

Facilitation of Indigenous Leafy Vegetable (ILV) and Bambara Groundnut User Groups in Northern Ghana



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Summary

The agricultural sector in northern Ghana faces a myriad of challenges that relate to production, post-harvest handling, marketing, and information flow/knowledge exchange among stakeholders. Given these constraints, there is a clear need to intensify efforts towards transforming agriculture with a view to reducing poverty, increasing food and nutrition security and reducing environmental degradation. In the 1970s, the farming systems research method emerged with the object of understanding the constraints that farmers face and then providing scientific options in a participatory manner on-farm to address the constraints using an interdisciplinary approach. With the farming systems method, even though farmers were consulted, scientists remained as a key source of knowledge and innovation. In the 1990s, other farmer participatory approaches emerged where scientists and farmers co-created new knowledge that were directly relevant to the latter's livelihoods. These new approaches recognized the importance of farmer engagement in the knowledge development process and this has since been used as a means of disseminating new crop production techniques to farmers to boost productivity, improve food security and reduce rural poverty. One such participatory approach is the concept of Germplasm User Groups. Two such Germplasm User Groups on Bambara Groundnut and Indigenous Leafy Vegetables (ILVs) have been formed in northern Ghana under the Seeds for Resilience (SFR) Project.

In 2022, the CSIR-PGRRI together with the CSIR-SARI, the collaborating institute for the SRF Project in the Northern and Upper East Regions organized two sets of meetings in four communities with members of the Indigenous Leafy Vegetable (ILV) and Bambara Groundnut User Groups. These meetings were organized in the Golinga and Libga communities in the Northern region, where the ILV User Groups are located and the Bugri Bulpieli and Naransaag communities in the Upper East region where the Bambara groundnut User Groups are also located.

The report is presented in two parts. Part One presents the outcome of the meetings organized with the User Groups (both ILVs and Bambara). These meetings include one organized on the 25th and 26th July 2022 for the ILV User Group in the Golinga community, and the 27th and 28th July 2022 for the ILV User Group in the Libga community in the Northern Region of Ghana. For the Bambara User Groups, the meetings were organized on the 1st and 2nd of August 2022 for the

Bambara User Group in the Bugri Bulpielis community, and the 3rd and 4th of August 2022 for the Bambara groundnut User Group in the Naransaag community in the Upper East Region of Ghana.

The meetings were organized to assess the constraints, opportunities and threats associated with the production and marketing of ILVs and Bambara groundnut. The meetings also sought to develop a workplan and collate the training needs of the User Groups.

Part Two of the report presents the outcome of the meetings organized to collect feedback from User Groups on their assessment of the new genotypes of ILVs and Bambara Groundnut planted on farmers' fields and on trial plots. As part of this, a meeting was organized on the 26th of September 2022 for the Bugri Bulpielis User Group and the 27th of September 2022 for the Naransaag User Group. For the ILV User Groups, a meeting was organized on the 2nd of October 2022 for the Golinga User Group and the 3rd of October 2022 for the Libga User Group.

PART ONE

Situation analysis, training needs and work plan of User Groups

1.0. Introduction

A total of 32 members (18 males and 14 females) from the Golinga and 39 members (19 males and 20 females) from the Libga ILV User Groups (UGs) took part in a two-day meeting (see the Appendix). For the Bambara Groundnut User Groups, a total of 36 members (7 males and 29 females) from the Bugri Bulpielis and 38 members from the Naransaag User Groups (13 males and 25 females) participated in the meeting. The outcomes of the meetings are presented in Sections One to Section Three of this report. Section One presents a situation analysis of crop production among the User Groups, SWOT analysis and financial mobilization among the UGs. Section Two presents the training needs while Section Three presents a proposed workplan developed by the UGs to cover their activities for a period of one year.

Section One

1.1. Crop production trends among User Groups

The trend of crop production among the User Groups was observed to fluctuate depending on the type of crop around which a User Group was formed. For members of the ILV User Group, the meeting revealed that vegetable production has been on a steady increase across the two communities due to the high demand for leafy vegetables among a greater proportion of the population of the Northern Region. Members were of the view that due to the presence of irrigation facilities in the two communities hosting the ILV User Groups, production was high all year round, with the dry season providing the highest amount of revenue for the groups. With regards to the production of cereals and leguminous crops, members indicated a decline in production, due to declining soil fertility levels and high costs of agro-inputs.

For the Bambara User Group, members indicated a decline in Bambara production due to erratic rainfall patterns and low yields as a result of continuous recycling of farmers' own varieties as well as increased demand for arable (agriculture) land and declining soil fertility. Several members of the User Group have indicated their willingness to cultivate Bambara on large scale basis, but for financial constraints. Members of the Bambara User Groups from the two communities also reported a decline in the production of cereals (e.g. legumes, maize??), legumes (e.g.) and other root and tuber crops (e.g.) due to the high costs of inputs, declining soil fertility and erratic rainfall patterns.

Members of the User Groups also indicated that they did not have access to any crop production support although they had made attempts to get support from the Government of Ghana's Planting for Food and Jobs (PFJ) program.



A cross section of the Golinga ILV UG



A cross section of the Ligba ILV UG

1.2. SWOT Analysis of crop production for the User Groups

The meetings were also used as platforms to conduct SWOT analysis for the User Groups to help determine the strengths, weaknesses, opportunities and threats that the groups face, in order to assist the project team to identify relevant entry points to execute activities and initiatives within the UGs.

Members of the UGs were put into groups of three (that is, producers, traders and processors) to help identify the strengths, weaknesses, opportunities and threats in their respective crop value chain category. The team then collated the information from the groups and presented them to members in the meeting to agree on which ones were to be captured as strengths, weaknesses, opportunities and threats.

SWOT Analysis for ILV User Groups

The availability of an irrigation facility, and the high demand for ILVs across the two project communities were reported to be the strengths of the UGs (Table 1). Notable weaknesses and threats identified included the high cost of inputs, high incidence of field pests and diseases, lack of improved seeds of ILVs, limited access to arable lands to expand production and lack of technical know-how on post-harvest handling of ILVs.

Table 1: SWOT analysis of ILV User Groups

<p>Strengths</p> <ul style="list-style-type: none"> -Availability of irrigation facilities in the two project communities for dry season production. 	<p>Weakness</p> <ul style="list-style-type: none"> -High cost of agro-inputs -Low technical know-how on post-harvest handling of ILVs -Lack of access to new seeds of ILVs
<p>Opportunities</p> <ul style="list-style-type: none"> -High demand for ILVs by consumers, marketers and processors. -Safer method of producing ILV under an irrigation facility compared to the use of unsafe waste water by other ILV growers. 	<p>Threats</p> <ul style="list-style-type: none"> -High incidence of pest infestation -High incidence of disease -Consumers switching from ILVs to foreign vegetables -The presence of middlemen who exploit producers, leading to reduced income.

SWOT Analysis for Bambara User Groups

The SWOT analysis conducted for the two Bambara User Groups revealed a high demand for Bambara Groundnut, the ability to prepare different recipes from Bambara, presence of indigenous knowledge on how to cultivate the crop and the availability of a ready market as the strengths and existing opportunities. Despite these strengths, access to improved seeds of Bambara, harvesting, and the destruction of the grain by storage insects were identified as threats to the production of the crop. Unavailability of land was also identified as a major threat to the production of the crop, since some farmers now allocate their land to cereals and other leguminous crops, due to the long maturity duration of some Bambara varieties. Table 2 presents the SWOT analysis of the Bambara User Groups.

Table 2: SWOT analysis of Bambara groundnut User Groups

<p>Strengths</p> <ul style="list-style-type: none"> - High market prices for Bambara groundnuts - Ability to prepare different traditional recipes from Bambara groundnuts. - Technical know-how on indigenous method to cultivate the crop. 	<p>Weakness</p> <ul style="list-style-type: none"> - Longer maturity period for some varieties - Low yielding of traditional varieties -Lack of access to seeds of improved varieties of Bambara groundnuts.
<p>Opportunities</p> <ul style="list-style-type: none"> -High demand for Bambara groundnut. - Multipurpose usage of Bambara groundnuts for home consumption and other traditional uses. -Less input requirement for production, hence more savings on inputs. 	<p>Threats</p> <ul style="list-style-type: none"> -High incidence of storage pest infestation -High disease incidence - Switching from cultivation of Bambara groundnuts to cereal and other legumes given land constraints.

SWOT Analysis of Traders and Food Processors

Interactions with traders and food processors on the UGs, revealed that the availability of ready market and the abundance of ILVs and Bambara groundnuts throughout the year were the strengths associated with the marketing and processing of these commodities. In terms of

opportunities, the traders and processors indicated that the high nutritional values associated with ILVs and Bambara were the key factors to sustaining their business activities.



A cross-section of participants from the Bugri Bulpielis Bambara UG

Lack of technical know-how on storage of ILVs and post-harvest losses caused by storage insect of Bambara were identified as weaknesses in the marketing of ILVs and Bambara groundnut. Processors from the Bambara UGs also identified lack of modern value addition facilities as another weakness, since they still rely on indigenous knowledge to process their harvest and this often led to a very short shelf life for foods processed from Bambara. Lack of financial support coupled with a lack of an organized value chain was also identified as a weakness in the marketing segment of the value chain (Tables 3 and 4).

Table 3: SWOT analysis of marketers of ILVs

<p>Strengths</p> <ul style="list-style-type: none"> - Availability of ready market for ILVs - Abundance of ILVs due to the presence of irrigation facilities - Good market value for ILVS 	<p>Weakness</p> <ul style="list-style-type: none"> - Lack of technical know-how on post-harvest handling of ILVs - Lack of financial support to assist traders to expand business - Lack of an organized value chain system to link marketers to producers
<p>Opportunity</p> <ul style="list-style-type: none"> - High nutritional benefits of ILVs helps to increase demand - High income from the sales 	<p>Threats</p> <ul style="list-style-type: none"> - Poor road network linking markets - Pest and insect attacks on ILVs, hence reducing market value - Influx of foreign vegetables in the market.

Table 4: SWOT analysis of Bambara marketers and processors

<p>Strengths</p> <ul style="list-style-type: none"> - Availability of ready market for Bambara groundnuts. - Good market value for Bambara groundnuts due to high demand for home consumption and traditional purposes. - High demand for processed food from Bambara groundnuts. 	<p>Weakness</p> <ul style="list-style-type: none"> - Lack of storage materials to store Bambara groundnuts - Lack of financial support to assist traders to expand business - Low awareness of Bambara groundnuts in the mass media compared to other legumes - Use of age-long traditional recipes for processing.
<p>Opportunity</p> <ul style="list-style-type: none"> - High nutritional benefits of Bambara groundnut. - High income from the sale of both raw and processed Bambara groundnut. 	<p>Threats</p> <ul style="list-style-type: none"> - Storage pest attacks - Shorter shelf life of processed food products from Bambara groundnuts

1.3. Financial Mobilization Within User Groups

One major challenge identified in all the meetings organized centered on financing the activities within the User Groups. Participants revealed during the meetings that, though they work

together as a group, financing of activities within the group has always been a challenge. For the Golinga ILV UG, participants indicated that, after receiving the seeds from the SFR Project, they had wanted to put aside some of the seed to establish a seedling nursery for the entire User Group, but could not achieve that, since it was quite challenging to get members to contribute money to carry out that activity. This was also reported by the other User Groups. They all ranked financial constraints as the number one challenge facing the smooth running of the groups.

Across all the meetings organized, the team tried to find out from members, how the mobilization of funds was done in the past to finance group activities. Some participants indicated that they mobilized funds through personal contributions, while others indicated that they were members of the Village Savings and Loans Association (VSLA), hence they could borrow monies from these VSLAs to finance such activities and later pay at the end of harvesting.

The UGs appealed to the project team to help facilitate the establishment of VSLAs within the UGs which could be used as the first point of access for funds to carry out activities within the UGs. They were also of the view that members of the UGs could also borrow from these VSLAs to expand their production of ILVs and Bambara groundnuts. Marketers and food processors within the UGs also indicated that they could also borrow monies from these VSLAs to support their business activities.

Section Two

2.1. Identification of Training Needs among User Groups

A session of the meeting was dedicated to assessing the training needs of the User Groups. This was done to help the team identify the training needs of members of the groups, which could help boost the production of ILVs and Bambara. It was also observed from the meeting that members were still using traditional methods to cultivate their crops, thus resulting in low output. They were of the view that if the team developed training models that could improve their methods of production, it will help boost the production of these crops in the shortest possible time. The training needs of the groups have been categorized according to the two User Groups, and presented in Tables 5 and 6.

Table 5: Training needs of ILV User Groups

User Group	Type of training needed
Golinga ILV User Group	Identification of new ILV varieties
	How to use drip irrigation for ILV production during the dry season
	Training on general vegetable production
	Training on soil fertility
	Training on vegetable seed production
	Training on compost preparation
	Training on marketing and pricing of ILVs
	Training on record keeping
	Training on post-harvest handling of ILVs
	Training on the concept of Village Savings and Loans Association to help in resource mobilization.
Libga ILV User Group	Compost preparation
	Biochar preparation
	Pest and disease management training
	Post-harvest handling of ILVs
	Marketing and record keeping for ILVs
	Seed production training on ILVs

Table 6: Training needs of Bambara Groundnut User Groups

User Group	Type of training needed
Bugri Bulpielis Bambara User Group	Training on Bambara groundnut seed production
	Training on GAPs in Bambara production
	Training on efficient harvesting to reduce losses
	Market and record keeping
	Training on chemical free storage of Bambara
	Training on value addition
	Training on pest and disease management
	Training on the concept of Village Savings and Loans Association to help in resource mobilization.
Naransaag Bambara User Group	Training on GAPs in Bambara production
	Training on the concept of Village Savings and Loans Association to help in resource mobilization.
	Training on post-harvest handling of Bambara
	Training on Bambara seed production
	Training on seed storage

Section Three

3.1. Development of Workplan for Working Groups

This section presents the workplans for the User Groups. The workplans were developed by the groups with facilitation from the project team. These workplans were developed to give the groups a well-defined activity-based plan to implement activities, as well as help track the progress of work undertaken by the UGs. In carrying out this activity, participants were put into two groups, that is, one group made up of producers and another group comprising traders and processors. Members in each sub-group were tasked to develop a workplan that will capture activities that will be implemented from harvesting to the next cropping season for the Bambara UGs and activities from the establishment of vegetable farms or gardens from the rainy season through to the dry season and to the next cropping season for members of the ILV User Groups.

All workplans developed by the UGs also captured the period for meetings and expected trainings during the cropping and off-seasons. It also captured who will be responsible for carrying out specific activities at given time intervals. This will help the project team make provision for attending the meetings that require the participation of project team members. Tables 7 and 8 presents the workplans for the ILV and Bambara User Groups across the project locations.

Table 7: Workplan for Golinga and Libga ILV UGs

Activity	Person(s) responsible	Start date	End date
Harvest ILV seeds from trial fields	User Group members, with monitoring from CSIR-SARI	October, 2022	November, 2022
Meeting with UG members (monthly)	UG members	October, 2022	December, 2023
Land preparation for dry season ILVs production	UG members	December, 2022	January, 2023
Meeting with CSIR-SARI team	UG members and SARI team	February, 2023	February, 2023
Organization of first training in????	SARI team	February, 2023	March, 2023
Planting ILVs on fields at irrigation site	UG members	December, 2022	January, 2023
Field management activities	UG members	January, 2023	February, 2023
Organization of second training in????	SARI team	May, 2023	May, 2023
First harvesting of ILVs	UG members	February, 2023	March, 2023
Formation of VSLA	UG members	June, 2023	June, 2023
Weekly meeting to save to VSLA	UG members	June, 2023	March, 2024
Third training with CSIR-SARI in???	SARI team	July, 2023	July, 2023
Site selection for demo plots for main season	UG members and SARI team	May, 2023	May, 2023
Land preparation and sowing of ILVs	UG members and monitored by SARI team	May, 2023	June, 2023
Field management activities	UG members and SARI team	June, 2023	June, 2023

Table 8: Workplan for Bugri Bulpielis and Naransaag Bambara UGs

Activity	Person(s) responsible	Start date	End date
Harvest Bambara from trial fields	User Group members, with monitoring from CSIR-SARI	November, 2022	December, 2022
Meeting with UG members (monthly)	UG members	November, 2022	December, 2023
Meeting with CSIR-SARI team	UG members and SARI team	January, 2023	February, 2023
Organization of first training in???	SARI team	April, 2023	April, 2023
Organization of second training in???	SARI team	June, 2023	June, 2023
Formation of VSLA	UG members	June, 2023	June, 2023
Weekly meeting to save to VSLA	UG members	June, 2023	March, 2024
Third training with CSIR-SARI in???	SARI team	August, 2023	September, 2023
Site selection for demo plots for main season	UG members and SARI team	May, 2023	May, 2023
Land preparation and sowing of Bambara groundnuts	UG members and monitored by SARI team	June, 2023	June, 2023
Field management activities	UG members and SARI team	July, 2023	August, 2023

PART TWO

Feedback from User Groups on Use of introduced ILV and
Bambara groundnut genotypes

Introduction

This part of the report presents feedback on the ILV and Bambara varieties that were distributed to User Group members in the four project communities. The meetings were organized by the CSIR-SARI SFR team to obtain feedback from members on the performance of these varieties on farmer fields and trial plots. Due to insufficient quantities of seeds, only 15 members each from the ILV UGs had access to seeds from the project, while 20 members each from the Bambara UGs also received the seeds of genotypes that the project distributed (Tables 9 and 10). The project team gave much consideration to gender in the distribution of the seeds, to allow for an evaluation of these varieties based on gender disaggregation.

The feedback assessment was done based on crop and location. The feedback was intended to guide the team on the genotypes that are more preferred based on their agro-morphological characteristics. It will also give the team first-hand information on the performance of these genotypes on farmer's field, which will serve as a basis for the selection and promotion of these varieties among project community members and beyond.

The meetings were organized in October, where both crops were well developed and could exhibit characteristics which could be selected and appreciated by members based on direct observation. The feedback from the meetings are presented below.

Section Four

4.1. Feedback from the ILV User Groups

This section presents feedback from the ILV UGs in the Golinga and Libga Communities. For the Golinga ILV UG, a total of 20 group members participated in the meeting (Appendix V). Feedback was obtained from both the trial plots and the individual farms that received and evaluated the seeds.

Two genotypes each of *Corchorus*, Roselle and *Amaranthus* were distributed among the 15 selected members for cultivation on their fields. The genotypes of *Corchorus* distributed to members in this group did not germinate, those that germinated also died after some short period. It was revealed during the meeting that members who had received the seeds did not subject them to warm water treatment before sowing, because they assumed it was done before

distribution to them, which was not the case. This reinforces the need for a training on general vegetable production.

They indicated that the genotypes of Roselle and *Amaranthus* distributed to them had a good plant stand, broad leaves and looked attractive. They were of the view that these genotypes would give high market prices when seeds are produced to support large scale production.

On the trial field at the Golinga community, one genotype of *Corchorus* was viewed by members of the UG as having a plant stature that resembled the wild type of *Corchorus*. According to them, this genotype would have a low market value when produced commercially, since there is low demand for such wild looking types of *Corchorus* on the vegetable market.



Preferred type of *Corchorus* at the Golinga community



Preferred type of *Corchorus* at the Golinga community



The type of *Corchorus* that UG members in the Golinga community indicated low preference for

In terms of insect infestation on the *Corchorus* genotype planted on the trial plots in the Golinga community, participants indicated that all the varieties given to them were less resistant to insect pest infestation, since majority of them had visible insect damage on their leaves. They, however, indicated that they did not observe any disease symptoms compared to their own varieties.

For the *Amaranthus* genotypes cultivated on the farmer and trial plots in the Golinga Community, members indicated that all the genotypes were highly preferred. They mentioned the broad and deep green leafy nature of these genotypes as the reasons for their preference for these genotypes over their existing types. UG members were of the view that these genotypes would have a higher market value when commercialized. They also indicated that these genotypes did not show any disease symptoms on the field compared to their own types. With regards to insect pest infestation on the field, members rated the severity as being the same when compared that on their own types.



Genotypes of *Amaranthus* cultivated by the Golinga ILV UG



Genotypes of *Amaranthus* cultivated by the Golinga ILV UG

Table 9: List of members from the Golinga UG who received seeds from the project

No.	Name.	Roselle	Amaranthus
1	Musah Mbalenge	10224 (G) / 10353 B(Y)	10285(G) / 10298 A(Y)
2	Ibrahim Alhassan	10358 (Y) / 10203 B(G)	10251(G) / 10182 A(Y)
3	Rakia Alhassan	10226 B(Y) / 10350 A(G)	10298 A(G) 10285(Y)
4	Osman Fusieni	10202 (G) / 10357 (Y)	10251 (Y) / 10090(G)
5	Mariama Musah	10171 (Y) / 10229 (G)	10141(Y) / 10281(G)
6	Alhassan Alhassan	10353 A(Y) / 10113(G)	10199 A(Y) / 10281(G)
7	Ibrahum Abdulai	10203 B(G) / 10357(Y)	10182 A(Y) / 10090(G)
8	Nafisah Osman	10357 (G) / 10226(Y)	10182 A(Y) 10291 A(G)
9	Sanatu Sualisu	10113 (G) / 10203 B(Y)	10141(G) / 10199 A(Y)
10	Meimunatu Alhassan	10202 (Y) / 10358(G)	10141(G) / 10285(Y)
11	Larbi Ibrahim	10356 (G) / 10353 B(Y)	10199 A(G) / 10284(Y)
12	Mansura Mbangba	10353 A(G) / 10226(Y)	10291 A(Y) / 10298A(G)
13	Oluman Issahaku	10170 B(Y) / 10224(G)	10291 A(G) / 10284(Y)
14	Alhassan Abdul Matin	10228 (Y) / 10363(Y)	10251(Y) / 10281(G)
15	Rukaya Dauda	10388 (G) / 10363(Y)	10090(G) / 10284(Y)

* G = Green label, Y = Yellow label

For the Libga ILV UG, a total of 25 members took part in the meeting. From their assessment of the genotypes given to them by the project and also from the trial plots, they indicated that some genotypes of Roselle had trifoliate leaves, which according to them, had low market value, especially those with trifoliate slender leaves compared to those with trifoliate broader leaves. They also revealed that the trifoliate slender leaves are only demanded by consumers when the trifoliate broad leaves are scarce on the market.



A Roselle genotype with trifoliate slender leaves at the Libga ILV UG trial plot



A Roselle genotype with trifoliate broad leaves at the Libga ILV UG demonstration plot

For the genotypes of *Amaranthus* given to the group, all members of the UG indicated a high germination rate of the seeds given to them. They also mentioned characteristics such as broad leaves, good plant stand and greener leaves as some characteristics they preferred in the genotypes. A genotype with purple-like leaves was however less preferred by some farmers, due to reasons such as very soft leaves, which could easily attract insects. Members reported high insect infestation on the genotypes distributed to them, which they indicated was not different from that on their own types. They however reported not seeing signs of diseases on the distributed genotypes compared to their own types.



Amaranthus cultivated at the Libga ILV UG trial plot



Amaranthus cultivated at the Libga ILV UG trial plot



Amaranthus cultivated at Libga ILV UG trial plot

The seeds of *Corchorus* given to the Libga UG did not also germinate. Members cited similar reasons as that given by the Golinga UG as the reasons why the seeds did not germinate.

The team after the meeting also went round to inspect some seeds given to members which had been sown and ready to be transplanted on their fields. It was observed that the nurseries were well managed by the members and tagged with yellow and green labels to help differentiate between them before transferring them to the fields.



New varieties of *Amaranthus* under nursery in the Libga community



Genotypes of Roselle under nursery in the Libga community



Genotypes of Roselle under nursery in the Libga community

A member of the User Group took the team to his Roselle and *Corchorus* field where he reported signs of “striga” infestation as a result of the yellowing of the vegetables. He indicated that they had to adopt the pouring of powdered charcoal on their plots anytime they observed such

symptoms. To them, this has gone a long way to control the “striga” infestation on their vegetable fields. They, thus, requested the team to help train them on biochar preparation, since they believe the application of biochar on their fields will help in controlling “striga” on their vegetable farms.



Signs of “striga” on *Corchorus* in a farmer’ field



Signs of “striga” on a Roselle in a farmer’ field

Table 10: List of members from the Libga UG who received seeds from the project

No.	Name.	Roselle	<i>Amaranthus</i>
1	Alhassan Asumah	10224(Y) / 10170B(G)	10313(Y) / 10274(G)
2	Azaratu Adam	10350A(Y) / 10171(G)	10184(Y) / 10295(G)
3	Gabosh	10299(Y) / 10208A(G)	10282(Y) / 10139(G)
4	Kadijah Issahaku	10363(G) / 10388(Y)	10186(Y) / 10316A(G)
5	Adishetu Osman	10350A(G) / 10229(Y)	10297(Y) / 10380(G)
6	Memunatu Adam	10356(Y) / 10353A(G)	10297(Y) / 10316 A(G)
7	Alhassan Mumuni	10170B(G) / 10171(Y)	10193(G) / 10317 (Y)
8	Iddrisu Ziblim	10208 A(Y) / 10299(G)	10184(Y) / 10316 A(G)
9	Tampuri Alhassan	10229(G) / 10353B(Y)	10295(G) / 10186(Y)
10	Sochi	10228(G) / 10417A(Y)	10297(Y) / 10380(G)
11	Adam Mumuni	10417A(G) / 10388(G)	10186(Y) / 10139(G)
12	Rahama Adam	10208A(G) / 10299(Y)	10317(G) / 10193(Y)
13	Shaibu Abu	10113(Y) / 10356(G)	10282(Y) / 10295(G)
14	Mariama Abdul Moomin	10202(G) / 10358(Y)	10139(G) / 10317(Y)
15	Niendo Fuseini	10228(G) / 10417 A(Y)	10193(G) / 10282(Y)

* G = Green label, Y = Yellow label

Section Five

5.1. Feedback from the Bambara groundnut User Groups

This section presents feedback from the Bambara UGs in Bugri Bulpielis and Naransaag. For the meeting with the Bugri Bulpielis UG, a total of 25 members participated. Like the ILV User Groups, the team also gathered feedback from members of the UGs on the use of the Bambara genotypes distributed by the project.

Members of the Bugri Bulpielis User Group revealed during the meeting that, the varieties of Bambara groundnut distributed to them by the project had a higher germination rate compared to their own types. They also reported that, from the plant stature, they could deduce that these varieties would outperform their already existing types. Some members also revealed that in terms of physical appearance of the genotypes, they could see that most of them had deep green leaves compared to their existing types, an indication that they were healthier compared to their own.



A visit to the Bugri Bulpielis trial field

For the members who received the genotypes (Table 11), they reported observing good germination rates even in fields that were partially flooded compared to their own types which, in many cases, had poorer germination or died shortly after germination.

Some members also revealed that the distributed genotypes were early maturing compared to their existing types. This was evident when the team visited the trial fields in the community to observe the early podding of some of the distributed genotypes as reported by members during the meeting. As at the time of the meeting, most of the farmers' own types were still in their early vegetative stages, although they were planted within the same period as the distributed genotypes. This was an indication that the varieties introduced to the UGs would mature earlier.



A good plant stature at the Bugri Bulpielis trial plot

Members of the UGs also expressed their appreciation to the team for introducing these genotypes to them which, they believe, would be ready for harvesting when the fields still have some amount of moisture, thus making harvesting easier compared to using hoes to harvest when the ground becomes hard.

A few members however expressed worry about the early maturing nature of some of the distributed genotypes, since this means that they have to divide labor between harvesting these

varieties and working on their other crop fields. Others also expressed fears about the crops maturing when the rains have not ceased. They were of the view that this could likely lead to unharvested pods germinating or getting rotten in the fields. This perception can be formally evaluated or subjected to a participatory research.



Early podding of new genotypes at the Bugri Bulpielis trial plot

In terms of yield, the UG members indicated that they could not readily tell the yield potential of the distributed varieties since the crops were still fresh on the fields as at the time of the meeting. For those who received seeds from the project, they believed these genotypes were likely to out yield their current types, considering the number of fresh pods that had been produced by some of the types.

In terms of disease incidence, some members reported seeing some disease symptoms on some of the distributed genotypes as well as their own types. They appealed to the team to help train them on disease management on Bambara. They believe this training when given, will help sustain production of Bambara groundnut which would translate to higher outputs for them.

Some members also wanted to find out from the team what processes would be put in place by the project to promote the distributed of new genotypes when they were produced in large quantities, since they wanted to be trained as seed producers for these material so that they could supply these seeds to farmers in the district and beyond. In response, the team revealed to them that there is a communication component of the project that will liaise with various media houses in the region and beyond to promote these genotypes and as well, link other farmers to the User Groups to purchase the certified seeds of the distributed Bambara groundnut genotypes they produce. The team believed that such an initiative will help solve the problem of farmers buying Bambara groundnut grains from the market for sowing. According to participants this had often led to them buying mixed types with varying maturity periods.

Table 11: List of members from the Bugri Bulpielis UG who received Bambara groundnut seeds from the project

No.	Farmer	Genotype 1	Genotype 2
1	Ibrahim Sakina	BG21 (R)	BG19 (G)
2	Inusah Amega	BG18 (R)	BG7 (G)
3	Deborah Charlse	BG25 (R)	BG11 (G)
4	halidu Atirang	BG003 (R)	BG34 (G)
5	Awin Abalug	BG24 (R)	BG13 (G)
6	Asumalis Abugbil	CVDZ-6 (R)	BG11 (G)
7	Issifu Adama	BG2 (R)	CMV07-18 (G)
8	Osmani Alale	BG4 (R)	BG25 (G)
9	Tahiru Ajara	BG003 (R)	BG2 (G)
10	Tahiru Barikisu	SANKANA (R)	BG9 (G)
11	Aluka Bukari	CMV07-18 (R)	CVDZ-2 (G)
12	Bukari Salamatu	CMVOG (R)	BG13 (G)
13	Sule Abugri	BG9 (R)	CVDZ-2 (G)
14	Apoaning Paul	SANKANA (R)	CVDZ-6 (G)
15	Salifu Maria	BG8 (R)	CMVOG (G)
16	Mamudu Memuna	BG29 (R)	BG4 (G)
17	Salam Fatima	BG29 (R)	BG34 (G)
18	Adamu Mariama	BG24 (R)	BG21 (G)
19	Inusah Zuwera	BG18 (R)	BG19 (G)
20	Mamadi Fatima	BG7 (R)	BG8 (G)

* G = Green label, Y = Yellow label

For the Naransaag UG, a total of 30 members participated in the meeting. The meeting was facilitated jointly by the CSIR-SARI team and staff from the Ministry of Food and Agriculture, working on the project. For this user group, a total of 20 members also received the different genotypes of Bambara to cultivate on their fields. A participatory field trial was also carried out in this community, showcasing all the genotypes introduced by the project. Feedback from the meeting showed that members were very impressed about the agro-morphological characteristics of these genotypes compared to their own types. Like members of the Bugri Bulpielis UG, this User Group also observed good germination rates for the distributed genotypes compared to their existing types. They also mentioned the deep green appearance of the leaves, which in their view, was an indication of a good performance of these genotypes under poor soil conditions.

In terms of maturity, members from this UG also confirmed early podding of most of the distributed genotypes, compared to their own types which were cultivated within the same period. In their view, the early podding could translate into higher yields, since optimum soil conditions would be available to help sustain more podding.

On the issue of early maturity coinciding with harvesting of other food crops on the farm, members did not see it as a problem, but rather an opportunity to have diverse food types early in the household as a way of ensuring food and nutrition security.

All members of the Naransaag UG who received the new genotypes reported not seeing any disease symptoms on their field as at the time of the meeting. They, however, reported observing disease symptoms on some of their own fields cultivated with their Bambara groundnut types. They also confirmed observing good plant performance for the distributed genotypes in fields which were slightly flooded compared to the existing Bambara types cultivated on the same fields.

Members of the UG appealed to the team to provide them with training on seed production for the distributed genotypes, so that they could produce high quality seeds of these Bambara germplasm for sale to community members and beyond. They were also of the view that when this training is given to them, they will serve as the central point for access to the distributed seeds of Bambara in the district and the region as a whole.

Table 12: List of members from the Naransaag UG who received seeds from the project

No.	Farmer	Genotype 1	Genotype 2
1	Amaale Agotiba	BG19 (R)	BG11 (G)
2	Musah Limata	BG18 (R)	CVDZ-6 (G)
3	Asaan Alariba	BG7 (R)	BG25 (G)
4	Mohammed Memuna	BG9 (R)	BG29 (G)
5	Musah Safia	CVDZ-2 (R)	CMVOG (G)
6	Adamu Faiza	BG4 (R)	SANKANA (G)
7	Musah Aishetu	CMV07-18 (R)	BG21 (G)
8	Aruk Abugribon	BG2 (R)	BG13 (G)
9	Asaan Ayampoaka	BG24 (R)	BG003 (G)
10	Abagre Akamah	BG4 (R)	BG11 (G)
11	Abugbilla Aguriba	BG8 (R)	BG34 (G)
12	Mbilla Agitiba	BG9 (R)	CMV07-18 (G)
13	Abugri Caterine	CVDZ-2 (R)	BG003 (G)
14	Ayaabilla Akisi	BG19 (R)	CMVOG (G)
15	Mbun Avoka	BG13 (R)	BG29 (G)
16	Amaale Ayariga	BG18 (R)	BG24 (G)
17	Sammy	BG34 (R)	CVDZ-6 (G)
18	Bukari Mariama	BG25 (R)	BG21 (G)
19	Mamadu Mariama	BG7 (R)	BG8 (G)
20	Dramani Barchisu	SANKANA (R)	BG2 (G)

* G = Green label, Y = Yellow label

Appendix I: List of participants from User Groups who attended the User Group meetings

List of participants from Golinga User Group

No.	Name	Gender	Contact
1.	Oluman Issahaku	Male	0240391586
2.	Ibrahim Abdulai	Male	0248275359
3.	Abukari Yissif	Male	0245281481
4.	Alhassan Fuseini	Male	0249325164
5.	Osman Fusieni	Male	0547525491
6.	Iddrisu Alhassan	Male	0241251834
7.	Seidu Fuseini	Male	0544575327
8.	Ibrahim Alhassan	Male	
9.	Yakubu Nasagri	Male	0548432817
10.	Rashid Issah	Male	0573207738
11.	Alhassan Fuseini	Male	0248583725
12.	Rakiya Alhassan	Female	0546107546
13.	Sanatu Sualisu	Female	0599612229
14.	Iddrisu Alhassan	Male	0240453553
15.	Musah Mbalinje	Male	0248460774
16.	Abu Yakubu	Male	0556330866
17.	Dauda Musah	Male	0543580075
18.	Rukaya Dauda	Female	
19.	Sanatu Issah	Female	
20.	Alhassan Alhassan	Male	0551733660
21.	Memunatu Alhassan	Female	0244076081
22.	Nafisa Osman	Female	0554820528
23.	Asimawu Alhassan	Female	0555710546
24.	Ayishetu Karim	Female	
25.	Mansura Mbangba	Female	0554069692
26.	Mariama Musah	Female	0246723846
27.	Zaratu Mohammed	Female	
28.	Rabi Ibrahim	Female	0596532275
29.	Abdulai Fuseini	Male	0240475420
30.	Alhassan Abdul Matin	Male	0598117505
31.	Niima Yussif	Female	
32.	Memunatu Alhassan	Female	

List of participants from Libga User Group

No.	Name	Gender	Contact
1.	Mariama Abdul Moomin	Female	
2.	Tampuri Alhassan	Male	0247307046
3.	Dawuni Sanatu	Female	
4.	Dawuni Abdullai	Male	0555720886
5.	Adishetu Osman	Female	0591071295
6.	Memunatu Adam	Female	0596687112
7.	Sulemana Fuseini	Male	0243817770
8.	Dawuni Wumbei	Male	
9.	Fuseini Ibrahim	Male	0558820630
10.	Azaratu Adam	Female	0550555226
11.	Mahama Naporo	Male	0243518998
12.	Gabosh	Male	0247244377
13.	Iddrisu Ziblim	Male	0242774962
14.	Rahama Adam	Female	0556523558
15.	Mohammed Sanatu	Female	
16.	Adam Mumuni	Male	
17.	Dawuni Azara	Female	0540741116
18.	Shaibu Abu	Male	
19.	Fuseini Sulemana	Male	0547122081
20.	Fuseini A. Mumin (Sochi)	Male	0593894625
21.	Fuseini Neidow	Male	0246127191
22.	Mumuni Baako	Male	0542588728
23.	Wumbei Zeinab	Female	
24.	Sumani Abdul-Rahaman	Male	0545554414
25.	Mahama Ibrahim	Male	0542391858
26.	Sulemana Ayisha	Female	0594095243
27.	Ibrahim Fauzia	Female	0594491684
28.	Eliyasu Maliya	Female	0246712774
29.	Naporo Beji	Female	
30.	Yakubu Sanatu	Female	
31.	Abdul-Rahaman Sanatu	Female	0549667516
32.	Mohammed Wahabu	Male	0247363237
33.	Fuseini Adamu	Female	
34.	Abdullai Neipag	Female	
35.	Abdul-Rahaman Barikisu	Female	
36.	Saibu Afishata	Female	
37.	Alhassan Asumah	Male	0550555226
38.	Kadijah Issahaku	Female	
39.	Alhassan Mumuni	Male	

List of participants from Bulpeilis User Group

No.	Name	Gender	Contact
1.	Halidu Atirang	Male	
2.	Ibrahim Sakina	Female	0543060080
3.	Mamudu Memuna	Female	0543060137
4.	Deborah Charles	Female	0541268827
5.	Aluka Bukari	Female	
6.	Adamu Mariama	Female	0557686057
7.	Hawa Inusah	Female	0246663756
8.	Salam Fatima	Female	0543391501
9.	Fatima Mahamadu	Female	0241328079
10.	Salifu Maria	Female	0591705661
11.	Tahiru Barichisu	Female	0546628533
12.	Mamadi Fatimata	Female	0245650189
13.	Bukari Hajara	Female	
14.	Inusah Zuwera	Female	0249941273
15.	Saratu Halidu	Female	0593249715
16.	Apoaning Paul	Male	
17.	Hellen Makulia	Female	
18.	Sule Abugri	Male	
19.	Seidu Bukari	Male	0554517303
20.	Tahiru Barikisu	Female	
21.	Abaalug Sule	Male	0248494424
22.	Awin Abalug	Female	
23.	Issifu Adama	Female	
24.	Atiig Abugbil	Female	
25.	Bukari Salamatu	Female	
26.	Osman Aisha	Female	
27.	Tahiru Ajara	Female	
28.	Hamidu Atiig	Male	0550686467
29.	Osmani Alale	Male	0548355481
30.	Mamadi Fatima	Female	
31.	Sala Bukari	Female	
32.	Amadu Amina	Female	0248429177
33.	Azuri Akuka	Female	0241793595
34.	Rakia Zakaria	Female	0541784482
35.	Safiatu Inusah	Female	0547947213
36.	Musah Maria	Female	0552909985

List of participants from Naransaag User Group

No.	Name	Gender	Contact
1.	Abugbilla Aguriba	Male	
2.	Mbilla Agotiba	Female	
3.	Ayabilla Samuel	Male	0249202914
4.	Musah Limata	Female	
5.	Bukari Mariama	Female	
6.	Abanga Margaret	Female	0548916343
7.	Mohammed Memuna	Female	
8.	Dramani Barchisu	Female	
9.	Musah Aishetu	Female	
10.	Asaan Agure	Male	0597735635
11.	Abugri Caterine	Female	
12.	Ayaaba Bukari	Male	0241785118
13.	Aruk Abugribon	Female	0597735675
14.	Awini Zacchaeus	Male	0597926457
15.	Salifu Mbasakia	Female	0594323975
16.	Amaale Agotiba	Female	
17.	Yakubu Atini	Female	0246667833
18.	Iddrisu Rahi	Female	0551952506
19.	Ayaabilla Akisi	Female	
20.	Bugri Mercy	Female	0552636460
21.	Abindaw Mumuni	Male	0548873828
22.	Adamu Faiza	Female	0597629659
23.	Abugri Jibril	Male	0243019602
24.	Abagre Akamah	Female	
25.	Apuor Aguur	Male	0246335768
26.	Mamadu Mariama	Female	
27.	Adindaw Iddrisu	Male	0245683721
28.	Mbun Avoka	Male	0593458979
29.	Asaan Michael	Male	0240248005
30.	Musah Safia	Female	
31.	Adams Akisi	Male	0554227785
32.	Asaan Alariba	Female	
33.	Dahamani Barikisu	Female	0541582591
34.	Asaan Ayampoaka	Female	
35.	Aruk Dominic Akologo	Male	0249238329
36.	Sumaila Zelia	Female	0555338698
37.	Asigri Ndebugri	Male	0547665059
38.	Moro Mpuaka	Female	0547651317