

Gender and the Legume Alliance: Integrating Multi-Media Communication Approaches and Input Brokerage

D2.6 A report of focus group discussions in Tanzania

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Acronyms

Acronym	
ASA	Agricultural Seed Agency
CABI	CAB International
CATI	Computer aided telephone interviews
FFS	Farmer Field School
FGD	Focus Group Discussion
GALA	Gender and the Legume Alliance
GAPs	Good agronomic practices
IITA	International Institute of Tropical Agriculture
PICS	Purdue Improved Crop Storage bags
SAIRLA	Sustainable Agricultural Intensification Research and Learning in Africa
SUA	Sokoine University of Agriculture
SMS	Short Message Service

Executive Summary

The project 'Gender and the Legume Alliance: Integrating Multi-Media Communication Approaches and Input Brokerage' aims to address the Sustainable Agricultural Intensification Research and Learning in Africa (SAIRLA) Research Question 5. 'What strategies are most effective for improving access to and capacity to use market, agronomic and other information and knowledge by poorer smallholders, especially women and youth, to achieve sustainable intensification?'

Focus group discussions (FGDs) were conducted in Tanzania to answer three questions: i) are there systematic differences with respect to men, women, and youth's access to information?; ii) is there a significant difference in access to and use of improved technologies by men, women and youth?;(iii) what is farmers' perception on the effect of approaches which target groups compared to approaches targeting individuals?

The FGDs were conducted in Arusha, Kilimanjaro, Morogoro and Iringa Regions of Tanzania with farmers growing beans and soybean. A total of 4 FGDs with men and 4 FGDs with women were conducted in May 2018. Overall 72 men and 62 women were interviewed.

In terms of information sources, adult men seem to have access to a wider array of information sources compared to adult women and youth. Traditional communication channels are used by adults, including village meetings, agricultural extension officers, and agrovets. Radio seems to be a prerogative for adult men while the youth preferred mobile phone and social media, such as Facebook and WhatsApp.

Information delivered through groups, such as village meetings and demonstration plots, was thought to be more effective. The motivations associated with this were that groups favour interaction and exchanges between farmers. Many people are involved and consultations are easy regarding difficult issues, and information flows to many people over a short period of time. During village meetings there are also extension officers who explain to the farmers issues that are difficult or not well understood by the farmers. Groups are also good because everyone is involved, hence everyone gets an opportunity to learn and in case one forgets something he or she can consult others who were in the group. However farmers would appreciate to receive agricultural information aligned with crop cycle and being informed about the village meetings early in advance.

The FGDs revealed that, apart from fertilizer use, there were no substantial differences between adult men and women as well as the youth with respect to awareness and use of improved common bean and soybean technologies. Overall, there was low use of inoculants and PICS bags, which was associated mainly with the lack of awareness. Low use of fertilizer, pesticides and improved seeds varieties was attributed mainly to high costs and lack of available inputs.

1.0 Introduction

The project 'Gender and the Legume Alliance: Integrating Multi-Media Communication Approaches and Input Brokerage' aims to address the Sustainable Agricultural Intensification Research and Learning in Africa (SAIRLA) Research Question 5. 'What strategies are most effective for improving access to and capacity to use market, agronomic and other information and knowledge by poorer smallholders, especially women and youth, to achieve sustainable intensification?'

In Tanzania work on the campaigns was implemented in collaboration with sister projects to scale-up the delivery of messages to small-scale farmers to support them to intensify production of common beans and soybean. Media used in the scale-up campaigns in Tanzania included: radio, mobile-mediated messages, social media comics and youth media and point of sale materials intended for use in agro-dealerships. Interpersonal approaches include demonstration plots and training days.

Focus group discussions (FGDs) fall under Output 2: Information flows within households mapped and power relations analysed vis-à-vis gender and social difference. This is in order to provide the basis for identifying information such as input needs, awareness, practices, challenges and adoption for smallholder farmers. It will also provide the basis for the follow up survey under output 4 to assess trends and changes in knowledge and behaviour. FGDs fall explicitly under activities 2.4, 2.5 and 2.6. FGDs are meant to study intra-household dynamics and information flows in more depth. FGDs were conducted at the community level.

Data and information generated from FGDs is meant to support quantitative data obtained from surveys to achieve the requirements of output 2. The FGDs address information sources, farming practices, input use intensity and reasons, improved varieties, pest and disease management, storage and effect of information dissemination approaches.

The analysis and report answer the following specific research questions;

1. Are there systematic differences with respect to men, women, and youth's access to information?
2. Is there a significant difference in access to and use of improved technologies by men, women and youth?
3. What is farmers' perception on the effect of approaches which target groups compared to approaches targeting individuals?

2.0 Study methodology

This study was conducted in the same place where computer aided telephone interviews (CATI) and other surveys were conducted. The FGDs covered 134 farmers consisting of 62 women and 72 men farmers. The study involved 4 FGDs for men and 4 FGDs for women that were conducted over 8 days' period in May 2018. This translates to 8 FGDs disaggregated as 4 for common beans and 4 for soybeans. The FGDs were conducted in areas where common beans and soybeans are grown in Tanzania and also areas where projects associated with GALA are conducted. The FGDs included radio listeners, radio listening groups' participants, demonstration plots participants, leaflets readers and Shujaaz readers.

From the CATI survey the top 8 regions for the study were Kilimanjaro, Ruvuma, Tanga, Iringa, Njombe, Morogoro, Mbeya and Dodoma. The sites for FGDs were purposively selected from those listed by the CATI survey as the top regions (Table 1). The FGDs were conducted in 4 districts selected purposively based on spatial separation in an effort to identify the effect of the campaigns in areas with different climatic conditions (agro-ecological zones). These areas were also selected based on main value chain partners target or operational areas as provided for in the CABI_IITA sampling strategy for CATI in Tanzania. In each

of the districts selected for the study 2 FGDs were conducted, where 1 was for men farmers and the other one for women farmers. Efforts were made to obtain information from youth in the men and women groups. For purposes of this study youth are farmers aged 18 to 35 years.

Table 1: Focus group discussion study sites in Tanzania

Region	District	No. of FGDs	No. of women participants			No. of men participants			No. of all participants	Crop
			Adults	Youth	Total	Adults	Youth	Total		
Arusha	Arusha DC	2	11	6	17	15	6	21	38	Soybean
Kilimanjaro	Moshi Rural	2	14	5	19	12	5	17	36	Common bean
Morogoro	Mvomero	2	7	8	15	10	8	18	33	Common bean
Iringa	Kilolo	2	7	4	11	8	8	16	27	Soybean
Total FGDs & participants		8	39	23	62	45	27	72	134	

The National Coordinator at Sokoine University of Agriculture (SUA) in collaboration with the agricultural extension officers organized the groups that participated in the FGDs in the relevant places. They also organized refreshments where necessary for the FGD participants. The FGDs were implemented by the National Coordinator, facilitators, rapporteurs and CABI socio-economist. Data from each of the groups was collected using FGD guidelines (Appendix 1). Thematic analysis was used for this study and this report is prepared based on key themes arising from the findings that enabled achievement of the study objectives by providing answers to the research questions.

3.0 Synthesis of the FGDs

3.1 Common bean and soybean production

3.1.1 Proportion of farmers involved in production

The proportion of farmers growing common beans in the different villages ranged from 75-100%. According to adult men and women as well as the youth common bean was ranked as a very important crop and those not involved in its production cited reasons such as limited capacity that could be associated with limited land size or occasional withdrawal associated with crop rotation to control pests and diseases. There were two main common bean crop seasons such that during the low rain season about 75% of the farmers planted common bean, but during heavy rainfall all farmers in the village produced common bean. Thus in practice all farmers planted common beans in all the regions where the study was conducted.

About 64% of women and 29% of men who participated in the FGDs were reportedly growing soybean, most of whom belonged to groups associated with a Clinton Foundation initiative that had encouraged farmers to take up soybean farming. Only 2-3% of farmers outside of the Clinton Foundation initiative were reportedly growing the crop. All farmers reported a declining interest in growing soybean due to a consistent lack of markets for their produce.

3.1.2 Purpose of growing common beans and soybean

Common beans are grown for the purpose of providing income and as a source of food for the household according to the women. The men and youth of both sexes argue that they grow common beans mainly for business purposes. Overall the two groups agree that the main purpose of growing common beans is for business purposes. Similarly, soybean is viewed primarily as a cash crop by all farmers including men, women and youth. However, with the exception of the youth, both men and women said that in addition to soybean being a source of income, they also grow the crop for food. However, majority of soybean farmers were frustrated by the lack of markets and had given up soybean farming.

3.1.3 Average production of common bean and soybean

There are differences in production of common beans based on gender. The differences are attributed to capacity to undertake good agricultural practices. The average production of common bean varies depending on whether the farmer is male, female or youth. Production also varies depending on climate which is the amount of rain received as well as the size of land devoted to production of common beans. Adult women reported that the production of common beans ranges from 5 to 10 tins of 20 kg each per acre. Female youth reported that one could get up to 20 tins per acre if all good agricultural practices (GAPs) are followed. Women farmers, both adult and youth, reported that production has been declining due to pests and diseases. Adult men reported that the average production ranges from 10 to 14 tins per acre. Male youth reported that the production is an average of 8 tins per acre.

For soybean, there were no differences in production among all groups. Majority of farmers reported an average production of 320kg of soybean per acre although farmers in Arusha and Kilimanjaro Regions had not yet harvested their crop at the time of conducting the FGDs.

3.1.4 Challenges of common bean and soybean production

Both common bean and soybean farmers reported many challenges limiting crop production, key among them pests and diseases. For common bean, the pests include aphids, ladybird beetles, white flies, cutworms, bean fly, termites and ants while those afflicting soybean include Fall Army Worm (FAW), grasshoppers, worms, caterpillars, ants, and rodents such as squirrels. Both categories of farmers also reported diseases suspected to be rust and blight. Female common bean farmers reported that the diseases are most critical at the flowering stage, with affected flowers dropping to the ground and in some instances pods containing a lot of water and no seeds.

Adult farmers also noted that improved seed varieties and pesticides are not easily found, and even when pesticides can be accessed they are sold at high prices which most of farmers cannot afford. In the absence of improved varieties, farmers are forced to continue using local seeds every year, a situation which has consistently resulted in low yields. Costs of production for common bean were reported as being high by both youth and adult male farmers, attributed to the high costs of inputs. Female youth also reported lack of modern technology for planting common bean as one of the challenges leading to poor harvest. .

Adult male and youth reported poor application of pesticides and other agricultural practices due to low technical knowhow. There is also shortage of rainfall during the growing period as a result of climate change which caused the beans to dry out. In some instances, drought may result in complete crop failure. The capacity to address all these challenges in the production of common beans was restricted by limited funds available and low technical know-how which some farmers attributed to low interaction with extension officers. Soybean farmers also reported similar problems associated with access to inputs. All farmers also reported high costs of fertilizer and difficulties in accessing preferred seed varieties as challenges. The youth talked about lack of inoculants and lack of appropriate handling/storage space leading to post-harvest losses. In addition, farmers felt that soybean is a complex crop unlike common bean, it takes longer to germinate and involves higher costs of production (fertilizers, inoculants and labour) compared to prices

fetched from sale of the produce at market prices. Soybean was viewed as labour intensive, requiring frequent weeding, and sensitive in that its growth was easily affected by too much rainfall.

3.2 Use of improved seed varieties

3.2.1 Seed varieties used

The common bean varieties produced according to female and male farmers were yellow beans, soya, tabora, rosecoco (Liamungo), malivesi, garoli, white beans, mkemwema, The varieties preferred by women were soya, tabora, soya kijivu, soya njano, Msukenjwi, jesica, yamungogo, and njano dume (uyole njano) because of its/their strong resistance to pests. Men preferred soya, rose coco and Njano because they have high productivity compared to other varieties. Notably, farmers were not able to identify the improved varieties but only reported on the preferred varieties. There were no differences between men and women with respect to capacity to identify the different varieties, which suggests paucity of information to both groups of farmers. The common varieties for soybean were soya 1 (*spaiki*) and soya 2 (*safari*). A section of farmers said they were not familiar with varieties since soybean was a new crop in the area.

3.2.2 Sources of the seed varieties

The main sources of the common bean varieties grown were local shops and markets, agrovets, neighbours/friends, business men and women in the local markets, farmer groups (especially women groups). Farmers get varieties from the people coming in the market to sell their produce (farmers and business men). Other sources are N2Africa, a large scale, science-based “research-in-development” project focused on putting nitrogen fixation to work for smallholder farmers growing legume crops in Africa, the International Institute of Tropical Agriculture (IITA) and the Agricultural Seed Agency (ASA). Farmers also exchange varieties with fellow farmers. Some male and female farmers use their own seeds from previous seasons. There were no observed differences in access to soybean seed varieties among different gender groups. All farmers including men, women and youth reported obtaining seed varieties either from the Agricultural Seed Agency (ASA) or from extension service through the Clinton Foundation initiative. The seeds were also sold in kilogrammes at local markets and agro-dealer stores. The youth clearly demonstrated ability to differentiate between seed varieties, stating that safari was generally white in colour, while spaiki has black colour on its eye.

3.2.3 Preferred seed varieties

Adult women and men involved in the production of common beans reported that they prefer the varieties that they currently grow because they have a good taste (delicious), they have high demand/preferred in the markets (sell well) and fetch good prices. Some female farmers have an agreement with sellers of the seeds. These varieties are also easy to cook (quick/fast/good for cooking) and when planted thrive well, are tolerant/resistant to diseases and hence high yielding. The female youth reported that the varieties are easily obtained from fellow farmers, and that they do not cause gas when eaten. For soybean farmers, the issue of preference to seed varieties did not arise because soya 1 and soya 2 were the only available varieties given that soybean was a new crop in the area. In addition, they did not seek other options because they had been told that those were the varieties best suited to the area’s climatic conditions. .

3.2.4 Awareness of other seed varieties

Both men and women growers of common bean reported that they were aware of other common bean varieties other than what they planted. These include Mbundini, Chikwendile kwima, Kenya, koroboi, muacheapande, Rungemba, maharage ya Mbeya, uyole, mnobi, Mbundini, Kenya, Chikwindile kwima, Koroboi and Mwachapande, Lungemba, Mbeya beans, Uyole njano, Ifisi, Munubi, Tabora, goroli and white soya. kariasii or sura mbaya, au rozikoko/nyayo, kijivu, kuria (sura mbaya), rosecoco, Malves, Njano uyole,

White and Mbundini., Mrondo, Njombweni Mrondo, njombwe (which is for special food) and and Rukenge (has good productivity). Although all soybean farmers were not aware of other varieties, male farmers noted that they did not seek other varieties because in addition to being taught that the varieties they were using were the most suitable for their agro-ecological zones they were frustrated at the lack of markets resulting in low prices for their soybean produce.

Common bean growers were aware of other varieties but were not growing them for a number of reasons. In addition to land size limiting the number of varieties to be planted; adult female farmers prefer to plant varieties that they have known for a long time. They also argued that the varieties that they currently plant are the main varieties in the area and they think they are the best and there is no need to change. Other varieties are not readily available and are associated with poor quality, high costs of production and lack of markets. For instance, Malivesi and white are said to have poor quality soup, poor tastes and are less preferred in the market, thereby fetching lower prices compared to the varieties currently preferred by farmers. Men do not grow the other varieties because they are not easily available. Farmers also said they had limited technical know-how about these other varieties.

3.2.5 Sources of information on improved seed varieties

There were no significant gender differentials in access to improved varieties both common bean and soybean. Adult female common bean farmers get information on common bean varieties from neighbors, agriculture extension officers, market places, businessmen and fellow farmers. Female and male youth obtain information from radio such as Sauti ya Injili, market, their parents, neighbours and local markets. . Adult male farmers get information from fellow farmers, extension officers, radio, traders from other regions, demonstration plots and market places. Male youth also obtained information from buyers, extension officers and fellow farmers. Mobile phone was a key source of information for the male youth. They obtained Short Message Service (SMS) on how to use inputs like manure from E-Soko, an information and communication service for agricultural markets in Africa.

Similarly, all categories of soybean farmers including men, women and youth received information on seed varieties from extension workers, Farmer Field Schools (FFS), the Agricultural Seed Agency (ASA) and through the Clinton Foundation initiative. Both the women and youth also talked of accessing information on seed varieties through demonstration plots.

3.2.6 Problems of accessing improved seed varieties

Problems associated with access to improved common bean varieties include high prices, poor markets and unavailability in local stores, forcing farmers to incur additional expenses and time to purchase these varieties from neighbouring towns. Female youth also said that limiting land size full of mixed crops makes it difficult for other seeds to thrive. Some women quipped, "We don't know where to get improved seeds and we don't know the responsible person who can bring us those seeds." There are also financial constraints limiting ability to purchase improved varieties for women and lack of technical know-how on the right seed suitable for their geographical ecological zone (reported by men) as well as how to take good care of the seeds (reported by male youth). All categories of farmers experienced challenges in accessing soybean seeds after the end of supply by the Clinton Foundation project. Without community based seed producers, farmers were forced to incur travel costs in order to access improved (and expensive) varieties from far off town centres. However all farmers reported that they were no longer looking for seeds since some of them were not able to sell their last produce for lack of available markets.

3.3 Use of chemical fertilizer and manure

3.3.1 Proportion of farmers using fertilizer and manure

Most women farmers involved in production of common beans do not use chemical fertilizers. They noted that chemical fertilizers are only used by farmers who have undergone training on professional cultivation. This represents less than half of the farmers. One woman argued, “*I have never heard that any person is using fertilizer for common bean production in this village*”. Men and women that use fertilizer use *booster* to speed up growth. The youth noted that “*Agrico*”, another fertilizer, which speeds up growth of beans better than *booster*. Male youth reported that very few of them use chemical fertilizer, about one fifth of the farmers.

About 95% of soybean farmers reported using chemical fertilizer owing to the fact that soybean was a new crop to them and was largely viewed as being far different from indigenous crops such as maize or beans. The minority who did not use fertilizer attributed it to lack of finances to purchase the input.

3.3.2 Sources of chemical fertilizers and manure

All common bean farmers reported that they buy fertilizers from agrovets located in the village or in nearby towns, while manure was obtained from individual farmer homesteads or from fellow farmers. All those able to buy reported that there was consistency in the supply of fertilizers. Similarly, there were no differences among all soybean farmers regarding access to fertilizers. All agreed that the fertilizers were readily available in local agro-dealer stores at a constant retail price of between Tsh. 70,000 and Tsh 90,000. Only a few farmers who did not use fertilizer used manure on common beans.

Manure was used by very few soybean farmers although even in such cases it was reportedly incorporated into the soil way ahead of the planting season, implying that farmers did not specifically use manure for soybean. Instead, fertilizer was preferred because of the commercial value attached to soybean. For common bean farmers, the use of manure is as limited as the use of chemical fertilizer.

3.3.3 Reasons for not using chemical fertilizers

All categories of common bean farmers view chemical fertilizers as an unnecessary expense largely because they are expensive to purchase and traditionally, the crop has always been grown successfully without chemical fertilizers. Some female farmers thought that chemical fertilizer destroys the crop. Manure is perceived to be an equally good but cheaper alternative to chemical fertilizers. Lack of money to buy fertilizer and other inputs, as well as lack of education on the proper use of chemical fertilizer are other reasons for not using fertilizers according to women farmers. In addition, fertilizers sellers are found far away from the village, forcing farmers to incur additional expenses to purchase an already expensive product. Most of the farmers were not aware of the names of chemical fertilizer although a few mentioned DAP, UREA, CAN and WINNER as the common types of fertilizers.

In the case of soybean, women farmers attributed their lack of use of chemical fertilizers to lack of funds. On the other hand, some farmers wanted to first compare their yields with those of their counterparts who had used fertilizer before investing in fertilizer on a new crop without the certainty about its profitability and availability of markets. A section of female farmers thought that fertilizer makes soybean vegetative resulting in low yields. Some male and female farmers also believed their soils are fertile; and therefore unnecessary to purchase expensive fertilizers. Male farmers attributed their failure to use manure to shortage of the input (they kept very few animals) and added that application of manure is a laborious task because manure is heavy.

3.3.4 Sources of information on type of fertilizer and how to use it

Information on the type of fertilizer for use on common beans was essentially obtained from radios (KILI FM, Radio Free Africa, Shamba Shape-Up, Radio Sabina, Sauti ya injili), TVs (e.g. ITV), VICOBA agriculture extension officers, farmer-to-farmer exchange of information (fellow farmers) and agro-vets. In addition to these sources, it is noteworthy to mention that mobile phones (SMS, WhatsApp, and Facebook) were also a key source of information for the youth. They reported obtaining SMS from E-Soko, fellow farmers as well as social media applications such as Facebook and WhatsApp. Both male and female youth were of the opinion that the agro-vets were not well informed.

There were some differences in access to information on chemical fertilizer for soybean among different farmers. While all farmers obtained information from extension officers and the Clinton Foundation, the youth also gathered information from radio, the women also learned from each other while the men relied on their own experiences.

For soybean extension workers were the main source of information on the modalities of fertilizer use for both male and female farmers, including the youth. One male youth soybean farmer stated that he had been farming for a long time and used knowledge he gained from extension workers in application of fertilizer. Men also said that information on fertilizer application could also be obtained through village meetings.

3.3.5 How information is shared in the household

Information among common bean farmers is shared through village meetings. Sharing information at the household level is done through discussion (talks) especially during farming plans at the right season. "Sometimes if you have gone through training during family gathering especially after taking some food you can share and advise them to apply the new knowledge obtained." Exchange of information also occurs between friends during normal interactions. The female youth obtain information from phones especially SMS and WhatsApp. Men also obtain information from beer drinking groups and markets.

There were some differences in how information is shared within the soybean farm household. All farmers including men women and youth used mobile phones (calls/SMS) as well as farmer-to-farmer approaches in social gatherings. However in addition to voice calls and SMS, the youth also use print media such as pamphlets as well as social media (Facebook, WhatsApp) to share information with others.

3.3.6 Problems regarding access to and use of chemical fertilizers

Farmers that used fertilizers on common beans reported that the problem was high costs. Some women argued that: "*our biggest problem is that we are maintaining our traditional ways of farming not willing to change, majority farmers are farming under traditional farming practices and we don't see the importance of using chemical fertilizer on common bean during planting*". Fertilizers are not available on time and some fertilizers are fake/ expired and have low efficacy (less effective). There not enough funds to buy the fertilizers. Fertilizer containers are opened and then not closed completely, which leads to caking of the fertilizers.

Some of the women thought that continued fertilizer use on soybean leads to soil depletion. Men involved in soybean production reported challenges in accessing quality and legitimate fertilizers in addition to fertilizers not being available in local agro-dealer stores, lack of knowledge on fertilizer types and application as well as lack of finances to purchase these fertilizers. According to discussion with soybean farmers "legitimate" means less fertilizer than what is declared on the container.

3.4 Use of inoculants

3.4.1 Farmer knowledge of inoculants

All common bean farmers irrespective of gender did not know inoculants. This is attributed to the fact that inoculant is not used in the production of common beans. Majority of soybean farmers had not heard of the word inoculant before. Only a small group of them seemed to be aware of such a product. One male youth said he knew what inoculant is as well as its benefits but did not know where to find it. Only soybean farmers including men, women and youth who were part of the Clinton Foundation initiative had received inoculated seeds, and had been taught the benefits of inoculation. However it was difficult for individual farmers and even extension workers to access inoculant since it was not readily available.

3.4.2 Sources of inoculants

Female soybean farmers were not aware of any other source of inoculant apart from the Clinton Foundation. Men soybean farmers on other hand reported that in addition to the Foundation, extension workers were also a source of inoculant. All soybean farmers were trained on inoculant use by the Clinton Foundation.

3.4.3 Reasons for not using inoculants

The main problem with obtaining and using inoculant was lack of easy access to the input as well as lack of the technical knowledge on its application. Access to inoculant was particularly difficult for soybean farmers who were not part of the Clinton Foundation initiative. Male soybean farmers were keen to use inoculant if it was deemed beneficial but repeated that accessing the product was extremely difficult.

3.5 Pest and diseases in common bean and soybean

3.5.1 Key pests and diseases

Women common bean farmers reported that there were black-coloured pests known as *kikombe* or chikombe which attack leaves to the extent of completely destroying them. Other pests include Chikui/Kikui, found underneath the leaves and which cause folding of leaves leading to stagnation of the crop, Mang'ondo, which affects flowers thereby hindering pulp growth and resulting in loss of and *Ikobo* which is found in the soil and destroys the roots and eventually leads to loss of entire crop. They also reported presence of white coloured pests which reside on leaves causing them to turn ash-gray. Additionally, men farmers reported existence of butterfly, whiteflies, cut worms, armyworms, mildew, termites, and diseases such as blight, rust and yellowing/wilting of leaves. Overall, the men appeared to be more informed the signs of damage as well as the types of pests and diseases.

Majority of soybean farmers reported challenges with pests such as grasshoppers, butterfly, cutworms, caterpillars, aphids, *kimatira* and diseases such as fungus, rust, blight and mildew. However, some soybean farmers could not identify some of the pests and diseases by name and could only describe symptoms such as pierced leaves, folded leaves, black-spotted leaves etc. Even in instances where soybean farmers could not identify names of pests and diseases, they sprayed pesticides based on the training they had received from extension workers.

3.5.2 Pests and diseases management and use of pesticides

Pest and disease management practices used by common bean farmers included use of chemical pesticides (e.g. ATICAN, FECRON 720, NINJA, and Farmer Zebu in addition to application of wood ash, lemon grass, neem tree extracts, tobacco leaves, pepper, tephrosia and Mexican Marigold (repellent). Occasionally, traditional approaches are also used. For instance, farmers believe that the smell of burning pests in the infested farm can help to drive away other pests from the affected farm.

Overall both male and female soybean farmers use pesticides (Kareti, Profrecron 720, Ninja, aivoli, Ekizanto, Komfu, rikoni and famazebu) to manage pests and diseases. There were also pesticides provided by the Clinton Foundation although farmers did not know their name because they had been repackaged in unlabelled containers. In addition, female soybean farmers reported uprooting affected plants while male soybean farmers also reported the use of neem, tobacco leaves, ashes, and traditional herbs such as *lingategeta* for management of pests and diseases.

3.5.3 Sources of pesticides and other inputs used to manage pests and diseases

The sources of pesticides and other inputs used in the management of pests and diseases were local shops and agro-vets.

3.5.4 Problems of accessing and using pesticides

Common bean farmers reported that low incomes, high costs of pesticides, low availability in local agro-dealer stores and lack of knowledge and skills (technical know-how) on pesticide use were the main challenges. The youth in particular reported that they lack technical know-how and skills about chemical pesticides and indigenous (traditional) pesticides.

Both male and female soybean farmers said pesticides were expensive and that they had to travel long distances to access them in neighboring towns when local agro-dealers were out of stock. In addition, they had challenges with safe use of pesticides (such as when using repackaged and unlabeled fertilizers) and lack of protective gear. The youth did not report any challenges with access to pesticides.

3.5.5 Sources of information on pest and disease management

Women common bean farmers obtain information on pests and diseases from fellow farmers and extension workers who show them how to treat the pests and disease. Radio Sauti ya Injili Moshi also provides agricultural information for different issues including management of pests and diseases.

In the case of soybean, farmer-to-farmer approaches, extension officers and agro-dealers were the main sources of information for all farmers. In addition, men cited radio and pamphlets as a source of information.

3.5.6 Problems of accessing and using information on pest and disease management

According to some women common bean farmers there was no information on pesticides. Sometimes pesticides were not available in the village hence costly to access. Lack of income, lack of technical know-how and poor availability of pesticides were the other issues. Men noted that there was no difficulty in accessing and using information because fellow farmers were always willing to help. The only problem is having few extension officers compared to the population of farmers.

Soybean female farmers reported no problems with using information on pests and diseases due to easy access to extension workers who were readily available to offer support. Although radio was also a source of information, not all of them had access to radios. Male soybean farmers on the other hand felt that extension workers were not readily available to offer support, perhaps because they were few and could only be available for a small number of people within a reasonable geographic distance.

3.6 Marketing/sales of common bean and soybean

3.6.1 Market places and marketing channels for common bean & soybean

Common beans were sold directly to consumers at the farm gate, to local markets, middlemen, small business men, secondary schools, hotels, markets in the nearby towns, village/ farm gate, aggregators, wholesalers and traders. On the other hand, Clinton Foundation was the sole buyer of soybean for purposes of processing it into livestock feed for export to foreign markets. The purchase price was Tsh.1200 per kilo of soybean for farmers in groups and Tsh. 1100 for individual farmers, although farmers reported that the foundation had also stopped buying from them after foreign markets stopped purchasing soybean from Tanzania. As a result, all soybean farmers also tried to sell their produce to small traders in neighbouring towns as there was no demand for the produce in their villages. In the last season 1kg of the soybean was sold at Tsh. 300 in local markets in addition to farmers paying for transport costs of ferrying produce to markets, which had resulted in farmers giving up on soybean farming. Male soybean farmers appeared to have more information on markets than female farmers. While the female farmers only sold their produce through the Clinton Foundation, male farmers used both the foundation, middle men and other buyers. However, all groups of farmers lamented the lack of markets and poor market prices. A section of farmers who had not yet harvested their crops did not have any information on where they would to sell their produce.

Buyers of common beans from farmers sold them to local markets, schools, markets in towns far away from the village (e.g. Dar Es Salaam), neighbouring countries (e.g. Kenya), schools, hotels and wholesalers. Some buyers are also speculators who store and then sell later when prices are high. All common bean farmers reported that they do not receive any support from buyers. Soybean farmers reported having received seeds, fertilizer and pesticides from the Clinton Foundation, costs which were deducted from the proceeds of their sale of soybean. In addition to inputs, farmers also received training on use of fertilizers from the foundation.

3.6.2 Sources and types of information on marketing

Women common bean farmers obtained information from businessmen, fellow farmers, traders in the markets, market centres and brokers in the markets. The major source of soybean marketing information for the female farmers was the Clinton Foundation. Male soybean farmers were perceived to have more information on markets and prices because they also had contact with middlemen, people in the market and sometimes direct buyers through telephone calls. However, all farmers were essentially grappling with lack of market information.

Common bean women farmers reported that they receive information on type of beans needed by the buyer, the price of beans, selling points or markets and the increase and decrease of demand for common beans, transportation costs, preferred markets and highly priced common bean varieties. Soybean farmers reported receiving information on price of soybean prices from various sources but no information on markets.

Adult common bean women farmers wished to know the right place to sell their beans (official markets), official price of beans, official buyers of beans, types of varieties that can be used, price of beans, types of beans required in the markets and special markets for common beans. The youth wished to know the quality, quantity and type of beans preferred in alternative markets, prices in other regions, calibration of measuring equipment to avoid being defrauded by buyers and differences in benefits/profits from selling in different markets while the men wished to know the quality of common beans needed and measuring units for the

beans. All soybean farmers wanted to receive information about prices, available markets and opportunities for soybean contract farming.

No price information is received by farmers before selling of common beans. Soybean farmers reported that they receive information on price prior to selling their produce to the Clinton Foundation. A male farmer also mentioned negotiating prices over the phone with other buyers in the markets who offered to buy the produce at Tsh. 700 per kg.

3.6.3 Challenges encountered during marketing

Both male and female common bean farmers faced challenges to do with lack of specific target markets and irregular fluctuations in market prices which led them to selling their produce at low prices. Business men reportedly have the tendency to lower the price and value of certain varieties in the market and then pretend to offer good prices for other varieties thereby causing confusion among farmers on which varieties are most preferred in the markets. In addition, all farmers were always prone to fraudulent buyers who used weighing equipment which had been improperly calibrated to under-weigh the produce. Lack of unity among farmers also means that they lack the bargaining power both to deal with fraudulent buyers and to negotiate better prices. They play with farmers' mind always for them to buy at low prices.

About 95% of soybean farmers were constrained by the lack of soybean markets as well as low prices for their produce. Common bean was more preferred than soybean because it fetched more favorable prices in local markets unlike soybean for which farmers still had to bear transportation costs to ferry produce to far off markets.

3.7 Use of technologies for storage (PICS bags)

3.7.1 Farmer knowledge of and use of PICS bags

Many common bean farmers said they know Purdue Improved Crop Storage (PICS) bags, which were locally known as "*Kinga Njaa*" and that contained two nylon bags inside and third outer cover. However, they reported that very few farmers use PICS bags because farmers often sell their produce immediately after harvest. When they needed to store common beans, they used normal sacks (plastic bags) locally available in the village. Most of the youth were not aware about the existence of the special plastic bags known as *Kinga Njaa* or PICS, except a few who heard about it from other people or saw it when it was being promoted at the market place. All soybean farmers were aware of PICS bags and the benefits of using them in that they did not require using chemicals. However, majority of them were using common bags and only a small group were using PICS bags.

Only very few men and a few women used PICs for storage of common beans. Similarly, only about 12% of women and 14% of men involved in soybean production were using PICS bags. However they used them on other crops such as maize and beans and not soybean, largely because soybean prices in the markets were very low compared to the price of PICS bags. 1 PICS bag costs TSh. 5000 while that of soybean is priced at Tsh. 2000. In addition, farmers preferred to use PICS bags on food crops instead of soybean which is mainly a cash crop, handed over to Clinton Foundation upon harvest.

3.7.2 Sources of PICS bags and information on PICS bags

Common bean farmers reported that the PICS bags were found at the Tanzania Farmers' Association, from agricultural extension officers and special agrovets at the price of Tsh. 5500 per bag which many farmers could not afford. Soybean farmers reported that PICS were readily available from extension workers, and from local agro-dealer stores as well as different initiatives such as Rural Urban Development Initiatives (RUDI) and One Acre Fund who had conducted training on post-harvest handling in the area.

Common bean farmers learned about the PICS from Tanzania Farmers Association, village meetings, agricultural extension officers, churches, shopkeepers and agrovets. Majority of soybean farmers learnt about PICS bags mainly from extension workers, organizations such as Rural Urban Development Initiatives (RUDI) and One Acre Fund, pamphlets from retailers (women), village meetings (men) as well as learning from other farmers (youth).

3.7.3 Reasons/Challenges why farmers do not use PICS bags

Many common bean farmers said PICS bags are prone to destruction by rats. They reported that in some instances the pests pierce through the bags and destroy the common beans or other crops stored in them. In instances where markets were pre-guaranteed, farmers did not see the need for the bags since the produce was sold immediately after harvest. Male farmers reported that the main reason for not using the PICS is the high price and the PICS were not easily available. The PICS bags are said to have capacity for only a small quantity of common beans. Lack of money to buy the PICS was a major challenge according to the male youth.

The main reason for lack of use of PICS by all soybean farmers is the high cost of purchasing PICS bags. Lack of money to buy the bags was a major challenge according to the male youth. Instead farmers use pesticides such as *shumba*, *shamba* and *actelic gold dust*. Other soybean farmers also said PICS bags were not available in local agro-dealer stores and that they had to incur additional transportation costs to purchase them from neighboring towns.

3.8 Information sources on agriculture for households

3.8.1 Common sources of information for households

The most common sources of information were agricultural extension officers, telephone, village/group meetings, fellow farmers and media like radio (Sauti ya Injili from Moshi). The youth reported use of the radios and TVs, internet, and phones. Some female youth reported, "Our parents have been cultivating common bean for such a long time so we are depending on their experiences". Both female adults and youth obtained information from seminars and workshops organized by different NGOs and extension workers. Men reported in addition the churches, mosques, village meetings and beer clubs. The village executive was another source of information. For men group the most common sources include extension officer, TV, fellow farmers during market day or group meeting, through telephone calls. For both male and female youth the most common sources include fellow farmers, extension officers, market gathering where we meet different farmers from neighbouring village and social media through mobile phone.

In the case of soybean growers the most common sources of information for households were farmer-to-farmer exchange of information, farmer field schools, village meetings, demonstration plots, agricultural shows and exhibitions, extension officers, media such as radio, television (ITV, TBC, etc.), mobile phones, YouTube, WhatsApp.

3.8.2 Preferred sources of information by farm households

There were no distinct differences in preference of the source of information but it emerged that the youth preferred social media and phones, attributed to the speed with which they receive information. Adult women prefer meetings called by extension officers because they are able to ask questions and receive answers during the meetings. Female youth prefer FFS because they can learn by doing. In addition all youth are happy with print formats, radios and social media such as WhatsApp. Other sources of information used include leaflets, pamphlets, flyers, brochures, newspapers, texts or short notes, which are preferred by adult men and women because they can be retained and retrieved for future reference. Village meetings and seminars, especially those organized by government systems are preferred by women and men. The government involves all people without exceptions. Churches and mosques are preferred sources because they also include all irrespective of gender. Extension agents are another source that is preferred because they provide direct teaching to farmers increasing chances of farmers understanding. Meetings are also preferred because of the geographical position of the villages; agricultural officer cannot visit all farmers individually.

All categories of soybean farmers preferred mobile phones and extension workers because of the mobility and accessibility of mobile devices and the reliability of advice from extension service respectively. Demonstration plots were also preferred because of their ability to practically demonstrate agronomic practices and technologies as well as the impacts of their adoption. In addition to the aforementioned, youth involved in soybean production preferred mobile phones and social media applications because of the speed and variety of forms in which information can be shared such as phone calls, texts, images, videos etc. The youth also preferred learning from observing their own parents as well as attending specialized seminars or group meetings. Women and men also preferred in addition to groups, farmer field schools, and seminars because of the opportunity to learn from experts. Men also argued that unlike women who were tied by chores at home, they had better access to media such as TV and radio.

3.8.3 Who in the household has access to information sources?

There were some variations in terms of who had the greatest access to different sources of information. Adult women engaged in common bean production had access to most of the information sources. This is because they participated in village meetings and when at home they listen to news concerning agriculture. The women receive information and disseminate to other household members. Adult men had access to the mentioned sources. This is because they participate in village meetings and when at home they listen to news from radio. In terms of specific channels it emerged that radio was more accessible to men involved in common bean production because women are very busy with household chores. Village meetings and churches/mosques were accessible to all common bean farmers. The youth have a good chance to access information from TVs. In the case of market places, all farmers can access information regardless of their sex. But youth have more time to attend the market place. Both adult and young common bean farmers have access to agriculture extension officers. Youth have more access to information passed through mobile phones. Most farmers both adult and youth noted that the youth are the ones using mobile phones in their day to day life.

Of all information sources, extension workers and mobile phones were the most accessible to majority of soybean farmers irrespective of gender or age. TV and radio could also be a source for all soybean farmers although this is dependent on other factors such as whether farmers own TVs and radios, listenership/viewership (reach) of these media and timing of the programmes etc. Women and men involved in soybean production were more likely to attend physical village meetings unlike the youth who had access to mobile phone apps such as WhatsApp, Facebook, and YouTube etc.

3.8.4 How different types of information are shared

Adult women and men who grow common beans said that they share information through word of mouth and through phone especially information on seeds and market. Verbal information sharing between farmers occurs in meetings, churches, mosques and over telephones. Youth share information through SMS, WhatsApp, and other application on mobile phones. Verbal information is also shared at meal times.

There were no differences in how and what type of information is shared by the soybean growers. Generally information on varieties, good agronomy practices, pest and disease management, fertilizer application and soybean prices and markets, was shared through various approaches including farmer to farmer approaches, short messages, phone calls and group meetings. However, it was reported that the youth are keen to know information regarding varieties to grow and marketing information on soybean while adults were keener on information about land preparation and associated costs. The most shared information among farmers was the nutritional importance of soybean for the family and the promised availability of markets for the produce.

3.8.5 Farmer perceptions about information delivered through groups and that delivered to individuals in terms of influencing learning and uptake of new technologies

Both common bean and soybean farmers were of the view that information delivered through groups was more effective than information delivered through individuals. Group approaches have capacity to reach many farmers at once (over a short period of time), encourage farmer interaction and consultation on difficult issues and hence provide better opportunities for learning and uptake according to both adults and youth. Some group approaches such as farmer field schools and demonstrations enable farmers to learn from practical observations as well as from one another. The group approaches cited include meetings/seminars, demonstration plots, radio listening groups, training, small-pack inputs, films–videos and farmer field schools (FFS). The presence of extension officers at these meetings also allows them to explain and demonstrate otherwise difficult practices to farmers. Group approaches are also good because they involve everyone irrespective of gender, hence provide equal opportunities for all to learn and guarantee that farmers can consult each other in case they forget what they learnt. However, mass media approaches such as radio and TV may not be as effective because not all farmers have access to these devices and listenership and viewership can be fragmented depending on the number of stations available in one locality. Individual approaches to delivery of information include comics, leaflets, village based advisors and radio programs, print-material, phone-call-survey and SMS messages. It should be noted, however, that while individual approaches are not necessarily preferred, they also play a crucial role in reinforcing group learning because an SMS can be referred to at a later date.

3.8.6 How best information can reach farmers and associated approaches

Adult women common bean farmers reported that information can reach them best through meetings where they have a chance to ask questions and get required answers. Female youth involved noted that farmer field schools are best because they learn by doing. Youth said leaflets can be retrieved for future reference. Adult women said that press is also best as one gets information that can spread to others. Adult women and youth stated that meetings, pamphlets and radios are good sources. For both adult men and women; best reach of information can be achieved through use of mobile phones especially SMS, and extension officers. Information through parents and village chairperson can also easily reach youth. Male youth stated that the use of WhatsApp is the best as one can take pictures and share to other groups. Formation of groups specifically for sharing information and provision of information to schools can enhance the reach of information in the community.

Village meetings were preferred by all soybean farmers because they were organized up to the lower levels of administration like hamlet and street. They are also a good alternative for farmers who may not have access

to mobile phones. Involving existing government and religious systems can also help reach more soybean farmers because communities have faith in these systems. Besides demonstration plots having a practical aspect to them, they also enable farmers to practice on their farms what was observed at demonstration plots. Some farmers took up the practices based on observations and learning from their fellow farmers.

3.8.7 Measures to improve access to information

All common bean farmers and women soybean farmers felt that increasing the frequency and consistency of village meetings, trainings (conveniently scheduled with ample notice) could increase access to information. Notices about meeting should be given early and information should also be shared early in small and targeted portions for specific activities during the crop cycle. Female common bean farmers added that messages to be shared should align with the cropping cycle to ensure that farmers are not bombarded with too much information at a go. The youth and women also said that print materials such as leaflets should contain clear and concise information for easier understanding. Demonstration plots should also be increased because they provide an opportunity for all farmers to learn irrespective of literacy levels and are more effective at influencing adoption of technologies. Adult male soybean farmers felt that passing messages through government systems such as community leaders and extension would increase information access because people have faith in these systems. In addition, increasing the frequency of extension visits, linking farmers groups with extension workers and facilitating transportation costs for group leaders (to other farms/trainings) would also increase access to information.

3.8.8 Changes that have occurred in sharing of information since last year

All farmers noted that the speed and timeliness with which information is shared has increased due to wider telephone network coverage, increase in mobile phone ownership and increase in number of agricultural programs on radio and TVs. There were more information sources available. Notably, agro-dealers were increasingly becoming a source of information in addition to being points of sales and there were more frequent visits by extension officers and other experts. Youth said that with the presence of smartphones, other modes of information dissemination have been developed such as WhatsApp. Male youth reported that the cause for change is cooperation in sharing information. Early adopters of technologies also assist in formation sharing because they act as an example for fellow farmers. For instance, those who adopted new varieties such as "*Uyole Njano*" have helped other farmers to understand the importance of using new improved varieties of common bean. Farmers also reported increased cooperation among researchers and agricultural extension officers and with other stakeholders in agriculture.

High pest infestation and disease incidences that cause widespread damage to crops e.g. fall armyworm and African armyworm have caused changes in information sharing as researchers and government systems attempt to prevent, monitor and control infestations. Other factors that have led to changes in information sharing are increased education levels, globalization, technological advances and staying far from the family. Global development has changed behaviour of the young people especially with respect to how they interact with the adults.

Soybean farmers attributed the change to the development of new technologies that require farmers to search for information as well as increase in government accountability requiring that extension officers deliver information to farmers.

3.8.9 Improvements required with respect to information sharing

Farmers said that information should be aligned to cropping cycles and delivered in a timely manner. For instance, extension officers should devise a mechanism for sharing information before or at the start of the season. Adult male farmers were categorical that radio programs should be aired at a convenient time such as from 8:00 pm to 9:00 pm and meetings should be conducted from 11:00 am to 2:00 pm and on specific days. Leaflets should contain large prints for ease of reading and should be available at the village office.

Farmers also added that there must be a system of sharing information at the household level, with parents advised to establish a system where family meetings are held at least once per month and family members encouraged to share opinions freely. Farmers should also be encouraged more to form groups so that they can access more education on common bean production.

All soybean farmers said they needed more training/seminars, building stronger links between farmers and extension workers as well as organizing more farmers into groups. However one youth said that the only problem they had was lack of information on sustainable markets and no problems with information sharing.

3.9 Awareness and adoption of technologies

3.9.1 Information receipt and sources of information in the last one year

Only a few farmers received information about common beans from the agricultural extension officer. The information was on how to how to prepare land, seeds of common beans, how to plant and use of pesticides. Majority of soybean farmers had not received any information in the last one year. Only 12% of adult female soybean farmers had received information on soybean in the last year possibly because Clinton Foundation, which had been the main source of information, was no longer promoting the crop for lack of markets.

Adult men and women common bean farmers said that the sources of information were IITA, Radio Free Africa and Radio Sauti ya Injili, meetings at the agricultural office, market place, fellow farmers in the village and researchers. Both adult men and youth also mentioned agricultural extension officers, farmer field schools and phones (especially for the youth), books, demonstration plots, relatives and fellow farmers. Most information for the men was received from channels involving groups. There were significant differences in information sources among soybean farmers. Adult male and female soybean farmers accessed information from conventional sources such as extension workers, Farmer Field Schools and seminars. The youth on the other hand obtained information through ICTs including radio and mobile (WhatsApp, YouTube) in addition to extension workers.

3.9.2 Key technologies learned that farmers did not know about

Key technologies learned by common beans farmers were majorly good agronomic practices such as planting in rows, correct spacing of beans, types of fertilizer to use e.g. chemical fertilizers and manure, safe use of pesticides and improved seeds to increase yields, information on alternative markets and the importance of using PICS bags for storing common bean. Farmers also noted that it is possible to get high yields from correct spacing as it allows easy weeding, enhances crop protection and eases harvesting.

Soybean farmers had learned about improved varieties, good agronomic practices such as planting in rows and with correct spacing as well as value addition products from soybean such as milk and livestock feed.

3.9.3 Whether the messages influenced current practices in production

The messages influenced current practices in common bean farming. Most adult women reported that they practiced planting in rows and correct spacing after observing from demonstrations and/ or receiving advice from extension officers. Recommended pesticides were also used in the control of pests and diseases. Some women farmers reported that they use new varieties. They were not specific on the new varieties used which raised questions on their understanding. Some female farmers reported that they were using creative storage approaches including PIC bags for common beans. Men farmers reported that using row and correct spacing made it easy to cultivate and harvest crops. A majority of farmers did not adopt the new technologies due to lack of money. Some male youth reported that planting in rows requires more money and more labour (people to help in aligning the rope). Adult men on the other hand noted that although it is true that planting in rows is more costly, it is good because only two seeds are put in every hole and you end up using fewer seeds than

when planting the traditional way by broadcasting. The messages did not influence current soybean practices. Most soybean farmers said they were not planning to plant soybean in future.

3.9.4 Observed/perceived benefits of learned and utilised practices

The key benefit observed among common bean farmers is the awareness and adoption of good agronomic practices which has resulted to lower costs of production and improved/higher yields. Common bean growers reported that less (few) seeds were used after adopting learned practices. Consequently, costs of production have been lowered arising from less seed purchase. They also reported improvement in yields (production) as a result of adopting practices. Planting in rows using the recommended spacing makes it easier to weed the crops as well as to manage pests and diseases and boosts crop growth. Male youth reported that their crops are now healthy and there are fewer cases of pest and disease infestation and incidences. One adult male farmer reported as follows: "My neighbor who adopted the new farming technology and uses pesticides has good common bean and it is expected that he will have good yields this year".

Some of the soybean farmers had not harvested their crops and so could not report any benefits. However, female farmers who had harvested mentioned that they had learned some good agronomic practices such as use of improved varieties. Male farmers had learned about planting in rows while the youth said that they had learned about types of pesticides used in soybean farming.

3.9.5 Challenges farmers have encountered in taking up learned practices

The challenges that farmers have encountered in taking up learned practices in common bean include limited access to inputs (limited availability of improved seeds and pesticides) coupled with high prices of these inputs. Some training was also not aligned with the seasons which made it difficult for the farmers to adopt the practices. Additionally, farmers were deprived of their incomes by buyers who used fraudulently calibrated weighing equipment to under-weigh the seeds at the point of sale. The market for common beans is also not well structured leading to fluctuations in prices and consequently losses for farmers.

All soybean farmers reported challenges with lack of information on markets, high costs of and poor access to inputs (seeds and fertilizers), longer germination period, fluctuating market prices despite high production costs, proper use of inoculant and safe use of repackaged and unlabeled pesticides as well as lack of soybean processing equipment. In addition some farmers also mentioned effects of climate change.

Appendix 1: FGD Data collection tool

Good morning/afternoon. We are coming from CABI with permission from the local government. We are conducting a focus group discussion to assess how different communication channels contribute to knowledge and uptake of technologies for common beans and soybeans. We wish to engage you in discussions and information obtained will be used for research purposes only. We wish to note that the information you report will not be associated with any individual persons and will be used to enhance productivity of common beans and soybean. Your answers will not affect any benefits or subsidies you may receive now or in the future.

Date -----
 Name of facilitator -----
 Name of rapporteur -----
 Name of coordinator -----
 Region -----
 District -----
 Ward -----
 Village -----
 Number of FGD participants -----
 Type of FGD (women or men) specify -----
 Crop (specify) common beans and /or soybean -----
 GPS coordinates (UTM): N: _____ GPSN S: _____ GPSS
 E: _____ GPSE W: _____ GPSW

A. Common bean/soybean production:

1. What is the proportion of farmers growing common bean/soybean?
2. What is the primary purpose of common bean/soybean e.g. cash, food, or both food and cash?
3. What is the average production in kg per acre in this area (village)?
4. What challenges do you get regarding production?

B. Seed use (improved varieties grown)

1. What varieties are used (often farmers do not know the name, this might be possible, you might want to bring a few pictures of different varieties to show)?
2. From where do farmers get the varieties?
3. Why they prefer these varieties (note, it seems that some farmers buy under a sort of agreement with sellers)
4. If they are aware of other varieties (mention names of other available varieties or show pictures. To be noted farmers might use)
5. From where they get information about varieties?
6. Which other varieties do you know?
7. If aware of other varieties why they are not using them?
8. Problems they encounter with respect to getting and using seeds (improved varieties)?

C. Chemical fertilizer and manure

1. What is the proportion of farmers using chemical fertilizer?
2. From where do you get the chemical fertilizer (check if subsidised, if so, from whom, how often, if from agro-dealers how far they are, if the supply is constant, etc.)?
3. For those that do not use fertilizer; do they use manure, or they don't fertilize at all?
4. Ask for reasons for not using it (note some farmers might not have the right to decide what to do in the farm)
5. From where do you gather information on the type of chemical fertilizer and modalities of use
6. From where do you get information on how to use chemical fertilizer
7. How do you share this information with anyone in the household?
8. What problems do you get regarding obtaining and using chemical fertilizers?

D. Inoculant (where applicable)

1. Do you know what inoculant is?
2. If not, explain (some farmers apparently do not know that what they are using is inoculant) and then re-ask, please record if a positive answer on the use came after the explanation of what inoculant are.
3. If yes, how did you get information about it? What proportion of farmers is using inoculant (type known to farmers by name)?
4. If yes, from where (source of inoculant) do you get the inoculant that you use?
5. From where did you learn about the way to use it?
6. If they are not using it, ask whether they would be keen to use it
7. What problems do you get regarding obtaining and using inoculants?

E. Pest and disease management – Pesticide use

1. Which are the key pests and diseases?
2. How are pests and diseases managed?
3. Which inputs are used in pest & disease management? (e.g. pesticides, wood ash, tephrosia, neem)
4. From where do you get inputs? (e.g. pesticides, wood ash, tephrosia, neem, etc.)
5. What problems do you encounter in accessing pesticides?
6. From where do you get information on pest and disease management
7. What are the problems of accessing and using information on pest and disease management

F. Marketing/sales of beans

1. Where do you sell the beans?
2. Where do the buyers take the beans?
3. What is the source of information on marketing?
4. What information do you receive on marketing?
5. What information do you wish to receive on marketing?
6. Which marketing channels did you use to sell your common bean?
7. What support do you receive from the buyers of beans?
8. What price information do you receive before selling beans?
9. What marketing challenges do you have?

G. Technologies for storage (Use of PIC bags)

1. Do you know PICS bags?
2. Where do you get PICS bags from?
3. Do you use PICS bags (whether they use the PICS bags)?
4. If they don't use them why, etc.,
5. How did you learn about PICS bags?
6. What challenges do you encounter using PICS?

H. Information sources on agriculture for households

1. What are the most common sources of information for households?
2. Who in the household has access to the mentioned sources?
3. How is information shared and what type of information? e.g. new varieties, markets, agronomic practices etc.
4. What are the preferred sources of information for men, women and youth, and why?
5. What is the perception of farmers about information delivered through groups and that delivered to individuals in terms of influencing learning and uptake of new technologies? [Individual: comics, leaflets, village based advisors and radio programs, phone-call-survey, SMS messages; Groups: FFS, radio listening groups, demonstration plots, print-material, training, small-pack inputs, films–videos, etc.]
6. How best can information reach men, women, youth? Which approaches and why?
7. How can access to information be improved?
8. What changes have occurred in sharing of information since last year?
9. What is the cause of the changes that have occurred?
10. What improvements do you require with respect to information sharing?

I. Awareness and adoption

1. Did you receive information on soybean/common bean in the last one year?
2. From which sources did you receive information? e.g. participation at demonstration plot, radio program (name the program & radio station), village-based advisors, extension workers, extension materials etc.
3. What key technologies were learned, that farmers did not know about?
4. Did the messages influence current practices in common bean and soybean production? E.g. changed practices, increased area under production, introduced new varieties etc.
5. What are the observed/perceived benefits of learned (and utilised) soybean/common bean practices?
6. What challenges have farmers encountered in taking up learned soybean/common bean practices?