food security and sustainable agriculture.

The station has been involved in addressing challenges like climate change and disease management in agriculture. However, it's worth noting that there have been disputes over land ownership, with some families reclaiming land belonging to the research station.

Some local families claim that their land was leased to the Government and the leases expired. However, for a long time, Ikulwe has embarked on thriving participatory research.

2.4.7 Achievements of Ikulwe Agricultural Research Station:

Ikulwe Agricultural Research Station has been involved in various research activities focused on improving agricultural practices. Some of its achievements include;

i. Crop Research in crops like cassava, beans, sweet potatoes, and upland rice so that they develop resistant and high-yielding varieties.
ii. Soil Fertility Management; use of green manure and improved fallow for soil fertility improvement
iii. Soil Erosion Control; use of living barriers such as vetiver grass to control soil erosion.
iv. Participatory Research; Ikulwe has engaged in participatory research with farmers, identifying and prioritizing problems related to crop production and working together to develop solutions.

v. Technology Adoption; Farmers in the surrounding communities have adopted new technologies and crop varieties have been developed through research, such as bean and rice varieties.

2.4.8 Committee Observations and Findings;

The Committee observed the following,

i. The structures were very old and not maintained. Most of them are structures of 1930s
ii. The staff are light on the ground as most designations are not filled.
iii. The staff seemed eager to work but they are not facilitated. Many of the staff found at the station were on contract.
iv. The manager reported that there was a rigorous land court case which has dragged on for many years.
v. Well-kept gardens and thriving crops were seen in the surrounding of the offices.
vi. Visibility needed to be enhanced by having signpost well branded and by the road.
vii. No innovation or running project was reported.

2.4.9 Challenges;

Ikulwe Agricultural Satellite Station is faced by many challenges which include;

i. Land ownership disputes; This dispute is hindering the station's ability to effectively conduct research and implement projects.
ii. Limited Resources; Insufficient funding, infrastructure and equipment has impeded research and development activities.
iii. Climate Change; Ikulwe being an Agricultural Research Stations has had to adapt to changing climate conditions. This has come with challenges due to financial constraints to procure the necessary equipment like for irrigation (water for irrigation)

iv. Technology Adoption; Integrating new technologies, such as satellite imagery and precision agriculture has proved a constraint due to limited expertise and facilitation.

v. Community engagement is quite constrained due to the existing land conflict, yet building trust and collaboration with local farmers and communities is crucial for success of agricultural research stations.

vi. The court case has proved very expensive and strenuous

2.5 GENERAL RECOMMENDATIONS

1. The Government needs to allocate more funds to Zonal Agricultural Research Development Institutes (ZARDIs) so that thorough research is conducted in order to improve or innovate new species for better yields, since Agriculture is the backbone of Uganda's economy.
2. The Government needs to enhance the remuneration of scientists holding PhDs. As such, the salaries need to be competitive to ensure motivation, which in will result in retainability for institutional memory and streamlined efficient outputs.
3. The Government through NARO needs to intensify monitoring, supervision and evaluation to deter occurrence of scenarios like that of Kalengyeri, where the station is totally left without stewardship.
4. The Government should ensure that Agricultural Research Stations maintain, guard and preserve the original seed against extinction.
5. The Government should ensure that appropriation of funds to cater for recruitment is done diligently.
6. The Government should ensure that land for ZARDIs is without encumbrances, and where they emerge, indulgence is made in real good time to avoid stalemates.
7. The Government should invest in climate smart agricultural practices with a keen emphasis on regions highly affected by weather events like landslides and drought.

2.6 CONCLUSION;

The Committee field activity oversight report has brought out critical issues such as neglect, with reference to the current state of Kalengyeri agricultural field station. However, it has also served as an eye opener in regard to modernized agricultural practices like rejuvenate agriculture and use of reverse bench terraces to cultivate on hill slopes.

The Committee therefore, recommends that the report be adopted.

I beg to submit.

REPORT OF THE COMMITTEE ON SCIENCE, TECHNOLOGY AND INNOVATION ON OVERSIGHT FIELD VISIT IN REGARD TO RESEARCH AND DEVELOPMENT IN ZONAL AGRICULTURAL STATIONS (ZARDIs) UNDER THE STEWARDSHIP OF NARO

No.	Names	Signature
1	Hon. Niyonsaba Alex, **Chairperson**	
2	Hon. Asiimwe Florence Akiiki, **Deputy C/P**	
3	Hon. Kyobe Luke Inyensiko	
4	Hon. Wambedde Seth Massa	
5	Hon. Mbayo Esther	
6	Hon. Awany Tony	
7	Hon. Ojok Andrew Oulanyah	
8	Hon. Kubeketerya James	
9	Hon. Okiror Bosco	
10	Hon. Adome Francis Lorika	
11	Hon. Okot Boniface Henry	
12	Hon. Werikhe Peter Christopher	
13	Hon. Okori-moe Janet Grace	
14	Hon. Ezama Siraj Brahan	
15	Hon. Feta Geofrey	
16	Hon. Nafuna Muloni Irene	
17	Hon. Musinguzi Yona	
18	Hon. Ninkusiima John Paul	
19	Hon. Nsamba Patrick Oshabe	
20	Hon. Aol Betty Ocan	
21	Hon. Auma Kenny	
22	Hon. Kinobere Herbert Tom	
23	Hon. Okullu Aabuka J. Anthony	

24	Hon. Najjuma Sarah	
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26	Hon. Akugizibwe Aled Ronald	
27	Hon. Adidwa Abdu	
28	Hon. Mboizi Arthur Waako	
29	Hon. Ameede Agnes	
30	Hon. Walyomu M. Moses	
31	Hon. Kayondo Fred	
32	Hon. ~~Awany Tony~~ Lekuru Joel	