



Partnering for success: Uganda Consortium Experience of multi-stakeholder engagement in the African Indigenous Vegetable research

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Introduction

1. Title of the case study to be documented:

Partnering for success: Uganda Consortium Experience of multi-stakeholder engagement in the African Indigenous Vegetable (AIV) research

2. Executive summary

As per its name the executive summary is a short synthesis of the entire paper with two to three paragraphs maximum. It should state the key conclusions or lessons learned, as well as convince the reader to continue the reading the entire paper.

3. Project description

3.1 Background and the definition of the problem

Low household incomes, declining crop productivity and persistent food insecurity are interrelated problems limiting socio economic development of many Ugandans (NRC, 2006). This central problem motivated different organizations and institutions to work together to devise long lasting solution to this challenge. The concerned institutions ranged from academic institutions (UCU, Makerere University & Greenwich University), government institutions (MAAIF & NARO), and Private sector practitioners (FARMGAIN) and development actors (CHAINUGANDA and CARITAS), Farmer organizations (Namulonge Horticulture, butiki 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, and IITA.

Academic institutions such as UCU and Makerere University have sought to resolve this problem by training people with skills and knowledge, as well as encouraging the appropriate attitudes needed to solve food insecurity issues. The problem was perceived at these institutions as a human resource problem. On the other hand regional networks such as AfriSol, CABI, AVDRC, and IITA conceived this problem as a production, conservation and genetic depletion issue. Meanwhile development agencies such as CHAIN Uganda, Caritas Jinja looked at this problem in terms of community marginalization and limited participation in food decisions. FarmGain perceived the food problem in terms of market imperfection fueled by asymmetric information flows and price collusion practices of traders. Each partner sought to solve the problem in their own way, but the individual efforts did not yield any substantive results.

AfriSol as a consortium first came together in a scientific networking meeting in Naivasha, Kenya called Agricultural Research Connections (ARC) Workshop from May 2nd - 7th, 2010. It started with members from 3 African countries. With support from PAEPARD through RUFORUM, AfriSol in June 2012 held a brain storming workshop on tackling the problem of

food insecurity and specifically qualitative food insecurity manifested as malnutrition. Members from five different countries participated in this meeting at Entebbe. The meeting sought to harness the potential within a multidisciplinary team of stakeholders with the goal of unlocking the potential of African solanaceous species biodiversity for the improvement of nutrition, health and income. One of the opportunities to put this into action came with the EU-PAEPARD call for proposals through FARA in 2012 to which the team responded. However, the specificity of the call required a maximum of three African teams with a European partner, much as, at that time 14 African countries were willing to participate. The secretariat then agreed that the Uganda team which had responded take lead in the meantime, while more opportunities for the other countries are sought.

It is after these meetings that the various stakeholders concluded that AIVs present a great potential of addressing this growing qualitative food insecurity problem. AIVs contain vitamins and minerals which are essential in the absorption and metabolism of food ingested by the body. Although Uganda is home to hundreds of African Indigenous Vegetables, which can supply the required vitamins and minerals such as β -carotene, vitamins C and E, folates, iron and calcium, these vegetables have not been mainstreamed in the staple diets. This has largely been due to; a) seasonality of supply, b) long distances between production areas and potential consumption centres and c) poor post-harvest handling and preservation processes.

Despite the fact that the National Food and Nutrition Policy of Uganda highlight importance of vegetables in diets, there exist gaps in vegetable consumption (NRC, 2006). The average consumption of vegetables and fruits is approximated at 200g/person/day, which is far below the WHO recommended minimum intake of 490g/person/day (FAO, 2013). Over 21% of the population is classified as under nourished and 38% of children malnourished (FAO, 2013). This project, therefore, was instituted to contribute to food and nutrition security by improving post-harvest handling of AIVs.

The project was launched in 2014 with the aim of improving post-harvest handling and processing of African indigenous vegetables (AIVs). This was envisaged that it would prolong AIVs shelf life, smoothen seasonal supply hence increase their consumption in nutritionally vulnerable populations while at the same time increasing revenue for small holder farmers engaged in their production.

3.2 Objectives of the study

Objective of project:

To improve post-harvest handling and preservation of indigenous vegetables (especially Solanaceae sp) in order to prolong their shelf-life and hence increase their consumption in nutritionally vulnerable populations, while increasing the revenue of those engaged in their production.

Specific objectives of project:

1. Better knowledge of indigenous vegetable varieties with prolonged shelf-life.
2. Increased knowledge about technologies and processes for prolonging shelf-life of indigenous vegetables.
3. Better understanding of efficient delivery pathways for value added indigenous vegetables to end-markets.

3.3 Stakeholders involved

Uganda Christian University (UCU) and partners; Natural Resources Institute (NRI)-University of Greenwich, CHAIN Uganda and FARMGAIN coordinated by AFRISOL and in partnership with RUFORUM are jointly implementing a PAEPARD supported project entitled *Enhancing nutrition security and incomes through adding value to indigenous vegetables (AIV) in East and Central Uganda*.

The research team is multidisciplinary as it is composed of subject matter specialists and experts who include food scientists, to handle food processing and post-harvest handling aspects (from NARO and Makerere University), a socio-economist to handle social, economic and rural development issues from CHAIN Uganda (NGO) and FarmGain (Private business enterprise), a communication specialist from CABI, a botanist from Makerere university, a breeder from UCU and a crop protection specialist from UCU handle crop aspects. The team partnered with Jinja district extension staff, Caritas Jinja (a local NGO) and Butiki irrigation Farmer group (local CBO), as well the local councils I, II and III officials in Mafubira division of Jinja district.

Table 1: The partners involved in the project, their level of participation and roles

Stakeholder	Stage of participation						Role
	Consortium Initiation	Idea	Proposal	Inception	Implementation	M&E	
AFRISOL	√	√	√	√	√	√	Initiation
Uganda Christian University			√	√	√	√	Project coordination and breeding leadership
CHAIN UGANDA			√	√	√	√	Spearhead farmer

							participation
FARMGAIN			√	√	√	√	Spearhead market participation
RUFORUM			√	√	√	√	Capacity building
Makerere University				√	√		Spearhead postharvest technology
MAAIF				√			Seed inspection
IITA				√			Contribute agronomy technologies
AVDRC				√	√		Avail germplasm
CABI				√	√		Development of communication materials
Sub-county Local Governments (Butiki-Kyekidde-Jinja; Bumboi (Mbale; Busukuma-Wakiso)				√	√	√	Farmer mobilization; evaluation of pilot trials
CARITAS				√	√	√	Farmer mobilization
District production offices				√	√	√	Farmer mobilization
Farmer organizations				√	√	√	Farmer mobilization
University of Greenwich				√	√		Technical backstopping

The Table above highlights the contribution of different stakeholders to the project activities. The core research team participated in all activities such as idea generation, proposal writing, project implementation, monitoring and evaluation.

Challenges with Partnerships

Some stakeholders experienced no problems at 33.3% (Figure 1), the same percentage of stakeholders reported the problem of money handouts that is becoming an expectation from every project (33.3%), lack of clarity on roles of partners (16.7%), micro credit institutes want pay back in a short time (8.3%), certain stakeholders have no interest in some aspects (8.3%) and decentralised budgets (8.3%).

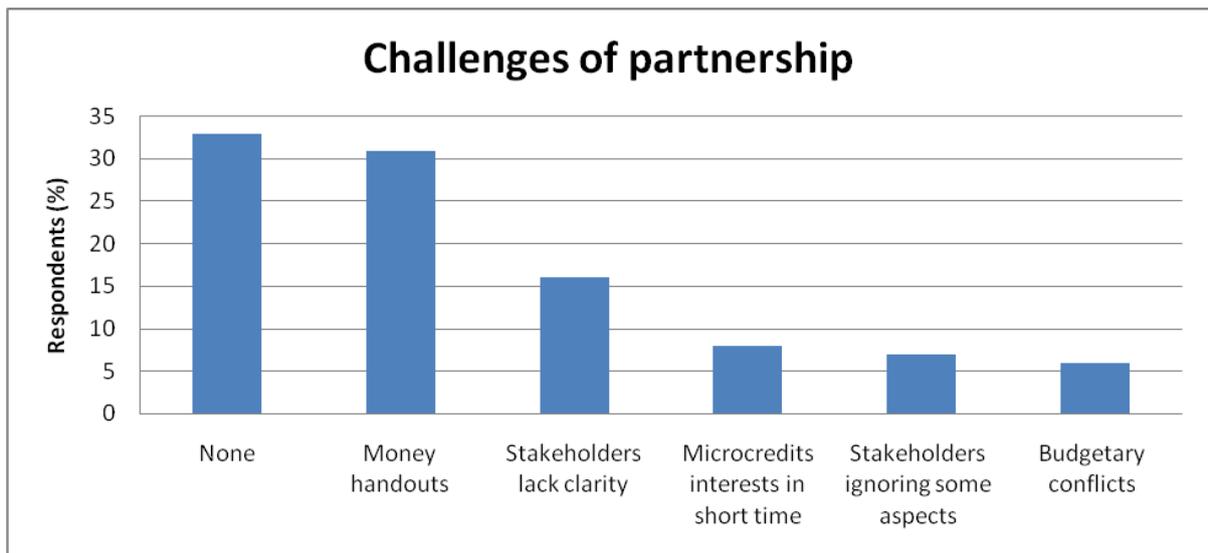


Figure 1 Stakeholder challenges with partnerships

4. Project progress

4.1 Activities.

Having implemented this project for about three years to date, a number of milestones were covered and substantial outcomes achieved as indicated below;

Objective 1: Varieties of indigenous vegetables with longer shelf-life and processing potential identified and profiled.

Activities and outcomes:

Activities were designed to achieve this result:

- A nationwide participatory survey was conducted to identify and collect indigenous vegetables in all the five major agro ecologies of Uganda. These collections have enabled the establishment of a germplasm and conservation centre at UCU. At the germplasm collection centre, vegetables with good post-harvest traits that meet consumer preferences have been identified. Four accessions are profiled and are being tested and evaluated by farmers to be soon released for the first time as varieties. CHAINUG spearheaded the nationwide survey while UCU took lead in the establishment of the germplasm centre, and the characterization and development of accessions.

Objective 2: Appropriate processing and handling mechanisms/technologies for indigenous vegetables adopted.

Activities and outcomes:

The following activities were designed to deliver this result;

- A nationwide participatory survey was conducted to identify and collect vegetables handling and processing technologies in over 60 districts of Uganda, and these were profiled at Makerere University and UCU. The technologies underwent testing at the food science and nutrition incubation centre at Makerere.. Four handling technologies were profiled, tested and evaluated by farmers, traders, transporters and communities, and those selected by the farmers are charcoal coolers, and packaging in thin perforated polyethylene bags. In terms of processing, vegetable drying and powders were selected as appropriate processing technologies by participants. CHAINUG spearheaded the nationwide survey while UCU took lead in product and technology development and refinement at Makerere University.

Objective 3: Appropriate delivery pathways of value-added indigenous vegetables established.

Activities and outcomes:

- Market studies were conducted in the major markets in municipalities of Kampala, Mbale and Jinja as well as some adjacent peri-urban centres to estimate the demand of vegetables and vegetable derived products. The most traded commodities in Kampala

were *Solanum aethiopicum* (Shum group, locally called 'Nakati'), while in Jinja it was *Amaranthus* spp. and Mbale it was mainly *Solanum aethiopicum* (Gilo group, locally called 'Ntula'). The study further found out that the structure of the vegetable supply chain is very short. Farmers hire transporters to move the vegetables to the various markets but ownership remains with producer until the commodities are sold to the wholesalers or traders.

Objective 4: Information sharing mechanisms on utilization of indigenous vegetables established.

Activities and outcomes:

The activities conducted to achieve this result included:

- Production and dissemination of information products: The Afri-Sol website, www.afri-sol.org, continues to provide an important platform for the exchange of ideas and innovations to promote Solanaceae species. Leaflets, brochures and manuals on vegetable production were produced and circulated to farmers and the public at two National Agricultural Trade fairs in Jinja in 2016 and 2017, the National Seed Expo in 2017 and two farm camps at Gayaza High School in 2016 and 2017 with an attendance of over 1000 farmers and 50 schools visiting our stalls. Information on the progress of activities and research findings was shared with different stakeholders in scientific meetings and conferences in USA, France and South Africa. Conducting awareness campaigns on indigenous vegetables production, their nutrition, value addition and business and marketing skills on radio show/programs were conducted on four radio stations (Simba FM, Namirembe FM, NBS FM, Liberty Radio). Fora such as TV stations; the Internet, including You-Tube, and Print media such as the Daily Monitor ; t-shirts were produced, bearing messages on the importance of indigenous vegetables; and the team participated in an outreach to over 47 secondary schools at a farm camp in August 2016.
- Newspaper articles were produced in national newspapers on prolonging the shelf life of indigenous vegetables. Newspaper articles were published three times by the Daily Monitor newspaper, and one by The Standard.
- Farmers and team members participated at the national seed fair, and twice at the Jinja National agricultural trade show in July 2016 and February 2017.
- A baseline study was conducted and 5 monitoring and evaluation sessions were successfully conducted.

4.2 Results/outcomes

Impacts of AIV PAEPARD project

Project benefits and impacts are experienced at different levels for participants namely at household, community, district and implementing organisations.

Household Level

From the perspective of households, a number of impacts are noticeable. In Table 2 stakeholders indicated the following as the impacts to households; food security (70%), livestock ownership (44.4%), increased income (40%) and paying school fees (30%). Other impacts identified – albeit not by a significant proportion of project participants include land and loans acquisition (Table 2); improved food security; and reduced medical expenses on nutrition related illnesses. This is illustrated by the case story of Nalongo Aidah (Box 1).

Table 2: The percentage of stakeholders indicating the impacts at household level from project

Impact item	Stakeholder response (%)
Food security	70
Livestock ownership	44.4
Increased income	40
New houses	10
Pay school fees	30
Bought land	10
Access loans	10
Improved seeds	10
Reduced medical expenses	10

Box 1: Miracle vegetable restores life of a child

“My daughter Amina was not a normal child,” narrates’ Nalongo Aida of Kyekidde, Jinja district. She was always sick actually she could neither walk nor talk yet she was over three years old. I was totally stuck, with no money to take her to the hospital. When the vegetable project started here in my village in 2015, I was among the selected farmers to host the demonstration of very many indigenous vegetables from the project on my farm. I noticed a unique dodo variety with reddish coloration and suspected this could contain more blood giving components. I have consistently eaten this vegetable, and I give the red soup to Amina. The miracle dodo healed my daughter and everybody started asking me what cure I had used. Because of this fame, Jinja dioceses selected me to promote the miracle dodo and I have trained other mothers on the production and utilization of red dodo.

Benefits to community

Stakeholders indicated that there were benefits that accrued to the community. These include: knowledge and skills; increased business activity; increased asset build up; increased food supply; loan access; and peace and unity (Table 3) and (Box 2). The highly mentioned benefit overall was the community members accessing loans to finance farming business.

Table 3: The percentage of stakeholders indicating the impacts of the project at community level

Impact Item	Stakeholder response (%)
Knowledge transfer	12.5
More businesses coming up	12.5
Assets build up	12.5
Increased nutritious food supply	12.5
Access loans	25.0
Peace and unity	12.5

Box 2: Quality vegetables mean wealth

“I have always had it in my heart that every person needs and deserves a decent house, but I previously had no way to realise that dream,” says Rose Nayiga of Namulonge, Wakiso district. Rose lived in a mud-and-wattle house, struggling to survive on a small income. With the arrival of the AIV project in 2015, all of this was about to change for her. The project immediately recognised her potential, and invited her to training courses.

“The training on seed production in 2016 restored hope in me as I discovered so many new opportunities that I had previously been unable to see,” she says.

Empowered by the new skills and knowledge, Rose started growing vegetable seeds. She generated 120kgs of seed, and this enabled her to raise UGX 6.3 million which she is using to build a brick house.

Rose exemplifies the benefits of an effective partnership between the project and community members, as she has experienced tangible and scalable results.

Benefits to the district

The project has noted significant impacts at the district level which include: the registration of farmer groups; human capacity building of farmer groups; unity; and the increased supply of cheap nutritious food to schools; reduced hunger; increased crop products; and improving living standards (Table 4) and (Box 3). Improved living standards were the most highlighted benefit at the district.

Table 4: The percentage of stakeholders indicating the impacts of the project at district level

Benefit	Stakeholder response (%)
Group registration	12.5
Farmer groups	12.5
Unity	12.5
Supply cheap food to schools	12.5
Reduced hunger	12.5
Increased crop products	12.5
Improved living standards	25.0

Box 3: Charcoal cooler resuscitates a dying enterprise

“Vegetable is everywhere: under the beds, in the living rooms, in the kitchens, everywhere. And rats are everywhere too,” Anthony Odonga observed after the first bumper harvest which followed the AIV project’s intervention.

This aptly highlights the unintended downside of the dramatic increase in productivity. Thanks to provision of high yield seeds varieties and training in modern agronomic practices, the average vegetable harvest increased from 1.8 tons per hectare to a staggering 3.9 tons. However, post-harvest handling practices had not caught up with this dramatic productivity increase, meaning that households like Odongo’s often stuck with a surplus of vegetables. With no central storage mechanism and limited access to markets for individuals, vegetables were going to waste.

In 2016, after a training visit to Makerere University, The Kyekide Irrigation Farmers requested assistance to build a charcoal cooler to store and prolong the shelf-life of vegetables. Following the intervention, the members store their vegetables and go to look for market.

Odongo says that 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.

Impact on implementing institutions

The project significantly impacted the way the implementing institutions view target people and their priorities. The research team noted those two aspects which include; understanding target people priorities and coming to terms with the complexities of malnutrition issues (Figure 2). This aspect is best explained by the change in priorities with farmers in Jinja, who transformed from being solely vegetable producers to vegetable seed producers and distributors.

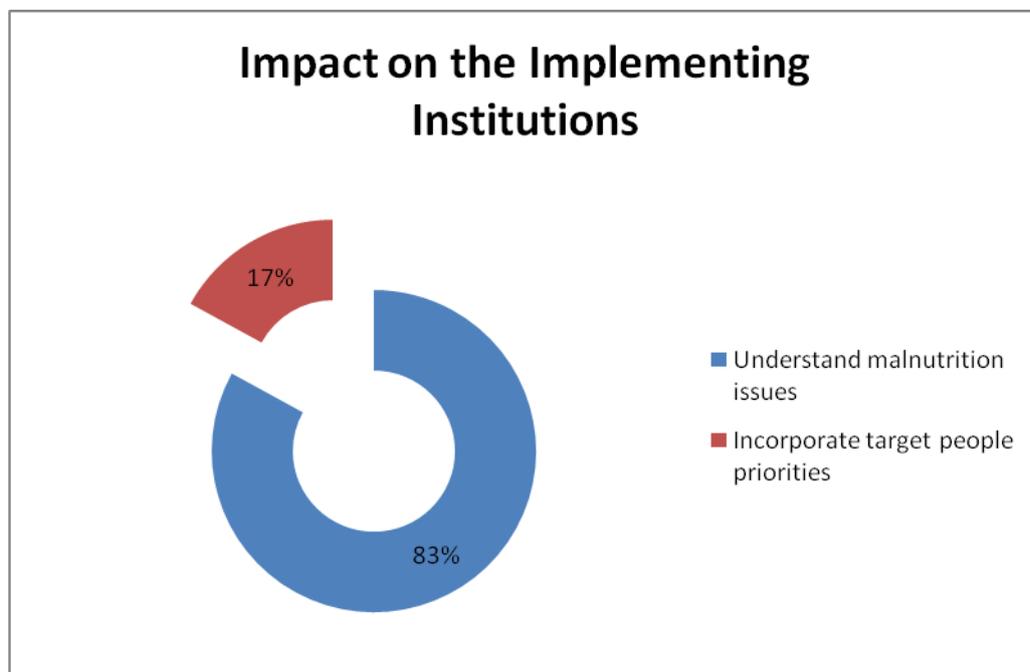


Figure 2 Showing impact of partnerships on the implementing Institutions

Box 4: Networking is capital in waiting

Since the idea generation period in 2013 under AFRISOL, all the AIV research team members have honed their skills in proposal writing, resource mobilization, and management and governance. The team has submitted eight proposals for different calls and **three have won funds**. One of them that has been approved is on **the functional vegetable seed system that came from the prioritisation exercise while working with farmers and other stakeholders (WOTRO- Food and Business)**; the other is on **the development of robust molecular markers for *S.aethiopicum* (Mujeres por Africa Foundation)** and the third is towards **characterizing the germplasm for drought tolerance (TWAS) which has been a challenge in the duration of the project**

The participants expressed a number of expectations that included increased agricultural commercialization; access to loans; increased income; access to inputs; access to training; increased savings; increased food supply; and education for children. Although a number of expectations were far beyond the scope of this project, a reasonable number of them indicate

the impacts the community members yearn for. A higher proportion of participants (25%) expected this project to contribute to increased household and group incomes.

When stakeholders were asked to rate the performance of this project in building farmers' institutions on a scale of 1-5 (Table 5), the majority (75.0%) reported that this project consistently and frequently met requirements; while 25% said some of the requirements were not met. No stakeholders indicated that the project exceeded the expectations; similarly no stakeholder mentioned that this project never met requirements at all. The implication of this is that there is still room for improvement on meeting some of the initial expectations.

Table 5: Rating the performance of the Uganda AIV project

Rating of CA/FFS	Percentage respondent
Consistently exceeded requirements	0
Consistently and frequently met requirement	75.0
Often never met some of the requirements	25.0
Never met requirements at all	0

The percentage of stakeholders expressing the opinion related to unmet expectations is presented in Figure 3. The fact that money (income is low) is still elusive was reported by 34% respondents, while all practices not being used by (33.3%) and only 11.1% reported no problem.

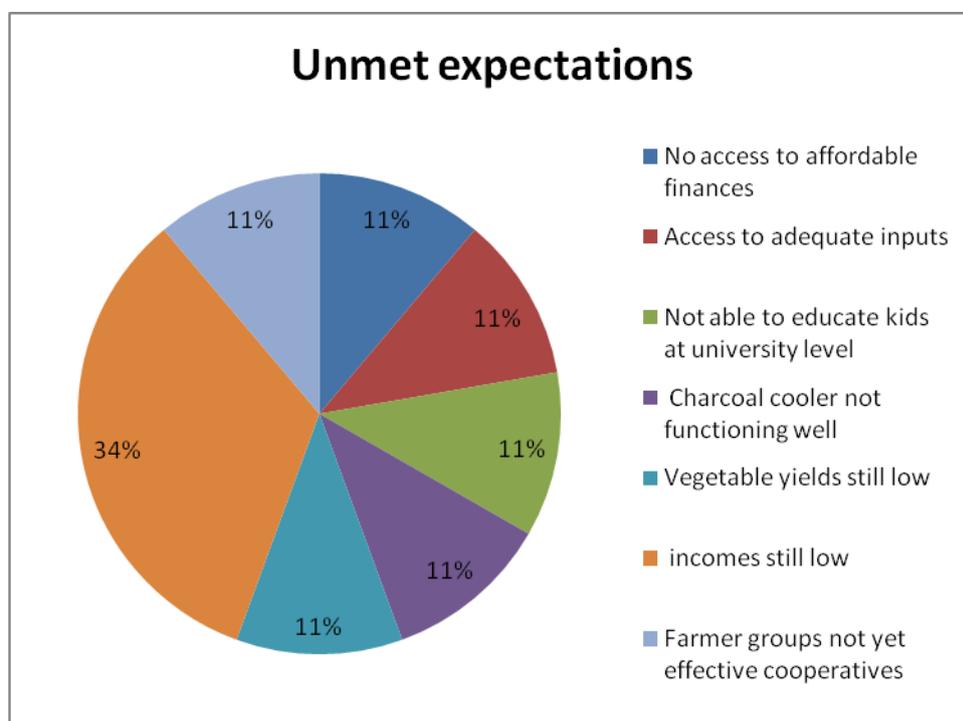


Figure 3 Showing stakeholders' unmet expectations

4.3 Sustainability.

Evidence of continuity

Close to the heart of every project/ technology or methodology are issues of sustainability. For that matter this PAEPARD AIV project is no different. The team sought the views of the stakeholders on the evidence of the continuity of the activities or outputs of this project. Although there were no considerable differences (Table 3.6), stakeholders pointed out a number of evidences that indicate they will continue being used. These include a high number of farmers using the best vegetable production and utilization practices; group members are facilitators of trainings; member contributions to revolving fund; multipurpose use of vegetables e.g. food and cash crops; availability of technical knowledge; local people are involved and interested in practices; availability of inputs; concept taken up by district extension services; districts are allocating budgets to nutritional programs and being integrated with other projects, e.g. ISSD local seed business.

Table 3.6: The stakeholders expressing continuity of AIV project

Evidence	
High number of farmers adopting best vegetable production and utilization practices	√
Group members are facilitators of trainings	√
Member contributions to revolving fund	√
Multipurpose use of vegetables e.g. food & cash crops	√
Availability of technical knowledge	√
Local people are involved and interested in processing and handling	√
Availability of inputs	√
Concept taken up by district extension	√
Districts are allocating budgets to nutritional projects	√
Being integrated with other projects such as ISSD local seed business	√

Related to sustainability are also the issue of threats that need to be addressed. Stakeholders identified issues such as old members leaving the group; wrangles and misunderstandings concerning payment of loans; loss of focus by new groups; absence of follow up; wrangles concerning the ownership of implements and inputs; termination of grants; weak leadership; land fragmentation; vagaries of nature (drought, pests and diseases) and impacts on soil are long term yet farmers have interest in short term issues (Table 3.7).

5. Lessons learnt

5.1.

A number of factors helped to make this project successful and they include the following;

- Trainings were adequate and the issues of malnutrition addressed were relevant as the problem was real and prevalent.
- Training methods for some partners such providing wide exposure in farm and exchange visits for farmers were practical and motivating.
- Multidisciplinary approach of implementing team was appropriate as there was always someone to solve the problem as it emerges.
- Involvement of local leadership.
- Technologies were simple and easy to use.
- Market for the produce was available.
- Supervision and follow up was adequate and timely.
- Monthly project meetings and quarterly meetings ensured that all partners were up-to-date with the project progress.
- Consortium agreements specifying roles and conditions clarified what is expected of each partner.

5.2. Constraints

- Unavailability of some inputs. For example, the project started without AIV foundation or breeders seed and had to start by developing an improvement programme with selection from the landraces collected.
- Level of participation is quite varied e.g. Farmers joined at point of project implementation but were missing at proposal development stages.
- Short time for implementation of activities; some breeding and institutional building aspects are at infancy stage yet the project is coming to an end. The project was very ambitious with deliverables.
- Some agents/ agencies have different expectations.
- Delay in delivery of inputs/ implements.

5.3. Brokerage and facilitation

Three organizations brokered the success of this AIV project. UCU, which coordinated and provided the leadership of the entire project. RUFORUM which organized the proposal write shops and AFRISOL which coordinated the different institutions in a solanacea family.

5.4. Capacities

The capacities to conduct multi-stakeholder engagements have been greatly enriched under the PAEPARD project. Initial support was provided by RUFORUM that convened the consortium at project inception in 2012 . RUFORUM has continued to engage with the consortium with suggestions of other stakeholders that might enrich the ongoing research. Extra support has been obtained as a result for example, the PhD student on the project has been able to access Carnegie Funding towards her research besides the Graduate tutorship Fellowship that enables her to have her tuition waived at Makerere University in return for her services as a tutor there. The consortium has also built its capacity to manage EU funds with support from the grant managers, FARA. FARA also supported the consortium's capacity in communication by encouraging different linkages within the PAEPARD community like FARNPAN and also NRI where an article was produced documenting progress in 2016. We also received training to use the OSIRIS online documentation system.

5.5. Project management

- Monthly project meetings and quarterly meetings ensured that all partners were up to date with the project progress.
- Consortium agreements specifying roles and conditions clarified what is expected of each partners.

5.6. Policy environment

Universities were very supportive because the project fit into their community outreach programs. Some of the result outputs are disseminated through this arrangement. This work also directly supports the National Seed Policy (MAAIF, 2016) whose mission is to have 'a competitive, profitable and sustainable seed sector where farmers access affordable quality seed and planting material.' Until now there has been no initiative to develop indigenous vegetable seed in Uganda.

Conclusion

- Partnerships are an effective vehicle for running a cross-cutting project like this one on nutrition as it brings a plethora of disciplines and institutions working jointly and disseminating the solutions.
- Partnership approach is slow; therefore long planning horizons are needed when implementing such a project.
- Partners with a common problem like malnutrition seek consensus of working together easily.
- Communication involving direct messages is a key in implementing multi-stakeholder projects. Monthly and quarterly interactions ensure that conflicts and misunderstandings are solved immediately.

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