END OF PROJECT REPORT 2014 - 2017

Enhancing Nutrition Security and Incomes through adding Value to Indigenous Vegetables in East and Central Uganda

Submission Date: 30th August 2018
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Acknowledgement
Special thanks to the project team of researchers at Uganda Christian University, RUFORUM, Natural Resources Institute (University of Greenwich, United Kingdom), Farmgain Africa and CHAIN Uganda for the work well done in implementing this project. Appreciation extended to the vegetable farmers and local governments in East and Central Uganda, WorldVeg (Formerly AVRDC), CABI, CARITAS, IITA, MAAIF and NARO among many other development partners for their participation. Finally, special thanks go to the European Union who provided funding for this project through the Forum for Agricultural Research in FARA (FARA) and particularly its programme of Promoting African and European Partnerships in Agricultural Research and Development (PAEPARD).
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<td>EU</td>
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<td>FARA</td>
<td>Forum for Agricultural Research in Africa</td>
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<td>AIV</td>
<td>African Indigenous Vegetables</td>
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<td>PAEPARD</td>
<td>The Platform for African European Partnership on Agricultural Research for Development</td>
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<td>Uganda Christian University</td>
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<td>NRI</td>
<td>Natural Research Institute, University of Greenwich</td>
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<td>RUFORUM</td>
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<td>Centre for Agriculture and Bioscience International</td>
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<td>IITA</td>
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Executive Summary

Sub-Saharan Africa is home to many indigenous vegetable species. These vegetables contain vitamins and minerals which are essential in absorption and metabolism of food ingested by the body. However, up to 50% of the population, especially women and children below five years of age, are deficient in vitamins and minerals due to postharvest losses. It is also estimated that about 27% of deaths in sub-Saharan Africa are attributed to low consumption of fruits and vegetables. In the project focus country Uganda, it is anticipated that 89% of Ugandan households consume fruits and vegetables, yet this consumption only accounts for 63.5 Kg per person per annum (Nakibirango, 2015). The international daily requirement for vegetable consumption is 146kg per person per annum. The consumption in Uganda is far less than the required international standard. Vegetables provide an important source of income, minerals and vitamins which are critical for human health, growth and livelihood. Low household incomes, declining crop productivity and persistent food insecurity are interrelated problems limiting socio economic development of many Ugandans (NRC, 2006). African Indigenous Vegetables (AIVs) present a great potential of addressing this growing qualitative food insecurity problem.

In November 2014, through the European Union funded project under the PAEPARD/Forum for Agricultural Research in Africa (FARA) Competitive Research Fund (CRF) II project entitled “Enhancing nutrition security and incomes through adding value to indigenous vegetables in East and Central Uganda,” this three-year project was birthed. The project was implemented by the Department of Agricultural and Biological Sciences, at Uganda Christian University together with institutions ranging from academic institutions (Makerere University & Greenwich University), government institutions (MAAIF & NARO), and Private sector practitioners (FARMGAIN) and development actors (CHAIN Uganda and CARITAS), Farmer groups (Namulonge Horticulture, Butiki-Kyekidde irrigation and Mbale united farmers), Local governments (Wakiso, Mukono, Jinja and Mbale districts and Local councils) as well as regional networks such as AFRISOL, CABI, AVDRC, RUFORUM and IITA.

The project aimed at improving postharvest handling and preservation of indigenous vegetables (especially Solanaceae sp) in order to prolong their shelf-life and increase their consumption in nutritionally vulnerable populations, while increasing the revenue of those engaged in their production. Specifically, the project sought to:

1. Better knowledge of indigenous vegetable varieties with prolonged shelf-life.
2. Increase knowledge about technologies and processes for prolonging shelf-life of indigenous vegetables.
3. Better understand efficient delivery pathways for value added indigenous vegetables to end-markets.
Through this project, partners worked with farming communities engaged in the production of Nakati (S. aethiopicum), Entula (S. aethiopicum L. Gilo group), Dodo and Bugga (Amaranthus sp), and Katunkuma (S. anguivi) in Eastern and Central Uganda. The main achievements from the project’s implementation include: increased households consuming leafy/indigenous vegetables 3-5 times a week from 20% in 2015 to about 47% in 2017; increased gender empowerment as witnessed in the increased participation of women and youth in the African Indigenous Vegetables (AIV) value chain; capacity built at different levels - one (1) PhD, six (6) masters and five (5) undergraduates have benefited from conducting their research resulting into eight (8) peer reviewed publications; increased incomes at 110% in East and Central Uganda from vegetable production. 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; technologies for prolonging shelf life of vegetables after harvest were developed and disseminated such as the charcoal cooler and several packaging materials for vegetables; a collection of indigenous vegetables from all parts of Uganda has been established and characterized.

In addition, Uganda Christian University, in collaboration with CABI developed new manuals focusing on appropriate agronomic practices. These manuals were instrumental during farmers, students and the community trainings. They are currently used in Organic and Sustainable Agriculture lectures for the students of Agriculture and Entrepreneurship in Uganda Christian University. The EU/PAPEARD project activities increased awareness of Indigenous Knowledge use, built capacity through training at farmer level and for student through research support, improved the nutrition & health of communities, improved seed systems & production of indigenous vegetables and promoted value addition and increased access of farmers engaged in AIV to market.
1.1 Result One: Generated better knowledge of indigenous vegetable varieties with prolonged shelf life; led by UCU and CHAIN Uganda

The objective of this activity was to understand how postharvest physiological deterioration is regulated in S. aethiopicum Shum. This activity was achieved through conducting field visits, screen house, laboratory experiments as well as data analysis. Focus was placed on adding value to African Indigenous Vegetables (AIV) through participatory varietal selection as well as adapting existing (local and exotic) postharvest technologies and processes to local situations and conditions in order to prolong vegetable shelf life. At the start of the project, there were no quality seed varieties. The focus was placed on generating more uniformity within the respective landraces through a farmer participatory selection process. Farmers participated and developed on-farm seed varieties lines which was a big milestone fostering farmers as production units of quality seed and development of seed enterprises.

A key achievement documented was the development of on-farm variety purification system resulting into development of three vegetable variety lines which was done through characterization of the African Indigenous Vegetables germplasm at three levels; morphological (in the field), biochemical (evaluating the variation in postharvest deterioration) and genetic (identifying molecular markers) characterization. Through efforts of this project, there has been increased consumption of African Indigenous Vegetables in nutritionally vulnerable populations and increased incomes of those engaged in their production. This has led to the development and improved access of quality indigenous vegetables seed and seed processing by small scale farmer. This has improved
and sustained the seed quality while increasing farmer income resulting from bumper harvests.

During this period, over 300 farmers were trained on seed production, on-farm good agronomic practices, seed purification and processing in Mbale, Wakiso and Jinja. In addition, farmers were trained on marketing and postharvest handling of African Indigenous Vegetables in East and Central Uganda. This training increased awareness and greater understanding of African Indigenous Vegetables as well as increase the confidence of the farmers engaged. This includes presentation skills that were demonstrated during the farmers trade shows in Jinja. Capacity of farmers in the use of improved seed processing technologies, quality assurance, marketing, business management was implemented in partnership with CHAIN Uganda and Ministry of Agriculture, Animal Industry and Fisheries who have the mandate to regulate quality seed in Uganda. The farmers who engaged in this activity are now able to produce, clean and quality seed for sale.

Through this activity, there was increased gender empowerment as witnessed in the increased participation of women and youth in the value chain. It is mostly the women who engaged in growing indigenous vegetables in a household which is indicative of how important indigenous vegetables are to their livelihoods.

“I joined the Kyekidde Farmers’ Group in 2016 after being attracted by the activities they were engaged in. I was initially engaged in one group – the Elderly Group focusing on supporting the elderly persons within the village by constructing houses for them. When I saw the benefits gained by the group members, I requested to be accepted to join the group and was accepted. Since then, I have benefited from trainings on how to adopt new agronomic practices for these indigenous vegetables. Among the vegetables I have on my farm include amaranthus, cow peas, spider plants, and jutte mallow. I have benefited a lot from the sales of these vegetables as well as the seeds. I have used the revenue from these sales to continue with the construction of my house. I have used the skills I gained after visiting Makerere University to dry some of the vegetables and grind them into powder before selling. This vegetable powder is then used by many farmers to prepare sauce to accompany other foods.”  

Mrs. Aidah Ibanda - Kyekidde Farmers’ Group

Overall, results indicate that 29% of the respondents found the trainings to be extremely useful while 55% found them to be very useful. Approximately 9% claimed the trainings where somehow helpful whereas 6% claimed they were slightly helpful and only 1% found them not to be of any use at all.
1.2 Result two: Increased knowledge about technologies and processes for prolonging shelf life of indigenous vegetables; led by UCU and CHAIN Uganda

The objective of this activity was to apply postharvest technology to harvested vegetables in order to maintain quality (appearance, texture, flavour, nutritive value and safety) and to reduce losses between harvest and consumption. To achieve this, identifying and testing of processing and handling technologies was carried out. In addition, a baseline survey was conducted in 2015 on the use of packaging material and cooling technologies which indicated there were no technologies or significant processing being used at the time on the indigenous vegetables. Potential packaging materials and cooling technologies were tested in the laboratory for their performance in extending shelf life of indigenous vegetables in 2015/2016. The charcoal cooling technology was developed as well as three different packaging materials with capability of prolonging shelf life of vegetables were identified and tested.

In September 2017, a survey was conducted by CHAIN Uganda together farmers from seven districts; Jinja, Mbale, Kampala, Arua, Gulu, Wakiso, and Fort Portal on evaluating the postharvest handling technologies being fronted by the project. It was then followed by an onsite participatory evaluation of the effectiveness of the technologies in increasing shelf life of AIVs in January 2017 as well as training on use of post-harvest handling technologies.

A total of 155 farmers from Jinja and Wakiso were involved in this activity. The perforated polythene bag and the charcoal cooler were highly ranked by the farmers and are now
being used in their day to day marketing of AIVs increasing the availability of the AIVs and farmers’ income. Three (3) charcoal coolers were constructed during this project. One based in Jinja with the Kyekidde Farmers’ Group, another at the Namulonge Horticulture and one based in Makerere University as a demonstration. The introduction of the charcoal cooler increased the vegetable shelf life to more than three (3) days allowing the farmers to store vegetables as a result of bumper harvest as well as improve on nutrition through consumption of vegetables.

Households growing *Amaranthus sp* (Dodo) grew from 15% in 2015 to 64% in 2017 while those growing *Amaranthus blitum* (Bugga) slightly grew from 30% to 32% yet those growing Spider plant (Jobyo) grew from hardly any to 20%. Households growing *S. melongena* (Eggplant) grew from 11% to 24% whereas those growing *Brassica oleracea* (Sukuma wiki) slightly increased from 28% to 32%. Due to the introduction and use of the appropriate technologies in the farming communities, farmers have since been able to increase the price of Dodo vegetable from UGX 500 per bundle to UGX 2,000, and this has spurred on more community members to engage in vegetable farming.

The charcoal cooler was the post-harvest technology mostly tried-out by the communities in which the project was implemented. In Jinja district, about 39% of the households claimed to have used it whereas 45% of households in Wakiso had a similar claim. Of those who tried out the charcoal cooler, approximately 32% claimed it was quite expensive in terms of set up and maintenance whereas 23% claimed its water requirements were unmanageable and 17% claimed its size was not sufficient enough.
1.3 Result three: Better understanding of efficient delivery pathways for value added indigenous vegetables to end-markets; led by FarmGain Africa Ltd

The focus of this activity was to establish appropriate delivery pathways for value added indigenous vegetables and link farmers to value chain actors. To achieve this, a study on demand and supply study to determine the volumes of AIVs demanded on the market was conducted in 2016 with supply and value chain actors. The results of this study and information generated have been passed on to the farmers through trainings on marketing of AIVs. A total of two hundred and thirty farmers (230) were trained in Jinja, Mbale and Wakiso. A consumer acceptability study on processed vegetable products was also carried out in November 2017. This entailed supplying fresh and processed S. aethiopicum products to key stakeholders and capturing acceptability data for differently treated leafy products postharvest. The study found that consumers preferred the fresh S. aethiopicum compared to the dried vegetables. The most acceptable of the dried vegetables was the whole Nakati that had been dipped in a saline solution before drying.

Delivery pathways for indigenous vegetables have been established and some farmers have been linked to very profitable markets. Benefits and costs of indigenous vegetable trade have been established and quantified. Farmers have been linked with key stakeholders like the IITA youth group and end markets in Jinja and Wakiso. In addition, farmers have been able to open retail markets in Kampala and Entebbe targeting high end consumers with high value vegetables including the indigenous ones. One youth, Eriya Matovu from Namulonge Horticulture in Wakiso, has opened a vegetable outlet in Kololo (a high class suburb in Kampala) and at the US embassy in Nsambya, Kampala as well as at UN base in Entebbe. Mechanisms such as networks have been brokered in key vegetable markets to ensure farmers have reliable access to markets. Further, the farmers in Mbale, Wakiso and Jinja have been trained in business dynamics.

Having been trained in business dynamics, Eriya got inspired to look for new markets. Eriya opened vegetable stalls in three locations within Kampala city and one in Entebbe town. The latter location targets the staff at the UN base while the former locations comprise of a high-end restaurant which
opens every Saturday from 9am to 3pm for fresh vegetable vending as well as an international school where expatriate children study and the US embassy. Each day of vending vegetables puts sales revenue approximating US$ 800 into Eriya’s pocket. On average, weekly sales amount to about US$3,200. Eriya has brought on-board seven other youth (some his siblings) into this trade. This story gives hope that smallholder farmers, particularly youth, when equipped with skills and knowledge can bring about a transformation of not only their lives but an entire economy.

1.4: Result 4: Information sharing mechanisms on utilization of indigenous vegetables established; led by UCU and CHAIN Uganda

The objective of this activity was to increase awareness on use and production of indigenous vegetables. Various dissemination methods ranging from development of communication materials, exhibitions, meetings and radio programs were carried out during the project.

Every year, the Uganda National farmers Agricultural holds a trade show is held as a platform for displaying and identifying innovations made by local and foreign companies through improved technologies for better production, marketing and poverty eradication. The farming communities and the Department of Agriculture took part in the National Agricultural Trade Show in Jinja under the theme “Improved Nutrition through Vegetable Production” where they emerged as the second-best exhibitors.

During these activities and trade fairs, UCU widely circulated the instructive Fact Sheets on AIVs and other related communication materials. The project partners attended this trade show to promote the project products and create awareness on the African Indigenous Vegetables. Through these shows, the project witnessed an increase in the self-esteem and confidence of the farmers Mrs. Nalongo Aidah and Mr. Anthony Odong who took charge of training other farmers on production of the AIVs. Over 150 people visited the stall, Networks created between farmer groups, extension workers, organizations, researchers and schools; and areas of outreach / collaboration with farmer groups, schools and institutions identified.

Knowledge sharing and dissemination was held at Gayaza High School with over 80 students attending during the National Annual Farm Camp held in Gayaza, Wakiso district. Demonstration plots were constructed at each of these sites. Seed for the sites was
provided by the PAEPARD project through the AVRDC seed multiplication that was done at the Skills development center, Ntawo. CABI provided support with training manuals on vegetable and seed production which was used in farmer trainings in six villages during community outreach programs run by the Department of Agriculture and Biological sciences Uganda Christian University. Students and farmers learnt the importance of good agronomic practices like crop rotation, proper spacing and seed bed preparation, and they were happy to learn about the variability in *Amaranthus* spp.

To increase reach of the importance of AIVs, Farmgain Africa contracted a media expert to train the project team partners from UCU on how to develop radio content on a specialized topic such as “Importance of indigenous vegetables in human diets”. This training aimed at making scientists better communicators to an audience which is not scientific or technical at all but yet targeted by this project. Materials including radio scripts and posters on the key details of the project have been developed and have been used in 20 radio talk shows on Namirembe FM since the month of April to September, 2016, every Friday. The project took advantage of this opportunity to share results from the ongoing research and also train farmers on various topics concerning vegetable production; such as, Introduction to nutrition, specifics of vegetable preparation and recommended daily intake, Safe Agrochemical use, Kitchen Gardens and their care, commercial indigenous vegetable production (seeding rates, fertilizer rates, pesticides rates), vegetable value chains, postharvest losses, etc.

The Project’s success stories were also shared at various knowledge sharing platforms such as the International SolGenomics Conference at UC Davis, the Africa Agriculture Science week and FARA General Assembly in Rwanda, the Agriculture trade show in Jinja and the RUFORUM science week in Cape town in 2016. One newspaper article was published in Uganda’s national local newspaper, the New Vision as well as a feature article was written by Tim Chancellor and shared via www.paepard.org/paepard@dgroups.org.

On the 5th and 6th July 2018 Uganda Christian University together with partners organized an end of project dissemination workshop to debrief on the project activities and results achieved by project implementers and partners; highlight project impact and success stories to the public, partners and media and create opportunity for interaction between stakeholders and the public and pave the way forward on how to sustain activities. As part of this dissemination workshop, a field trip to the farming communities in Jinja was organized to allow the participants engage and interact with the farmers on site. Over 80 persons including media attended the dissemination workshop. This activity included use of social

Photo 7: One of the Students making a poster presentation during the dissemination workshop
media to increase visibility of the success stories which recorded a 32,614 reach online using #BetterVegetablesBetterLives.

During the project life, various publications were developed and shared to increase visibility and use of the indigenous vegetables. A total of (12) papers, (18) student thesis, four (4) videos documentaries, one (1) impact booklet, printed banners and leaflets were published and used at visibility events. These are available online at the AFRISOL website at http://afri-sol.org/. These are available under the annex section. Videos produced are available on the AFRISOL YouTube Chanel.


Over 2000 people were reached through project dissemination campaigns. Overall, trainings emerged as the most popular mode of dissemination and these were mostly conducted by the project team members. Results indicate that 46% of respondents did have a chance of listening to at most 10 radio shows during the project implementation period whereas 13% had a chance of listening to more than 10 radio shows.
Lessons learned by partners from the Action and how they have been utilized and disseminated?

The partnership constituted of diverse team members who brought on board various skills and partnerships contributing to achieving the project goal of increasing nutrition and income through improved African indigenous vegetables. Project team members have acquired skills of developing technical content and presenting to lay people. The skills acquired include, radio script writing, oral delivery of technical subject matter in a simple form and dynamics of attracting listeners. These skills and partnerships brokered with academic, government and private sector resulted into new collaborations for resources mobilization through proposal writing.

Activities that were planned but were not implemented and the reason for this.

Please add if any activities should be noted

Relationships between partners in the Action

The project has nurtured key strategic relationships among the project partners. This has greatly contributed to the success of this project. Here are some insights from various project partners in regards to the project implementation and relationships;

“As a university, this partnership has allowed us to collaborate with other universities such as Makerere University and the University of Greenwich. We were able to acquire equipment for the laboratory through the partnership with Makerere University which has a well-established food science laboratory. Our students on this project were also able to conduct collaborative research. University of Greenwich offered backstopping support. The project has helped us to establish important partnerships that will last ever after the project has been resolved. It is important for us to maintain and sustain this collaboration, research exchange and continue working on relevant demand driven research.” Dr. Michael Masanza, Dean Faculty of Science and Technology, UCU

“I thank the various partners that we have worked with on this project. What we have been able to attain on this project has been through consented effort. I believe that with more investment in this area of indigenous vegetables, we shall see more heathy families. I thank RUFORUM for the linkages with different partners on this project and building our capacity to respond to funding opportunities. CHAIN Uganda has been instrumental in linking us and working with the selected farming communities in Mbale, Jinja and Wakiso. Uganda Christian University allowed this project to the hosted. I am grateful for the support from EU through PAEPARD/ FARA; and most indebted to all the partners and stakeholders on the team that have made this possible.” Dr. Elizabeth Balyejusa Kizito, Uganda Christian University.

“I thank to all the partners with whom we have worked with on this project. This has been one of the best projects CHAIN Uganda have ever worked on where all the partners know what is going on. Am so happy and grateful that we have been able to communicate through this project since it started until its conclusion. We are grateful to our partners and funders; the funds came in time and we were able to do our work. Most importantly, am
very thankful to the farmers in Mbale, Jinja and Wakiso with whom we have worked very well since this project started. I have seen them move from tiny gardens to big acres. Am grateful for their support and continued interest in this project." Dr. Apolo Kasharu, Executive Director, Chain Uganda.

“It has been very good working with the partners on this project. We have learnt a lot working together and also discovered there are so many opportunities in the indigenous vegetables. For example, the seed sector, there is still a lot that can be done. We also had the idea of utilizing vegetable waste since not all the parts of the vegetable plant is consumed and ends up as vegetative matter. We need to find ways of utilizing vegetable waste as either animal feeds or fertile. We need to find ways to utilize waste materials in other ways that are eco-friendly and beneficial.” Dr. John Jagwe, Managing Partner, Farmgain Africa

Expenditure on the Activities of the project
Please add to this section based on the financial report summary.

Challenges and measures taken to address them
There is a lot of information that has been to generated from this project. There is need to build capacity building on production of vegetable at farmer and commercial level as well as exploring opportunities for valve addition to combat on the vegetable loss. It will take consented effort of every sector to contribute to the wellbeing of people in Uganda and Africa as a whole to ensure that the people are healthy. There is need for the Ministry of Agriculture, Animal Industry and Fisheries, Ministry of Public Health and local government to invest more in indigenous vegetables. Below are key sustainable measured that were implemented;

1. Institutionalizing vegetables in the university community outreach programs through teaching and learning.
2. Establishing key linkages with government for example the Mukono local government, the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF)
3. Continued research with National, Regional and International institutes (National Agricultural Research Organization- NARO, NIAB-UK, WorldVeg, MARI-Tanzania, ICRAF, CRG-Spain)
4. Membership in important Networks such as the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), SOLGenomics

Conclusions and Recommendations
Through coordination of the PAEPARD project, Uganda Christian University has become the prime collection spot of AIVs and is now nationally recognized for its efforts on the African Indigenous Vegetables for crop improvement. Uganda Christian University aims at becoming the centre of excellence in vegetable research in the region. CHAIN Uganda has provided valuable capacity strengthening for the farmer groups, and is still anticipated to continue training farmers on seed business as well as engagements with private sector within the seed system. Farmgain Africa has provided linkages and
networking for the farmers with the available markets. This role is still critical for expanding the production of leafy AIVs and seeds. Hosting the PAPEARD project has facilitated the university to conduct demand driven research on African Indigenous Vegetables (AIV), which have received limited attention internationally yet are in great demand locally and regionally by the African population. The project research has provided a profound sense of awareness on use and consumption of indigenous vegetables in Uganda in several ways. Farmers have been empowered to commercialize indigenous vegetable farming, which was hitherto a neglected and underutilized area. The project has provided training - informal (to farmers) and formal (in undergraduate and graduate programs). There has been increased research publications on indigenous vegetables and generated technologies and processes that are scalable both at national and regional levels.

Annexes I: Partners

Partner Logos

List of partners

1. The European Union Commission (EU)
2. The Platform for African European Partnership on Agricultural Research for Development (PAEPARD)
3. Forum for Agricultural Research in Africa (FARA)
4. Uganda Christian University (UCU)
5. Agricultural Marketing and Market Information – (FARMGAIN Africa)
6. Coalition for health Agriculture and Income Network (CHAIN Uganda)
7. Natural Resources Institute (NRI) - University of Greenwich
9. Regional Universities Forum for Capacity Building in Agriculture (RUFORUM)
10. The Ministry of Agriculture, Animal Industry and Fisheries (MAAIF)
11. The National Agriculture Research Organization (NARO)
12. Centre for Agriculture and Bioscience International (CABI)
13. International Institute of Tropical Agriculture (IITA)
14. Catholic Relief, Development and social services organization (CARITAS)
15. Farmer group (Namulonge Horticulture, Butiki-Kyekidde irrigation and Mbale United farmers)
Annex II: List of papers publications

1. Apolot Mary Gorret, Joshua Ssozi, Agnes Namutebi, Michael Masanza, Kizito Elizabeth, Deborah Rees, and Acham Hedwig, “Changes in Sensory and Quality Characteristics of *S. Aethiopicum* (Shum) and *A. Lividus* (Linn) Leafy Vegetables along the Supply Chain.” *American Journal of Food Science and Technology*, vol. 6, no. 4 (2018): 161-166. doi: 10.12691/ajfst-6-4-5.


List of posters published

1. Effect of different processing conditions on proximate and bioactive contents of Solanum aethiopicum (Shum) powders for cottage scale production. Akanyijuka S, Acham H, Tumuhimbise G, Namutebi A, Masanza M, Rees D and Kizito E.B.
3. Appropriate Zero Energy Technology for Prolonged Shelf Life of Vegetables

List of Factsheets developed

2. Growing African Indigenous Vegetables: Entula (Solanum aethiopicum Gilo)
4. Growing African Indigenous Vegetables; Malakwang (Corchorus Olitorius)
5. Growing African Indigenous Vegetables; Nakati (Solanum aethiopicum Shum)
Annex III: Pictorial

A farmer at the Annual National Farmers’ Federation Agricultural Trade Show in Jinja explaining AIV production.

A farmer displays the different types of packaging aimed at prolonging shelf life of vegetables.

A Charcoal Cooler - An appropriate technology developed to extend the shelf life of vegetables to more than 3 days.

A farmer demonstration during the end of project dissemination field trip in Jinja.

Dean, FOST chats with the Head of Cooperation, EU during the project dissemination workshop.

Participants at the end of project dissemination workshop held on 5th July 2018 at Fairway Hotel, Kampala.