

RESEARCH, POLICY AND COLLABORATION FOR FOOD AND INCOME SECURITY

FOOD & BUSINESS APPLIED RESEARCH FUND COUNTRY WORKSHOP, UGANDA



Participants Group Photograph

January 26th - 27th 2017

Imperial Botanical Beach Hotel

WORKSHOP REPORT

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Executive summary

This report documents the Uganda, Country workshop of projects under the Food and Business Applied Research Fund (ARF) which was held between 26 – 27th January 2017 in Entebbe Uganda. The workshop was jointly organised by the Ministry of Foreign Affairs of the Netherlands, the Netherlands Organisation for Scientific Research (NOW – WOTRO), The Food and Business Knowledge Platform and the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM). The report is a documentation of the proceedings and outcomes of the workshop without interpretation. It provides details of what transpired and serves as a reference document for participants and other stakeholders in the broad area of global food security. The outcomes of the working groups and plenary discussions are reported essentially verbatim in Section 2.0 of this report. The background, process and key outputs are highlighted below, with details presented in the other sections of this synopsis as well as in Annexes. The convening attracted 9 research teams, representing a significant number of ARF projects (Table 1) compared to other countries (e.g. Benin 6 and Ghana 4) supported between 2013 – 2016.

Table 1: Applied Research Fund (ARF) projects in Uganda

ARF Projects in Uganda

Introduction of cashew nut for income security for poor farmers in Northern Uganda

Farmer-led soil innovations to sustain food production

Macro Nutrient Fortification of first-line food cereals with milk protein to produce affordable value added cereal products in Uganda/East Africa

Stabilizing sesame yields and production in the Lango region, Northern Uganda

Strengthening agribusiness Ethics, Quality Standards & ICT usage in Uganda's value chains (AGRI-QUEST)

Enhancing Rice Markets in Uganda through Smart Micronutrient Fertilization (ENRICH)

Improved Resilience Through Sustainable Production Of Grafted Tomatoes In Uganda (Project – IRESO)

Cassava Applied Research for Food Security in Northern Uganda

Enhancing Rice-greengram productivity in Northern Uganda (ERIGNU)

In addition to the representatives of the project teams, there were other stakeholders (policy makers, practitioners) in attendance making a total of 65 participants (Annex 2). The workshop was guided by a well structured program (Annex 1) managed by a facilitator, entailed participatory engagement among all participants including the conveners. All projects had the opportunity to share about their implementation experiences featuring opportunities and challenges. The focus was to identify cross-cutting aspects that could further collaboration and bring about synergy and cohort-learning in knowledge co-creation within an enabling policy environment. The aim of the workshop therefore was to secure joint working and learning in order to enhance policy relevance and (potential for) impact through a country specific focus. External stakeholders shared/gave presentations on “relevant initiatives and priorities and potential for policy

relevance of the ARF projects”. The last activity of the workshop was a field visit that was intended to provide opportunity to participants to link research – knowledge co-creation process to application.

The morning session (9:00-11:45am) of day 1 (26th) was focussed on engaging participants to learn from each other and this was achieved through self-introductions to promote acquaintance and presentations of project briefs to provide information and market individual projects. This session was also used to bring participants at par with the objectives of the Food and Business Knowledge Agenda, an initiative of the Ministry of Foreign Affairs of The Netherlands that focuses on enhancing global food security in cooperation with the private sector.

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List of abbreviations

All: Africa Innovations Institute

ARDC: Aquaculture Research and Development Centre

ARF: Food & Business Applied Research Fund

FGD: Focus Group Discussion

MAAIF: Ministry of Agriculture, Animal industry and Fisheries

NaFIRRI: National Fisheries Resources Research Institute

NARO: National Agricultural Research Organisation

NECPA: North East Chilli Producers Association Limited

NGO: Non-Government Organisation

PWD: Person with disability

RUFORUM: Regional Universities Forum for Capacity Building in Agriculture

SECAEC: Solidaridad Eastern and Central Africa Expertise Centre

UNBS: Uganda National Bureau of Standards

UOSPA: Uganda Oilseeds Producers and Processors' Association

VAI: Value Addition Institute

1.0 Introduction and background

The Food and Business Knowledge Agenda is an initiative of the Ministry of Foreign Affairs of the Netherlands that focuses on enhancing global food security in cooperation with the private sector. As part of the agenda, two funding instruments for research, managed by NWO-WOTRO, were launched in 2013: The Food & Business Global Challenges Programme (GCP) and the Food & Business Applied Research Fund (ARF), under the umbrella of Food & Business Research.

ARF research is driven by the knowledge demands of local practitioner organisations (private companies, NGOs and governmental organisations) and is executed by these same practitioners, together with one or more research organisations. Projects funded by ARF show the applicability of newly developed or adjusted knowledge, insights, technologies, tools, products or services or by analysing bottlenecks and identifying solutions at system level. These projects are expected to contribute to improving sustainable access to sufficient and healthy food for the most vulnerable people. More specifically, ARF-funded research must contribute to the Netherlands' food security policy and be aligned with the Netherlands Embassy's Multi Annual Strategic Plan in the country in question.

In 2015, a Regional Workshop was held in Entebbe, Uganda on strengthening knowledge co-creation and research uptake. As a build up to this workshop, country specific workshops were held in Ghana and Benin in 2016. In the case of Uganda, nine projects are being implemented under the ARF. A 2-day (26 – 27th January 2017) workshop was organized to bring together and facilitate interaction of stakeholders engaged in the implementation of these projects. The meeting was held at the Imperial Botanical Beach Hotel, in Entebbe Uganda and had 65 participants (including representatives of project implementation team, policymakers and public officials from the Ministry of Agriculture Animal Industries and Fisheries as well as from the National Agricultural Research Organisation).

1.1 Objectives of the workshop

The aim of the workshop was to facilitate joint working and learning in order to enhance policy relevance and (potential for) impact through a country specific focus. A broad understanding of policy was applied including policies of all types of organisations at the international, national as well as local level. It was conducted as a hands-on facilitator-led workshop that used various methods including Facilitator (Ms. Monica Kapingiri) input, Group Discussions, Plenaries, Market-place ideas and Small Group Exercises, Experiential learning, Individual presentations and self-reflection. The power point presentations were aimed at projects sharing specific aspects of project implementation and results concerning their work and progress made. The discussions on both days were to identify; opportunities for enhancing policy impact, for collaboration between different projects and for enhancing food and nutrition security specifying; i) **Key lessons learnt** ii) **Policy issues/ actions** and ii) **Key collaborations**. A field trip was organised to facilitate experiential learning and give participants opportunity to witness knowledge and research application in practice

1.2 Workshop approach

The Applied Research Fund (ARF) country workshop (Uganda) was organized by the Food & Business Knowledge Platform (F&BKP) and NWO-WOTRO Science for Global Development in collaboration with the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) in Uganda. The two day workshop was divided into three sessions; i) power point presentations with questions and answers, ii) group discussions and iii) a field trip. Nine project presentations were made and three presentations not related to individual projects from SYS PONS (a consulting company founded by experienced consultants and evaluators for social innovation), Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and National Agricultural Research Organisation (NARO). The presentations were for 10 minutes each followed by five minutes of questions and answers. The project presentations were organized around three areas; **On research results, From output to outcome, and Approaches to reach the (ultimate) target group.** The group discussions were conducted as theme based open space discussions on day one and as plenary on day two. All the discussions were based on the power point presentations. Results of the discussions were then presented by a group representative on each day with other participants asking questions when clarification was needed. During the field trip, participants visited Tende Fish Farm in Garuga and National Fisheries Resources Research Institute (NAFIRRI). The key observations, discussions, actions and conclusions arising from the workshop are presented in this report.

1.3 Conclusions and follow up

The workshop generated the following recommendations which constitute conclusion and follow up actions for the different stakeholders.

1. The different ARF projects should explore linkages through working together with other projects and other relevant stakeholders and embrace cross learning.
2. The project research teams and partners should expand and promote research on markets locally and regionally taking advantage of enabling policy environment.
3. One key aspect in knowledge co-creation should be provision of technical support to farmers and communities to facilitate dissemination of key research findings. This in part entails developing information dissemination systems.
4. For purposes of securing sustainability, there is need to seek further collaboration with research and development institutions as part of the implementation process. In this respect, the project research teams should work closely and link with national bodies and research institutions. In addition to securing sustainability, this will also ensure quality of activities implemented.
5. In consideration of climate change and its impact on rural livelihoods, the research teams should embrace and streamline climate smart strategies and approaches in community and agriculture development projects.
6. Embrace and pay attention to gender issues by conducting baselines on what is needed for effective gender engagement.
7. Conduct economic analysis of proposed research and development work/activities.

2.0 Workshop Process Report

2.1 Proceedings of day 1

On day one, the facilitator (Ms. Monica Kapiriri) welcomed the participants and explained the setup of the workshop. She then asked each person to briefly (by mentioning name of organisation, and one lesson learnt working with ARF projects and / or similar efforts) introduce themselves. The list of participants is presented in Annex 2. She then asked the participants to mention the ground rules needed to facilitate a learning environment which was needed for the workshop. The participants mentioned time management, respect for each other, avoid being occupied by “e-things”, responsibility for own learning, active participation, flexibility and avoidance of unnecessary movements.



2.1.1 Welcome remarks and introduction about ARF aim of the workshop

Ms. Corinne Lamain from NOW-WOTRO welcomed the participants and gave a brief introduction about ARF aim of the workshop. She gave an introductory presentation highlighting the objectives of the workshop, the workshop programme, the Food and Business knowledge agenda, the food and business knowledge platform and the food and business knowledge research explaining how each of the projects could benefit from the platform.

2.1.2 Brief presentations on specific project implementation and results

Six project power point presentations were made. The first three were under the theme “On-research results” and the next three under the theme “From output to outcome”. Participants were then asked to mention some issues of key importance that needed further discussion and the different issues identified were distributed into major thematic areas as shown in the Table 1. These were discussed in parallel open space sessions on the specific thematic groups relevant to projects and the country. Each group then presented the results from their discussions while other participants filled in gaps for each group using sticker notes attached to the presented work.

2.1.2.1 Macro Nutrient Fortification of first-line food cereals with milk protein to produce affordable value added cereal products in Uganda/East Africa.

The presentation was delivered by Gaston Ampe Tumuhimise from Value Addition Institute (VAI). The objective is to support the current protein fortification efforts by Value Addition Institute (VAI). It seeks to solve the problem of macro nutrients in sub-Saharan Africa although much attention is given to micro nutrients. It is thus aimed at providing as many macro nutrient rich products as possible in Uganda and surrounding areas. Animal source foods are expensive and hence there is a need for means of availing alternatives to nutrient insecure groups as cheaply as possible. During the first year, products were produced and this year (2017) they are being refined and progressed for regional markets. All work has been done in Makerere University Incubation Centre but the project is putting up technology to produce independently in Wakiso District. The next steps are; Continue marketing and scaling up. A shift of emphasis to macro nutrient fortification e.g proteins calls for attention. The bioavailability of plant protein is low; thus fortification using animal protein increases the protein component of the food product. Achievements: Increasing the nutritional component of plant based foods. There is still need to do Vitamin A equivalent analysis and sensory acceptability.

Emerging questions and answers

i. What is the advantage of animal protein over soya milk protein?

Soya contains many anti nutritional factors which may not be removed by farmers during processing

ii. What is the solution for people who cannot access processed products?

Avail the products at affordable prices

2.1.2.2 Enhancing Rice Markets in Uganda through Smart Micronutrient Fertilization (ENRICH).

The presentation on this project was made by Thomas Awio from Africa Innovations Institute (All), Kampala, Uganda. The goal of this project is to increase food and nutritional security and income of smallholder farmers producing lowland rice. The main objective is to increase lowland rice productivity in Eastern and Northern Uganda through fine-tuning the composition of micro and macro-nutrient fertilizer combinations and their application mode for optimum rice yields and improved nutritional quality. The project involved farmers where scientists and farmers gave their evaluation of the rice for consumer acceptability. It was revealed through this project that combining macro and micronutrient application raises the entire productivity of rice. Fertilizer application should be based on the amount of nutrients already in the soil. There is need to evaluate and identify the best combination of nutrients for rice production. A farmers' research group was selected and the members were involved in trial management and evaluation.

Questions and answers

i. Why preference of paddy over upland rice

The trials are using paddy rice but will upscale to upland rice after.

ii. Is the project about increasing yield or nutrient quality?

Both

iii. Is there any information on adoption rates?

Farmers were involved from the beginning and their evaluation considered but no information is available for adoption yet because trials are still going on.

2.1.2.3 Stabilizing sesame yields and production in the Lango region, Northern Uganda

This was project was presented by Mr. Ray Agong from Uganda Oilseeds Producers and Processors' Association (UOSPA). Sesame (Simsim) is referred to as "white gold" because its price is higher than that of any other grain/pulse in the project area. Farmers growing improved sesame seed through the consortium intervention earn up to \$83 per acre more than those who do not and beneficiaries' yields increased by 44%. The demand for improved sesame seed has doubled. There is a growing opportunity for expansion of the sesame value chain. There is also a rising demand for sesame and its products globally. The major challenge in the value chain is postharvest losses due to poor handling.

Questions and answers

i. How was gender included in the project?

Working with 3640 farmers, 2002 of whom are women

ii. What climate smart technologies are you implementing?

Using elite varieties and crop protection techniques

iii. Since there are no cooperatives, what is the experience in mobilising farmers?

USPA had already organised farmers for another crop so the project just utilized these farmers.

2.1.2.4 Introduction of cashew nut for income security for poor farmers in Northern Uganda.

This project was presented by Mr. Helen Acham Elungat from North East Chilli Producers Association Ltd (NECPA). The project targets to increase food production and income security of 5000 farmers in Northern and Eastern Uganda, plant 300,000 trees with an estimated total income of 1 million Euros per year by the end of 5 year of the project. The project business case is vested in seedling production in a tree nursery, production of cashew nuts by farmers and processing of the nuts. The project has already reached/attracted 1200 farmers whose total tree count is 6500 trees plus a central farm of 11,678 trees. 25 mt of cashew nuts have already been produced by farmers. The project promotes high yielding and early maturing varieties. All the 1200 farmers have been linked to a processor with buying agents per district. The crop produce has high demand locally and regionally when appropriate quality is observed. The project has put specific emphasis on trust in most of the activities in the development of the cashew nut value chain. There is a reasonable increase in production at farmer level. A tree nursery was established to enable a sustainable supply of high quality seedlings to farmers; emphasis is on trust. Farmers are organised in groups in form of cooperatives and associations. There is abundant market for the nuts.

Questions and answers

i. What lessons were learnt while introducing a new product?

It is best to start from the market perspective including quality aspects

ii. Is the project introducing new varieties?

Using new varieties that mature faster than local varieties

iii. What are the implications of the low revenue per acreage in adopting the crop?

Cashew nut can be intercropped with other crops to improve yield per unit area.

2.1.2.5 Cassava Applied Research for Food Security in Northern Uganda

This was presented by Mr. Titus Alicai from Oxfam. Cassava is a food security and staple crop in many parts of Uganda. It is resilient/tolerant to environmental stress. Yield is in the range of 25-45 tons per hectare. The production of the crop is challenged by pests and diseases. There is also shortage of good quality planting materials. There is need to increase farmers knowledge on production and marketing aspects of the crop. The aim of the cassava applied research project is to boost production, utilisation and improve market access for farmers in northern Uganda. The project intends to improve food security of 2500 farmers. Farmers are engaged in participatory variety selection. They are presented with varieties for testing on their own farms. They are also engaged in the evaluation and assessment of germination, taste, cooking quality, tolerance/resistance of the different varieties. There are 2 recently released cassava varieties and 4 are near release.

Questions and answers

i. The aim includes production, what other value chain actors were applied?

Farmers' Produce groups, District production offices

ii. Doesn't use of cassava for production of beer create a food security threat?

This can be solved by increasing the production to meet both needs for food and beer production.

iii. New varieties are rotting away in the field, what is the solution for this?

The cassava should be harvested on time and so the major issue of concern in this respect is post-harvest handling

2.1.2.6 Improved Resilience Through Sustainable Production Of Grafted Tomatoes In Uganda (Project – IRESO)

This was presented by David Ogwang from Solidaridad Eastern and Central Africa Expertise Centre (SECAEC). The project started in January 2017 with the objective of improving Wealth, Nutrition and Resilience through sustainable production of Grafted Tomatoes, with 4,500 beneficiaries in Uganda. Bacterial wilt is one of the challenges facing tomato production. The project deals with identifying/screening varieties that are high yielding, resistant to disease and desirable to the consumers. 500 youths clustered in 6 groups are targeted for involvement in greenhouse production of tomato. The project emphasizes

resilience, disease and pest management, stakeholder sensitization and youth participation. Project activities include; Mobilization, Situational analysis, mapping and Baseline assessment, Screen tomato rootstocks for Bacterial Wilt tolerance in Uganda, Commercialised Grafted tomato seedling production with youths through Young Plant Risers (YPR) Nurseries. Improve the capacity of 4,000 smallholder tomato farmers for commercial production of grafted tomato fruits in Uganda. Create awareness on the potential of grafted Tomato technology through knowledge development and dissemination.

Questions and answers

i. Will the small tomato varieties be included in the study?

If the tomatoes are got, they will also be included in the study

ii. What measure of income resilience will be used?

Consistent increase of farmers' income

iii. Has grafting of tomatoes been successfully done commercially in other areas?

Yes and information will be got from these projects to help the current project run better.

Enhancing policy relevancy

2.1.3 Open space discussions

The open space discussions were based on 7 identified thematic areas with key policy issues/actions and collaborations for projects that emerged from the sessions that came earlier. The key issues discussed during the open space discussion in groups are presented with corresponding policy actions and collaborations in table 2.

2.1.4 Potential for policy relevancy of the ARF projects

This was presented by Dr. Ephranse Tumuboine from the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). She started by emphasizing that the ministry is mandated to initiate, develop and coordinate implementation of policies, programmes for sustainability of market oriented, improved quality and safety of agricultural products for food security and improved household incomes, with a goal of promoting Food and Nutrition security to improve household incomes through coordinated interventions. The presentation highlighted that there are several markets that cannot be penetrated due to various factors such as European and some East African markets due to factors like influenza which limits transportation of eggs. It was indicated that some commodity policies are available but shelved for some time e.g. the cassava policy. The ministry focus on value addition, production and productivity as cross cutting issues like climate change and gender. To put up certification schemes,



Presentation on policy relevancy

there is need to work with government to make it official so as to make products marketable abroad. Concern was raised through the presentation that research may produce technologies only suitable for particular areas which have no potential for scaling up to other areas of the country. There is need to make research part of the government priorities to make it fully effective. It was stressed that research can lead to policy and policy can lead to research therefore there is need for teams to work together to fulfil the needs of the country. Dr. John Magembe, a commissioner for crop and seed certification from National Agricultural Research Organisation (NARO) added that research leads to policy and vice versa and urged partners to apply for research funds when the call comes up especially in the country's area of interest.

Questions and answers

i. What is the importance of having policy on commodities?

Policy is a means of solving challenges along the commodity value chain. It is used to remove bottle necks within value chains that hinder government (MAAIF) from achieving its mission.

ii. What is the procedure for importing seed from abroad for the purposes of research?

The mandate for research is under NARO so permission would get got from NARO and then taken to the ministry for endorsement. Additionally, all the research would have to be done under the supervision of NARO.

iii. Is the ministry aware of the problems associated with tomatoes and pepper being sprayed with so many chemicals?

The chemicals are needed to protect produce but the different chemicals sprayed have different degradation periods which the farmers are expected to follow.

iv. Are there outlets for certification decentralized to district level?

Certification is a central government role but inspection can be done by local government under guidelines by central government.

v. How much control is there on the importation of agricultural produce into Uganda?

There has been an issue of stuff to control imports at borders but the government is going to subcontract an independent firm to be paid by government.

vi. What is government doing to ensure that policies reach the farmers and researchers?

Local governments have copies of the policies but cannot give the written copies to the local farmers because of high illiterate levels. Research is needed on how to best make farmers aware of these policies.

vii. Is there a policy for translation of university research findings into application?

Research agendas of most research projects are different from the agendas of the government due to the objectives of different funders; So there is still a disconnect.

viii. What is the knowledge base of the people making policies?

There is a policy making processing in which any policy has to be consulted on but this depends on where you are, whose interests are being addressed and how the consultation is done.

ix. What areas of research are being funded by NARO?

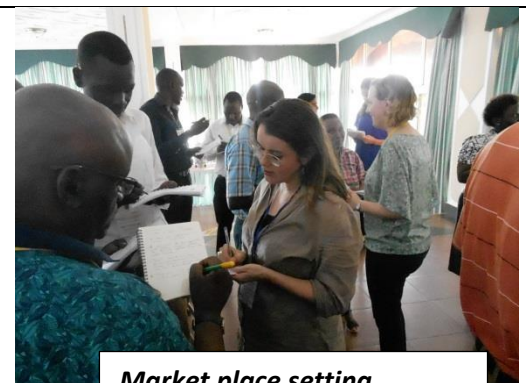
Mainly livestock and seed but the areas should be of importance to the Uganda people. Fund between 50,000 and 250,000 USD.

2.2 Proceedings of day 2

Sessions of the workshop on day 2 started 30 minutes earlier than indicated on the program because other presenters had been added to the program. The facilitator emphasized that the ground rules for a learning environment used the previous day still held started with a recap of day 1 and presentations about “outputs and impacts” .This was then followed by three presentations under the theme “Approaches to reach the (ultimate) target group” and then table discussions about the presentations of the day according to the criteria used to discuss topics of the previous day determining the cross cutting issues. This was for 15 minutes after which results of the discussion were presented as indicated in annex 4. The day ended with a field trip to Tende fish farm and Aquaculture research and development centre. Participants were then briefed about the field trip for the afternoon.

2.2.1 Recap of day 1

Day 2, started with a five minutes session in which each of the participants wrote down as many lessons as learnt from the previous day. Participants were asked to share their lessons with each other and get as many as possible from others in a market place setting of buying and selling goods. This went on for another five minutes after which the market was closed and the participants moved back to their seats. A presentation was made about outputs and impacts by SYS PONS. According to this presentation, outputs are immediate impacts of the effort and impacts are long term visions of what needs to be achieved. It was indicated that preconditions are based on needs assessment in a particular area. The presentation emphasized impact pathways which illustrates how the desired impacts can be achieved. Exercise to differentiate between output, outcome/ impact was also given to engage the participants. It was concluded that as far as ARF projects are



Market place setting

concerned, outcomes are short term and midterm results whereas outputs and outcomes are results of direct interventions (what you directly do).

2.2.2 Brief presentations on specific aspects of project implementation and results.

Three presentations under the theme “**Approaches to reach the (ultimate) target group**” followed by table discussions about the presentations by determining the cross cutting issues.

2.2.2.1 Farmers led soil innovations to sustain food production

This project was presented by Mr. Paga Moses Monday from Makerere University and Laurie Van Reemst from WUR – Alterra. The project developed the research approach experiment after field assessment of the problem low farm yields. There is much more yield increase in Pader as compared to Oyam which might be due to environmental differences as might be expected. Focus Group approach was used in Nebbi and together with farmers collected soil samples for soil testing. The team used radio talk shows to inform farmers and the entire community about the project. It was easier to reach many farmers at the same time with focus group discussions.

Questions and answers

i. How can farmer led innovations be combined with proper research? How much control should the farmer Versus researcher have?

Ask farmers for all their ideas and use them to formulate you experiments.

ii. How did the project determine the poor, moderate and fertile fields?

Determined from FDGs about how farmers tell the fertility and they use biological indicators. Soil sampling for routine analysis was then done.

2.2.2.2.Strengthening agribusiness ethics, quality standards and ICT usage in Uganda’s value chains

This was presented by Mr. James Ssemwanga from The Ssemwanga Center for Agriculture and Food Ltd. He said that their partnership with Makerere University Business School strengthened agribusiness among their beneficiaries. He asserted that ethics are low in value chains. The Law firm which is also a partners in this project provides an understanding that laws and ethics are closely related. The presentation indicated that target groups have roles to play but don’t play them because of ignorance. Testing laboratories for quality are only found in Kampala and yet testing has to be done all over the country calling for more partnerships for expansion of reach of such services to upcountry area.

Questions and answers

i. Elaborate on the research methods used

Structured and unstructured interviews and a mixture of qualitative research were used. There is however still plan to set up a quasi-experiment.

ii. How does the ethics minister fit into the project?

The project has made contact with the ethics minister and the ethics desk at the president’s office.

iii. Where do you appeal in case of unethical issues?

There is power at the hand of the consumers and sometimes what is considered unethical may be illegal. The project will empower consumers with the information about their rights.

iv. How are you going to deal with the global aspects of the ethical issues?

It is up to consumers to relate to global standards but they are disjointed from suppliers and this is majorly brought about by efforts of NGOs which buy seeds for farmers removing contact with seed suppliers.

2.2.2.3 Enhancing rice-greengram productivity in northern Uganda

This presentation was made by Obaa Benard from Makerere University. Project started in January 2017 and inception. Green gram can be harvested in two weeks. It is a legume and would contribute to increase of N in the soil and can be used as green manure. The project has a platform that can be used by farmers to contact researchers on issues they want to be addressed. This system was observed in other countries like India where they use green gram or chick peas

Questions and answers

i. Is there market for green gram in Uganda?

There is big market both in export and people in Uganda will be encouraged to consume it because it is very nutritious

ii. Will the crops be intercropped?

For the initial part of the project, no intercropping will be done but it can be included later

iii. **Are you working with farmers on sub county basis or scattered?**

Identified some new farmer groups through local government structure.

2.2.3 Field trip

2.2.3.1 Tende Fish farm and training centre: key message and observation

Tende fish farm and training centre is an integrated farm with a number of activities and enterprises. The farm has piggery, poultry, fish rearing in tanks and in lake cages, goats and cattle. It is a complimentary system where the animal manure is used to grow food for the cat fish and tilapia. The young fish are bought from the source of the Nile at National Fisheries Resources Research Institute (NaFIRRI) in Jinja. The farm is proud of a readily available fish market locally and regionally. Orders can come from neighbouring countries including Congo, Kenya and Rwanda. One of the challenges the farm currently faces is getting enough mukene (silver fish) from the lake which is used to make food for fish. Mukene cannot be got in large quantities because of high demand. Research is ongoing regarding the potential of bivalves to substitute mukene to reduce the quantity of mukene needed. There is 60% crude protein in bivalves therefore they are rich protein source for animal feed. They can also be used to treat water and their shells can be used in animal feed for calcium which hardens egg shells. Research is needed concerning the growth rate and efficiency in filtering water. There is a major challenge of hatchery feed and bi valves can provide quality protein. The farm currently works with 2 MSc and 4 BSc students. Other options for accessing protein include manga beans, chicken offals, abattoir wastes, soya black soldier flies and cockroaches. There is however anticipated competition between use of bivalves for either animal food or human feed.



Experimental studies on bivalves (biology and growth characteristics) as potential substitutes for mukene (silver fish) at Tende fish farm.

2.2.3.2 Aquaculture Research and Development Centre (ARDC), Kajjansi.

The Aquaculture Research and Development Centre is operated under the National Fisheries Resources Research Institute (NaFIRRI). The objective of the trip to this centre was to see how the various ARF projects link to the research centre. A presentation was given by Dr. Mwanja Tenywa Matthew (PhD) titled “*Research and Development Status of aquaculture in Uganda*”.

Key message and observation

It was indicated through the presentation that cages increased the population of fish in Uganda based on the available statistics. There is an already existing aquaculture policy which now stands alone and is not under the agricultural sector. The centre has realised a big market for fish nationally and abroad. It was revealed that although there are over 500 native fish species in the country, only Nile perch, tilapia and cat fish are being reared at the station. The number of fish species is expected to increase with time.

The centre noted a challenge of fish feed and the institute is looking for alternative locally available material for fish feed as substitutes. The centre also needs for more funds and opportunities for collaboration. This offered a potential opportunity for some of the partners in ARF projects to establish partnerships with the centre and the institute.



Workshop participants at the fish breeding pond at the Aquaculture Research and Development Centre (ARDC) in Kajjansi



3.0 Lessons learnt from working together

The following were outlined by workshop participants as lessons learned from working together on the projects as partners in the consortia. Based on the discussions during the workshop, there was consensus that the process of knowledge co-creation has yielded the following lessons.

1. In investment, participant involvement is key
2. There is a lot of wealth in indigenous information that can be utilised
3. Together we can
4. Practitioner organisations can work best with researchers
5. Forming and maintaining consortiums has challenges
6. All stakeholders have complimentary roles
7. Consortium is the best way to go
8. Cassava is the best food security crop
9. Farmers are also researchers
10. Complementarity of roles
11. Recommendations to farmers and other stakeholders need to consider their environment
12. Finger millet can eradicate poverty
13. Value and capacity of partnerships should be considered
14. Working with farmers to develop technology is the best
15. The character of the chairman/ head of a group is key to success of any program

General way forward for the projects

The different projects were asked to discuss the general way forward for their projects with reference to what had been discussed in the workshop. The workshop concluded that the following aspects needed to be taken care of.

1. Explore linkages through working together with other projects and other relevant stakeholders and embrace cross learning.
2. Expand and promote research on markets locally and regionally.
3. Provide technical support to farmers and communities including dissemination of key research findings.
4. Seek further collaboration with research and development institutions.
5. Work closely and link with national bodies and research institutions to ensure quality including Uganda National Bureau of Standards (UNBS) and to train stakeholders.
6. Embrace climate smart strategies and approaches in community and agriculture development projects.
7. Develop information dissemination system.
8. Promote community led research and development.
9. Embrace and pay attention to gender issues by conducting baselines on what is needed for effective gender engagement.
10. Conduct economic analysis of proposed research and development work/activities.



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Table 2: Thematic areas, policy issues/actions and key collaborations suggested from the open space discussion

KEY LESSONS EMERGING	KEY POLICY ISSUES/ ACTION	KEY COLLABORATIONS
INCLUSIVE VALUE CHAINS		
<ul style="list-style-type: none"> i. Participation of all stakeholders in the value chain is critical for example exporters should not put up standard that could exclude small holder farmers. This can be reduced by empowering or capacitating farmers to meet standards ii. Appropriateness/ affordability of technology that are promoted in the value chain iii. Value chain should make business sense for public sector players iv. Study the power relations within the value chain concerning information, knowledge, and ability to process. This power has to be balanced for a win-win situation in the value chain v. Research that comes up with solutions that empower all actors in the value chain especially small holder farmers 	<ul style="list-style-type: none"> i. Policies around standardisation and regulation around a particular value chain for example cassava value chain has no policy. ii. Policy to regulate power of the every value chain actor for example prices strengthening farmer competitiveness. iii. Promote ware house receipt systems iv. Fast tracking the reviewing of the cooperative act v. Domestic regional trade policies for example COMESA seed standard vi. Fast tracking the draft of national seed policy and policies on input like fertilizers, seeds, herbicides and pesticides vii. Support implementation of these policies and laws. viii. Affordable development finance to farmers especially small holders. This will promote inclusiveness in the value chain and enhance post-harvest handling/ processing ix. Tax regulations that promote local business along the value chain x. Invest in post-harvest handling technologies 	<ul style="list-style-type: none"> i. Policy push as a group e.g. climate change picking lessons from all projects ii. Cassava and ethics project on standards iii. Sharing knowledge on soil fertility management e.g. sesame and cassava projects are in the same regions e.g. with F&BKP and fertile ground initiatives iv. Sharing events e.g. workshops v. Sesame and cashew nut work with the oil seed multi stakeholders' platforms.
LINKING ACTORS		
<ul style="list-style-type: none"> i. Regular meetings for planning and reviewing e.g. platform ii. Can policy issues come from the bottom. Cause public debate iii. Actor mapping for roles and expectations iv. Knowledge transfer 	<ul style="list-style-type: none"> i. Frame policy proposals ii. Involvement of policy makers in project implementation 	<ul style="list-style-type: none"> i. Linkages between all value chain actors for development



<ul style="list-style-type: none"> vi. Information meetings vii. ICTs 	<ul style="list-style-type: none"> iii. Policy influencing what policy issues and how to engage 	<ul style="list-style-type: none"> ii. Link between research and extension
SOCIAL DIFFERENTIATION		
<ul style="list-style-type: none"> i. Identification of enterprises that address different interests group like the youth, women and PWDs. ii. Unclear responsibilities dealing with youth and gender iii. Most projects are designed for only a particular group of people and design should include all interest groups iv. Access to productive resources (land and money) by PWDs and women v. Gender capacity building (for women) along the value chain especially production and marketing. 	<ul style="list-style-type: none"> i. Policies addressing access to factors of production ii. Dialogue opportunities in policy influencing iii. Policies are available in different sectors with weak implementation iv. Despite good land policy men still take ownership of them 	<ul style="list-style-type: none"> i. Participatory research and project implementation ii. Need to identify different implementing actors iii. Dissemination of gender policy in research
FOOD/ NUTRITION SECURITY		
<ul style="list-style-type: none"> i. Consumer preference in research role of traditional types over focus on commercial affordability ii. Post-harvest handling iii. Ugandans slow to adopt new technologies iv. Gender or cultural acceptability v. Poor distribution and waste of food 	<ul style="list-style-type: none"> i. Supportive to value addition e.g. removing tax on value addition technology ii. Affordable irrigation technology iii. Strong awareness raising such as nutritional dialogue iv. Renew produce marketing board marketing reserves v. Renew household store linked to regions/ zones vi. More up to date information on food security 	<ul style="list-style-type: none"> i. learning focus ii. exchange visits
PROJECT SUSTAINABILITY		
<ul style="list-style-type: none"> i. Involve private sector in project implementation as an up-taker (markets) ii. Address local needs of the community by involving them in project implementation iii. Enhance exchange focal meetings for scaling up outputs 	<ul style="list-style-type: none"> i. Projects should align with the relevant policy frameworks in place ii. Integrate government policies and extension infrastructure 	<ul style="list-style-type: none"> i. Non-Government organisations ii. Farmers/ communities iii. Investors iv. Government



<p>iv. Initiate community associations for resource mobilisation for example village savings</p> <p>v. Technology alignment and acquisition as a tool for sustainability</p> <p>vi. Emphasize strengthening of business models of the project</p>		
<p>MARKETS</p>		
<p>i. Markets viewed as a derivative of many other influencing factors including infrastructure, production, competitiveness, cost-effectiveness, compliance with standards and availability of service such as laboratories and storage.</p> <p>ii. Provide incentives to private investors in areas that impact on farmers who are the major producers for the markets.</p> <p>iii. Markets are highly influenced by government by government policies. Keep policy makers in the loop with right information to influence markets for example rice production and import in Uganda.</p> <p>iv. Attention to quality standards at the production and entire value chain.</p> <p>v. Unlock market opportunities through value addition and regulation of tradable products.</p> <p>vi. Trust in market value chain by key actors is critical if markets are to work. This included exploring opportunities for vertical integration of markets and exploring opportunities for government interventions whenever feasible on minimum commodity prices for farmers' produce.</p> <p>vii. It is critical to adopt a strategy to lobby government for policy changes at a collective level of consortium-WORTO level where need arises.</p> <p>viii. It is critical to create an opportunity for information flow timely in the value chain about prices and quality standards.</p> <p>ix. Explore and advocate for opportunities to establish produce aggregation and warehousing facilities in major commodity production zones. This can be through:</p>	<p>i. Availability and development of markets for produce</p> <p>ii. Market intelligence and modelling</p> <p>iii. Farming as a business</p> <p>iv. Ethical consideration in agricultural production</p> <p>v. Certifications- product an quality</p>	<p>i. Strong linkage between input dealers, researchers and extension workers for better results on-farm.</p> <p>ii. Breeders are as important as soil scientists and agronomists and so should work together.</p> <p>iii. Memorandum of understanding being signed between academic, research institutions and MAAIF.</p>



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Using commodity cluster/zoning by government intervention is possible.

- xi. Special incentives and financing to private sector to invest in warehouses and processing facilities
- xii. Deliberate effort to re-establish cooperatives and societies country wide.
- xiii. Regulation of agricultural trade within national borders.

PRODUCTION

- i. Development and release of new varieties should be closely monitored
- ii. Matching crops and crop varieties with soils and Agro Ecological Zones to avoid mismatch and crop failure. But this requires availability and relevance of soil information and awareness.
- iii. Skilling extension workers in the aspect of soil fertility management.
- iv. Quality control to eliminate counterfeit products.
- v. Trust among stakeholders is key
- vi. Clear the impression that Ugandan soils are fertile

- i. Crop insurance for small holder farmers to reduce losses made by the farmers in case of crop failure due to various issues.
- ii. Policies to restrict movement of planting materials which may lead to spread of diseases are needed.
- iii. Reactive policies by law of 1950s.
- iv. Policy to share the risk between farmers and companies
- v. Region specific policy and regulatory framework
- vi. Better regulation of input distribution (seed, fertilizers, pesticides) to eliminate fake products
- vii. Remove restrictions to fertilizer use for example the taxation on fertilizers which makes Uganda have the highest price per unit of fertilizer in the whole world.



Annex 1: Program for the workshop

DAY 1	<u>Morning – Introductions, acquaintance and project presentations</u>	
9.00	Coffee and registration	
9.30	Welcome and introduction about ARF aim of the workshop	NWO-WOTRO: Corinne Lamain
9.45	Brief presentations on a specific aspect of project implementation and results concerning (10 minutes each max, followed by 5 mins Q&A): <u>On research results</u> <ul style="list-style-type: none"> • Macro Nutrient Fortification of first-line food cereals with milk protein to produce affordable value added cereal products in Uganda/East Africa • Enhancing Rice Markets in Uganda through Smart Micronutrient Fertilization (ENRICH) • Stabilizing sesame yields and production in the Lango region, Northern Uganda 	ARF consortia presenters
10.30	Coffee/tea	
11.00	<i>Presentations continued</i> <u>From output to outcome</u> <ul style="list-style-type: none"> • Introduction of cashew nut for income security for poor farmers in Northern Uganda • Cassava Applied Research for Food Security in Northern Uganda • Improved Resilience Through Sustainable Production Of Grafted Tomatoes In Uganda (Project – IRESO) 	ARF consortia presenters
11.45	Discussion around questions on the presentations – identifying cross-cutting aspects	Plenary
12.30	Lunch	
	Afternoon - enhancing policy relevance	
13.30	3 open space/parallel sessions on a specific thematic focus relevant to projects and the country. Identification of thematic focus by consortia	
14.30	Presentations (10 minutes each): <ul style="list-style-type: none"> - relevant initiatives and priorities in the country - potential for policy relevance of the ARF projects Plenary Q&A	Two external stakeholders: <ul style="list-style-type: none"> - Anno Galema Dutch Embassy - Mr. Opolot Okasai, Director Crop Resources MAAIF - Ms. Ephrance Tumuboine, Assistant Commissioner Crop and Seed Certification
15.00	Coffee/tea	



15.30	Presentations on sessions, followed by discussion on specific issues (in relation to policy relevance and impact)	Plenary
16.30	Wrap-up of the day, preview next day	
17.00	Drinks	
Day 2	<u>Morning – reaching the ultimate target group</u>	
9.00	Coffee	
9.30	Welcome and introduction for new participants	NWO-WOTRO: Corinne Lamain
9.45	Brief presentations on a specific aspect of project implementation and results concerning (10 minutes each max, followed by 5 mins Q&A): <u>Approaches to reach the (ultimate) target group</u> <ul style="list-style-type: none"> Farmer-led soil innovations to sustain food production Strengthening agribusiness Ethics, Quality Standards & ICT usage in Uganda's value chains (AGRI-QUEST) Enhancing Rice-Greengram productivity in Northern Uganda (ERIGNU) 	ARF consortia presenters
10.30	Coffee/tea	
11.00	Discussion around questions on the presentations – identifying cross-cutting aspects	Plenary
11.45	Wrap-up of both days, preview fieldtrip	
12.00	Lunch and checkout for Uganda Participants	
	<u>Afternoon (tentative) – Field trip</u>	
01:00	Departure field trip in Kajansi	
18:00	Return from fieldtrip; departure for Ugandan participants	

Annex 2: List of participants

ARF Projects Uganda			
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Farmer-led soil innovations to sustain food production	Alistair Taylor	ZOA Uganda (Project leader)	alastair@zoa.ug
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	Laurie van Reemst	WUR - Alterra (Extension specialist)	laurie.vanreemst@wur.nl



		and Dutch representative)	
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ARF Projects Uganda			
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	Ivan Okori	WindWood Millers Ltd, Kampala, Uganda	ivan@thinvoid.com
Improved Resilience Through Sustainable Production Of Grafted Tomatoes In Uganda (Project – IRESO)	David Ojwang	Solidaridad Eastern and Central Africa Expertise Centre (SECAEC)	David.ojwang@solidaridadnetwork.org



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Annex 3: Feedback from participants on proceedings of day 1

The following lessons were highlighted by participants in the morning of day 2 as learned from workshop sessions of day 1.

The lessons learnt from day 1



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| <ol style="list-style-type: none"> 1. Sustainability is still not embedded in most projects 2. Youth integration in projects is still missing 3. Farming is still practiced at subsistence level 4. Projects should include more forestation and reforestation 5. Research evaluation is key in adoption of new technologies 6. Trade regulations by government agencies is key in stabilization of agricultural produce marketing. 7. Networking is important 8. Ethics and integrity are key along the food chain among stakeholders 9. Farmers take interest when projects benefit or impress them 10. Small holder farmers need to be insured 11. Government should start funding research 12. Need to tailor technologies to sites 13. Power relations in the value chain should be considered 14. Need collaboration between projects 15. Policy development is still weak 16. Projects mainly focus on increasing production and nutrition and not preserving soil fertility 17. There is a wrong perception that grafting is equal to genetic mixing 18. There is a gap in livestock and dairy research 19. Soil component seems to be neglected in many projects. Projects can benefit by having accurate spatially explicit soil information available 20. Strong focus on upscaling to ensure sustainable output on the long term 21. Cassava is a food security crop in Uganda 22. Project sustainability needs collaboration with the government, NGOs and final beneficiaries 23. Policy framework is big requirement in project initiation and sustainability 24. Trust is important in projects collaboration 25. Collaboration is important but projects are at different stages therefore a platform to update each other is important 26. Research is only relevant to development if it is translated to policy and strategic implementation 27. Quality of seed is available but trust between players need to be built 28. Participatory research in Uganda has not yet been fully explored 29. Uganda is ranked the lowest user of inorganic and organic fertilizers thus poor soil fertility 30. Sesame is the lowest yielding crop in Uganda 31. It is possible to graft tomatoes to Irish | <ol style="list-style-type: none"> 37. Private sector should be involved to business approaches 38. Address local needs of communities 39. Enhance exchange meetings 40. Macro nutrient fortification is needed in Uganda 41. Sesame is the most important oil seed in Uganda 42. The difference between output, outcome and impact 43. Collaboration is always possible (we are different projects but we were perfectly well on joint assignments). 44. Don't forget "local" 45. People driven is key. 46. Data plus practice is good 47. Keep government informed/included 48. Wrong perception that grafting is the same as genetic improvement 49. Building trust among collaborators 50. Research should be linked more to policy 51. Transparency is key 52. Small holder farmers will only take ideas that make sense to them 53. Power relations in the value chains must be understood 54. Sesame is on lowest among cereal/pulse crops 55. Small holder farmers should be insured 56. The importance of involving all stakeholders in project development and implementation (value/importance of knowledge co-creation) 57. There are varieties of high yielding cashew nut 58. It is possible to graft tomato on potato 59. It is important to tap the different expertise 60. Technologies should be tailored to where they are best fitted. 61. Policies are regulatory 62. Cassava is an important food security crop. 63. Balance innovators of technologies and end users 64. Multi-stakeholder approach 65. Nutrient and Water management 66. Boarder control for seed 67. Agroforestry 68. Rate of fertilizer development is very high and does not give time for adoption by farmers 69. Quality seed attainable but requires trust 70. Public money investment in research 71. A commercial approach; whose main focus is the introduction of high yielding and pest/disease resistant/tolerant varieties. |
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<p>32. There is need for different people collaborate within projects</p> <p>33. Harvesting of cashew nuts can start after two years</p> <p>34. There is need to balance interest of farmers and researchers.</p> <p>35. Gender should go beyond numbers and look at gender and power relations at household level and within the value chain</p> <p>36. Sesame is not a cereal crop but not a seed crop</p>	<p>72. Conserving indigenous crop varieties that are important for sustainability</p> <p>73. Policies for are important for project sustainability</p>
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Annex 4: Results of the Group discussions on day two

From the table discussions of day 2, participants came up with the following remarks as agreed from their various table discussions.

1. More storage should be done on raised and air tight racks.
2. Need to check expertise in the different teams.
3. Since most wetland have been utilized, there is a struggle between reservation Vs Usage
4. Use of locally available crop varieties should be considered because variety selection is key to success of any project.
5. There is need to check why farmers culturally do **the** things they do identifying objectives and purposes of farmers.
6. Identify how to apply the theory of change in the new projects better
7. Sustainability for farmers using fertilizers.
8. Need for bi laws on wetland use and drying procedure.
9. Need to create awareness in different aspects therefore The need for farmer education
10. Government should have incentives for farmers.
11. Projects can foster resilience among small holder farmers.
12. Specific interest groups interested to be incorporated into research agendas and hence gender and youth dynamics in all project should be clear.
13. Upland rice varieties fit into the government strategy to reduce rice importation hence there is an opportunity to dialogue with the government.
14. Projects should build on on-going projects.
15. How to seek redress for the less vigilant.
16. There is no ethical code set for Uganda.
17. There is a problem of soil fertility in Uganda.
18. The difficulty of doing participatory research.
19. Collaborative advocacies need to make comprehensive documents with all of the projects included
20. Joint efforts in form of policy letters
21. Need to demystify farmer's ideas and fears for example about GMOs