

PAEPARD PROJECT WORKSHOP

Disseminating Research Findings: Enhancing Nutrition security and Incomes through adding value to Indigenous Vegetables in East & Central Uganda



PEAPARD WORKSHOP REPORT
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ACRONYMS

AIV - African Indigenous Vegetables

UCU - Uganda Christian University

CHAIN Uganda - Coalition for Health, Agriculture and Incomes

EU - European Union

FARA - Forum for Agricultural Research in Africa

PAEPARD - Promoting African and European Partnerships in Agricultural Research and Development

NRI - Natural Resources Institute, University of Greenwich

NARO - National Agricultural Research Institution

MAAIF - Ministry of Agriculture, Animal Industry and Fisheries

KCCA - Kampala City Council Authority

RUFORUM - Regional Universities Forum for Capacity Building in Agriculture

FARMGAIN Africa Ltd

1.0 Introduction

This report documents proceedings of a dissemination workshop conducted by several stakeholders including Uganda Christian University (UCU), FARMGAIN Africa Ltd, Coalition for Health, Agriculture and Incomes (CHAIN) UGANDA, Natural Resources Institute (NRI), University of Greenwich, UK with funding from European Union through Forum for Agricultural Research in Africa (FARA) on the program of Promoting African and European Partnerships in Agricultural Research and Development (PAEPARD). This was done through a consortium called Afri-SOL which is a network of African researchers/stakeholders with interest in indigenous African vegetables especially Solanaceae species. The Project entitled “*Enhancing nutrition security and incomes through adding value to indigenous vegetables in East and Central Uganda,*” was coordinated by the hosting institution’s Principal Investigator, Dr. Elizabeth Kizito. The end of project dissemination workshop had the following purposes:

- a. To debrief on the project activities and results achieved by the project implementers and partners,
- b. To highlight project impact and success stories to the public, partners and media and
- c. To create opportunity for interaction between stakeholders and the public to pave way forward on sustainability

The workshop also looked at listening to voices from communities as they make a compelling argument on the issue of the neglected indigenous species and forging a way for income generation and improved nutrition.

1.1 Remarks from Dean Faculty of Science and Technology, UCU- Dr. Michael Masanza

In his remarks Dr. Masanza welcomed participants and farmers to the dissemination workshop and acknowledged the contribution of all partners and funders of the project. While the catch word for the project was ‘Better vegetables, better lives,’ it created a greater conversation and interaction between the farmers and partners of the project. He mentioned that Uganda Christian University is looking beyond feeding the world in engaging with research that concerns nourishing the population. He indicated that there is an invisible and silent hunger within the population that goes without being noticed and that nourishment is not only about quantities of food consumed but having a balanced diet. Dr. Masanza stressed the potential of



indigenous vegetables in making a critical difference in the nutrition of the African population.

Dr. Masanza appreciated the work of the project team for the technical support, the Vice chancellor- Dr. John Ssenyonyi, the Ministry of Agriculture Animal Industry and Fisheries, other Stakeholders like Makerere University, Natural Research Institution - University of Greenwich, Kampala City Council Authority (KCCA), partners like the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) for support in linking the project to the funders to conduct a cutting-edge research for knowledge building and community outreach.

1.3 Remarks from Vice Chancellor, UCU- Dr. John Musisi Senyonyi

In his remarks the Vice Chancellor of Uganda Christian University welcomed participants to the dissemination workshop. Dr. Senyonyi mentioned that the university was honoured to be the host institution for agricultural development in improving African indigenous varieties for greater nutrition and livelihoods. The Vice Chancellor thanked the stakeholders for nourishing people and recognised PAEPARD, farmers and RUFORUM for their contribution in this research. He highlighted the value of this research in raising awareness and informing stakeholders but also providing accountability of what has been done throughout the 3-year project. He noted that results attained can be used to lead a change in communities in policy and practice and also that sharing information influences decisions.



“I want to highlight the main reason for our time here today - the dissemination of project results. We want to raise awareness or promote our outputs, to inform you our stakeholders about what was done and thus provide accountability for the resources received. We will cherish your feedback on this work, but we also encourage you to tell others about what we have done. The results from this research can be used to lead to change in communities, and cause changes in policy and practice.” He stated.

He noted that the project promised to deliver on the varieties of indigenous vegetables, the supply chain, deliver information on indigenous varieties and noted that stakeholders would hear how results were achieved and mentioned that the researchers valued stakeholder feedback in building a strong way forward especially in the fight against food insecurity in Africa. He urged participants to go out and preach the gospel of what they

would get from the workshop. Dr. Senyonyi thanked the Department of Agricultural and Biological Sciences at UCU, and in particular, Dr. Elizabeth Balyejjusa Kizito, for working on this project. He acknowledged the desire by the team to help the helpless, care for the disadvantaged and improve the plight of people suffering from food and nutrition insecurity, especially the vulnerable women and children in Africa.

1.4 Remarks from RUFORUM Representative- Dr. Paul Nampala



Dr. Nampala noted Uganda Christian University joined the RUFORUM Network in 2014 and its speed of engagement was faster than other universities that even joined earlier and that, explained why they won the bid to host the project. Uganda Christian University is a member of the RUFORUM Network, a consortium 85 African Universities in 36 countries in Africa. Dr. Nampala argued that even if the project was winding up, there was much to learn from others. For example, the project could emulate RUFORUM which once was once a project, grew to a program and later became an institution. In his remarks he mentioned that the project had created strong

networks and that staff had been able to make new partnerships from this work such as the University of Ghana in West Africa.

Dr. Nampala credited PAEPARD for publishing papers, policy briefs, strengthening farmer groups and training farmers while connecting the university to society and also training young students in academia. He mentioned that due to the quality of their work, RUFORUM would support these PAEPARD students to make presentations in the upcoming RUFORUM Biennial Conference which will be held in October, 2018 in Nairobi, Kenya. The RUFORUM Biennial Conference brings together a pool of scientists, policy makers, private sector and government which would be a great platform for the project to benefit from networking opportunities and dissemination of findings.

He continued to say that RUFORUM believes this forum was a key place for dissemination, learning and networking which are key issues in the world of academia. In conclusion, he stressed that there was need to expand this research to be a platform that would exist and continue to attract funding to build knowledge in different capacities for incomes and nutrition security in Africa.

1.5 Remarks from FARA/PAEPARD- Dr. Jonas Magabe

Dr. Magabe expressed his gratitude to the European Union for the support given for the last 11 years and in particular for the 3 and half years funding for the PAEPARD project coordinated by the Forum for Agricultural Research in Africa (FARA). He noted that FARA operates on the following core functions:

- Advocating for support on policy, providing budget for agricultural research, and generating knowledge for national development.
- Building human capacity and institutional systems
- Knowledge, information sharing and dissemination
- Partnerships at regional level where PAEPARD links Europe to Africa



Dr. Mugaba noted that PAEPARD had been operational since 2007 and therefore was a long-term project from which the African Indigenous vegetables consortium received support hosted by Uganda Christian University. He mentioned that this was a demand driven multi-stakeholder research which had put users and researchers at the centre of contributing knowledge. This kind of research brought researchers and farmers together and as the result farmer's capacity was built. He gave an example of a farmer from Jinja who visited Makerere University on a tour and felt like a graduate from the institution.

He mentioned that engaging rural farmers was a practical way of solving farmers' problems in specific contexts. He also noted that through this research another window of opportunity had been opened which required competitiveness to be able to attract funds. He credited Uganda Christian University for setting itself as a centre of excellence in African Indigenous Vegetables (AIVs). He believed that FARA was still willing to partner and support research for development and investing in neglected crops that play a big role in improving nutrition across countries. He noted that there was a link between agriculture and Sustainable development goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture.

1.6 Remarks from AGRINATURA -Dr. Remi Kahane



In his remarks as the representative of AGRINATURA, the European association gathering 31 institutions on agricultural research and higher education for development, Dr. Kahane was pleased to participate in the closing event of the African Indigenous Vegetables project from which strong lessons could be learned, not only from the technological results obtained, also from the quality of the partnerships created. A real dialogue has been established between scientists and non-scientists including the private sector; and a new way to collaborate with European partners is opened that should last, he noted.

Through the many products and results generated during the project, the consortium has given more visibility to the African indigenous crops and called for more attention to be paid on nutrition security, food safety and good postharvest practices, food sovereignty, the seed sector for underutilized species, and biodiversity management. This project has given evidence that innovation can be low-technology, affordable and impactful; Innovation can be driven by users, farmers or agri-entrepreneurs; Innovation needs skills and incentives, he affirmed.

Dr. Kahane noted that indigenous vegetables were close to his heart and that he had a special interest in them. He pointed out that the project had run on partnerships and relationships and created a dialogue where farmers, public sector have had to discuss and negotiate on impacts and income generation. He noted that this research had a connection with broader topics such as food sovereignty and indigenous crops. He stressed the importance of not depending on imported rice and vegetables to manage biodiversity in the country to address food security. He also acknowledged that the project had far reaching impact globally and that it could be out-scaled and upscaled in that sense. He noted that there was an opportunity to develop proposals for more partnerships and believed that UCU had the skills and competence. Dr. Remi pledged support and noted that research was part of innovation which requires skills and incentive to continue with the engagement.

1.7 Official Opening- Representative from the Ministry of Agriculture Animal Industry and Fisheries- Mr. Joseph Okei



Mr. Okei noted that agriculture was significant to Uganda as a backbone where 65% of the population depended on agriculture creating a competitive advantage in the region. He mentioned that the Agriculture National Policy was a market-oriented component that emphasized sustainable agriculture. Mr. Okei stated that government of Uganda was working on the constraints that hinder private sector and also improving public service delivery to create environmental, regulatory and private sector lead in agriculture. He indicated that the Ministry had a strategic direction on agriculture and prioritized crops, vegetables and fruits. He noted that fruits and vegetables were one of the commodities that

were being focused on right from financial year 2018/19 among other crops.

Mr. Okei laboured to explain the ministry's focus on food security, nutrition and improving income which were key for a healthy population that is more productive. He mentioned that a lot of local knowledge was known about some indigenous vegetables. For instance,

"...In Northern Uganda, there is a vegetable called Malakwang, it is a specie of hibiscus. Folks say when you eat it you get a lot of breast milk. There is Ggobe, they say those vegetables lead to production of milk. We have dodo, our friends in Kenya have sukumawiki. Some of these vegetables which are highly nutritious and some of them are common."
(Okei Joseph- MAAIF)

He indicated that this research was a good initiative to harness the great potential that indigenous vegetables have in improving nutrition of the population. He expressed his appreciation to the PAEPARD AIV project team for the effort in investigating the neglected but potentially nutritious vegetables. He highlighted the fact that the ministry was able to partner with UCU and CHAIN Uganda to develop quality assurance protocols for varieties of these indigenous vegetables. He also commended the ministry for supporting farmer irrigation groups with irrigation equipment, helped farmers in various trade links and developed their capacity. He thanked partners like FARA for the work on vegetables, AFRISOL, UCU and believed for sustainability of the project and other developments. He acknowledged that through the ministry policy framework of private/public partnerships such initiatives (to do with vegetable service centres for improving income, food security and nutrition of households) in the country could be

strengthened. He noted that these vegetables could potentially end up in the EU market because the support of EU could not be underrated and therefore issues to do with regulatory standards of the vegetables are being worked on. He indicated that it was an honour to attend this dissemination meeting for the project entitled enhancing nutrition security and income through adding value in indigenous vegetables in East and Central Uganda and therefore declared the dissemination workshop officially opened.

2.0 After morning break session

2.1 Project overview- Project Principal Investigator, UCU - Dr. Elizabeth Kizito

In her presentation Dr. Kizito mentioned that the study was conducted as a consortium of Afri-Sol, a network of African researchers and stakeholders with interest in indigenous African vegetables especially Solanaceae species. In 2012 there was an engagement between RUFORUM and Afri-sol and 14 members in Africa where strategies were proposed to improve the plight of nutrition in Africa by tapping into the potential of indigenous vegetables. She acknowledged RUFORUM's key role as a partner in linking the consortium with FARA through which the funding for this research was obtained under PAEPARD.



Dr. Kizito proceeded to highlight key result areas for the project and the major deliverables as: (a) varieties of indigenous vegetables with longer shelf life and processing potential identified and profiled; (b) appropriate processing and handling mechanisms/technologies for indigenous vegetables identified; (c) appropriate delivery pathways of value-added indigenous vegetables established and (d) Information sharing mechanisms on utilization of indigenous vegetables established.

Key Sustainability Pathways established

1. The Consortium actively seeks for funding to support its work
2. linkages with National, Regional and International research institutes eg National Agricultural Research Organization (NARO), MARI-Tanzania, ICRAF, WorldVeg, NIAB-UK, Hanze University, GRG-Spain
3. Institutionalization of vegetables production in the university outreach at department level
4. Linkages with local government (Mukono) and the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF)

5. Membership in Key Networks - RUFORUM
6. Uganda Christian University is developing as a center of Excellence in Vegetable Research
7. Emerging Indigenous seed businesses
8. Some farmer groups have now become service providers (TOT)

Overview of Result Framework

Intervention Logic	Project Target	Achievements
Overall Objective: Increased (i) consumption of African indigenous vegetables in nutritionally vulnerable populations and (ii) revenues of those engaged in their production	<ul style="list-style-type: none"> – Increased daily consumption of leafy vegetable by households in East & Central Uganda to 60% – 10% increment in household incomes from sale of indigenous vegetables 	<p>60% from 48% at the baseline</p> <p>>100% income from 5%</p>
To strengthen the capacity of the most promising consortia	<ul style="list-style-type: none"> – 300 farmers equipped with technologies and skills for seed production and of prolonging shelf life of indigenous vegetables 	Over 250 farmers trained; 11 under graduate; 7 masters and 1 PhD
Result 1: Better knowledge of indigenous vegetable varieties with prolonged shelf life	<ul style="list-style-type: none"> – A vegetable collection among farmers in Uganda. A target of up to 100 different vegetable accessions by year 1. – Participatory varietal selection to validate and produce 3 new vegetable varieties by year 3 – On-farm varietal line purification system to enhance vegetable varieties developed by year 3 	<p>A collection of over 180 vegetable accessions is characterized and maintained at UCU by 2015</p> <p>4 candidate indigenous vegetable lines have been produced by 2017</p> <p>A seed purification system has been developed by 2017 (farmer based)</p>
Result 2: Appropriate processing and handling mechanisms/	<ul style="list-style-type: none"> – different postharvest handling practices and 2 processing methods tested on identified indigenous vegetables by year 3 	3 post-harvest handling practices tested (zero energy technology; packaging materials) in 2016/2017

Intervention Logic	Project Target	Achievements
technologies for indigenous vegetables documented & availed to targeted stakeholders.	<ul style="list-style-type: none"> - different food based industries in Uganda involved in testing the identified processing and handling technologies above by end year 3 - A profile of processing & handling technologies by year 1 	<p>2 processing methods tested by 2017</p> <p>Pilot testing of the cooling and packaging technologies done on-farm in 2017/2018</p> <p>A survey conducted in East and Central Uganda in 2015</p>
Result 3: Appropriate delivery pathways of value-added indigenous vegetables established	<ul style="list-style-type: none"> - A profile on the vegetables farmers in East and Central Uganda by year 1 - A Demand & supply study conducted on potential market for value added indigenous vegetables - Profile of existing value chains produced - At least 1 delivery pathway identified and promoted by end of Year 3 	<p>A survey was conducted in 2015</p> <p>A survey was conducted on the demand and supply of AIVs in 2015</p> <p>The Value chain for AIV was profiled in 2016</p> <p>An appropriate delivery pathway has been identified by 2017</p>
Result 4: Information on utilisation of indigenous vegetables shared with a wide array of stakeholders through appropriate pathways.	<ul style="list-style-type: none"> - Web site established by Yr1 - At least 3 publications released by end of Year 3 - Linkage to a mobile phone-based system of updating key stakeholders especially on market information and training opportunities in Yr1 - One Video documentary on vegetable production Schools/community outreach programs (4 schools, farmer groups) by Yr3 - Attend annual innovation platform meetings - At least 2 newspaper/ articles by end year 3 	<p>Website was in place Year 1</p> <p>Farmers trained on market access platforms including mobile phone by year 3</p> <p>Documentary produced by Year 3</p> <p>Over 40 schools/ 2000 farmers reached in various fora by year 3</p> <p>Annual IP meetings attended</p> <p>2 articles published by year3</p>

2.2 Providing Access to markets – Farmgain Africa, Dr. John Jagwe

In his presentation Dr. Jagwe highlighted the role of Farmgain Africa as linking farmers to the markets. This was done through a series of trainings to understand market dynamics. He shared Eria's story whom he interacted with at the baseline study where information on the advantages of offseason and irrigation was shared.



Eria ventured into planting with the help of irrigation and this has yielded. He went to a restaurant in Kampala and opened a stall to market vegetables. I was impressed with what I saw because now he employs 8 people and is making a lot of money. At Entebbe UN base and at a certain international school he opened market to sell vegetables and now he has a network of other farmers who supply him with the vegetables. He has records of expenses, revenues showing how much he earns (Dr, Jagwe John).

Role of FarmGain Africa on the project

1. Result 3: Appropriate delivery pathways of value-added indigenous vegetables established.
2. Result 4: Information sharing mechanisms on utilization of indigenous vegetables established. Business trainings were conducted, training farmers on record keeping, off season production, technology of irrigation and using small pumps. Farmers were linked to the market.
3. Through awareness creation, a documentary of the project was made, radio talk shows were conducted and brochures and posters were printed.
4. There was increased vegetable production in the study area and this improved the health of the population.
5. On Monitoring & Evaluation, households growing *Amaranthus* (*Dodo*) grew from 15% in 2015 to 64% in 2017, households growing *Amaranthus* (*Bugga*) slightly grew from 30% to 32% yet those growing *Spider plant* (*Jobyo*) grew from hardly any to 20% and HHs growing *S.melongena* (*Eggplant*) grew from 11% to 24% whereas those growing *Brassica oleracea* (*Sukuma wiki*) slightly increased from 28% to 32%.

Result Indicators

1. Households consuming leafy/indigenous vegetables 3 – 5 times a week registered an increment from 20% in 2015 to about 47% in 2017 whereas those hardly consuming any in a week dropped from 9% in 2015 to approximately 2% in 2017.
2. Improvement in the consumption of vegetables from 133 gm/person/day in 2015 to about 162 gm/person/day in 2017.
3. Average sales revenue from indigenous vegetables for households in Jinja district doubled from about Ugx, 503,000 (\$150) in 2015 to Ugx 1,008,000 (\$300) in 2017.
4. Average revenue from sale of seed of indigenous vegetables is highest in Wakiso district with some households registering sales as high as Ugx 800,000 (\$220) annually.
5. Since 2015, average quantities of indigenous/leafy vegetables sold by households increased by 409% in Jinja district and by 127% in Wakiso district.

2.3 Presentation on Engaging Farmers, CHAIN Uganda - Dr. Apolo Kasharu



The farmers were placed at the forefront by implementing partners in order to learn the art of farming as they also improve their livelihood. Chain Uganda led this result area by bringing on board farmer engagement through participatory learning. Farmers engaged in using the local knowledge and researchers valued their input in the implementation of the project. Chain Uganda helped train farmers in organised groups in strategic market-oriented production and raising a platform for them to engage in a more logical manner.

Farmers initially were not seriously engaging with local vegetables but by the time the project started winding up, they had expanded the gardens and realised they could earn money out of them especially the seed. The seed production and processing gained ground and market. Farm demonstrations followed by farm visits were done, farmers also were engaged in trade shows which acted as learning and sale points. Through participatory focused group discussions, farmers were engaged to talk about their experiences with indigenous vegetables.

Success stories

- Peoples housing changing
- Farmers have engaged with livestock rearing

Lessons learnt

- Participatory learning is an effective approach for putting farmers in the driving seat
- Training methods like demonstration farms and exchange visits very vital learning experiences
- Experimentation and social learning with local solutions
- Supervision and follow up very vital

Challenges

- Unavailability of some inputs
- Level of participation was varied
- Short time implementation of activities
- Some agents have different agenda eg local leaders want to exploit this for political ends

2.4 Farmers Sharing - Testimony from Ann Wamimbi



Anna appreciated this project, UCU, CHAIN Uganda who came to Mbale when they were unknown to them. They found the farmers in an organised small group (UWESO) whose focus was more on saving. The farmers despised them, little knowing they had come with such knowledge. They welcomed them, they gave the farmers training on the African egg plants, *Amaranthus*. Initially it was for subsistence farming for home consumption. They learnt about Nakati (the leafy African egg plant) and also received seed. The farmers were impressed that the visitors were so equipped that when they were asked for seed, they had actually travelled with the

seeds. The first season was not too good as there was a drought.

They however were able to plant and focused on getting more seed. They also discovered that Nakati sold faster than the greens they traditionally grew. The women farmers then agreed to farm as women groups but then also individuals took initiative to have their own plots to grow the vegetables. She went to explain how their lives had been transformed from growing these AIVs: the women are much better than before the project came. The

women were now able to make a much more bigger saving compared to the used to save previously. Their savings had increased-

‘...when the project came a share in our group was worth 1,000 Uganda shillings as part of the savings effort but now we save 10,000 shillings, these days the least person saves 15,000 and this money is deposited in a box and opened in December. We can now lend to each other, we are able to educate our children now. Our children no longer feed on only one type of food, we have variety. When the children come back from school and they find only one type of sauce they ask for Nakati. I have seen this with my own eyes because I am the chairperson of the women group that grow vegetables.’

‘...because of the big pool of money, people can now borrow money to buy iron sheets. I am looking forward to hosting you in Mbale, I will show you those houses built out of growing vegetables. I am talking with all honesty, women have bought goats and cows. The women are now proactive compared to the past because of the income generating activities. We have not stopped there, because of the training we have gained knowledge on soil management, water management and skills. We have decided that the group of women will buy chicken this month of July (the local breeds) and we are hoping that in December we will sell them preparing to raise money for school fees for our children January and February next year.’

She encouraged all to visit and verify with their own eyes. She appreciated the project for training them and sharing knowledge. Anna acknowledged the development partners and funders and prayed God to bless them with long life.

3.0 Discussion, Debate and Reactions

1. ***What was the rationale of your study places, regarding where the study was conducted, was there any specific reason the study never began with for example Nwoya district? About the choice of areas where we worked. We formed as we did PRA around the country, these are areas where you find a lot people are engaged in vegetable growing and if you want success, work with people who know what they need. There problem of malnutrition in those areas, so we needed those areas to work with communities that have these problems to be solved.***
2. ***Why did farmers focus on vegetable seed? The focus on seed production, we have all quantities of seed and people call it seed but in terms of business, we don't call that seed, they have a category where they fall. Seed was not one of the results, opted for participatory research and said if it is going to be participatory, we have to follow what farmers want to be done. We noticed that seed was a need, so we said how can we help people get seed locally and as we moved along the way, it became more attractive than the leaves because people would make more money. We got a project that would train farmers on seed production, but we experienced another major obstacle where there was no foundation seed, again we moved backward. Purification helped us to get a starting point, something that looks like pure or***

clean. When we are talking of seed of Nakati or Ntula, we are talking about pure lines that seem to be consistent and these are ones we are taking on and train farmers to maintain them.

3. ***What was the rationale for Nakati? There are other African indigenous vegetables, why was Nakati chosen? Why were other indigenous vegetables not included in the study? On the rationale of the Nakati, one of the studies done shows that Nakati is most indigenous African vegetable and because we wanted to focus on nutrition and income, it has a bigger potential to increase incomes. We also did participatory activities to understand how and why it is widely consumed and it is highly grown in the central region that is the rationale why we concentrated on it. On a given day in markets you have between 38 tonnes of Nakati being traded per day. Nakati is also consumed in Western Uganda, in areas of Hoima so it is widely known and consumed. Those of us who are from Mbale, when they came to train us, the training was about Nakati and Ntula but initially we were growing Sukumawiki. We used fertilizers bought from the markets but the training was focused on Nakati. We started growing Nakati without fertilizers but used organic manure and the production was quite high, we realised that the input is low compared to growing sukumawiki. In terms of pesticides, Nakati didn't require unlike sukumawiki. We are able to get seed production but also take it to the market. The seed production or the money got from Nakati seeds was much more than we expected. Nakati seeds were in grams but fetching us more money than kilograms of coffee. Let me tell you a secret why we went for Nakati, we have a weed called isoba, when a child gets a fungal infection on the head, we apply it to the affected area and on the body. When they brought us the option of Nakati, Nakati is a medicinal plant, it works in the body and out of the body. Initially we would apply it on the ringworm but now Nakati is more useful because we apply it and also eat it. It treats a range of diseases inward and even on the outside the body. We have been able to form other two groups and they also grow Nakati. Its benefits have drawn us to adopt growing Nakati.***

4. ***The charcoal cooler was something very interesting. They wanted to know more if KCCA or other traders were interested in moving this to the market level because at the household level the technology proved it could keep vegetables fresh a long time. On charcoal coolers, the scale of operation is wide but according to the strategic plan of markets in Kampala, the scale of operation for cool technologies is weak. Appropriate technology would do well in Kampala city but we still have smaller markets within Kampala city council and farmer groups. We have found that farmer groups are using the technology more, when they are not able to sell they take the vegetables back within a given time. They usually take in the morning especially the Jinja group, when they take in the morning and they are not sold, they bring them back and keep them the whole day and try the next morning. About the charcoal cooler, farmers have adopted this technology in Jinja they have constructed one and we promised that when it reaches the roof we shall sponsor the roof.***

5. ***What strategy was put in place for this project to reach the farmers in deep areas, I like Kasese, and Bundibugyo? On reaching out to other farmers, we have followed up by strategically linking these seed producers to other people. We promoted indigenous vegetables on radio and we get overwhelming demand, so what we have done is to bring other strategic partners on board specifically seed companies. A number of them we have been reached and they are taking these seeds across the country and we have also worked with other government projects that are promoting nutrition and supply seed through local government. We have not reached everywhere but with chance and time we shall reach there.***

6. ***I would like to know if there was an impact made on the education sector because we believe that farming is the biggest dimension in education. what was your strategy for the school feeding program? On the strategy for school feeding program, what we do as a university in our community outreach programs, we encourage that students are trained in sustainable agricultural production and also specifically on vegetables so when they go to different communities, they are able to transfer knowledge. One of the outputs that we want to see is the interaction with a farmer and see the growth household consumption and income of the farmer. In schools, we usually participate in an annual school camp where over 50 schools participate, and we do a training program from vegetable production to how you prepare the vegetables.***

7. ***I want to appreciate what you have been doing. The main interest is to reach farmers who have better variety to improve their lives, also we need to reach farmers with a good product. I have heard that People buy vegetables from the locals, how did you handle the issue of middle men? On the issue of market brokers, those kinds of initiatives that don't bypass brokers, emphasis has been made to have markets where farmers can directly access consumers. I expect farmers in Mukono area, Wakiso to take advantage when the university opens its doors and gives a market day.***

8. ***Appreciation goes to all those that presented, the presentation was very interesting, and it sounded like there were no hiccups, were there any problems and how did you overcome them. On challenges, we did have challenges. One of the greatest challenges was the loss of one of our key researchers on the team. When you lose a member on the team and a key person, you are at a loss on the knowledge that they were adding. In result 2 I think we have not attained fullness of what we thought we would attain in terms of technologies because we were supposed to test technologies. We were given somebody from the school of nutrition and for them to come on towards the end they have to first understand, so we concentrated on wrapping it up. The climate was a challenge, you expect that it would rain for the whole season and it rains one month, though there are ways of mitigating that it remained a challenge. There were many costs especially with irrigation***

9. *On consumption, most of these vegetables are not actually consumed raw, they are cooked. What method would you recommend for cooking these vegetables, because vegetables are boiled, cooked and steamed. If you didn't research on this maybe it should be one of the way forwards. Recommendations on how we should prepare vegetables that is the project we started working on, we characterised consumption patterns and quality of the vegetables. A study on cooking of vegetables in Lubaga division and from the preliminary findings, the best vegetables are the steamed, followed by fried and then boiled. Traditionally indigenous vegetables are steamed but not overcooked.*

10. *My question goes to the entire research team, at the beginning of the project, you went out to the end users and not farmers because they engage more than farmers, and now it looks like the end users are now going to come to you and my experience working with universities, sometimes these end users come and there is no place where they can go, there is no designated office that can receive a farmer and you find them in corridors and some professors are running away from them. What is UCU's strategy because in one of the presentations you talked about institutionalisation, how far is this institutionalisation. If a lady from Mbale came to UCU who is going to meet and whose office, is she going to the Deans office? What is the strategy?*

The university strategy to interact with those who want to follow up. The Deputy Vice Chancellor who is in charge of external relations is ablest in what has been going on with this project and through our community outreach initiatives, he has allowed the farmers to open a market once a month to come and sell their vegetables and other agricultural products at the university. Now our challenge has been popularization because when you mobilize farmers to grow and then you have to meet the demand at the university. There is an office of external relations to handle and off course capacity needs to be built on technology transfer, how we move our technologies from the university to entities to appreciate them. The farmers have numbers they can call at the University and they can be answered.

11. *I did research on indigenous vegetables earlier and I feel this is a big basket of knowledge added onto this area and I believe whatever is coming out of these outputs will lead to the development of agricultural research as well as indigenous vegetables in Uganda and in Africa. This is a great asset for all of us as researchers, I want you to have a strategy on how to conserve 109 indigenous vegetables so that the next generations to come can make good use of these. I would like to appreciate the implementors of this project, I would like to add one thing to this implementation model within the engagement of private players. All along we have been concentrating on scientists in a context that we always work as scientists. From today's presentation I have appreciated the role of private sector in terms of disseminating research to the end users. I would like to recommend FARMGAIN Africa and CHAIN Uganda for having participated on this project and successfully linked it to the end users and I think in the nearby future you will be called upon in our mainstream research as NARO to have a broad implementation of most of our projects.*

We have done the whole collection especially the sollaneous, we are wrapping up with characterisation and purification. We are looking at sharing the seed with farmers because that is conversation and on top of conservation, we did a national genebank, we are working with the farmers with different seed and allowing them to select what works for them so that varieties and genotypes adapt the farmers growing conditions.

4.0 Closing session

The Closing ceremony involved recap of the morning session by Prof. Masanza as part of debriefing the Head of Cooperation, European Union (EU) - CEDRIC MEREL. The students made poster presentations to the EU head of cooperation's and the other distinguished guests. Below is the list of posters presented during the workshop.

No	Poster title	Authors
1	Farmer perceptions and selection cues of selected indigenous vegetables in east and central Uganda	Kabod Pamela, Kasharu, J.N. Jagwe, Michael Masanza and Elizabeth Kizit
2	Documenting postharvest practices along <i>S. aethiopicum</i> Shumand <i>A. lividus</i> leafy vegetable supply chains in Central Uganda	Apolot M, Namutebi A, Nandutu A, Kabod P., Ssozi J., Masanza M., Jagwe J.N, Kasharu A., Rees D., Kizito E. B., and Acham H
3	Effect of different processing conditions on proximate and bioactive contents of <i>Solanumaethiopicum</i> (Shum) powders for cottage scale production	Akanyijuka S., Acham H., Tumuhimbise G., Namutebi A., Masanza M., Rees D., and Kizito E. B.
4	Effect of storage condition and post-harvest handling method on the shelf life of stored <i>S. aethiopicum</i>	Sekulya S., Namutebi A., Nandutu A., Kabod P., Ssozi J., Masanza M., Jagwe J. N., Kasharu A., Rees D., Acham. H., and Kizito E. B.

4.1 Remarks from European Union Head of Cooperation's – Mr. CEDRIC MEREL



He expressed his great pleasure to be at the workshop and congratulated the team for the successful end of project workshop. He said that the European Union was supporting food and nutrition and sustainable agriculture in Uganda and urged the project to link with the private sector continuity. The EU is keen on fostering these linkages (public and private). He continued to say that the EU supports projects such as the AIV to increase vegetable consumption and enhanced revenues for farmers. For instance, it was funding a 500 billion project in Uganda focused on climate

change encouraged the AIV to see how they can tap into this for sustainability. He also encouraged the team to develop ways to disseminate the knowledge generated giving priority to great actions such as preserving the environment, social and green economy. The team was also urged to look at certain actors who are normally marginalized such as the women and youth. It was also important that the project scaled up and out with research into increasing shelf life of vegetables. He mentioned that this was not a stand-alone project rather there are opportunities to link with other projects being financed by the EU.

4.3 Closure and cocktail

During the closing ceremony, the Dean FOST, Dr. Masanza appreciated all the partners, media and stakeholders for coming to the end of project dissemination workshop and declared the workshop closed. The delegates were treated to a non-alcohol cocktail with entertainment from a local traditional music group called Talent house. The cocktail started at 3:30pm and ended at 5pm.



Annexes

Annex 1: Program for end of project dissemination workshop

Meeting Venue: Fairway Hotel & Spa Kampala | Date: 5th July 2018

Agenda:

1. To debrief on the project activities and results achieved by project implementers and partners
2. To highlight project impact and success stories to the public, partners and media
3. To create opportunity for interaction between stakeholders and the public and pave the way forward on how to sustain activities

Programme

Time	Programme Item	Representative
08:30 - 09:00	Arrival and Registration of Guests	Ushers
09:00 - 09:15	Presentation of National, East Africa and Uganda Christian University Anthems	House of Talent
09:15 - 09:20	Opening Prayer	Representative from UCU
09:20 - 09:30	Welcome remarks from Dean FOST	Dr. Michael Masanza
09:30 - 09:40	Remarks from Vice Chancellor, UCU	Rev. Dr. John Musisi Senyonyi
09:40 - 09:50	Remarks from Executive Secretary, RUFORUM	Representative from RUFORUM
09:50 - 10:00	Remarks from FARA/PAEPARD	Dr. Jonas Mugabe
10:00 - 10:10	Remarks from AGRINATURA	Dr. Remi Kahane
10:10 - 10:20	Official opening-Commissioner MAAIF	Mr. Joseph Bazaale
10:20 - 10:40	Group Photograph	All guests
10:40 - 11:00	Tea Break	Hotel
11:00 - 11:10	Project Overview	Dr. Elizabeth Kizito
11:10 - 11:25	Post-harvest technologies and practices	Dr. Elizabeth Kizito
11:25 - 11:35	Providing Access to Markets	Dr. John Jagwe
11:35 - 11:45	Engaging Farmers	Dr. Apolo Kasharu
11:45 - 11:55	Farmers' sharing	Ms Anna Wamimbi from Mbale
11:55 - 12:30	Discussion and debate	Dr. Michael Masanza
13:00 - 14:00	Lunch Break and Refreshments	Hotel Arrangements
14:00 - 14:15	Student's poster presentations	Representation by student
14:15 - 14:25	Remarks from European Union Country delegation from Uganda	Head of Cooperation
14:25 - 14:35	Closing remarks	Dr. Michael Masanza
14:35 - 15:00	Entertainment and Cocktail (non-alcoholic)	House of Talent and Hotel
15:00 - 15:30	Departure at leisure	All Guests

Annex 2: Pictorial of the event - end of project dissemination workshop



Contact Information

For more information about the project, please contact Dr. Elizabeth Kizito at ebkizito@ucu.ac.ug or visit our website at <http://afri-sol.org/> . You can connect with us on social media through [Facebook](#), [Twitter](#) and [Instagram](#) using [@afrisolug](#).