

# Scaling-up improved legume technologies in Tanzania (SILT): Final Technical Report



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with ASA, IITA, WUR

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## Acronyms

ACT	Agricultural Council of Tanzania
AEZ	Agro-ecological Zones
AFAP	Africa Fertilizer and Agribusiness Partnership
AFS	Agriculture and Food Security
AGRA	Alliance for Green Revolution in Africa (AGRA)
AMDT	Agricultural Marketing Development Trust
ARIs	Agricultural Research Institutes
ASA	Agricultural Seeds Agency
ASHC	Africa Soil Health Consortium
B&MGF	Bill and Melinda Gates Foundation
CABI	Centre for Agriculture and Biosciences International
CATI	Computer aided telephone interviews
CIFSRF	Canadian International Food Security Research Fund
CRS	Catholic Relief Service
Demo	Demonstration
DfiD.	Department for International Development
DRC	Democratic Republic of Congo
EAC	East African Community
FIPS-Africa	Farm Input Promotional Services Africa
FRI	Farm Radio International
GAC	Global Affairs Canada
GALA	Gender and the Legume Alliance project
IDRC	International Development Research Centre
IITA	International Institute for Tropical Agriculture
ILTs	Improved Legume Technologies
MSc	Masters
MVIWATA	National Farmers Umbrella Organization
N/A	Not applicable
NARS	National Agricultural Research System
NLA	National Learning Alliance
PICS	Perdue Improved Crops Storage
QDS	Quality Declared Seed
SADC	South African Development Community
SAIRLA	Sustainable Agricultural Intensification Research Learning Alliance
SILT	Scaling-up Improved Legume Technologies
TAHA	Tanzania Horticultural Association
TASTA	Tanzania Seed Traders Association
TBC	Tanzania Broadcasting Corporation
TCRA	Tanzania Communications Regulatory Authority

TFRA	Tanzania Fertilizer Regulatory Authority
TOSCI	Tanzania Official Seed Certification Institute
VAT	Value-added tax
VBA	Village-based advisors

## 1 SILT executive summary

How do researchers and scientists reach farmers with their latest research results, recommendations and new varieties? How do they get the right information, seed and inputs to female and male farmers at the right time so that they can make informed choices to use the new technologies which will benefit their families through increased yields, nutrition or income? How do development actors encourage farmers to start to use these new technologies? And how can this be done at scale – reaching millions of farmers with relevant cutting edge research results – while ensuring all supporting input and output systems are operational? These are the issues that, in brief, this project examined, encompassing both research and development objectives.

In 2015 a group of likeminded organizations came together to explore a campaign-based extension approach to development communications for impact and scale, using funds and a methodology developed by CABI as part of its work on the Africa Soil Health Consortium. Our assumption was that instead of lots of individual organizations sending out differing advice to a few farmers, the organizations would work together to agree on those messages, and deliver them – at scale - through an integrated campaign approach ... messages that were technically identical, but where the delivery was tailored to the various members of the small-scale farming household, through different, but linked communications media. With this as a starting point, Farm Radio International, Shujaaz, the N2Africa project, [supported through the International Institute for Tropical Agriculture (IITA) and Wageningen University], the Africa Fertilizer and Agribusiness Partnership, the Agricultural Seeds Agency (ASA) and the Centre for Agriculture and Biosciences International (CABI) - as a consortium known as the Legume Alliance - produced its first co-ordinated common bean campaign. This campaign was known as *Maharage Bingwa* (champion beans).

As the consortium was reviewing its opportunities for continued research and development of this idea, the International Development Research Centre announced the Phase 2 call of the Canadian International Food Security Research Fund (CIFSRF). It was clear that our campaign based scaling strategy could become the centrepiece of the application. The team had two research questions.

- **Does the campaign based approach make uptake more likely?**
- **Does empowering more family members with direct access to information on agricultural approaches, change the decisions that households make - or the decision-making processes that lead to those decisions?**

In short, we wanted to test our theory of change and scaling strategy (see Box 2). The Legume Alliance realized that it needed to evolve to include key expertise on input markets. The Africa Fertilizer and Agribusiness Partnership and the Agricultural Seeds Agency (ASA) joined the Legume Alliance.

Over 28 months, the Scaling-up Improved Legume Technologies (SILT) project has used a unique scaling strategy to deliver a number of campaigns in the Northern and Southern Highlands of Tanzania, promoting soybean and common bean technologies (see Box 1 for definitions) which were developed and tested through a combination of work by the Selian Agricultural Research Institute and the IITA-led

N2Africa research project. This is significant in that only proven technologies, capable of deliver increased productivity and profit, were promoted.

After an extensive research process, we have evidence to show that the campaign based approach works. The SILT project has proven that the more sources of information that reach a farming household, the more likely they are to implement new technologies.<sup>1</sup>

### **Why invest in the campaign based approach?**

The SILT project has shown for the first time the value in investing in a multi-media approach to achieve scale. We now have evidence that a multimedia approach, framed in a knowledge based business model – works. This is a key result in itself which will move the field of development communications for agricultural extension forward, and has potential to eventually benefit millions of farmers. We believe this is the first time this has been tested, and can lead to considerable improvements in national extension and scaling strategies. Arguably, these results have been reached due to our concurrent success in the seed/input supply and policy areas, which provided the supportive environment needed for farmers to be confident and able to start to use the promoted technologies and practices.

The total overall investment in SILT was CAD 1.95M (including contributions from CABI), of which perhaps CAD 1.25 was spent on direct campaign costs (rather than servicing the grant, monitoring and evaluation, capacity building, policy related work and supply chain interventions). We reached 650,000 individuals over 28 months – costing less than CAD2 per farmer reached directly, and just less than CAD10 per farmer who has started to use one or more of the promoted practices. We suggest that this represents excellent value for money and cost effectiveness as a development initiative. Further work could refine the value for money represented by different campaign elements.

Specific results and findings from the various studies and evaluations conducted during the project include:

- The combined media campaign reached an estimated 655,662 members of farming households - 394,023 male and 261,639 female - over the project period with information about integrated legume technologies.
- The media campaigns stimulated an estimated **128,589** (77153 male and 51436 female) members of farming households to take up at least one of the promoted improved legume technology practices.
- The use of multiple delivery and communication approaches had a positive effect on the knowledge and uptake of the promoted technologies.
- The media campaigns included the following elements:
  - six radio series over five radio stations with estimated 508,000 listeners
  - half a million comics

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<sup>1</sup> This is based on outcome evaluation data collected by FRI, AFAP and CABI which points towards this conclusion. See the outcome by objective section later in this report for further information on this.



- 32 demonstration plots
- tens of thousands of SMS and weekly poll interactions via mobile phone
- 11,500 listening group members
- 10,000 copies of 10 different extension support materials distributed targeting farmers, extension workers, agro-dealers and other intermediaries
- 186 agro-dealers trained on input business management.
- Seven key areas of policy were changed in line with the discussions that SILT facilitated.
- In early 2018, new information from Ministry indicated that Selian 13 and other legume varieties were registered.
- Community-based demonstrations and field days encouraged women to participate, enhancing uptake of innovations. Women and youth were effectively reached through radio listening groups at community level.
- No significant difference observed in uptake of practices by both men and women across all practices, though proportionately more men used chemical fertiliser and rhizobium inoculant
- The adoption of improved varieties and incorporation of residues during land preparation were the 'most' adopted practices for common beans. For soybean, the adoption of improved varieties, the use of inoculants, and the use of the promoted spacing were the most often 'adopted' practices.

The percentage of radio listeners recorded in the outcome evaluation was lower than that usually observed in other FRI projects in the area. This may have been caused by the gap in time between the administration of the final outcome survey and the implementation of the activities. Nevertheless, the implementation of the radio programs allowed us to reach an estimated 508,000 listeners<sup>2</sup>.

Through the SILT partnership, significant strides were achieved in some of the key areas needing attention in national seed and extension systems for supporting scaling up. The integrated campaign approach to communications has reached a wider small scale farming audience with appropriately targeted messages, influenced the supply chain to be more receptive and reflexive and transformed policy. All this has boosted market scale-up of improved legume technologies and improved uptake of the promoted technologies.

Key enabling factors include having a wide variety of partners covering the complexity of activities and issues involved: seed supply, research, policy, communications and interactive radio. These partners realised early on the value of that each organization brought to the consortium, and that synergies and close integration would be the key to achieving and sustaining our objectives.

Another key factor was the high level of consistency of the message across the campaigns at scale. Having one technical brief, signed off at national level, was vital. However what really made the difference was the skill involved in, and therefore the effectiveness of, tailoring these messages to the targeted audience segment.

One of the key limiting factors the delivery team faced was that the improved bean varieties preferred

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<sup>2</sup> See Annex Nine - Outcome Evaluation summary.

by Tanzanian farmers were not formally registered in Tanzania. We could not openly promote these varieties, and farmers used informal seed markets. This led to confusion over whether improved varieties bought through the informal markets counted as improved seed. Access to new varieties remained a challenge as did the high cost of key inputs such as fertilizer. However, all the agronomy recommended for the officially registered beans in the campaign was in tune with what farmers needed and that became the focus.

A second issue was the supply and demand conundrum - between farmers keen to buy inputs; and seed producers and agro-dealers not convinced that farmers would purchase them. This was largely due to a mismatch between what farmers wanted to buy, and what could be sold through formal channels. It was also partly from a perception that farmers were not prepared to pay the market rate for inputs.

A SILT-led policy influencing process led to a consensus amongst the key opinion formers in the area of seed to help break this deadlock. An event of key stakeholders facilitated by SILT was timed to happen just ahead of a public consultation on the seed regulations. Seven key areas of policy were changed in line with the discussions that SILT facilitated. The convening power of AFAP and IITA has led to a key group coming together, one that suggested highly pragmatic approaches to cut input costs and get seed varieties registered more quickly. A second important change was the expansion of the community-based seed systems for bulking up new varieties. These policy changes will make the second limiting factor less important in subsequent years.

Under the demands of the SILT project, the Agricultural Seed Agency (ASA), has seen a seismic shift in their business model – which now includes them actively working to develop stocks of foundation seed and certified seed for both soybean and common bean varieties. The private sector seed producers are now following suit. IITA has been working to develop distribution channels for inoculant in North and South Tanzania. This should slowly put in place the functioning supply chains for inoculant and seed. To succeed this requires “pester power” from farmers reassuring the agro-dealers that they are interested in these inputs. This appears to have happened through the campaign. Key players in the seed system are now involved in solving its complexities.

Five MSc students worked within the project, four of them women. The National Agricultural Research system is very short of women in leadership roles. The five theses will contribute to the understanding of the campaign-based approach. Further journal papers will follow.

The project set out to explore gendered approaches. Annex Five presents a drama script developed by FRI and partners to explore different approaches to focusing women’s attention on improved legume technologies. Annex Seven contains details of Shujaaz and CABi working together to package common bean information to young people. Through its partnership with Shujaaz, SILT has been part of a big conversation, using comics and social media platforms, that has transformed young peoples’ attitudes to agriculture as an aspirational livelihood. Now, unlike their grandparents, young people want to farm smart as agricultural entrepreneurs.

Through the communications activity that the SILT delivery teams and the project champion have undertaken, there is a great deal of interest in how the approaches developed in this project can be taken to scale. This approach is referred to as *Supra-SILT*, showing how the project has achieved traction with some key opinion formers in legume technologies. The campaign-based approach is also being piloted in Ghana in soybean farming areas.

Reaching farmers through a variety of channels (print, demonstration plots, comics, interactive radio) and offering them chance to question and discuss the information, is half of the picture. In order to sustain the benefits, the national extension and input supply systems must operate in tune with the farmers and respond to their needs. The campaign approach gives farmers the opportunity to understand their options, but also to express their needs – representing an integrated, responsive and mutually beneficial framework for progress. We have taken the first steps towards understanding this, operationalizing it, and leaving the key building blocks for sustainability in place during this 28 month project.

## 2 The SILT research problem

Introducing and scaling-up improved agricultural technologies is a complex and long-term activity, incorporating supply, policy, extension, gender and socio-economic issues and market alignment to name a few. The Scaling-up Improved Legume Technologies project (SILT) was designed to address some of these issues, while promoting scaling and increased uptake of integrated legume technologies developed through the N2Africa project (led by IITA).

The research conducted within SILT aimed to test and understand how a campaign approach to scaling, with different format and media targeted different members of a typical small-scale farming family (ie young/older or male/female and combinations thereof) could best reach each individual, and then influence their knowledge, decision-making and adoption as a household (see also Box 2). The extension and communication information was presented as a campaign based approach, and the technical campaign material was all drawn from a single, technical brief, developed by the delivery consortium.

It is important to note that this initiative included both research elements, and development aims. We wanted to understand the contextualized insights into the relative merits of different combinations of media and approaches, to provide key learnings for future scaling-up programs by the partners and others, while at the same time increasing the use of tested improved legume technologies, focusing on common bean and soybean, in Tanzania.

During the initial months of the project, we decided to focus on common bean and soybean only. The project set out to employ gendered approaches to delivering information.

### Research questions

Our research challenge was to test how the different combinations of media and approaches work together:

- Which combinations contribute most to changes in awareness attitude and behaviour?
- Do different combinations better reinforce messages and lead to more retention of the key messages?
- Does providing multiple messages into farming households and communities change the decision-making processes and dynamics within the family?

#### **Box 1: What are improved legume technologies (ILTs)?**

There are 7 ILT practices recommended for common bean:

- P1. Incorporate residues when preparing land
- P2. Use seeds of improved varieties as developed by N2Africa
- P3. Recommended spacing
- P4. Recommended weeding
- P5. Use of P fertilizer
- P6. Time of harvest
- P7. Use of PICS (Purdue improved crop storage) bags for storage

#### **Practices for soybean:**

Practices P1-P6 above plus

P8. Use of inoculant

In addition, advice and responses were given around managing pests and diseases.

**Box 2: SILT scaling strategy: theory of change and assumptions**

Our scaling strategy was to develop a multi-media campaign, using radio as the hub to reach hundreds of thousands of farmers. The radio programs were coupled with print, demo plots, training days and mobile phone interactions, to support traditional extension approaches. This is in contrast to most development communication projects, which are usually constrained to a single form of communication - due to limited time, knowledge of alternative forms of media, or budget/ logic model limitations. Many development communications projects involve intensive face-to-face efforts and are cost and labour intensive. SILT hoped to show that there are cost-effective alternatives to reaching scale, and a range of options to suit different target groups and objectives.

Our project theory of change is an extension of FRI's theory of change that has been tested over 100 times across 8 countries in Sub-Saharan Africa: having opportunity to engage, ask questions, have their doubts responded to, and hear from other farmers, leads to changing perceptions and attitudes, and increased likelihood that farmers will take action to start practicing new ideas. We added to this theory a co-developed and agreed technical brief as a cornerstone of this approach. All campaign partners used an agreed technical brief as the basis for developing the different forms of messaging – be it radio, demo plot, SMS, comics. In addition, we know that women and men, young and old, prefer to get their agricultural information from different sources – word of mouth, mobile phone, radio. This tailored messaging is key to our theory of change, with different delivery methods for different groups. Therefore, through radio programs, mobile phones, face to face demonstrations and trainings and social media, we emphasised interactivity and dialogue, and tailored messages to different groups so as to increase the chances of change happening. Radio enables this to happen at scale.

The key research questions in this project have not changed to any significant degree during the project implementation. We have learned a lot, and with hindsight might now frame the questions in a more nuanced way, but the main research questions still stand.

**The crops**

SILT partners worked with two crops common bean and soybean. These are very different crops.

	Common bean	Soybean
<b>Rationale for growing</b>	Mainly a household consumption crop	Cash crop with some development of home consumption capitalizing on the high protein content
<b>Markets</b>	Ready market locally from households wanting to eat bean	Mainly by off-takers for processing – meaning Tanzania farmers compete on world commodity markets and prices are volatile
<b>Weather</b>	Common bean is not drought resistant but is more robust than soybean	Soybean needs to be planted in a window of perfect rainfall – too much or too little will have a big impact on the crop

<b>Seed</b>	<p>The locally preferred seed varieties had not been approved for use in Tanzania – so could not form part of the campaign</p> <p>Many farmers buy grain in the markets as seed</p>	<p>Seed varieties meeting local market requirements were available</p> <p>Many farmers buy grain in the markets as seed</p>
<b>Inoculant</b>	There has not yet been an inoculant developed for use with common bean	Inoculant approved for use in Tanzania in 2015

Table 1: Comparisons between common bean and soybean

The SILT delivery team was, therefore working with two very different legumes and two different sorts of improved technologies, and, therefore, different contexts for scaling up.

In the case of common bean the technologies were familiar – the message was to use improved seed. That is to substitute more productive varieties for what you already grow and add fertilizer (the fertilizer is different – but many farmers add some fertilizer to their maize so the concept is familiar). In the case of soybean, we were adding a completely new innovative product, inoculant. This seed treatment boosts soybean production and soil fertility –by enhancing the process of biological nitrogen fixing by adding good bacteria at planting. And because the inoculant is a living product very specific cold chain storage is required.

## Context

In the outcome evaluation survey, led by SILT partner FRI, we gathered various contextual information to put our findings into context, especially among legume growers. We present some key statistics here as background.

Mobile phone ownership is a key factor for success in scaling and interactivity tools. While it is a moving target, for now we see a significant difference between male and female respondents ( $p < 0.001$ ) in ownership of mobile phone (Table 2). 82.7% of male respondents own a cell phone compared to 67.1% for female respondents.

Ownership of mobile phone	Female	Male	Total
Yes, it is mine.	67.13%	82.66%	74.92%
Yes, I use someone else's mobile phone.	15.32%	6.98%	11.13%
No, I do not have access to a mobile phone.	17.55%	10.36%	13.94%
<b>Total</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>

Table 2. Respondent's ownership of a mobile phone

Table 3 below shows that among respondents, most of the land was owned either through a formal title

(48%) or customary rights (31.5%). Most respondents (79.7%) indicated that their farmland was 5 acres or less. This percentage was 84.7% for women respondents compared to the men (74.8%;  $p = 0.001$ , chi-square test).

Most of the land is ...	Female	Male	Total
... owned through a formal title	48.51%	47.57%	48.04%
... owned through customary rights	30.21%	32.77%	31.50%
... rented from the owner	10.43%	9.41%	9.92%
... considered owned by the household without formal allocation	8.94%	6.87%	7.90%
... borrowed from the owner	0.74%	1.27%	1.01%
... part of communal or “trust” land allocated by local authorities	0.53%	1.06%	0.80%
... given temporary free access from the owner	0.43%	0.42%	0.42%
Other	0.11%	0.53%	0.32%
I don't know	0.11%	0.11%	0.11%
<b>Total</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>

Table 3. Ownership of the land for female and male respondents

As noted in Table 4 below, most respondents (79.7%) indicated that their farmland was 5 acres or less.

Size of farmland (acres)	Female	Male	Total
Less than 2 acres	38.94%	28.33%	33.62%
2-5 acres	45.74%	46.51%	46.13%
More than 5 but less than 10 acres	11.06%	17.34%	14.21%
10 acres or more	4.15%	7.61%	5.89%
I don't know	0.11%	0.21%	0.16%
<b>Total</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>

Table 4. Size of farmland for female and male respondents

A few survey questions were included to provide basic information regarding food security, dietary diversity, and food sources. Table 5 shows that about half of the respondents indicated to have experienced some form of food insecurity during the year. Most of the households lacking food part of the year indicated that this situation occurred ‘sometimes’. The difference between sex was significant ( $p = 0.024$ ) with slightly more female respondents indicating that they had experienced food insecurity.

On average, respondents indicated that they were having a source of protein (meat, eggs, legumes) 3 days per week (standard deviation = 1.75) with no significant difference between sex (results not shown). Finally, practically all respondents (96.9%) indicated that they were getting their food from their own land, with 42.9% stating getting food from the markets. Other sources of food (gifts, aid, food for work, harvest from outside the farm) were all below (3%).

Frequency of household not having enough food in last 12 months	Female	Male	Total
Never	48.1%	53.5%	50.8%
Seldom	10.2%	6.4%	8.3%
Sometimes	38.9%	37.3%	38.1%
Usually	2.2%	2.3%	2.3%
Always	0.5%	0.4%	0.5%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Table 5. Frequency of household not having enough food in last 12 months for female and male respondents

As per the design of the survey, all respondents grew common beans. Although more households tended to use common beans at home, many were also selling them at the market or doing a mixture of home consumption and selling at the market (Table 6). The difference was significant among female and male respondents ( $p = 0.003$ ), with women more likely to use common beans at home. Among households selling common beans, about 47.2% indicated that these were their main cash crop (results not shown). Close to 74% of respondents (results not shown) indicated that they were intercropping beans with maize compared to 19% for monocropping. No significant differences between female and male respondents were observed in the percentage of households growing the different crops. In the context of the SILT project, it is interesting to note that the use other legumes was relatively low.

Common beans used at home or sold at market	Female	Male	Total
All or almost all is used at home	24.9%	19.9%	22.4%
Most is used at home	27.0%	23.4%	25.2%
About an equal amount is used at home and sold	15.7%	16.8%	16.3%
Most is sold	31.2%	38.5%	34.8%
All or almost all is sold	1.2%	1.5%	1.3%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Table 6. Common beans consumed at home or sold at market

### Summary and objectives

In summary, the goal of the SILT project is developing and using innovative and complementary communication approaches to scale-up improved legume technologies and establish sustainable input supply systems.

The project's vision was that by the end of the project, an information and distribution network of improved legume technologies driven by farmers and input suppliers, supported by various ICT systems operates efficiently and benefits at least 500,000 small-scale farming households in Northern and Southern Highlands of Tanzania. The four main objectives, with their expected outcomes, are:



- Objective 1:** To scale up various relevant legume technologies in northern and southern Tanzania
- Outcome 1.1** 500,000 farming families access improved legume technologies and related knowledge
- Outcome 1.2** At least 250,000 farming families in Northern and Southern regions (of which 50% female/youth) show increased knowledge
- Outcome 1.3** 100,000 farmers (of which 50% female/youth) start to practice one or more of the improved legume technologies
- Objective 2:** To test and assess the effectiveness of a multi-partner mixed media campaign in scaling up legume technologies
- Outcome 2** Evidence of effective combinations of delivery approaches to achieve change at scale established
- Objective 3:** To inform decision-making and policies that facilitate access and use of legume technology inputs
- Outcome 3** Evidence being used by policy makers to draft or revise policies that facilitate access and use of legume technologies
- Objective 4:** To strengthen the capacity of the national systems to improve small-scale farmers access to inputs and markets
- Outcome 4** Capacity of national input supply systems strengthened

### 3 Progress towards the milestones

The SILT project developed 30 milestones to aid progress tracking over the 28 month implementation period. At each six month interval, the team reported on progress towards achieving that period's milestones. A detailed table of milestones, with progress, evidence and comments is presented in Annex One. The majority of the milestones were achieved, whereas towards the end of the project, a few are showing 75% achievement.

In the first reporting period, the consortium completed all administrative inception activities, including: an official Inception Meeting attended by GAC, IDRC, the full consortium and district officials; development of four strategy documents; and all staffing and sub-contracting agreements. Start-up activities completed included: selection of demonstration plots, inoculant screening, radio audience research and a write-shop to finalize the soybean technical brief.

The milestones completed during second reporting period related to key initial activities. Milestones completed included:

- 500,000 copies of Shujaaz distributed (estimated reach of 75,000 within project target areas, reaching core target audience)
- interactive radio series begun on four stations in two regions
- 2,500 copies of extension support materials on common bean targeting agro-dealers produced and distributed during AFAP demos and extension staff in Southern and Northern Tanzania
- 12 tonnes of soybean seed produced (three varieties)
- agro-dealer trainings and farmer field days held
- first policy meeting was convened in Arusha.

As the project moved towards the mid-phase, the focus shifted to establishing and running soybean demo plots and training agro-dealers. We also started to work with FIPS – Africa and use their Village Based Advisors and groups as community listening groups for soybean. At this stage the MSc students research was well developed, and we began to collect data through sister projects, notably the Gender and Legume Alliance initiative led by CABI.

At the end of the second year of project implementation, we have published one journal paper, and have two under review, and three under development. During this period we completed six interactive radio series on five radio stations, and reported on the outcome evaluation of the soybean programs, implemented with supplementary funding from the Catholic Relief Service. ASA produced over 30 tonnes of certified seed and 24 tonnes of basic seed in the promoted varieties, while CABI led the development of a guidelines for investors manual - a copy of the prototype guide can be found in Annex Two.

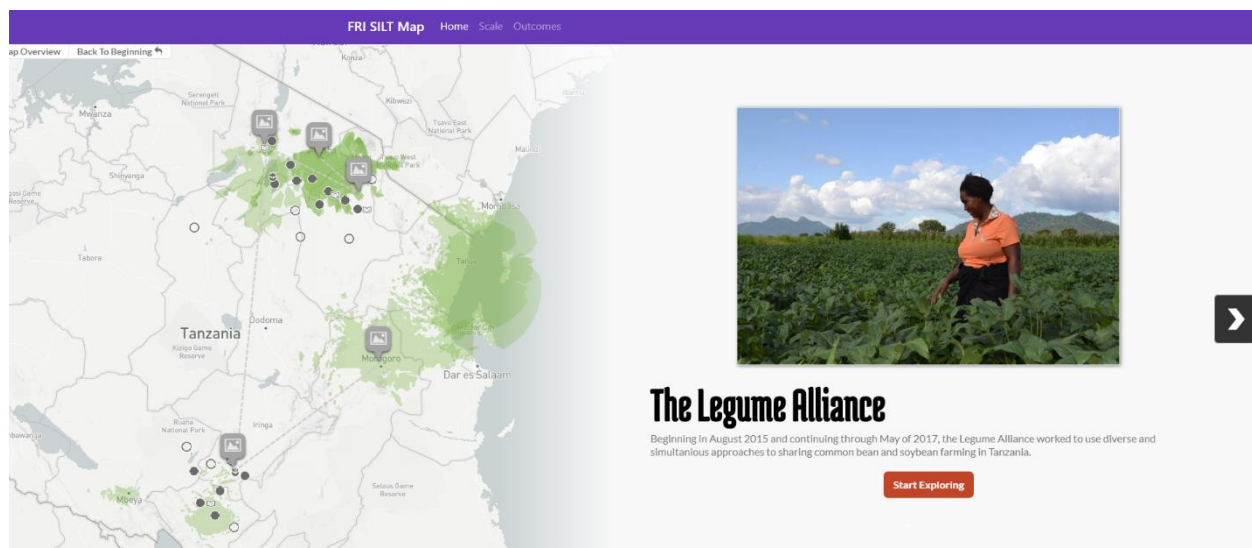
The final project outcome evaluation was delayed by one reporting period, mainly due to the need to encompass all project elements in the evaluation, and the complexity of the research design, sampling and questionnaire which took time for one project partner to coordinate with all consortium members.

We estimate that the campaigns directly reached an estimated audience of 655,662 (394,023 male

beneficiaries and 261,639 female), with a potential combined audience of up to eight million (demo plots, radio plus interactive tools, comics, printed materials, agrodealers, extension staff). Without a solid project baseline, knowledge gains are difficult to estimate with confidence. However, the milestone for uptake has been achieved, with an estimated 128, 589 starting to use one or more promoted practices in common bean or soybean. The policy related milestones have been largely achieved.

There is evidence to show that the campaign based approach works - the more sources of information that reach a farming household, the more likely they are to implement new technologies. The tailoring of the information – to attract youth, or women for example, contributes to this. These findings, combined with an improved understanding of the networks and linkages needed for effective national seed supply systems which improve and increase small-scale farming families' access to input and outputs markets, will be the main legacy of this project.

FRI has facilitated the development of an interactive results map to illustrate reach and potential reach based on project data that will be finalized in early 2018 and shared with all consortium partners and other development organizations in our distributions networks. View the latest draft of this map here: <http://bit.ly/FRIresultsSILT>



FRI has developed a new approach for showing the way that campaigns come together using an approach called story maps. Over the coming months FRI and CABI will be building on the ground work undertaken by FRI and their consultants to explore how the mapping technology presented in this report can be used as a proactive planning tool, as well as an evaluation tool. This should help to make better investment decision and ensure that the campaign based approach is employed effectively with sufficient co-location of media and approaches. Some dataset will be developed – such as radio coverage maps, or the location of agro-dealers, to which more dynamic data can be added such as the location of demo-plots. Both FRI and CABI are very excited by the potential of this technology.

## 4 SILT synthesis of research results and development outcomes

### Overview

The SILT project's expected development outcome was to achieve scale in terms of number of farmers reached with information by targeting farming families through multiple, tailored entry points – young, old, men, women - as way of both introducing and reinforcing key messages on improved legume technologies for common bean and soybean in Southern and Northern Tanzania.

Our related research focus was to evaluate the effectiveness of the various dissemination approaches, and combinations thereof, in raising awareness and knowledge, and stimulating farmers to test improved legume technologies on their farms.

In order to answer our research questions (see section 2), SILT undertook various assessments (which are not additive) which provide useful insights and policy implications for future engagement in similar interventions. They include:

- i) IITA-led support of five MSc. Students, who researched on the effectiveness of communication methods and gender influences affecting adoption of new technologies;
- ii) CABI-led intra-household surveys capitalizing on the Gender and the Legume Alliance ([GALA](#)) project
- iii) CABI-led Computer aided telephone interviews (CATI) survey capitalizing on the Gender and the Legume Alliance (GALA) project
- iv) Case studies
- v) FRI-led outcome evaluation for soybean campaign in Southern Highlands
- vi) FRI-led Final project outcome evaluation – common bean in the northern regions (see Annex)
- vii) Data source: Print materials used in learning
- viii) FRI-led Focus group discussions in the northern regions

The research pieces were conducted across SILT impact areas indicated below



Figure 1: SILT research sites

Through the SILT partnership, significant strides were achieved in some of the key areas needing attention in national seed and extension systems for supporting scaling up. The integrated campaign approach to communications has transformed policy, influenced the supply chain to be more receptive

and reflexive and reached a wider small scale farming audience with appropriately targeted messages. All this has boosted market scale-up of new legume seed and has improved uptake of the promoted technologies.

## Review by objective

**Objective One: To scale up various relevant legume technologies in northern and southern Tanzania.**

*Outcome 1.1. 500,000 farming families access improved legume technologies and related knowledge.*

We aimed to reach 500,000 farming families through the various elements of the multi-media campaign.

	Media	Reach	Notes	Running total
A	Radio – actual listeners	508,000	Soybean= <b>165,900</b> Common bean = <b>342,100<sup>3</sup></b> <i>*Both estimations based on extrapolation</i>	508,000
B	FIPS-Africa	11,500	Estimated	519,500
C	AFAP demos	1,682 plus estimated 20,000	Actual attendees  Plus approx influence of 20,000	521,182
D	Shujaaz	75,000	Estimate	596,182

Table 7: SILT estimates of reach for each element of the campaign

### 1.1a Radio

FRI undertook a mapping exercise to estimate the coverage of the six radio series across five radio stations involved in the project. Potential listenership of all stations engaged in the project is estimated at over eight million. The maps are presented in Annex Three.

Using these maps and population estimates, the total estimated number of listeners for the soybean component is 165,918 ~ **165,900**.

The total estimated number of listeners for the radio programs on common beans is 342,095 ~ **342,100**.

In total, combining the soybean and common bean radio series, we thus estimated that **508,000** adults living in areas of the Southern & Northern Highlands listened to at least one episode of the radio programs implemented during the SILT project. The detailed methodology for these calculations is found in Annex Four.

<sup>3</sup> This number includes populations within semi-urban and urban areas in Arusha. We decided to include these as large numbers of Arusha residents are likely interested and involved in common bean growing. If this population was excluded, the radio reach in the north would be estimated to be 136,800. For practice we decided to limit the calculation to only rural households.

*Outcome 1.2. At least 250,000 farming families in Northern and Southern regions (of which 50% female/youth) show increased knowledge*

This outcome has proven complex to measure with any confidence. For a variable such as knowledge, a more reliable method would be with a baseline. There was a trade-off between the research and the campaign requirements and the budget available. A decision was taken by the consortium and a formal baseline measurement of knowledge was not included. Without a baseline study, it is complex to measure any 'jump' or 'change' in knowledge. All we can do is compare households exposed versus not exposed to project interventions, as in Figure 2.

For a crop like common beans that has been cultivated for many years by many farmers and for which there have been many interventions - it is not that surprising to see relatively high knowledge levels among farmers 'not-exposed' to project interventions. They may have been exposed elsewhere or at some other time, thus making potential 'changes' in knowledge more difficult to detect. Furthermore, for a crop that is already well established, farmers may be more inclined to maintain their current (and somewhat proven) practices and the 'knowledge' associated with it. On a more practical note, the long time lag between the end of the project and the administration of the survey (common bean) may have affected farmers' ability to link changes in knowledge to specific interventions. The delay of the evaluation and switch of radio stations mid-project will also have had a problematic effect. However, the results show that farmers participating in SILT project activities had a higher knowledge scores, on average, than non-participants:

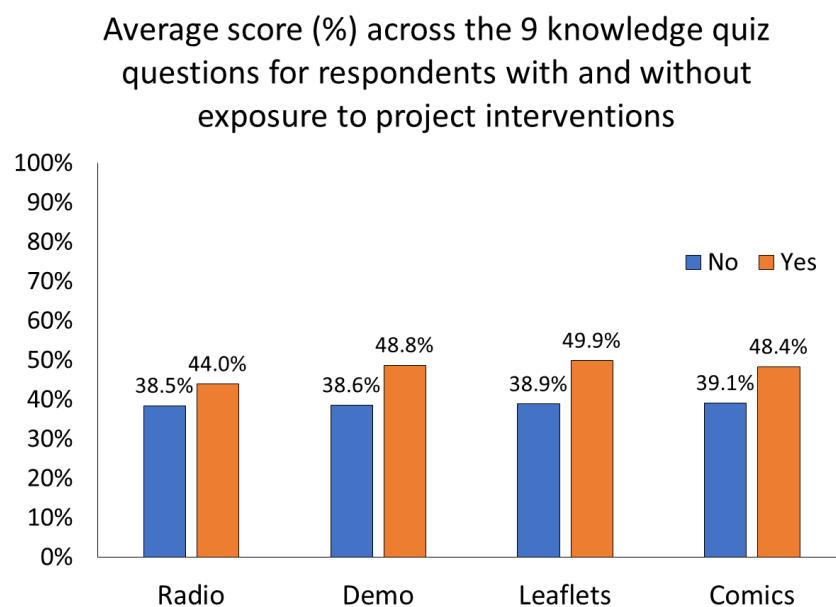


Figure 2: Average quiz scores by project intervention

The focus group discussion carried out in 2018 also gave SILT some valuable insights into knowledge levels and the how farmers understand key issues. For example, the discussions showed differences in

the way that extension workers and researcher describe varieties and the way that farmers talk about them.

Soya Njano, a variety consistently identified as a farmer preference was not registered as a recognized variety in Tanzania. Seed and grain had made its way from Kenya and had taken hold in the farmer's field as a preferred variety. The SILT campaign team could not promote this variety, however the work undertaken on seed policy has resulted in quicker routes to seed registration and these varieties should soon be finding their way into the formal seed markets. This variety appears to bring a premium in local markets, which tends to appeal to the men. The variety is also less likely to cause gas when it is digested, which makes it popular.

All the farmers bought grain as seed – some thought this meant they were improved varieties, others didn't. What is clear is that farmers get no safeguards in terms of the quality of what they buy. The perceived cost of the grain as seed is high.

*Outcome 1.3. 100,000 farmers (of which 50% female/youth) start to practice one or more of the improved legume technologies*

The total number of farmers starting to practice one or more of the improved legume technologies, as estimated through the outcome evaluation led by FRI, is **128,589**.

By crop, we estimate the total number of farmers up-taking at least one improved practice in soybean to be **16,960**.

For common bean, we have an estimated total of **111,629** farmers using one of the improved legume technologies. The detailed methodology for these calculations is found in Annex Four.

Using only the results from FRI outcome evaluations, we see that the adoption of improved varieties and incorporation of residues during land preparation were the 'most' adopted practices for common beans. For soybean, the adoption of improved varieties, the use of inoculants, and the use of the promoted spacing were the most 'adopted' practices.

THE SILT project focused on testing the knowledge based business model for scaling, and estimated reach, uptake and increased demand. We can infer that use of new varieties fertilizers and better agronomic practices have increased productivity but measuring the long term impacts is outside the scope of this effort. Data from demonstration trials shows yield increase from application of different technologies (Phosphorus, inoculants and their combinations of common bean; NPK-fertilizers on common bean). Information on area increase due to adoption of legume technologies and achieved yield is part of larger, longer term studies, including the N2Africa end line study due to take place in June-July, 2018.

### **1.1b Calculation of the Shujaaz figures**

The team started from the assumption that not all of the comics will be distributed into rural areas and within those that are, not all will result in a contribution to the knowledge of the farming family. But, to

complicate the matter further each Shujaaz will pass through multiple hands (estimates of 12 readers per copy in circulation have been suggested) and this re-circulation can go on for many months after the initial publication. The ASHC team opted for a very conservative estimate, given that circulation is 500,000 - SILT had to estimate an effective reach for the comic.

- The team estimated that 1 in 10 of the comics would land with young people likely to be able to access land = 50,000 and that half the comics would be shared with another giving us =75,000

Shujaaz is more than comics, it has other elements of the youth platform Facebook, other social media and radio – we assumed that the social media act in a supportive capacity to the comics and therefore have not added on additional numbers.

**Objective Two: To test and assess the effectiveness of a multi-partner mixed media campaign in scaling up legume technologies.**

*Outcome 2: Evidence of effective combinations of delivery approaches to achieve change at scale established*

In this section we present evidence from the various campaign elements – radio, Shujaaz, the students’ research, demo plots, print materials, on-farm trials, and focus group discussions – and describe how each contributes to the effectiveness of the integrated campaign approach.

**i) Data source: FRI-led outcome evaluation (February 2018)**

The FRI survey was administered randomly across a large number of communities and over a wide geographical scope, with 1886 respondents, covering all campaign elements and interactions where possible (see Annex Six for full methodology and results). However, the number of respondents who were exposed to multiple project activities was relatively small:

- Radio program (256)
- Demonstration plots (116)
- Leaflets (59)
- Shujaaz comics (17)

As a result, it was not possible to look at all the possible combinations of project activities. To capture this idea of ‘synergy’ among the four types of project activities, respondents were classified into those exposed to “none”, “one” or “two or more” of the project activities, regardless of what they were.

These results suggest that, overall, the use of multiple delivery and communication approaches had a positive effect on the uptake of the promoted technologies. Although practices such as row spacing, weeding, and harvest time were not influenced by project activities, we can see that the use of multiple approaches influenced the uptake of improved bean varieties, fertilizer use, and the use PICS bags. Residue incorporation during land preparation had a similar trend but was not considered statistically significant. The effect of using multiple approaches was significant when examining the number of respondents using at least 1, 2 or 3 practices.

**Figure 3** below illustrates the percentage of respondents using each of the improved practices and practicing more than 1, 2 or 3 practices for respondents exposed to 0, 1 or 2 or more project



interventions

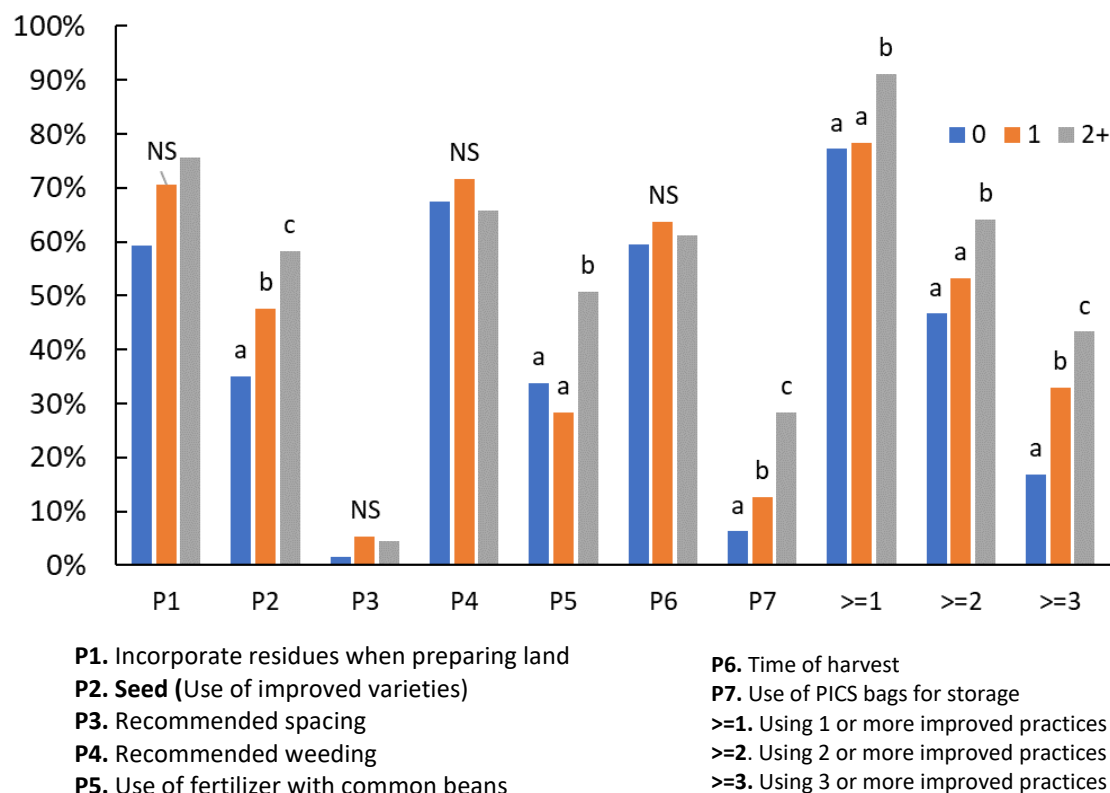


Figure 3: Percentage of respondents using each of the improved practices and practicing more than 1, 2 or 3 practices for respondents exposed to 0, 1 or 2 or more project interventions.

NB All campaigns included P1-P6 - only the radio campaign included P7.

## ii) Data source: Overview from CABI gender review

Results are based on two studies undertaken in Tanzania; i) intra-household survey of 332 households (898 individuals – o/w 451 are female), and ii) Computer Aided Telephone Interviews (CATI) of 2,930 respondents o/w 1143 are female, profiled primarily in GALA database. These surveys asked how people generally accessed information, and monitoring visits to the region.

Study results showed that more women and youth accessed information on soybean/common bean compared to general agricultural advice, due to use of interactive approaches in the campaign that encouraged more women participation at community level.

Practices such as community-based demonstrations and field days allowed women to participate in experimental design and monitoring, enhancing uptake of innovations. However, in practice the results from the demonstration plot delivered by AFAP showed significantly more men than women attending overall. Even allowing for the involvement of a local school in one of the AFAP demonstration plots,

under 35 year olds made up the majority of the places taken up at the common bean training days (see Table 9).

Radio achieved wide coverage with improved legume technologies. Integration with interactive radio listening groups at community level ensured more targeted reach of women and youth.

Monitoring visits observed higher proportion of youth and women in listening groups. Information sharing was observed at family level particularly by older and male family members. Though currently less structured, it provides an opportunity to promote family focused learning.

Uptake of technologies requiring cash input was low. However, there were no observed significant gender differences in uptake between men and women. This implies the need to focus on system wide strategies to make inputs available such as community based seed production and input brokerage.

### iii) Data source: Targeting youth with Shujaaz

In 2017, Well Told Story, the team behind the Shujaaz comic (a youth-oriented media platform consisting of comics, radio and social media), worked with CABI and the SILT team to develop one story focusing on promoting bean farming among the youth.

500,000 copies of the comic were distributed nationwide. WTS syndicated summary radio programs on the following stations: East Africa Radio, TBC FM, Kings FM, Chuchu FM, and Abood FM.

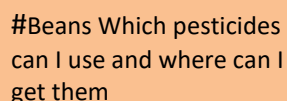
A decision was made to focus the comic approach only on common bean because it was a technology that had less entry hurdles for youth farmers as compared to soybean

It is important to undertake an assessment of technologies and review the level of complexity and sophistication required, especially when targeting new entrants to the approach. In the case of the improved legume technologies for soybean and common bean – common bean is a much more forgiving crop. The soybean technology brief is more complex than that for common bean in that it includes instructions on the application of inoculant. The application of inoculant is not a particularly complex process but the guidance on when to plant shows that soybean needs to have precise rainfall patterns to be viable. Common bean is more forgiving.

Common beans have completely different pathways to markets in that it is sold locally with very few barriers. Soybean is sold through aggregators, this means that all farmers have to get grain market

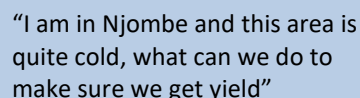
Shujaaz media has stirred conversation amongst young people on agriculture particularly beans farming through the comic and radio campaign, which has led to change of perception, interest and trial of beans farming

#### What fans said:

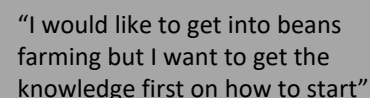


#Beans Which pesticides can I use and where can I get them

By 2017  
Shujaaz  
was  
reaching



“I am in Njombe and this area is quite cold, what can we do to make sure we get yield”



“I would like to get into beans farming but I want to get the knowledge first on how to start”

23% of all youth in Tanzania. The core demographic of Shujaaz is 16-24. During the past 3 years in Tanzania, Shujaaz has consistently presented stories that show the potential for positive economic activity from farming and agricultural value chains. In Tanzania in particular this is starting to have an impact on way that agriculture is seen by young people. Not agriculture as practiced by their grandparents – but smart farming approaches are now seen as a good option for creating a livelihood. Before the Shujaaz slow burn campaign farming was seen as one of the least attractive option for creating a livelihood.

**27%** of the survey respondents agreed with the statement *‘I am not engaged in agriculture but I would like to try some ideas’*

**56%** of the survey respondents agreed with the statement *‘agriculture is a very cool source of income’*

Source: 360<sup>0</sup> media report by Well Told Story.

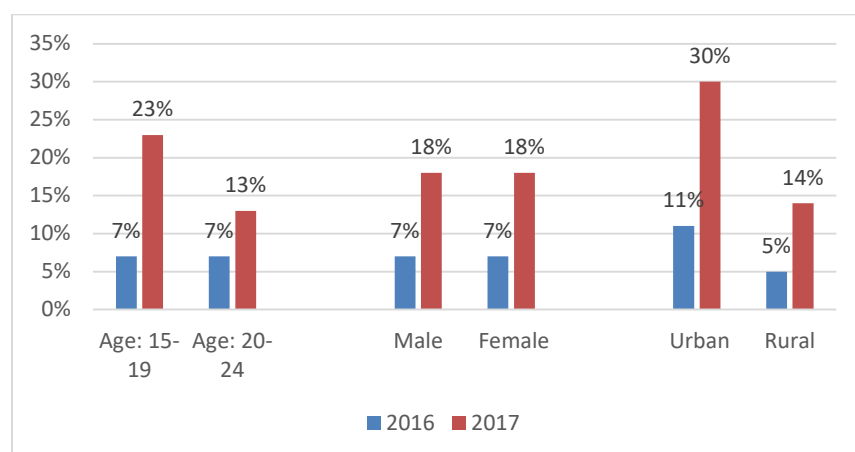


Figure 4: Age profile of Shujaaz readership as a % of the population of Tanzania as a whole

#### iv) Data source: Student study programs

The effectiveness of awareness creation methods varied according to location (AEZ) and gender (Table 4.4), and was often high in areas with project intervention compared to where there was none. Demonstration plots were often highly preferred by farmers as a method of technology dissemination, followed by radio, interaction with extension worker, farmer to farmer and printed materials (e.g. leaflets) was ranked least. The southern highlands are the breadbasket areas for Tanzania for many decades and thus farmers are quick to adopt to new technologies aiming at enhancing productivity. Because of their suitability in climate (relatively good soils with adequate rains), many interventions by the donor community, development partners, NGOs etc had been active in the southern highlands and these many activities have resulted in tremendous capacity building to the farming community in this zone. There is more interest in soybean production in the southern highlands because there have been investments by the private sector such as Clinton Foundation, Catholic Relief Services, IITA, USAID through its Feed the Future Project, Silverlands which have heavily invested in production of chicken feeds with soy bean being its main protein source.

	Northern highlands		Southern highlands	
Method	Men	Women	Men	Women
Radio	17	15	74	67
Demo	28	25	64	85
Leaflet	10	8	80	57

Table 8: Percentage of farmers accessing information from different dissemination methods by agroecological zone by gender (source students' work)

Interestingly, more than 70% of farmers were willing to pay for at least 2 technologies, with the majority ready to pay for improved seeds. Access to disseminated legume technologies, education level of the farmer, area under legume cultivation, farming experience and access to credit were key determinates to technology uptake.

Intra-household surveys showed that farmers' relied mainly on their own experience for general agriculture advices, but with significant gender differences in use of own experience, radio and other household member (Figure 4.3). There seemed to be no significant differences in accesses to information between men, women age. However, radio and demonstration plots were prerogative of men while women depended more on household members and neighbours for agriculture advice. More interesting was that information sources varied by crop, with more formal sources focusing on maize, soybean and other commercial crops.

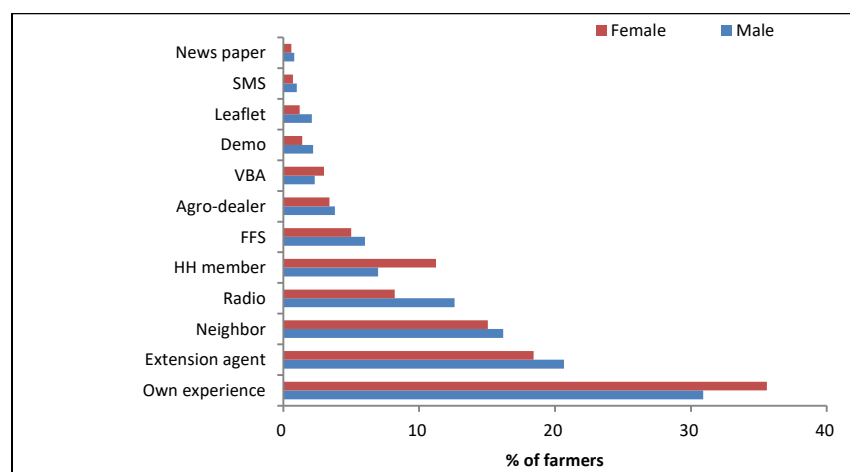


Figure 5: Access of agriculture information source.

NB. Source: GALA intra-household survey, October 2016.

Preliminary results show an increased number of farmers reporting awareness of legume technologies, and comparatively more farmers are applying promoted technologies than before.

Based on the research findings from the students research, the following statements could be made:

- 1) Interactive and inter-personal approaches facilitate learning and uptake of innovations – but there is a trade-off between reach & effectiveness

- 2) Combination of approaches is feasible as long as knowledge obtained spills over to other farmers, in which case village-based intermediaries become a key ingredient.
- 3) Gender differences exist in access to general agricultural information. Opportunities for information sharing at household and community level exist that can be enhanced to reach women and youth
- 4) Awareness of improved legume technologies is higher among SILT beneficiaries but this results is different according to the location e.g. 19% and 8% in the Northern Zone; 44 and 34% in Southern Highlands
- 5) 71% of farmers are willing to pay for at least 2 technology assessed
- 6) Willingness to pay for improved legume technologies is higher among SILT participants (72%), compared to non-SILT participants (65%), across Zones
- 7) Majority of farmers (80%) are willing to buy improved seeds.

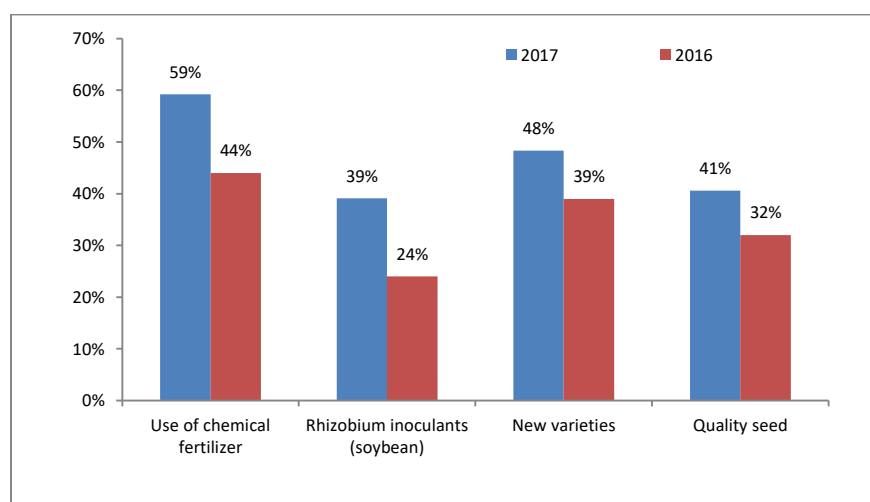


Figure 6: Shift of knowledge associated with SILT campaigns

NB. Source: Intra-household survey 2016, CATI survey 2017

#### v) Data source: Demonstration plots and training days.

AFAP established 32 demonstration plots over 2 years and followed up with farmer training days in 31 of the locations.

	Men	Women	Total farmers at training days	Youth men & women	Leaflets handed out
<b>Soybean (counted)</b>	335 (61%)	214 (39%)	549	305 (48%) were under 35 – including 120 school pupils	298

<b>Common bean (estimated)</b>	642 (56%)	491 (44%)	1,133	976 (86%)	1,508
<b>Total</b>	977	705	1,682		1,806

**Table 9: Breakdown of attendance at demo plot farmers training days**

AFAP estimate that in addition to the 1,682 farmers attending the training days at the demonstration plots some 19,000 -20,000 farmers were influenced by the training days and demonstration plots.

#### **vi) Data source: On farm trials of improved seed**

During 2016/2017 growing season, FIPS-Africa conducted 30 mother plots (30 villages) and estimated 2,163 farmers established baby plots in Wangingombe and Songea districts, Tanzania.

The mother and baby approach facilitates farmer learning from the demonstration site – ‘mother’ and trialing on their own plots –‘baby’. Comparison is then made on performance of ‘mother and baby’ plots to assess level of learning and adaptation of trained technologies by farmers. This is a strong way of ensuring high quality adoption of the technologies. At least 50% of the farmers practically involved in the demonstrations were women. This approach targeted both farmers in groups as well as individuals, which helped achieve scale of reach with ISFM information.

The mother and baby plot approach has many advantages over traditional demo plots. First, it supports on farm trial in the first year of activity. Second, the owner of the mother plot, in this case a FIPS village-based advisor act coaches to the farmers. FIPS advisors have another advantage too – in subsequent years the advisors will sell the inputs required to take the baby plot to scale.

#### **vii) Data source: Print materials used in learning**

SILT partners designed a total of 10 different extension support materials and distributed approximately 10,000 copies of the assorted extension support materials targeting farmers, extension workers, agro-dealers and other intermediaries. The materials contained messages, and key information for farmers, intermediaries and youth audiences on Good Agronomic practices, Integrated Soil Fertility Management and supporting messages on pests and diseases management, and markets for soybean and common bean farmers in Tanzania.

All materials for the campaigns were designed to be fit-for-purpose, aimed at either onward distribution to farmers through demonstration plot interactions, youth-oriented comic story distributed as a pull-out from a weekly sports newspaper and working with private sector company outlets (Coca-Cola), Point-of-Sale distribution at agro-dealers and other outlets, or as direct reference guides to be used by extension staff in their interaction with farmers.

The cost of reproducing sufficient quantities of the print materials to meet the demands on the ground was always prohibitive. However in a number of cases, partners found the materials attractive enough to invest additional resources to make photocopies to enable wider distribution. The use of simple illustrative content made the materials a valuable supporting tool for the intermediary-farmer interactions and as reinforcement of messages received from the radio programs

Materials usage ranged from reference guides, aide-memoir for farmers, point of sale information materials and infotainment-focused approaches like the comics. A key challenge was effective tracking of the various ways and places where the print materials were used, especially the comics which were distributed through commercial outlets which had a more diffused audience. The project also noted that higher diffusion of materials was directly related to the perceived quality of messages, hence in some instances, control groups of farmers who were not supposed to receive print materials still somehow received them through their informal networks.

SILT partners experimented with a variety of design concepts for materials including, flip-charts, flash-cards, posters, comics, and manuals as a way of increasing the utility of materials to support campaigns. In the case of agro-dealers, an initial assumption that ordinary hand-outs would be given out to customers visiting the shops was revised to take into account a need for display-type materials that would be hang in the shops instead. The increased utility of the materials meant that in some cases the materials were disseminated beyond the project target areas due to their perceived quality. A decision was made to focus the comic approach only on common bean because it was a technology that had less entry hurdles for youth farmers as compared to soybean which was mainly practiced by older members of the family.

**viii) Data source: Focus group discussions held in Northern Tanzania in February 2018.**

The focus groups gave valuable insights into the sources of information used by farmers and their attitudes to a campaign-based approach. Farmers from the discussions noted that they get farming information from extension officers, agrovet shops, farmer-farmer experience, all time farming experiences, radios and tv shows (Shamba Shape up). Moreover, farmers suggested the media combination of radios and demonstrations plots for farmers to learn practically, are useful as follow up on radio and leaflets.

In Arri all of the men agreed that demonstration plots were the most important method to help farmers understand the practices as they can see and actually practice themselves, but they also mentioned agro-vets. The second best was the leaflets, and then radio programs. In Gitting and Endasaki they talked about the value of a combination of radio and demo plots. The Arri women went further. They advocated the campaign-based approach. They said the most important method for encouraging changes in common bean production is demo plots where people can see what is happening, as well as leaflets and radio shows where they could hear “These can go together since each is important and not everyone can attend the demo but might see the leaflets or listen to the radio and ask questions which will be answered.” They believe multiple combinations would help reach more people at different times and serve a purpose. In Gallapo the women stressed the importance of radio in answering farmer’s questions.

The women in Gitting said in the past they had obtained information from extension officers, from demonstration plots and learning from elders. The Endasaki men and women and Migandini women also talked of elders and farmer to farmer sharing. The men in Endasaki encourage using extension officers for information. The women in Changarawe and farmers in Gallapo suggested that the radio programs be promoted so that more farmers become aware of them at the start of the season.

One farmer in Gallapo mentioned the TV program Shamba Shape up. The men in Changarawe were the only ones to mention SMS as a source of information and village meetings with experts.

The focus group discussion results in general supported and expanded on the data gathered, and are a rich source of information regarding farmer's perceptions of the campaign and the information they received. The full report is available as Annex Eight.

**Objective Three: To inform decision-making and policies that facilitate access and use of legume technology inputs.**

*Outcome 3: Evidence being used by policy makers to draft or revise policies that facilitate access and use of legume technologies*

The Project involved the Ministry of Agriculture and Presidents Office-Regional Administration and Local Government during the launching of the SILT project in February 2016. The project worked closely with extension and research institutions in Tanzania to fine tune the delivery of the project. This dialogue, and the convening power of AFAP and IITA allowed us to have influential role in shaping policy.

The SILT project convened a timely intervention when the agencies invited were about to be canvassed on their views of how regulation should be tightened. The open space for conversation created a strong sense of convergence of ideas and in many ways 'shaped the path' for regulation that followed. It is impossible to attribute all of the policy and regulation changes to this event, but we are confident that it was a strong contribution to gaining a consensus about how the key issues should be addressed.

Issue raised at seed policy workshop	Stakeholder concerns were addressed in the following amendments to the Miscellaneous Amendment of the Seed Regulations in 2017
<p><b>Regulation</b></p> <ol style="list-style-type: none"> <li>1. Weak enforcement of regulations and laws has led to escalation problem of fake seeds.</li> <li>2. Harmonizing the roles of seed regulating authorities (Ministry/TOSCI).</li> <li>3. The need to invest adequately in institutional capacity development to enable them execute their duties properly.</li> <li>4. Inadequate capacities of regulatory institutions to timely fulfill their duties-under resourcing at TOSCI leads to delays in seed certification</li> </ol>	<p>Heavy fines for anyone selling fake seeds have been imposed (USD 50,000 and USD 100,000)</p> <p>Tanzania Official Seeds Certification Institute (TOSCI) has now been mandated with NEW powers which includes confiscation of the fake seeds and destroying them.</p>
<p><b>Registration</b></p> <ol style="list-style-type: none"> <li>1. The registration process for new seed varieties takes at least two years</li> <li>2. The need to pursue regional harmonization in the EAC and SADC of seed testing and release requirements.</li> </ol>	<p>A variety that has been approved in an East African Community (EAC = Burundi, Kenya, Rwanda, S Sudan, Tanzania and Uganda) country, will not require to be tested again. For South African Development Community</p>



	(SADCC =Zimbabwe, Botswana, Mozambique, Zambia, Namibia, DRC, Angola, Lesotho, South Africa, Tanzania, Malawi, Swaziland, Mauritius, Madagascar, and Seychelle) countries, if a certain variety has been catalogued in 2 countries, it will not also be tested.
<b>Seed research</b> <ol style="list-style-type: none"> <li><b>Seed research (by government research institutions) should be market oriented to satisfy farmers' needs and reduce mismatch between seed demand and supply</b></li> </ol>	Research Institutes: Under the Tanzania Agricultural Research Institute structure, they will have a Seed Unit to be involved in commercial seed production.
<b>Seed production</b> <ol style="list-style-type: none"> <li><b>Quality Declared Seed (QDS) should be sold beyond the ward -to district level to encourage seed production</b></li> <li><b>Access of pre-basic and basic seeds of public bred varieties by private seed companies in Tanzania</b></li> <li><b>Breeders (ARIs) suffer capacity shortfalls that delay the seed variety release process and undermines the quality and availability of pre-basic seed</b></li> </ol>	QDS: efforts are underway to Review the Seed Act of 2007 in 2018 the QDS will be included and changed to enable develop new regulations that will allow the QDS seeds to be sold in the whole district and not only ward as it is the case now.

Table 10: Issues raised and addressed through the policy workshops

AFAP is still in the process of completing the full policy briefs. The regulations moved quickly and over took the need for the document to be finalized.

A communications policy meeting was held in February 2018 to explore how the lessons from the project could be used to influence policy and regulation. This was supported by Audax Rukonge, who leads the Tanzania National Learning Alliance of Sustainable Agricultural Intensification Research Learning Alliance (the DFID-funding stream supporting GALA). In attendance: Ministry of Agriculture, Livestock and Fisheries, President's Office- Regional Administration and Local Government, regional agricultural officers--Morogoro, Manyara, Mbeya, Njombe, Ruvuma, Arusha, Sokoine University of Agriculture, SAILRA NLA, Tanzania Communications Regulatory Authority

This will lead to work with the Tanzania Communications Regulatory Authority (TCRA) to explore how they can better facilitate farmers' access to information. At the meeting, Mr Semu Mwakyanjala from the regulator echoed the usefulness of the policy review day and was keen to receive the policy brief document once completed. He felt that whilst TCRA does not have a remit to control prices in the market, it serves a broad public interest requirement in the output of broadcasters, telecoms and new media and could support further exploitation of media opportunities to get information to farmers. James Watiti from CABI will lead on developing a position paper with TCRA.

**Objective Four: To strengthen the capacity of the national systems to improve small-scale farmers access to inputs and markets**

*Outcome 4: Capacity of national input supply systems strengthened*

SILT invested in the Agricultural Seed Agency to accelerate the production of legume seed. One challenge we were not able to address in the project (but have subsequently addressed through our policy advocacy work) was the non-registration in Tanzania of the farmer's preferred varieties (which were developed in Kenya). The policy changes will mean production can soon change to these varieties.

AFAP compiled an effective seeds and inoculants demand prediction with data from various villages and provided the information to the Agricultural Seed Agency (ASA) and agro dealers for supplying to farmers. The following table stipulates the demand for both soya and common bean seeds as well as inoculants:

Year	Demand for common bean seed	Demand for soybean seed	Demand for soybean inoculant
2016	7.3 tonnes	N/A	247 packets <b>[24 kg of product]</b>
2017	100 tonnes	126 tonnes	3,241 packets of Legume fix 91 packets of Biofix <b>[693 kg of product]</b>

Table 11: Changes in supply and demand for inputs

In Table 11 above, effective demand for common bean seeds was 7.3 and 100 tons in 2016 and 2017 respectively. This shows that there is an increase in the supply of common bean seeds to farmers following SILT campaign.

Table 12 below shows quantity of common bean seeds (per variety) produced and delivered to farmers in 2015/16 and 2016/17 seasons. At the beginning of the project in 2015 ASA supplied only 37252 Kilograms of common bean seeds and this was mainly in Northern part of the country.

Variety	2015/16 - kg	2016/17 - kg
Lyamungo 90	24,161	25,262
Jesca	10,235	9,634
Uyole njano	6,814	23150
Lyamungo 85	21030	22,562
Uyole 96	5802	7000
Uyole 03	50	310
<b>Total</b>	<b>68,092</b>	<b>87,918</b>

Table 12: Details of common bean seed production from 2015/16 to 2016/17

NB: Source: the Agricultural Seed Agency.

In addition, 8.167 tonnes of soybean seed was produced in 2016/17.

Table 13 below shows detail of Soyabean produced from 2015/16 to 2016/17

SN	Variety	2015/16 (kg)	2016/17 (kg)
1	Uyole soya 1	0.00	1516.00
2	Uyole soya 2	3020.00	6651.00
3	<b>Total</b>	<b>3020.00</b>	<b>8167.00</b>

Table 13: Common bean variety and amount produced per year

During the project ASA has developed agro-dealer network in both the Northern and Southern highlands. A total of 75 agro-dealers were identified and trained on input business management. These had to meet stringent selection criteria identified by ASA. These dealers will be working closely with ASA to distribute bean seed to farmers. In some areas like Babati (Bashnet) and Karatu the project has also identified some large farmers who also act as agents for seed distributions.

Agro-dealers need to be made aware that there is income to be made from seed beyond cereals (maize in particular) but legume seed business can also be an important part of their income. This will help us address the supply issues and ensure farmers are easily reached with improved seeds.

### Changes in the inoculant market

At the point of the project scoping, the SILT partners had a series of constructive conversations with a Kenyan company, MEA Ltd, about their plans to market agricultural inputs. This company had worked with the partners in the in past and had a very good inoculant product it planned to launch in Tanzania. The payback on the inoculant product was anticipated to be long-term. The aim was for the sales of fertilizer to cross-subsidize the new product and help build strength across a portfolio of products. Changes in the market and the operation of the subsidy scheme meant that the market position for fertilizer was undermined, meaning that they could no longer operate in a commercially viable way in Tanzania. In short, our chosen partner, MEA, could no longer compete with large fertilizer companies including OCP, Tanzania fertilizer Company (TFC) , YARA, and Export Trading Group (ETG).

The local buffer stock of inoculants were available. But also new private chain drivers were identified and are selling imported stocks, IITA is producing in Ibadan, Nigeria the brand Nodumax (which need registration) and Legumefix from a UK manufacturer (Legume Technologies). Legumefix was supported by a very strong distributor Farm-Ag International will serve the east and southern Africa inoculant markets. Rizobacter has more recently entered into the market. The partners in SILT , led by IITA and N2Africa are exploring how the finding of the SILT program can be used to develop the inoculant marketing – not the market position of the supplier with whom we happened have a pre-existing relationship. In the long term we will be in better position to provide a market brokerage information system to the market not to just one player.

Going forward IITA has contracted, Guavay Co Ltd, based in Dar-es-salaam and Mteweale General Traders based in Njombe, for distribution of inoculants to other agro dealers and farmers.

AFAP has led on the training in legume technologies, to contribute to the strengthening of national

systems:

August 2016 – AFAP led on the training of 36 agro-dealers and extension officers

September 2017 - AFAP led on the training of 111 agro-dealers and extension officers

The five MSc students are included under this objective, whilst the results of their research are included under Objective 2. During the project period, two young people complete Masters qualifications:

**Amina Mstapha** was awarded a Masters of Science in Agricultural Education and Extension, November 2017 by the Sokoine University of Agriculture.

**Charles Rugamara** was awarded a Masters of Arts in Rural Development Sokoine University of Agriculture SUA November 2017.

**Ernesta Sanga** of Sokoine University of Agriculture; **Scolastica Mwema** of Lilongwe University of Agriculture & Natural Resources and **Daphrose Nimbona** of Kenyatta University, Nairobi, will have their theses approved by external examiners and will graduate between July and December, 2018.

	Demo plot	Field day	Leaflet	Radio
Charles	V	V	V	
Amina	V		V	V
Sanga	V		V	V
Scolastica	V	V		
Daphrose	V		V	V

Table 14: Coverage of student data gathering approaches and experience gained

**Highlight:** SILT was delighted that a selection process that was completely on merit resulted in 4 out of 5 of the successful candidates being women. The NARS system is chronically under-represented by women at all levels.

## 5 SILT synthesis of results towards AFS themes

The team assesses that the SILT project will primarily contribute to three of the four AFS themes, in differing degrees. We present the assessment of our contributions to those three themes here.

### *Increasing agricultural productivity (Availability)*

All the improved legume technologies developed by N2Africa and promoted through this project are designed and proven to increase agricultural productivity. In addition, while an environmental assessment was not judged necessary for the scope of this project (see Annex Eleven), we can note that potential environmental impacts are low, and more efficient use of inoculants, growing nitro-fixating legumes in rotation or inter-crop, and use of fertilizer (natural, chemical), lessens use or overuse of harmful practices. With the amount of inorganic fertilizers used (recommended for the crop), it is anticipated that most if not all of the fertilizer applied was utilized by the plants thus reducing environmental pollution hazards. Furthermore, the use of inoculants helped to build the bacteria populations in the soil thus making it more “live” thereby being more environmental friendly.

The results of the project, reaching over 655,000 members of farming households, and with over 128,000 estimated to be using an improved technology, this will contribute to increased productivity at the farmers’ field. In this project, we have seen:

- increases in knowledge and changes in behaviour supporting improved soil fertility
- a high level of consistency of message across the campaigns at scale
- significant influence in relation to seed policy
- a noticeable increasing uptake of SILT promoted practices over time
- no significant difference observed in uptake of practices by both men and women across all practices, though proportionately more men used chemical fertiliser and rhizobium inoculant
- access to new varieties remained a challenge as mentioned by farmers as well as high cost of procured inputs such as fertiliser
- uptake of good agricultural practices such as spacing, early planting and crop rotation was taken up by majority of farmers, largely because there are barely any costs associated with these practices.

### Percentage of respondents with and without exposure to project interventions who are using improved varieties of common beans

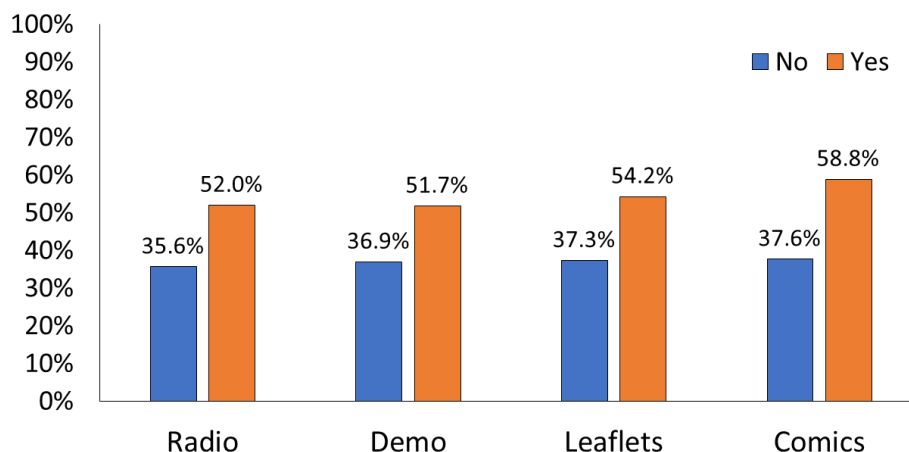


Figure 7: Percentage of respondents with and without exposure to project interventions

### *Improving access to resources, and/or markets and income (Accessibility)*

The SILT project has placed great emphasis on not only informing farmers of the improved legume technologies, but supporting the input supply systems to ensure farmers can access inputs needed. The success of the work carried out by ASA and AFAP in developing the seed supply system has gone a long way to improving access to resources, and these and wider agencies now appreciate and see the value in a more collaborative approach, trying to make the link from farmers demand to agrodealers to the seed producers.

The soybean programming in the Southern Highlands shows the complexities in working with farmers to increase productivity. The crop is new, or a recent re-introduction, and has been promoted as a cash crop. Through the efforts of the Catholic Relief Service, plus a good growing season, and use of improved practices, farmers had good soybean harvests with increased productivity. Yet, the farmers were let down at the last moment by the buyer. This emphasizes the downside of increasing productivity for what is primarily a cash crop, when it seems the market linkages are not fully embedded into the project and the markets are not ready or stable. This is especially true of world traded commodities. The price of pigeon pea has dropped by over 80% recently in central Africa as a result of an import ban being imposed by the primary market.

Any approach involving cash crops, such as soybean, still requires that the farmers can find suitable markets. More work is needed to ensure that farmers are organized and persistent in their approaches to marketing cash crops through relationships with trusted buyers. AFAP has been encouraging local government to work in this way.

In terms of access to information, we find that the ICT component of the interactive radio is engaging with a cohort of farmers in their 20s and 30s (young farmers are considered by the project to be under 35). However, radio itself reaches a significantly older demographic.

Farmers seem to rely mainly on their own experience and on a limited array of sources of information represented primarily by extension agents, radio and neighbours. Farmers will only share information about technologies they are familiar with and farmer need a different impetus for information on innovations – such as the introduction of inoculation.

When looking at potential differences in information sources between men and women, we find out that, not surprisingly, men have access to more different sources of information. Some sources seem to be the prerogative of men, such as radio and demonstration plots. Men usually have control over radio and that demos are mostly attended by men. The recruitment of farmers attending demo is usually undertaken by contacting the head of household and / or through phone, whose use if mainly managed by the men within the household. Left with fewer sources of information, women learn from their experience and share their own experience with other family members, more frequently than men do.

Women are participating in the SILT project either as first contact people (directly involved in managing the demonstration plots) or in support roles. Examples include:

- The demonstration plot in Namtumbo district, Ruvuma region is owned by a woman
- In Mbozi district in Mbeya region, the demo plot is owned by a farmer group of 84 members, 29 are women
- In Kilolo district in Iringa region, out of the 15 group members, 7 are women
- In Mbeya rural district in Mbeya region, the demo plot is owned by a group of 22 women
- 4 of the 5 research student (recruited on merit) are women

## Informing policy

The project elements focusing on informing policy in the seed and extension sectors have been very strong and successful. Approaches to policy makers under Objective 4 of this project have been well received. In the final days of the project, further seed varieties have been licensed in Tanzania, including some of the varieties promoted. In addition, we have strengthened the understanding, at government, research and policy level, of how the seed systems operate from the farmers' point of view, and what needs to be done to improve this. A wider understanding of the systems which need to be outward looking and operational has been gained by many. This was largely achieved through including key high level and strategic players in SILT policy meetings. These included: seed companies, Ministry of Agriculture, Tanzania Official Seed Certification Institute (TOSCI), Alliance for Green Revolution in Africa (AGRA), Tanzania Seed Traders Association (TASTA), Sokoine University of Agriculture (SUA), N2Africa International Institute of Tropical Agriculture (IITA), Tanzania Fertilizer Regulatory Authority (TFRA), Agricultural Seed Agency (ASA), Tanzania Horticultural Association (TAHA), Agricultural Marketing Development Trust (AMDT), Kilimo Markets, National Farmers Umbrella Organization (MVIWATA), Agricultural Council of Tanzania (ACT) and various agro-dealers.

Issues emerging from the policy discussions included:

Issues which were raised by stakeholders	Outcomes
<ul style="list-style-type: none"> <li>• <b>Scale up awareness creations using different platforms such as, radios, SMS, leaflets, farmer's exhibition show, demo plots and farmers training centers</b></li> </ul>	<p>Awareness on the need to use inoculants in enhancing common and soy bean productivity has been effective and as a result, we are seeing more inoculant demand. This has resulted into finding two local companies agreeing to be the main agents for the inoculants something that has never happened before.</p>
<ul style="list-style-type: none"> <li>• <b>Developing public private partnerships for improving awareness creation and leverage resources</b></li> </ul>	<p>The Government has also realized the potential of the inoculants in enhancing legume productivity at prices that can be afforded by all smallholder farmers.</p>
<ul style="list-style-type: none"> <li>• <b>Incentivized private sector involvement to enhance availability</b> <ul style="list-style-type: none"> <li>- <b>Enabling regulatory environment</b></li> <li>- <b>Import and local production</b></li> <li>- <b>Aggregated demand for inputs</b></li> </ul> </li> </ul>	<p>Two private sector stakeholders, namely Guavay and an agro-dealer named Mteuele have decided to be local agents for the Legumefix inoculants. The Government mechanisms should assist the private sector to aggregate demand for the inoculants well ahead of the next farming season</p>
<ul style="list-style-type: none"> <li>• <b>Establish reliable markets for pulses crops for smallholder farmer</b></li> </ul>	<p>During the SILT Project implementation period, we have realized that if there is a reliable market for the common and soy beans, it will drive demand for the technologies involved i.e. more farmers will be encouraged to adopt. There is need for the Government to regulate and create good business environment to ensure there is reliable output market</p>

Table 15: Issues emerging from the policy discussions

### Use of research results

The SILT project has involved the Ministry of Agriculture, Livestock and Fisheries and regional administration and local government ministries, from project launch, during execution of the project (in both the development of the materials and the planning and delivery of the demonstration plots and training days) until and including the final policy meeting at the end of the project.

The relationship with the GALA project has brought access to a Sustainable Agricultural Intensification National Learning Alliance in Tanzania which works as a policy hub. This will further strengthen and continue to give SILT opportunities to take its learnings into the mainstream policy arena.

Two policy briefs on enhancing availability and use of seeds and inoculants by smallholder farmers are in progress.



## 6 SILT project outputs

The SILT project is producing a number of key documents to help to share the lessons and learning from the project. The delivery team is committed to deliver these outputs in line with IDRCs Open Access Policy, where this is consistent with the stringent requirements of the journal publishers.

### Published journal papers

**Paper 1:** Achieving scale of farmer reach with improved common bean technologies: the role of village-based advisors. Journal of Agricultural Education and Extension, Kansiime et al., 2018.

<https://doi.org/10.1080/1389224X.2018.1432495>

### Journal papers under review

**Paper 1:** Determinants of Smallholder Farmers' Adoption and Willingness to Pay for Improved Legume Technologies in Tanzania. Lugamara et al (Paper submitted to African Journal of Rural Development)

**Paper 2:** Effectiveness of Communication Channels on Knowledge and Adoption of Improved Common Bean Technologies among Smallholder Farmers in Tanzania (Lugamara et al., 2017) (Paper submitted to Africa Review Journal on 13 September 2017).

### Other finalized products

**Output 1:** A manual was developed under the title "The socially engaged investors guide to communication for development: How public and private investment can influence attitudes and behaviour change in small scale farming households in sub-Saharan Africa"

This will be tested with the target audience over the next season and feedback from the prototype/ pilot will be built into a final version completed with additional support from B&MGF.

**Output 2:** Outcome evaluation summary report – FRI (Annex Six)

**Output 3:** Two backgrounder documents were developed. These are designed to provide broadcasters with key information on a specific topic in a few pages. One focuses on growing common bean, and one is on soil fertility. Both these backgrounders were translated into Swahili. These resources were distributed by email and posted on FRI website.

- <http://scripts.farmradio.fm/radio-resource-packs/105-farm-radio-resource-pack/backgrounder-growing-common-bean/>
- <http://scripts.farmradio.fm/radio-resource-packs/105-farm-radio-resource-pack/backgrounder-soil-fertility/>

**Output 4:** A range of tested campaign materials to **download and** adapt to new contexts (see Annex Ten)

**Output 5:** Technical briefs for soybean and common bean, and crop information databases on the ASHC website (See Annex Ten)

**Output 6:** Project infographic explanation of the campaign approach "Bean thinking"

**Output 7:** Project results infographic

**Output 8:** The three following Barza Wire stories were written by Tanzanian freelance writers and sent electronically to more than 3000 African subscribers, the majority of whom are radio broadcasters.

- <http://wire.farmradio.fm/en/farmer-stories/2017/04/tanzania-confusion-about-soya-bean-markets-discourages-farmers-16092>
- <http://wire.farmradio.fm/en/farmer-stories/2017/05/tanzania-farmers-switch-from-local-to-improved-bean-varieties-to-boost-yield-and-profit-16112>
- <http://wire.farmradio.fm/en/farmer-stories/2017/05/tanzania-growing-beans-is-a-family-affair-in-mbulu-16188>

- <http://wire.farmradio.fm/en/farmer-stories/2017/03/tanzania-inputs-help-farmers-improve-soya-bean-harvest-15962>
- <http://wire.farmradio.fm/en/farmer-stories/2017/01/tanzania-improved-seeds-increase-soya-bean-harvest-in-spite-of-drought-15809>

**Output 9:** Five-part gender equity drama for SILT project

FRI commissioned Kheri Mkali, a drama writer based in Dar es Salaam, to write a 5-episode serial drama on gender equity issues in common bean production, and translate the final English text into Swahili. The themes for the drama are based on findings from formative research, plus insights from a gender consultant, Dr Thembi Mutch, who worked on the SILT project. Briefly, they centre on issues such as male control of all post-harvest activities and decisions about common bean, including marketing, against the backdrop of a culture where sexual harassment and abuse are an open, unspoken secret.

[Beans, a family affair: Part 1](#)

[Beans, a family affair: Part 2](#)

[Beans, a family affair: Part 3](#)

[Beans, a family affair: Part 4](#)

[Beans, a family affair: Part 5](#)

Once we had the basic themes of the drama, we commissioned Kheri to produce an outline of the drama. Based on feedback on the outline, Kheri revised it and created a synopsis of the five episodes. Through a lengthy process of feedback, especially feedback from Thembi, Kheri produced a finished synopsis of the five episodes and began writing. All episodes were submitted to Freddy Baijukya, a knowledge partner in the project for a technical review. The final version of the drama is available in English, French and Swahili. The scripts were distributed by email and posted on our website.

**Output 10:** Charles Rugamara, Sokoine University of Agriculture, thesis title: Effectiveness of Communication Channels and Smallholder Farmers' Adoption of Improved Legume Technologies: a case of Morogoro Region, Tanzania

**Output 11: Amina Mstapha**, Sokoine University of Agriculture, thesis title: Effectiveness of Extension Methods for Scaling-up Improved Common bean Technologies Among Small-scale Farmers in Babati District, Tanzania

### **Work in progress**

Journal papers under development

**Output 1:** Journal paper Determinants of farmer behavioural change

**Output 2:** Journal paper Complexity of scaling-up agricultural technologies in sub-Saharan Africa: room for innovation

**Output 3:** Journal paper Cost-effectiveness of different delivery approaches

IITA is leading on the development of a series of journal papers – these were delayed by the late completion of the process evaluation. All are still at draft stage, needing information from just finalized studies by GALA, SILT and students.

**Output 4:** Legume Alliance Interactive Reach Map

**Output 5:** Policy briefs – AFAP was working on two policy briefs, but these were overtaken by events and the key areas of change advocated have been incorporated into the new seed regulations

**Output 6:** Interactive story map of the project (FRI website)

**Output 7: Ernesta Sanga** of Sokoine University of Agriculture, thesis title

**Output 8: Scolastica Mwema** of Lilongwe University of Agriculture & Natural Resources, thesis title

**Output 9: Daphrose Nimbona** of Kenyatta University, Nairobi, thesis title

**Output 10:** Silvestri et al. Improving awareness and adoption of agricultural technologies among farmers: Lessons from Tanzania on impact of radio and SMS

**Output 11:** Kansiime et al. Lessons learned in uptake of soybean messages across countries given differences in market environments, crop importance and livelihood strategies

**Output 12:** Silvestri et al. Scaling up agricultural technologies through ICT campaigns: Lessons from Tanzania on impact of different information sources

## **Note on partnerships**

The strength of the SILT partnership lies in the fact that each partner was carefully selected to bring specific skills, networks and activities to achieve the aims – we defined the inputs needed and sought out the partners who could deliver. In terms of developing stronger research partnerships, the non-research partners have benefited from developing a close working relationship with IITA. The inclusion of AFAP has facilitated a strong research – policy linkage whereby SILT has contributed to improved food security policies and gained the ears of decision-makers in Tanzania. Through the link to the N2Africa project, which is operational in nine countries, we have been able to share our scaling model internationally. Research partners, including Wageningen University and IITA have come to understand better the role the NGOs and similar actors can play in getting their outputs to the end user. In that sense, this short but intensive project has strengthened research and development partnerships in food security and specifically legume research, not only in-country, but also internationally (Canada, Europe, Tanzania) and regionally.

FRI's links with CABI has led to joint involvement in various other networks and investments, notably the Fall Army Worm network, where the organisations are working together in Uganda and Ghana.

Through working together, the partners appreciate the strength of the knowledge based business model, and the role that is needed from each partner to make it work. As a result, we are keen to replicate the scaling up model. The Legume Alliance will continue to exist and is actively seeking investments. CABI, IITA and FRI are currently collaborating on a number of potential new projects in sub-Saharan Africa, where we plan to use the knowledge based business model to scale out other tested technologies, and support national extension systems.

## 7 Problems and Challenges

The project has done a commendable job in creating awareness and increase demand for the legume technologies despite facing the challenges below:

**Challenge 1: Short duration of the project, non-alignment with agricultural seasons, and limited financial resources:** This challenge made it hard to make the most of the 28 months, and thoroughly track of change in behavior/adoption by over 100,000 farmers targeted by the project. More frequent evaluations are recommended, especially for tracking key large targets.

**Mitigation approaches 1:** CABI arrived at the partnership with substantial additional funds from B&MGF. This meant that the investment in CABI was primarily to cover third party costs (inclusion in Shujaaz and involvement of FIPS-Africa). With IITA, CABI raised additional funds through the SAIRLA call from DfID. This has had two desirable results. First, additional funds are available to explore the gender-related research issues central to the research questions set out in section 2 above. Other mitigation approaches included the concentration of the outcome mapping to just one the region. A rough estimate would be that CABI has invested about twice the budget that it received from IDRC. This has meant that considerable time has been invested into supporting the reporting to IDRC and data collection exercises. IITA has similarly had additional funds to support the supply chain developments.

**Mitigation approach 2:** FRI's final outcome evaluation covered all program elements in the north, and exhausted the budget allocated for this, and then used the budget allocated for environmental assessment.

**Mitigation approach 3:** Existing working relationships - many inception strategies were set up either at, or before, signing, meaning the project hit full speed very early on.

### **Challenge 2: Creating synergies in the campaign – lots of moving parts**

The campaign plans had clear strategies for how the different campaign elements could cross-reference each other. In reality the different partner leads and the different production time schedules made it hard to capitalize on these opportunities.

**Mitigation approach:** The mid-term review process spent a lot of time exploring how synergies could be improved. Even with monthly progress meetings and other events, in reality it still remained a challenge.

### **Challenge 3: Action research tensions**

Related to challenge 2 – this project had two aims – both research and development, and at times one was prioritized over the other. We had clear research designs in place and clear workplans, but in practical terms it was not easy to satisfy both needs, while keeping partners engaged and in agreement.

### **Challenge 4: Soybean output markets**

Inadequate soybean markets which is partly caused by sporadic/segregated production quantities. In 2017 the main soybean buyer, Silverlands Co Ltd, could not buy all soybean produced by farmers as expected. This was caused by a combination of a high yield and the VAT (18%) the investor had to pay for importing ingredients to produce poultry feeds.

The figures provided to SILT ahead of the commencement of the project by Silverlands, estimated the demand for soybean was about 20,000 tonnes. Production in country amounted to 4,000 tonnes. Import from Malawi and Uganda (and sometimes further afield) have made up the deficit. The project experienced more market challenges than had been anticipated. There was a depression in the soybean market (prices) worldwide. To facilitate access to cheap food the Government of Tanzania does not operate restrictions on imports of soybean. In the latter part of the project the process of dumping was rampant. This involves legume exporters selling grain at uneconomic prices in countries that have no controls to support a long-term market position by destabilizing local markets. Silverlands, experienced a business problem when 18% Value Added Tax was imposed on nutritional supplements they had to import to be able to mix with the soybeans and other cereals for poultry feed. The introduction of the VAT resulted into the chicken feeds to be very expensive and this resulted in turn to a reduced uptake by the poultry farmers and hence less purchase of the crop. However, after the Government realized the negative effect to the smallholder farmers, the Government abolished the VAT. Supply chain systems are therefore to be flexible in their response to farmer needs, overall the market for soybean is continuously increasing. However, imports, at times, flood the market. A policy change could buffer local prices. Improvements to productivity could make Tanzania production better able to compete in the world markets. Balancing the interests of cheap food and stable farm production is a difficult balancing act.

**Mitigation approaches:** Fortunately, the Government has waived the VAT effective 2018 AND Silverlands have promised to continue buying more soybean which will create a ready market for farmers who will then be encouraged to apply legume technologies.

**Challenge 5: Managing climate uncertainty was an issue when the rains arrived 6 weeks late in Tanzania.** FRI and its partner radio station had planned to deliver land preparation messages in real time – but then the rain did not come and the planting conditions were not suitable for a further 6 weeks. This affected demo plots.

**Mitigation approaches:** The program delivery team moved fast to write new content to fill the 6 weeks period so that the just in time nature of the advice was maintained. This meant the partners had to draw on their own resources to make 25% more content and buy 25% more airtime.

**Challenge 6: Personnel changes in the project:**

There have been significant changes with many of the key teams delivering this programme. The CABI team experienced 2 extended leaves of absence on health grounds. FRI saw two key staff move on from the Arusha site. IITA lost its principle investigator during the project and a change of research coordinators.

**Mitigation approach:** The CABI team was able to redistribute the workload until such times as the staff could pick up their duties. The consortium was held together by the continuity of Karen's role and by the appointment of the IITA research coordinator to take forward the project. IITA reallocated tasks within their team and recruited a new and very able research co-coordinator. Good team working across the partnership also ensured that the external delivery did not slip in any key areas – with the possible exception of the timing of the final outcome evaluation. FRI shouldered the bulk of the final outcome evaluation activity in order to play a central role in building an evaluation design that examined all of the intervention approaches as opposed to just radio.

### **Challenge 7: Legacy issues**

Whilst the consortium is confident that all delivery teams have been left with enhanced capacity and the information brokerage business model has been proven. What is not in place is the key function of innovation and information brokerage which has been shared by the principle investigators and, in some cases, their teams.

### **Challenge 8: Potential uptake of project results in near future / continuation of partnerships**

The SILT consortium was represented at the N2Africa closing conference in Kigali, in May 2018, to present the results of scaling up efforts in Tanzania, and to start to form new alliances to take this knowledge based business model to other countries and regions.

The N2Africa program comes to an end in 2018 and the Africa Soil Health Consortium in 2019. However, the potential for these two programs to work together to take legume production to scale has attracted the attention of investors, and the successes that the project teams have noted have spurred us to continue to seek new funding streams. The SILT team is in active conversation with investors on how the work that has been done by both projects could be combined to build an effective push to reach the majority of legume growing farming households across Tanzania, and across sub-Saharan Africa where N2Africa has been present.

N2Africa (through IITA and Wageningen University) has been asked to explore what a new phase of the project would look like – this has become known in the organization as a Supra-SILT project which could extend across 5 countries, subject to a suitable proposal being developed.

## 8 SILT overall assessment and administrative recommendations

IDRC is a very experienced investor in action research projects such as SILT. The project has successfully addressed a number of issues in scaling up legume technologies adoption. The relatively short timeframe of 28-months has focused minds, but issues such as input supply system changes, policy intervention and farmer adoption are long term processes. SILT has been fortunate that the timing worked for the policy consultation window but this was luck, not judgement. The consortium was also helped by the fact that we had worked together previously and were ready to start the first campaign almost immediately at signing, as this coincided with the start of the rainy season. If we had not had key relationships and activities in place, we would only have been able to run a campaign over one full agricultural season in the north, rather than the two achieved. In an ideal world, agricultural development projects would be timed to respect agricultural seasons for full impact, and run for a minimum of three years.

Some key house-keeping issues would include:

- 1) The decision by IDRC to create a tripartite contract for the SILT project looks, on paper, to be an ideal model for the delivery of a consortium project. It does however have several significant impacts. Partners do not share financial information with each other – this in turn meant that when one partner claimed to have no budget/money for an essential activity, other partners had to cover this partners costs as well as their own. This set up also meant that each organization could pursue methodologies that did not necessarily support the wider campaign plan, and there was no single project lead mandated to ensure the project goals were being addressed. For example, the placement of the demonstration plots was agreed with the local authorities and was delivered as common bean one season and soybean another, with little time for consultation or agreement with the research design. One way to resolve such challenges in a project is through the agreement to release financial resources against an agreed plan – this was not possible in this case because IDRC signed off the commitments and the spending.
- 2) With tripartite contracts in place, IDRC noted, and partners agreed, that one key contact organization was needed to streamline communications with IDRC. FRI took on this role to supply administrative co-ordination to the projects. In hindsight, this role needs to be clearly developed on paper, and agreed to by IDRC and all the consortium so as to avoid any misunderstandings in expectation around roles and responsibilities. The role had no clear mandate. If program management duties are expected, this would require clear lines of reporting, budget provision, access to all consortium budgets, and explicit buy-in and agreement from the consortium. In relation to point 1) above, in such an ambitious and complicated project with so many moving parts – which for success needed to be aligned - we would recommend hiring an independent Project Manager to play this role.
- 3) The creation of multiple strategy documents in a small project, and one where we were using an integrated approach may not have best supported the development of a single coherent and shared action plan. We would suggest in future projects produce a single document with key issues like gender; communications etc. clearly marked into the plan at each key stage
- 4) The budget template for the project at the planning stage could be more explicit about the elements that should be included in the partner workplans – the launch and inception workshops and end of project information sharing event benefitted the project, but strained the partners' budgets.



## Annexes

### Annex One - Milestones

Milestone	%	Evidence/Indicator	Comment
<b>Milestone 1.1</b> MoUs and sub-contracts, staff/teams in place	100	FRI, CABI and AFAP agreed that there is no need for Memorandum of Understanding between the parties and that the reporting structure from IDRC would be sufficient. Only IITA recruited staff specifically to work on SILT – all other teams were drawn from experienced practitioners employed or contracted by the partners or their sub-contractors.	FRI led on administration, with sub-contracts in place for IITA and ASA. CABI had sub-contracts with FIPS-Africa and Well Told Story ( <i>Shujaaz</i> ), as the funds they were allocated for the project went primarily to third parties (CABI costs were covered by B&MGF and the DFID SAIRLA project).
<b>Milestone 1.2</b> Inception workshop complete	100	The internal inception workshop was held in November 2015 in Arusha.  Official external inception workshop and project launch was held in February 2016 in Arusha. Photos, minutes and attendance sheets available	The external launch event was attended by all project partners, IDRC, Global Affairs Canada and representatives of Tanzania's Ministry of Agriculture.
<b>Milestone 1.3</b> Strategic plans finalised for experimental approaches to test effectiveness and complementarity of different scale-up methods for reaching farming families	100	Strategic plans for communications, gender integration, scaling-up and monitoring, learning and evaluation completed. All four strategy documents can be found in the annexes.	The research protocol document forms part of the overall monitoring, learning and evaluation strategy document.  The process of disaggregating the project plan into 4 prescribed strategies, at times, seemed to work against our efforts to bring these elements together into a single coherent body of work.
<b>Milestone 1.4</b> Key start-up activities complete according to action plan	100%	Start-up activities completed included: a start on the policy work, selection of demonstration plots and bean seed multiplication, inoculant screening, radio audience research, a write-shop on soybean to agree the technical brief and how the print would be developed.	
<b>Milestone 2.1</b> Participatory Radio Campaign launched and broadcast (one interactive radio	100%	The first common bean campaign was launched on Radio 5 and Radio Habari Njema in the Northern Highlands  The first soybean campaign has	Radio 5 subsequently had its license to broadcast temporarily removed. This had been a valuable partner station for FRI – fortunately this did not interfere with the delivery of our

series on three radio stations).		been launched on Radio Jogoo and Kings FM in the Southern Highlands	information campaigns but it did limit subsequent choice and therefore reach of stations
Milestone 2.2 (a) Comics developed, published, distributed	100%	500,000 copies of Shujaaz 6-page story distributed	Comics distributed the last Saturday in October 2016 through a combination of inclusion in the youth sports newspaper Mwanispoti and drops across Tanzania at selected Coca-cola booths. Social media and radio was in operation throughout November 2016
Milestone 2.2 (b) Point of sale materials developed, published, distributed	100%	2,500 copies of extension support materials on common bean good agronomic practices targeting agro-dealers produced and distributed during AFAP demos and extension staff in Southern and Northern Tanzania.	The decision on the placement of the demonstration plots was undertaken with the regional authorities in Tanzania. This meant that it did not support the research design as closely as we had anticipated. It meant that often we had large numbers of expensive demonstration plots in areas unable to access radio support and requiring special efforts (outside of the main campaign) to have some print in place
Milestone 2.3 Ten field days completed	150%	<b>2016:</b> Held 15 farmers field day for common beans attended by 1,133 farmers (642 male, 491 female; among them 976 were youth	The sessions involved soybean buyers, local governments, extension officers, NGOs dealing in soy bean promotion, agro dealers and seed producers. Farmers were linked to soy bean buyers
Milestone 2.4 Training of village based extension staff and agrodealers	100%	14 Agro-dealers trained (12 men and 2 women) 22 extension staff (17 men and 5 women)	
Milestone 2.5 Two metric tonnes of certified seed produced	Over achieved	11.8 tonnes of soybean in 3 varieties	
Milestone 2.6 Gaps in legume policy determined through scoping exercise	100%	Policy meeting held in September attended by 31 people	Focus of the meeting was seed policy – aligned to the development of new seed regulations

<b>Milestone 3.1:</b> Establishment of 16 demo plots for second season	100%	<p>From 8-21 December 2016, AFAP established 10 soybean demonstration plots in the southern highlands followed by six demos in Ruvuma, Njombe, Mbeya, Iringa, Manyara and Kilimanjaro regions, and Arusha regions from 13 -26 March 2017. Established 16 demo plots (each having 1 acre/0.4 ha) for soy bean in 8 regions in 2017.</p> <p><b>2017:</b> Held 16 farmers' field days for soybean attended by 807 farmers (501 male, 306 females; among them 280 were youth).</p>	AFAP has worked in collaboration with local, regional, district and village agricultural extension officers to identify and mobilize farmers to participate in the planting exercise.
<b>Milestone 3.2:</b> 600 rural agro-dealers at retail level trained and using point of sale information	57%	<p><b>Total: 341</b>  <b>AFAP total: 146</b>  2016: 36 agro-dealers and extension officers  201: 111 agro-dealers and extension officers</p> <p><b>ASA: 75</b>  <b>FIPS-Africa total: 120</b>  2016: 45  2017: 30  2018: 45</p>	<p>These numbers were always ambitious as they seemed to taken from baseline data of the population of agro-dealers that was not accurate.</p> <p>Agro-dealers and FIPS village based advisors were trained in line with the needs of the project 341 trained staff is a good result and should be judged on its own merits – not in the context of erroneous target figure.</p>
<b>Milestone 3.3:</b> 30 hub agrodealers trained and using point of sale information	%	<b>14</b> hub agro dealers and <b>22</b> extension officers were trained on good agronomic practices for legumes and the use of inoculants. Next training (for agro dealers and extension officers) will be in August 2017 using a training of trainers approach.	Training of agro dealers was implemented ahead of time. AFAP in collaboration with CABI and IITA organized training on improved legume technologies which were held in Makambako in Njombe region and another in Arusha.
<b>Milestone 3.4:</b> Up to 250,000 farming families access improved legume technologies and related knowledge	%	FRI estimates that the two radio stations used in the first common bean campaign in the north have reached over half a million potential listeners	Listener maps produced for all stations.
<b>Milestone 3.5:</b> Evidence from campaign one assessing progress on research aims collated, analysed and shared on	%	In collaboration with the UK-Aid funded Gender and Legume Alliance project (GALA) project, a study was conducted in Tanzania in 2016 to document farmer's information sources and the complementarity of dissemination approaches in Tanzania and Ghana.	SILT project updates and blog have been posted consistently on the Africa Soil Health Consortium website at <a href="http://www.africasoilhealth.org">www.africasoilhealth.org</a> .

website		The Tanzania portion of the GALA study, which is partly funded through matching funds from the Africa Soil Health Consortium project, will generate a report that directly complement SILT project research objectives particularly understanding gender differentials in access to agricultural information, participation in common bean and soybean campaigns, and utilization of improved technologies.	
<b>Milestone 3.6</b> Two policy-makers engagement meetings held	100%	The first seed policy meeting was held in Arusha on 26 September 2016 and was attended by 31 participants A second policy meeting was held from 6-7 April 2017 in Arusha, organized by AFAP in collaboration with IITA, with 21 participants.	
<b>Milestone 4.1:</b> Two peer reviewed articles prepared.	75%	One paper published, two under review and three in preparation. See S6 for details.	A write-shop was hosted by IITA in Nairobi, 9-12 May, 2017. Three papers were conceived including outlines and timelines for their development.
<b>Milestone 4.2:</b> Mid-term evaluation complete	100%	A mid-term review and planning meeting was held with all consortium in Arusha in 2016.	Decision taken to work with FIPS-Africa and significant work was undertaken by the partners to try to bring greater synergy to the campaigns
<b>Milestone 4.3:</b> Participatory Radio Campaign launched and broadcast (second interactive radio series on 3 radio stations).	100%	FRI has completed two series on common bean on Radio Habari Njema, one series on common bean on Radio 5, and one series on soybean in each of three stations, Abood, Kings FM and Radio Maria, working in collaboration with the Catholic Relief Services project Soya ni Pesa.	
<b>Milestone 4.4:</b> 10 metric tonnes of certified seed produced minimum	Over-achieved	At Dabaga, ASA has obtained 9.5 tonnes of common bean and 8 tonnes of soybean. To backup what was produced at Dabaga, 13 tonnes of certified seeds were produced at Arusha seed farm for distribution in the Northern part and the basic seeds sums to 24 tonnes.	This amounts to over 30 tonnes of certified seed and 24 tonnes of basic seed in the promoted varieties.
<b>Milestone 4.5:</b> Guidelines for selecting relevant approaches (suited to context)	100	A manual was developed under the title 'The socially engaged investors guide to communication for development: How public and private investment can influence	The guide was developed in a participatory manner engaging project implementers The guide describes the rationale for investing in communication for development,

for use in scaling up legume technologies drafted based on M&E data.		attitudes and behaviour change in small scale farming households in sub-Saharan Africa". A copy of the prototype guide can be found in the annex to this report.	the how and pre-conditions for investment. A write-shop was held with the SILT consortium members in early October 2017 to develop a first draft of guidelines for investors who are interested in communications for development as agricultural extension or commercial investment. B&MGF funds also paid for AFAP to be participate in this event as their funds had been exhausted by this stage. This will be tested with the target audience over the next season and feedback from the prototype/ pilot will be built into a final version completed with additional support from B&MGF.
<b>Milestone 4.6:</b> Workshop to develop policy recommendations organized.	100%	Minutes and attendance sheets for the meetings in September 2016 and April 2017 show that over 50 participants were attracted to the meeting Draft policy briefs were developed and are still in progress.	AFAP used to policy workshop process to shape the debate around the new seed regulations were held 6 significant changes can were achieved in the new regulations – SILT had shaped the path for these through its high level policy discussions, as there seem to be no other forum for these key agencies to meet informally to share ideas.
<b>Milestone 4.7:</b> Communication and dissemination of project results.	100%	A complete list of approaches to share the produced is in the annex	The team used a variety of blogs, conferences and research papers and will continue to share the information and lessons in the future
<b>Milestone 5.1</b> Up to 500,000 farming families access improved legume technologies and related knowledge	100%	Evaluations estimate close to 655,662 directly reached.  Potential reach is much higher, in the millions.	Full details in S4 and annex.
<b>Milestone 5.2</b> At least 250,000 farming families in Northern and Southern regions (of which 50% female/youth) show increased knowledge		Estimates show that knowledge increased after direct contact (i.e. listeners, readers, demo plot attendees), but levels of increase are hard to determine.	
<b>Milestone 5.3</b>	120%	Estimates gathered through the	

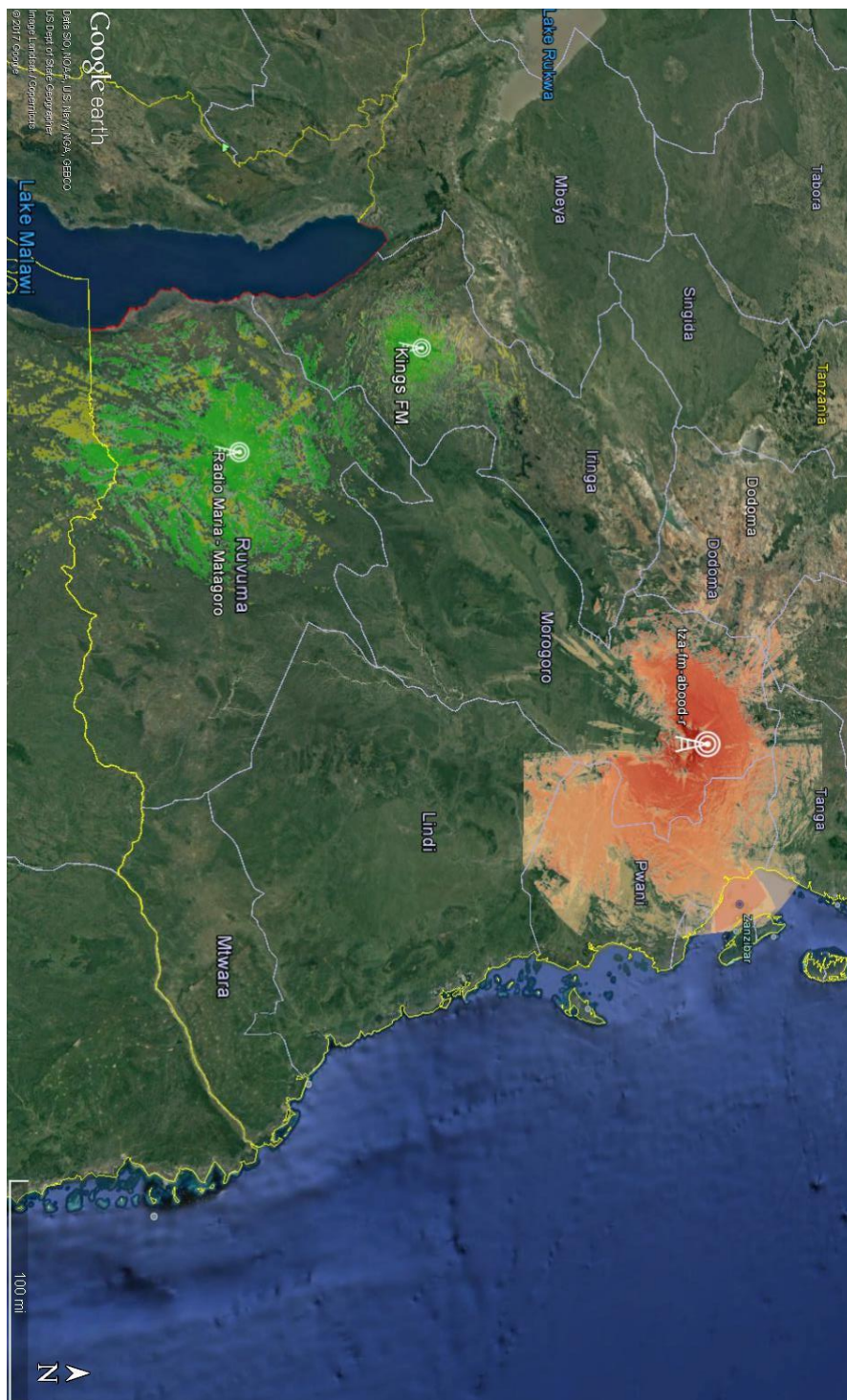
Approximately 100,000 farmers (of which 50% female/youth) start to practice one or more of the improved legume technologies		FRI-led outcome evaluation for soybean in Southern Highlands and common bean in the Northern Highlands, show an estimated 128,589 farmers have begun to use one or more improved legume technology	
<b>Milestone 5.4</b> Evidence of most effective combinations of delivery approaches and media to achieve change at scale established		Evidence from FRI-led outcome evaluation shows initial results – that increased combination of delivery approaches achieves better results.  <b>Policy:</b> Annex contains minutes and attendance notes of the communications policy discussion	Policy discussion follow-up: CABI to continue discussion with the regulator to try to encourage them to be more supportive of dissemination of information to small scale farmers.
<b>Milestone 5.5</b> Evidence generated by the project presented to policy makers to draft or revise policies that facilitate access and use of legume technologies		Link between the policy meeting discussions and the final regulations. Communications policy report available – Annex Nine.	In reality what happened was that AFAP, supported by IITA, facilitated a discussion that shaped a discussion and consensus that help to lead to the uptake of 6 discussion points from the IDRC-funded policy event into the final documentation. This was down to the timing of the event which fortunately dovetailed to the external planning environment.
<b>Milestone 5.6</b> Strengthened capacity of the national systems to improve small-scale farming families' access to input and output markets		AFAP compiled an effective demand prediction with data from various villages and provided the information to the Agricultural Seed Agency (ASA) and agro dealers for supplying to farmers. IITA has contracted a local company namely. However, these demand predictions were not subsequently checked for accuracy to assess the fitness for purpose of the approach.	Guavay Co Ltd based in Dar-es-salaam and an agro-dealer namely, Mtewe General Traders based in Njombe for distribution of inoculants to other agro dealers and farmers. 7.3 tonnes of common beans and 247 packets of inoculants were demanded in 2016 while 126 tonnes of soy beans, 100 tonnes of common beans, 3,241 packets of legume fix and 91 packets of biofix were demanded in 2017 showing an increase in demand over time.

**Annex Two - Investors Manual**  
(submitted as a separate file)



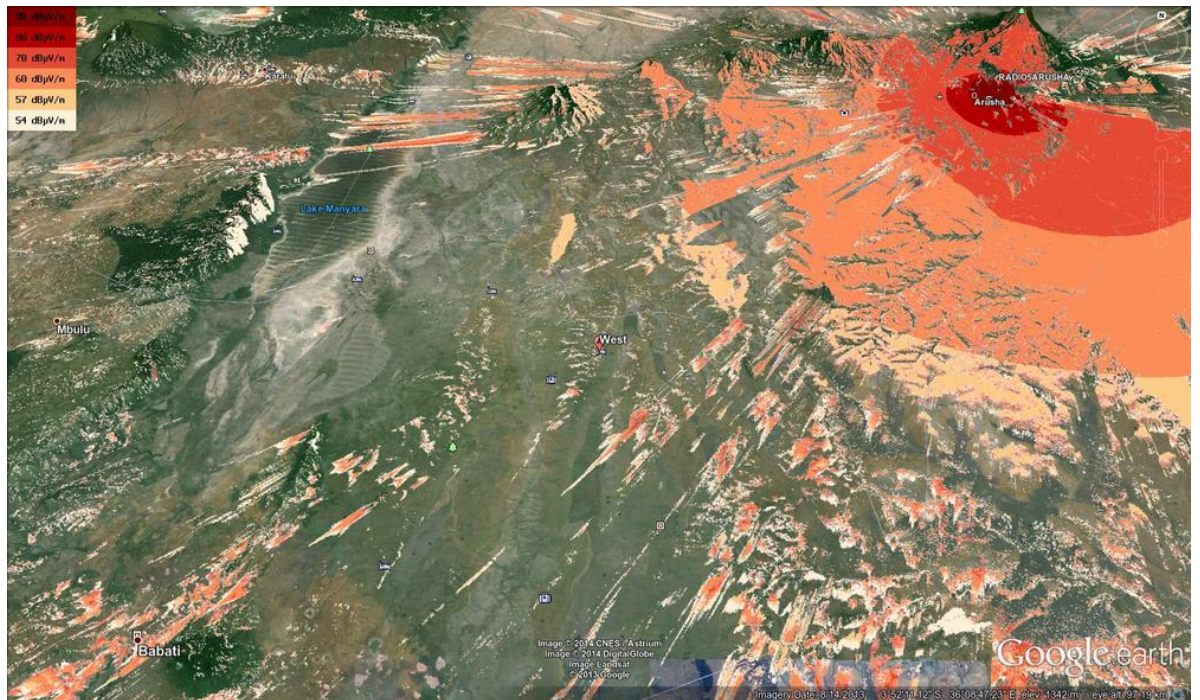
### Annex Three - Radio station reach maps

Radio coverage map showing all three soybean radio stations, Abood FM, Radio Maria, and Kings FM.

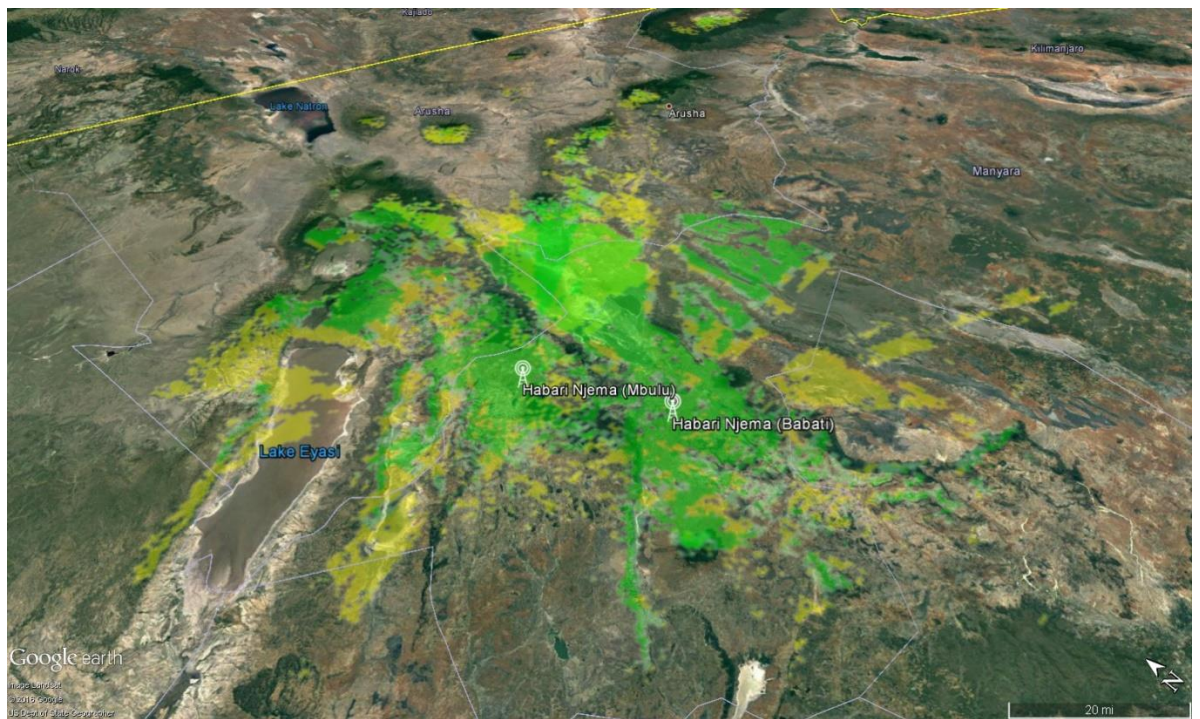


Radio 5 (common beans, northern region):





**Radio Habari Njema (common beans, northern region):**



## Annex Four - Radio Listenership and Uptake estimates and methods

### 1) Calculating actual listenership

#### Radio stations broadcasting in the southern regions of Tanzania

The total rural and adult population living within the coverage area of the three radio stations involved in the program in the Southern Regions of Ruvuma, Njombe and Morogoro is presented in the table below.

Based on estimates from the Catholic Relief Service an estimate of 15% of the population was used to approximate of the proportion of the rural adult population involved in soybean production in the Southern Highlands before the intervention.

Regions	Radio station	Rural adult population within area covered by radio	Number of soybean producers (15%)	Percentage of soybean producers listening	Numbers listening
Ruvuma	Radio Maria	242,069	36,310	46.27%	16812
Njombe	Kings FM	123,906	18,586	72.80%	13531
Morogoro	Abood FM	306,320	45,948	46.35%	21297
<b>Total</b>		<b>672,295</b>	<b>100,844</b>		<b>51,639</b>

**Table 10:** Current soybean farmers reached by the SILT campaign in the Southern Highlands

Regions	Radio station	Rural adult population within area covered by radio	Not growing soybean	Estimated listenership of radio campaign by non-growing farmers (20%)
Ruvuma	Radio Maria	242,069	205,759	41152
Njombe	Kings FM	123,906	105,320	21064
Morogoro	Abood FM	306,320	260,372	52074
<b>Total</b>		<b>672,295</b>	<b>571,451</b>	<b>114,290</b>

**Table 11:** Farmers currently not engaged in soybean production reach by the SILT campaign in the Southern Highlands

This indicates that the total number of potential listeners in the area is equal ~ 672,300.

When focusing on soybean producers only, the number of potential listeners is approximately 100,800 (using a proportion of 15%). FRI estimated the number of people reached by the radio programs (i.e., listening to one or more programs) by multiplying the total number of soybean producers within the coverage area by the proportion of listening soybean producers obtained from the household survey.

To account for potential listeners among adults in the rural area not currently growing soybeans, we also multiplied the number of non-soybean producers (571,451) by 20 percent (estimate based on other FRI projects in the region).

On that basis, the total estimated number of listeners for the soybean component is 165,918 ~ **165,900**.

### **Radio program on common beans production in the Northern Regions**

Using the methodology described above, the estimated number of adults living in rural areas within the zone covered by the two radio stations (Radio 5, Habari Njema) involved in the radio program on common beans is 699,704. This represents the number of potential listeners of the radio program. To estimate the total number of listeners within that coverage area, we multiplied that number of potential listeners by the percentage of listeners located within the radio coverage obtained from our household survey (19.55%). The total estimated number of listeners for the radio program on common beans is 136,792 ~ **136,800**.

## **2) Method of calculating uptake – Objective One.**

### **Soybean component in Southern Regions**

For this component, the household survey was administered only to soybean producers located within communities involved in the Catholic Relief Service (CRS) project. We thus decided to limit our extrapolation to the population of soybean producers located in these villages. Using population data from the 2012 census, we calculated the total adult population for the list of CRS villages and, as above, used a proportion of 15% soybean producers<sup>4</sup>.

The ‘target’ population in these villages was thus equal to 32,418 soybean producers. For each of the three regions, we calculated the total number of soybean producers in the CRS villages that started to practice at least one of the improved legume technologies by multiplying the number of soybean producers in the CRS villages by the percentage of listeners and the percentage of farmers implementing at least one of the practices since the project started (percentages obtained from our survey results).

The percentage of listeners who had started using one or more of the practices since the project started was 34% (Ruvuma), 64% (Njombe) and 86% (Morogoro). Using these numbers, we obtained a total of 9,900 soybean producers who had started using one of the improved technologies.

This total is, however, quite conservative as it excludes listening soybean producers located in other communities. If we were to assume that 20% of listening soybean producers in other communities were to uptake one or more of the practices (a conservative estimate), the total number of farmers up-taking at least one improved practice would then reach 16,960.

### **Common bean component in Northern Regions**

For the common bean component of the project in the Northern Regions, the percentage of listeners in our survey sample who are using at least one of the improved legume technologies was 81.6%, meaning that an estimated total of 111,629 farmers are using one of the improved legume technologies.

It should be noted, however, that an important number of non-listeners were also using at least one of the promoted practices (77.1%). This is because the ‘package’ of improved legume technologies promoted included relatively common practices (e.g., weeding, harvest time) for a crop that is itself very

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<sup>4</sup> The proportion of farmers growing soybeans in the region is not exactly known. The 15% used here is an approximation based on our exchange with knowledge partners and consultation of available documents.

common in the area. Other interventions (past and present), including those of the SILT projects, may have also contributed to enhancing the uptake of these practices by both listeners and non-listeners. Without a baseline study, it is more difficult to assess 'attribution' of impact to project activities.

A similar analysis but considering only farmers who had adapted at least 3 of the improved practices reveals a stronger effect of the radio program. In effect, the percentage of farmers who started using at least three of the promoted practices was 35.1% for listeners and 17.1% for non-listeners. When extrapolating these percentages to the total number of listeners in the project area, we see that the radio program may have contributed to an 'additional' 24,624 farmers adopting at least 3 practices.

When focusing only on the uptake of improved varieties of common beans, a key component of the SILT project, the percentage of listening farmers who started using improved varieties in our survey is equal to 53.1%, which corresponds to an estimated total of 72,640 farmers. Considering that the percentage for the non-listeners is 38.1%, corresponding to 52,120 farmers, we can estimate that the radio program may have contributed to an additional 20,520 farmers up-taking the improved varieties. Considering that the percentage of listeners within the radio coverage area was relatively low at 19.55% (compared to what has been observed in many other FRI projects), we can see that an increase in listenership to levels often observed in other projects -e.g., 40%, would have the potential to significantly contribute to achieving impact at scale.



## **Annex Five - Drama script**

The final version of the drama is available in English, French and Swahili. The scripts were distributed by email and posted on our website. They can be accessed here:

[Beans, a family affair: Part 1](#)

[Beans, a family affair: Part 2](#)

[Beans, a family affair: Part 3](#)

[Beans, a family affair: Part 4](#)

[Beans, a family affair: Part 5](#)

## **Annex Six - FRI summary outcome evaluation results**

(submitted as a separate file)

## Annex Seven - Shujaaz

As part of the SILT campaign the team at CABI commissioned a further story from Well Told Story, a public-interest media platform, which serves as a platform for young people to form a community, where they can discuss pressing issues.

Shujaaz uses an integrated omni-channel design that includes a free-of-charge nationally distributed monthly comic (500,000 copies a month), a weekly syndicated radio show, and digital media (Facebook, SMS, Twitter, WhatsApp) to tell stories of fictional characters and real people representative of youth from different parts of Tanzania as they encounter and resolve life challenges.

In 2015, CABI commissioned two stories: Chapter 6 featured a male hustler involved in bean farming and Chapter 7 featured a female hustler involved in the bean farming value chain activity. Both stories aimed to challenge gender stereotypes related to agriculture in general and bean farming in particular: The female hustler was an agro-dealer – an enterprise that most people associate with men. The male hustler was farming beans – beans are widely considered to be a women’s crop, although increasingly men are entering this space.

The IDRC investment allowed the team to commission one more -- follow up -- story in Shujaaz in 2017. During the first round of stories in 2015, Shujaaz was not working nationally; and the 200,000 comic copies with each story were distributed almost exclusively in the South of Tanzania.

By 2017, the Shujaaz coverage was national; and the additional story reached youth in all parts of Tanzania via 500,000 copies of the comic. At the same time, a syndicated radio program was on air on the following radio stations:

- **East Africa Radio** (National reach)
- **TBC FM** (National reach)
- **Kings FM** (Njombe, Ruvuma, Iringa, Mbeya)
- **Chuchu FM** (Zanzibar)
- **Abood FM** (Morogoro, Dodoma, Dar)

Shujaaz had a week-long radio campaign (five short stories) on each of these stations further exploring the themes from the comic stories, including gender-based stereotypes. Unlike adult farmer orientated radio, Shujaaz has built loyal fan base that tries to listen each day.

The additional story in Chapter 21 was designed as a recap (albeit a standalone story as well) featuring the hustlers from the previous chapters as well as testimonials from young people who successfully tried farming beans.

Based on the feedback from the audience, the Shujaaz team believe this was a successful approach to gendered youth communication because it relied on:

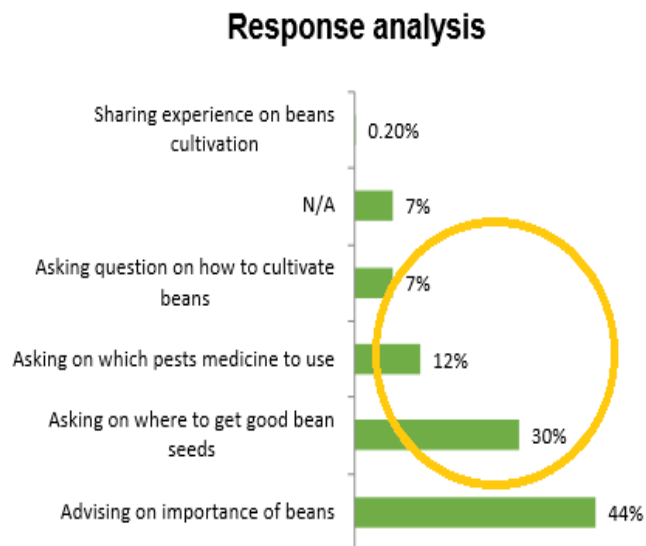
- A balanced non-stereotype representation of both male and female as bean farmers, showcasing that bean farming is an activity as appropriate for both sexes.
- Showcasing opportunities in the agricultural value chain by switching norm of the perceived roles/engagement of male and women.

Through its omni-channel, which includes both analogues and digital/social media, Shujaaz also crowdsourced positive deviant stories on bean farming, which helped shaping the content of

Chapta 21.

Figure 4.3 Analysis of responses to Shujaaz call out

**Call out:** Have you ever cultivated beans and what will you like to know about beans cultivation?



For the entire duration of the campaign, Shujaaz media were nudging conversation amongst young people on agriculture particularly beans farming through the Maharage Bingwa (Champion bean) campaign, which has led to change of perception, interest and trial of beans farming.

**What were the top three most important gender outcomes that your project achieved?**

Both boys and girls actively participated in the campaign; both shared feedback on the stories either seeking expert advice or showing interest in trying bean farming in the future. The Shujaaz team received over 350 messages in response to the last story via SMS or on Social media.

For the recap campaign 74% of the responses to the story came from men, although typically men are more interested in other "male" commercial crops such as water melons.

**Why were you successful? What factors supported you in what you were doing (gender practices and interventions) and in what you achieved (gender outcomes)?**

Shujaaz attributes the campaign's success to good knowledge/understanding of their audience to develop stories that were appealing to both males and females; all stories were pre-tested with a small group of fans before they were put into national media. Shujaaz team are confident, based on the fan response, that comic stories, radio programs and social media engagements were accessible to both men and women and actively engaged both men and women.

Shujaaz also used a subtle approach where, part of our campaign was to talk to youth about food and traditions and not directly about agriculture. Linking conversations to the food people like to eat to

conversations on producing bean to make money created a generally positive context for conversation. Some fans dipped into their childhood memories and others had a space to brag about their achievements as bread winners including through farming.

Similarly, conversations about beans being a staple food and a “cultural tradition” helped remove some of the stigma typically assigned to agriculture. Also, the topic of food as part of childhood memories was relevant and relatable by both boys and girls, which helped to move the conversation into a gender-neutral space.

Gamifying the campaign - asking fans what would they if they found a bag of beans on social media - helped bring in the element of bragging about somebody's smarts - also helped to neutralize the space in terms of gender.

#### **What factors constrained what the project could do and achieve?**

The Shujaaz campaign had limited time (one chapter) to effectively engage and track impact. And although the comic was set up with an agronomist in the 2017 campaign, there was still a limited amount of technical expertise to respond to fans questions timely to ensure further impact of through the project. Limited accessibility of the improved seeds across the country. Some fans wanted to start farming beans but they could not find these inputs in their location.

#### **Changing the national conversation around agriculture amongst young people**

The core demographic of Shujaaz is 15-24. During the past 3 years in Tanzania and 9 years in Kenya, Shujaaz has consistently presented stories that show the potential for positive economic activity from farming and agricultural value chains.

In Tanzania in particular this is starting to have an impact on way that agriculture is seen by young people. Not agriculture as practiced by their grandparents – but smart farming approaches are now seen as a good option for creating a livelihood. Before the Shujaaz campaign, youth perceived farming as one of the least attractive option for creating a livelihood.

Shujaaz has built strong brand loyalty by presenting young people with an authentic voice:

By 2017 Shujaaz was reaching 23% of all youth in Tanzania

27% of the survey respondents agreed with the statement ‘I am not engaged in agriculture but I would like to try some ideas’

56% of the survey respondents agreed with the statement ‘agriculture is a very cool source of income’

**Source:** 3600 media report by Well Told Story.



## **Annex Eight –Focus Group Discussion report FRI**

(submitted as a separate file)

## **Annex Nine - Communications Policy Meeting Report**

(submitted as a separate file)

## Annex Ten - Links to print outputs

Common bean manual Kiswahili -

<http://africasoilhealth.cabi.org/materials/common-bean-manual-kiswahili/>

Common bean pests and diseases leaflet Kiswahili -

<http://africasoilhealth.cabi.org/materials/common-bean-pests-and-diseases-leaflet/>

Common bean varieties poster Kiswahili -

<http://africasoilhealth.cabi.org/materials/common-bean-varieties-poster-kiswahili/>

Soybean manual Kiswahili -

<http://africasoilhealth.cabi.org/materials/soybean-manual-kiswahili/>

Zalisha Soya Bora poster -

<http://africasoilhealth.cabi.org/materials/zalisha-soya-bora-poster/>

Zalisha Soya Bora flash cards Kiswahili -

<http://africasoilhealth.cabi.org/materials/zalisha-soya-bora-poster-cuts/>

Common bean flash cards Kiswahili -

<http://africasoilhealth.cabi.org/materials/common-bean-household-cuts-kiswahili/>

Common bean flash cards English -

<http://africasoilhealth.cabi.org/materials/common-bean-household-cuts-english/>

Common bean flash cards English -

<http://africasoilhealth.cabi.org/materials/common-bean-bean-head-household-cuts-english/>

Common bean flash cards Kiswahili -

<http://africasoilhealth.cabi.org/materials/common-bean-bean-head-household-cuts-kiswahili/>

Common bean poster Kiswahili -

<http://africasoilhealth.cabi.org/materials/common-bean-poster-kiswahili/>

Common bean flipchart Kiswahili -

<http://africasoilhealth.cabi.org/materials/common-bean-flipchart-kiswahili/>

Common bean agrodealer poster Kiswahili -

<http://africasoilhealth.cabi.org/materials/common-bean-agrodealer-poster-kiswahili/>

## Annex Eleven – Notes on Environmental Assessment

**Prepared by Karen Hampson, Farm Radio International, on behalf of SILT consortium, Feb 2017.**

After over one year's implementation of the SILT project, the consortium has been through one full agricultural cycle. During this time, each organisation has experienced first-hand the environmental conditions involved in the project, and the attendant considerations. While many of the environmental issues were known in advance, we are now at a point in the project where we are confident about the environmental considerations involved, and that they are minor, posing no serious issues which would need a full environmental assessment.

During meetings with SILT consortium members, we suggest that there is no need for a full environmental assessment, and our justification is as follows:

### **1) In Tanzania, an environmental assessment is not mandatory for rainfed agriculture.**

Rainfed agriculture is dominant in Tanzania, with most agricultural labour provided by hand hoe. Smallholder rainfed farming systems, with family farm sizes averaging 0.2ha – 1 ha, compose the bulk of the farming landscape in the country, and are the target beneficiaries of this project. According to the Ministry of Agriculture in Tanzania, these systems generally give suboptimal yields, and due to their size and low-input nature (minimal use of fertiliser, pesticides and external water supply), are not subject to environmental assessment.

### **2) The amounts of fertiliser used will be small**

While it can be argued that wide scale, intensive and long term use of fertiliser can be detrimental to soils, this has not been the case for the target regions. The soils in the project target regions on the whole are degraded and lacking in key nutrients, but this is due to long term use with little replacement of organic matter and few or no fallow periods. On the contrary, more often than not, there are P and N deficiencies, and small amounts of fertiliser are needed to “kick-start” the soils. Legumes will fix nitrogen but N2Africa trials show that P fertiliser and blends will benefit soils and enhance yields in rainfed systems, providing environmental and wider benefits, rather than constraints. The rate and amounts of fertiliser use recommended through the project are low and we foresee that they will not pose any risks of polluting water streams with runoff or leeching of excess agrochemical.

### **3) Farmers will not open, convert or clear new land for legumes.**

Legumes are commonly grown in Tanzania, and this project seeks to promote the bundle of improved legume technologies, and overcome some noted obstacles to their increased use, in order to enhance yields, and encourage attendant benefits such as improved nutrition or incomes. As such, we are not promoting substitution of crops, but rather enhancing current agricultural practices, through soil regeneration, improved varieties and carefully tailored fertiliser and inoculants. In line with this, we do not promote the clearing of land or opening of new areas, but are encouraging improved use of current land areas. Environmental impact will rather be positive than negative in this instance.

### **4) We will not develop any large structures.**

In a similar vein, the project is working within existing infrastructures. We are promoting rainfed agriculture and there is no need, nor provision within the project to build any large structures such as roads, warehouses or dams, drainage or irrigation channels.

### **5) We are not introducing exotics or new crops**

This project is promoting improved productivity of commonly grown crops in Tanzania, common beans and soya beans. We are encouraging use of improved agronomic practices and seeds, but we are not introducing new or exotic crops. We will follow all regulations regarding certification of seed and policies surrounding Quality Declared Seeds.

**6) The project will not undertake any large scale environmental works.**

As the focus will be in improving productivity on-farm, there is no provision or planning of any large scale actions that may impact the environment, such as land clearing, deforestation, mass movements of soil, or intensive applications of agrochemicals.

The team rather puts forward the suggestion that increased use and scale up of Improved Legume Technologies offers various **significant environmental** benefits. Legume technologies are part of long-term approach to soil fertility management that can reduce use of N fertilizers, break up hard-pan soils and increase available soil organic matter. Focus on good agronomic practices will reduce the depletion of soil fertility and reduce loss of top soil. Our focus on inputs, including information, and a demand estimation service, we hope will bring major efficiencies to the agricultural inputs sector, reducing waste of over production and unnecessary transport of seed and inoculant.