Handbook of FRG approach trainings

March 2015

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1. Introduction

This handbook documents the approaches and contents of training for agricultural researchers on FRG approach. FRG approach is a research approach by which a multi-disciplinary research team, extension workers and group of farmers jointly conduct research on selected topics based on farmers needs on their field. Researchers facilitate the involvement of extension workers and farmer groups in all process of the research from planning to implementation, from monitoring to evaluation, and sharing outputs and results. The approach also involves other stakeholders when it is necessary (FRG Guideline 2009). The approach aims to contribute to improving farmers' production and management activities, and reducing risks in their practices are realized by addressing farmers' immediate needs and test the technologies under farmer's condition. This multi-dimensional nature of the approach requires researchers to be equipped with the details of the approach along with the skill of managing the different actors involved in the process.

The contents of the handbook are based on the training program experiences gained over five years from 2010 to 2015 at Adami Tulu ARC, Melkassa ARC, Mekelle University, Hawassa University, and Bahir Dar University. The training program involved researchers from the different organizations involved in agricultural research from the Ethiopian Institute of Agricultural Research, Regional Agricultural Research Institutes, and universities with agricultural faculties.

The handbook is organized in manner that follows the key steps to organize similar training for researchers. It consists of the design of the overall training, syllabus, suggested timetables, and PowerPoint slides with lecture notes of each step of the FRG approach trainings with illustrative examples. The main focus of the trainings described in this handbook is for FRG approach as a research method rather than extension or technology scaling up approach. As annex, two FRG based research reports are attached so that the readers can touch the actual process and outputs of FRG research activities.

It is expected that this publication will facilitate organization of FRG approach trainings for researchers in the future and as new experiences are gained and the FRG approach evolves, it will be further revised. Additionally, this booklet provides key ideas and essences of the trainings, and thus, the users of this booklets are expected to contextualize according to their situation.

2. The design of the FRG approach trainings

2-1. Objectives of the FRG approach training, program and the contents

The approach trainings consisted of three steps; basic, 2nd step and 3rd step. Basic training was focusing on introducing participants with the concept of approach and field visit to actual FRG farmers. The focus of 2nd step training was more on follow up after basic training, experience sharing among the participants on FRG approach and simple extension material development (PD manuals) skill. The 3rd step training was focusing on Gender sensitization workshop facilitation skill and discussions on common issues at conducting FRG research activities (Figure 1).

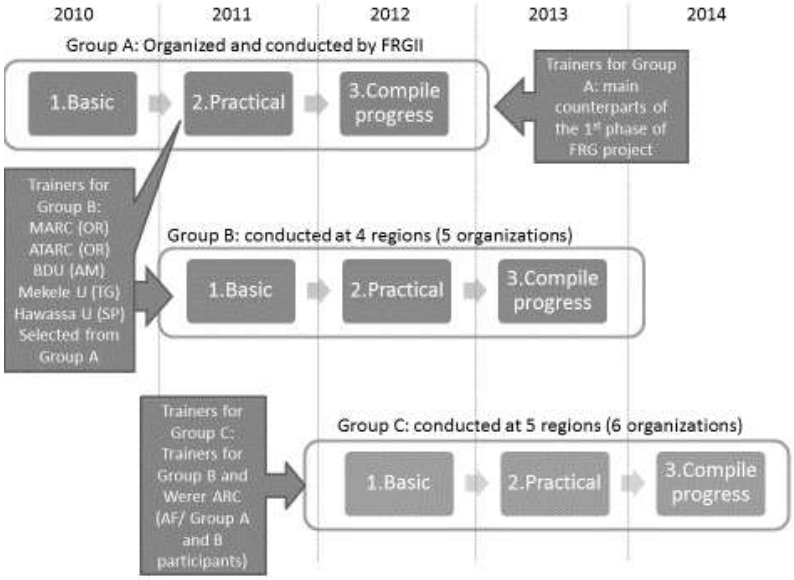

Figure 1. Design of three steps if FRG approach trainings

2-2. Host organization of the FRG approach trainings

To prepare for each training, Trainings for Trainers (ToT) were organized and conducted by FRGII project to standardize the contents and quality of the trainings at different locations. The number of participants of each group was set at 25 considering the easiness of handling in class work and field visit.

Before FRG approach training, Training of Trainers (ToT) or planning meeting before each step is recommended to make it efficient and effective. Resource persons can be drawn from five training hubs.

1. Melkassa Agricultural Research Center
2. Adami Tulu Agricultural Research Center
3. Mekelle University
4. Bahir Dar University
5. Hawassa University

2-3. Syllabus of each FRG approach training

Basic FRG approach training

Target Groups: Researchers of agricultural research center and universities

Aim: To introduce the participants with the FRG approach

Objectives: Participants will be able to conduct FRG research activities following the FRG guidelines

Sub topics	Contents	Learning objectives (participants should be able to:)	Methods	Materials	Practical skills	Time
1. Introduction of the participants	Name, organization, specialty, experience in FRG approach	To get to know each other	Oral presentation	N/A	N/A	Total 15 minutes
2. Organization of the training	Introduction of the training program	Understand the flow of the 3-step trainings and the contents of this specific training	Lecture	PowerPoint Laptop LCD projector	N/A	30 minutes
3. Presentation by groups on their FRG related experiences	(1) List of the topics of FRG based research activities previously conducted (2) Lessons learned (3) What the participants want to know more about FRG approach	This session is for the facilitators to learn who has how much experience in FRG approach for smooth facilitation	Oral presentation	N/A	N/A	15 minutes per group
4. Principles of FRG approach	(1) Introduction (2) Participatory research approach (3) FRG approach and FRG based participatory research (4) FRG approach: in practice (5) Gender consideration (6) Coordination of FRG process (7) Criteria for evaluation of FRG process (8) Foreseeable challenges and possible measures	Become able to apply FRG approach into their research activities	Lecture	PowerPoint Laptop LCD projector	Application of FRG approach in research activities	120 minutes
5. Visit to FRG farmers	(1) Farmers talk about their experience in FRG research activities (2) Q&A	Have clear vision of FRG activities from farmers' aspect	Field visit and discussion	N/A	Interaction with farmers	60 minutes
6. Practical	Presentation on previous	Have clear vision of FRG	Lecture	PowerPoint	Design and	60 minutes

experience of FRG approach	experiences in FRG research (one person one example)	activities from researchers' aspect		Laptop LCD projector	process of the FRG research	
7. Model proposal presentation & discussion	Presentation on sample FRG research proposal	Understand what information should be covered and how the research design should be shown in FRG research proposals	Lecture	PowerPoint Laptop LCD projector	Structuring FRG research proposal	30 minutes
8. Group work to develop FRG based research proposal	Group work to prepare PowerPoint presentation of mock FRG research proposal	Develop actual FRG research proposal	Group work	Laptop PowerPoint	Developing FRG research proposal	240 minutes
9. Presentation on developed proposals	Presentation of the proposal developed during the group work session	Deepen understanding on FRG approach by discussing on developed FRG research proposal	Presentation	Laptop LCD projector	Developing FRG research proposal	60 minutes including Q&A for each group
10. Discussion	Discussion on remaining issues	Understand FRG approach further	Discussion	N/A	Understanding FRG approach	30 minutes

2nd step FRG approach training

Target Groups: Researchers of agricultural research center and universities

Aim: To update the participants with sharing experiences in FRG research and PD manual development skill

Objectives: Participants will be able to come up with practical solution to their own activities which can apply FRG approach

Sub topics	Contents	Learning objectives (participants should be able to:)	Methods	Materials	Practical skills	Time
1. Introduction of the participants	Name, organization, specialty, experience in FRG approach	To get to know each other	Oral presentation	N/A	N/A	Total 15 minutes
2. Organization of the training	Introduction of the training program	Remind the flow of the 3-step trainings and the contents of this specific training	Lecture	PowerPoint Laptop LCD projector	N/A	10 minutes
3. Oral presentation by individual participants on their participatory research activity	(1) Topics of FRG based research activities previously conducted (2) Lessons learned (3) What the participants want to know more about FRG approach	This session is for the facilitators to learn who has how much experience in FRG approach for smooth facilitation	Oral presentation	N/A	N/A	5 minutes per person
4. Presentation on on-going participatory research by a participant	Presentation on previous experiences in FRG research (one person one example). Select two participants to present	Have clear vision of FRG activities from researchers' aspect	Lecture	PowerPoint Laptop LCD projector	Design and process of the FRG research	60 minutes including Q&A
5. Group discussion on common issues to all participatory research	Assign 1 topic for each group: (1) Field day (2) Exchange visit (3) Tips to work with farmers	Have practical solutions for the listed activities	Discussion	PowerPoint Laptop LCD projector Flipchart sheet	Designing and managing activities incorporated with FRG research	60 minutes
6. Presentation of the group work	Presentation on the outcome of the group work	Have practical solutions for the listed activities	Presentation	PowerPoint Laptop LCD projector Flipchart sheet	Design and process of the FRG research	45 minutes
7. Group discussion on common issues to all participatory	Assign 1 topic for each group: (1) How to facilitate wives participation to FRG	Have practical solutions for the listed activities	Discussion	PowerPoint Laptop LCD projector	Designing and managing activities	60 minutes

research	research (2) How data should be collected and how can we keep the scientific quality (3) How to involve DAs in FRG activity			Flipchart sheet	incorporated with FRG research	
8. Presentation of the group work	Presentation on the outcome of the group work	Have practical solutions for the listed activities	Presentation	PowerPoint Laptop LCD projector Flipchart sheet	Design and process of the FRG research	30 minutes
9. Presentation on visiting FRG site	Presentation of the FRG activities conducted at the visiting site	Grasp background information of the visiting site	Presentation	Laptop LCD projector		60 minutes
10. Field visit to FRG farmers	(1) Farmers talk about their experience in FRG research activities (2) Q&A	Have clear vision of FRG activities from farmers' aspect	Field visit and discussion	N/A	Interaction with farmers	60 minutes
11. Presentation on PD method	Introduce participants with PD method	Produce PD manuals	Presentation	Laptop LCD projector	PD manual development	60 minutes
12. Group work	Exercise PD manual development		Group work	Laptop		60 minutes
13. Group presentation	Present developed PD manual		Presentation	Laptop LCD projector		10 minutes per group
14. Group work	Exercise PD manual development		Group work	laptop		60 minutes
15. Group presentation	Present developed PD manual		Presentation	Laptop LCD projector		10 minutes per group
16. Discussion	Review any remaining issue	Deepen understanding and come up with practical solutions	Discussion	N/A	FRG research management skill	30 minutes

3rd step FRG approach training

Target Groups: Researchers of agricultural research centers and universities

Aim: To equip the researchers with practical measures to solve common issues to participatory research activities and quick gender assessment workshop skill.

Objectives: Participants will be able to come up with more practical solutions to their own activities

Sub topics	Contents	Learning objectives (participants should be able to:)	Methods	Materials	Practical skills	Time
1. Introduction of the participants	Name, organization, specialty, experience in FRG approach	To get to know each other	Oral presentation	N/A	N/A	Total 5 minutes
2. Organization of the training	Introduction of the training program	Understand the flow of the 3-step trainings and the contents of this specific training	Lecture	PowerPoint Laptop LCD projector	N/A	10 minutes
3. Identification of challenges and solutions in FRG based research	Group discussion	Note common challenges and solutions at practicing FRG approach	Group discussion and oral presentation	N/A	N/A	60 minutes including presentation
4. How to involve female household members and other household members	Presentation on actual example of FRG research activity focusing on gender consideration	Be conscious of what to do to promote female/ housewives participation	Presentation	PowerPoint Laptop LCD projector	Tips to promote female participation	60 minutes
5. How can we improve the research contents by farmers' participation?	Presentation on actual example of FRG research activity focusing on how farmers' participation contributed to improve the quality of research	Be conscious of the advantage of participatory approach for research	Presentation	PowerPoint Laptop LCD projector	Making use of farmers' participation	60 minutes
6. Plenary discussion	Discussion on remaining issues	Deepen understanding on FRG approach and come up with useful solutions	Discussion	N/A	Understanding FRG research	60 minutes
7. Briefing on quick gender assessment workshop	Presentation on quick gender assessment workshop	Conduct QGA workshop	Lecture	PowerPoint Laptop LCD projector	Facilitation of participatory workshop	60 minutes
8. Group work	Prepare necessary materials to be used for QGA workshop on the following day with farmers	Develop necessary flipchart materials	Group work	Flipchart sheet Permanent marker		120 minutes

9. Quick gender assessment workshop with farmers	Conduct quick gender assessment workshop with farmers	Conduct QGA workshop	Workshop	Flipchart sheet Permanent marker Scotch tape	Facilitation of participatory workshop	180 minutes
10. Plenary discussion	Discussion on remaining issues	Understand FRG approach further	Discussion	N/A	Understanding FRG approach	60 minutes

3. Basic FRG approach training

3-1. Objective of the Basic FRG approach training

This training is to introduce the researchers, who are from Agricultural Research Institutes and Universities from different part of Ethiopia to the concepts and basic idea of FRG approach.

3-2. Program of the training

Timetable of basic training on FRG approach

Day 1				
Start	End	Duration (min)	Program	Remarks
8:30	8:45	15	Registration	
9:00	9:15	15	Welcoming remark	Name of responsible person
9:15	9:30	15	Introduction of the participants	to be inserted here
9:30	10:00	30	Organization of the training	
10:00	10:15	15	Presentation by group A (with Q&A)	Presentation on each research institution on (1) List of the topics of FRG based researches previously, (2) Lessons learned, (3) What would they like to know more (inform the participants to prepare these in advance. At presentation, avoid lengthy ones and limit the topics to only these 3.)
10:15	10:30	15	Presentation by group B (with Q&A)	
10:30	11:00	30	Break	
11:00	11:15	15	Presentation by group C (with Q&A)	
11:15	11:30	15	Presentation by group D (with Q&A)	
11:30	11:45	15	Presentation by group E (with Q&A)	
11:45	12:00	15	Presentation by group F (with Q&A)	
12:00	12:15	15	Presentation by group G (with Q&A)	
12:15	12:30	15	Presentation by group H (with Q&A)	
12:30	13:00	30	Discussion	
13:00	14:00	60	Lunch	
14:00	15:30	90	Principles of FRG research approach (1)	
15:30	16:00	30	Break	
16:00	17:00	30	Principles of FRG research approach (2)/ Q&A	
17:00	17:30	30	Evaluation	

Day 2				
Start	End	Duration (min)	Program	Remarks
8:30	8:45	15	Registration	
8:45	13:00	195	Visit FRG farmers/ Q&A, discussion	Half day
13:00	14:00	60	Lunch	
14:00	15:00	60	Practical experience of FRG approach (A)	
15:00	16:00	60	Practical experience of FRG approach (B)	
16:00	16:30	30	Break	
16:30	17:00	30	Model proposal presentation& discussion	
17:00	17:30	30	Group work to create FRG based research proposal	list out the things to be accommodated in the proposal (refer to the FRG guideline p9-10, p40-41)
17:30	17:45	15	Evaluation	

Day 3				
Start	End	Duration (min)	Program	Remarks
8:30	8:45		Registration	
8:45	10:00	75	Group work (continued) 1hr 15min	

10:00	10:30	30	Break	
10:30	13:00	150	Group work (continued) 2hr 30min	
13:00	14:00	60	Lunch	
14:00	15:00	60	Presentation by group 1 (with Q&A)	
15:00	15:30	30	Break	
15:30	16:30	60	Presentation by group 2 (with Q&A)	
16:30	17:00	30	Discussion on raised issues	
17:00	17:15		Evaluation	

Day 4				
Start	End	Duration (min)	Program	Remarks
8:30	8:45	15	Registration	
8:45	9:45	60	Presentation by group 3 (with Q&A)	
9:45	10:15	30	Break	
10:15	11:15	60	Presentation by group 4 (with Q&A)	
11:15	12:15	60	Presentation by group 5 (with Q&A)	
12:15	12:45	30	Discussion on raised issues	
12:45	13:00	15	Evaluation	
13:00	13:15	15	Closing	
13:15			Lunch	

3-3. Contents of the each program and how to proceed/ facilitate

3-3-1. Presentation on each research institution

Request each participants to prepare following presentations: (1) List of the topics of FRG based researches previously conducted, (2) Lessons learned, and (3) What would they like to know more (Inform the participants to prepare these in advance. At presentation, avoid lengthy ones and limit their presentations to these three topics.).

3-3-2. Principles of FRG research approach

There are 42 slides. Pay attention to the time designation so that the participants do not lose concentration.

2

Outline of the presentation

I. Introduction
II. Participatory Research Approach
III. FRG approach and FRG based participatory research
IV. FRG Approach : In Practice
V. Gender consideration
VI. Coordination of FRG process
VII. Criteria for Evaluation of FRGs Process
VIII. Foreseeable Challenges and possible measures

The presentation consists of 8 parts.

3

I Introduction

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Why this training?

- Participatory research approach is being well recognized in the research system but still there is a gap in terms of understanding and skills required for application of the approach
- This training is to fill this gap
- The objectives of this training are:

1. To improve understanding about participatory research and FRG Approach
2. To share practical experience on participatory research
3. To understand about and equip with required skills to conduct FRG based research activity

Explain the objective of this specific training briefly.

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II Participatory Research Approach

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What does PR mean?

- Participatory research or farmer participatory research is a typology of research that enables clients to involve at various stages of the research process
- An approach to come up with an innovation customized to farmers who basically live in a Complex Diverse and Risk prone(CDR) environment

After explaining this slide, ask participants to explain the difference between participatory research and “using farmers in research”.

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Why PR?

- Purpose of PR
  - It provides research with farmers’ local knowledge and priorities so that the research output can fit to farmers’ biophysical, economic, social and cultural context.
  - It provides farmers with opportunities to build their capacity to innovate.
- CR cannot always produce technology which can be adopted by farmers
- Technology needs to incorporate local limiting factors

Emphasize that participatory research is not meant for benefiting farmers only. It is expected to benefit researchers and quality of the research itself as well.

Advantages of PR

- It enables farmers to develop a sense of ownership of the technologies which enhances wider technology adoption
- It develops farmers' analytical skills
- It obtains realistic input-output data for financial analysis
- It provides research with farmers' local knowledge and priorities so that the research output can fit to farmers' biophysical, economic, social and cultural context.
- **PR- a complement to CR**

Usually, the first bullet point is emphasized as an advantage of PR. However, the other bullet points are equally important.

Disadvantages of PR

- Requires good communication skill
- Difficult for managing trials
- Requires good data collection, analysis, and writing skill
- Costly

Tech. transfer VS participatory research

Tech. transfer

- One way flow of technology:
- Assumption: reductionist, trickle down
- Compartmentalization
- Interest in parts than the whole
- Problem and solutions prescribed
- Output/product oriented

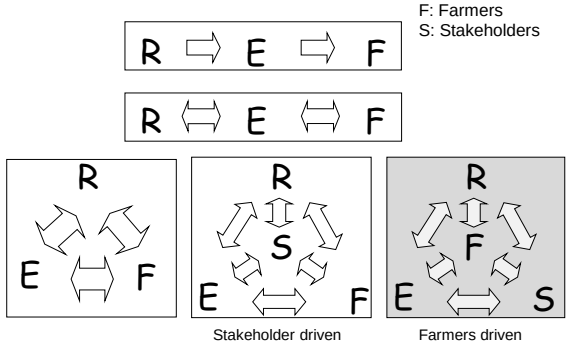
Participatory research

- Multiple way flow of info, knowledge and skill
- Assumption: farmers are diverse & have different realities
- Interaction
- Interest in the whole than parts
- Problems and solutions customized
- Values the process as well

Clarify the contrast among these two approaches.

Evolution of PR

R: Researchers
E: Extension agents
F: Farmers
S: Stakeholders



Stakeholder driven

Farmers driven

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The initial stage was one-way flow of information from Research to Extension, then to farmers. → It changed into interactive flow of information between Research & Extension, and Extension & Farmers, but there was no interaction between Research and Farmers. →These three actors came to triangle relationship. → Stakeholders came into the picture and they were in the center of the relationship. → The farmers came in the center of the triangle relationship.

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History of PR in Ethiopia

Late 70s to 80s	Starts with institutionalization of the FSR approach
1980s	Establishment of Research Extension Divisions (REDs) in various research centers and Research Extension Coordination at the HQs of the then IAR
1990s	The launching of projects Client Oriented Research (CSFL), Participatory Plant Breeding (CIAT), African Highland initiative (AHI) …
	Establishment of the Research Extension Farmers Linkage Department at the HQs of the then EARO now EIAR
	Introduction of FRGs
2000-	The proliferation of FRGs/FREGs

The history started with the farming system research approach in 1970s. Explain the trend/ flow of the different participatory research approach.

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III FRG approach and FRG based participatory research

FRG Approach: principles/corner stones

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- Multidisciplinary
- Farmers' participation
- Stakeholders' participation
- Group/collective actions
- Capacity development
- Gender consideration
- Information sharing
- Cost sharing
- Continuous interaction, improvement, learning
- Coordination

This slide is the most important slide among all of these to describe the characteristics of the approach.

FRG Approach: What it means?

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- FRG approach is one of the PR approaches.
- It is a research approach by which a multi-disciplinary team of researchers, extension workers and groups of farmers jointly conduct research on selected topics based on farmers' needs.
- Researchers facilitate the involvement of extension workers and farmer groups in all the process of the research
- The approach also involves other stakeholders when it is necessary.
- FRG approach enhances technology generation, verification and adoption process

These are the characteristics of FRG approach assured by the characteristics shown above.

FRG Approach: Premises

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- FARMER NOT NAÏVE(conservative), RATHER
  - **TECHNICAL OPTION NOT APPROPRIATE, OR**
  - **PROCESSES POORLY ORGANIZED**

Researchers typically tend to conclude the cause of low adoption of new technology by farmers as "lack of awareness". However, we have to doubt the technology itself or the process of the research activity.

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FRG Approach: Advantages 1/2

- Advantages to be working with groups of farmers
  - Appropriate coverage
  - Reflective learning environment
  - Influence
  - Feedback based on the reality
- Appropriate tech that meets farmers' need
- Refining available tech to fit actual farmers' situation

As well as the advantage of the PR, FRG approach is advantageous to improve the quality of the research.

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FRG Approach: Advantages 2/2

- BUILDING A SOCIAL CAPITAL
- institutions, relationships, attitudes and values that govern interactions among farming community
- Foster innovative farmers (problem solving capacity)
- Provide a platform for stakeholders interaction along the value chain to solve farmers' problem

There are several other advantages for the participating farmers also.

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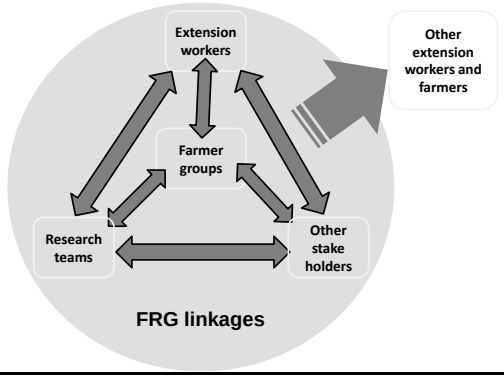
FRG Approach: Linkage and Outputs



FRG approach locates farmers in the middle and surrounding extension workers, research teams, and other stakeholders interact each other. The process and result could be communicated with other extension workers and farmers.

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IV FRG Approach : In Practice

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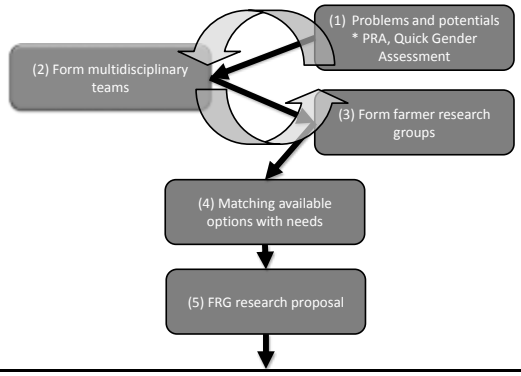
FRG approach: Planning stage



Among 1, 2, and 3, the steps could be repeated as required.

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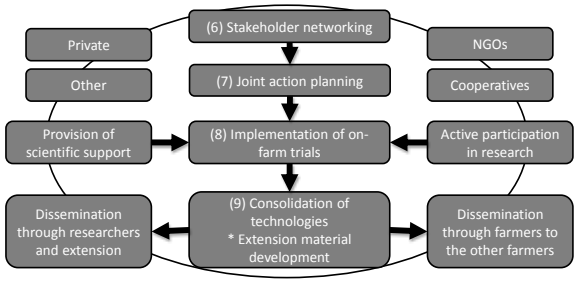
FRG approach: Implementation stage



Follow the sequential flow as shown in the slide.

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FRG Approach: Entry points

- Available technology
- Famers' need
- Farmers' innovation
- Research and development
- Pre existing activities with FRG farmers

Ideally, PRA or other survey to assess the needs of farmers to be conducted at the initial stage of the activities. However, it is also OK to start with available technology, pre-existing activities with farmers if they agree. It is because we expect the researchers there are well aware of the agro-ecological, socio-economic situation and needs of the farmers.

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Planning

- Conduct PRA (seasonal calendar, resource mapping, quick gender analysis*
- Identify technical options (feasibility, risk)
- Establish multidisciplinary team & leader
- Farmer group formation (size (15-20), equal chance, gender…) consult local community + DAs
- Matching options with needs and opportunities
- Agree a research topic with farmers
- Develop research proposal (Research design, stakeholders' role, cost sharing)*
- Developing joint action plan
- Submit the action plan to the local government

* If you have already submitted and approved research proposal in prior, it is modified according to the PRA and matching exercise

The last remark in this slide is very important:
"If you have already submitted and approved research proposal in prior, it is modified according to the PRA and matching exercise" because ultimately, responding to the farmers' reality is the first priority.

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Implementation

- Orientation
- Establish trials
- Trial farmers, site, inputs..
- Conduct trials
- Record keeping & on the spot analysis
- Training (proper planning)
- Field day (preparation)
- Exchange visit

These activities will be incorporated with FRG research activity. For the details of each activity here, please refer to the "FRG research guideline for agricultural researchers 2009".

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Process management

- Regular meetings
  - Within research team, within farmers, within extension
  - F-E-R meeting generally at trial sites
  - Keep short, consensus, updated (Try the best! Clarify agenda, Role of facilitator is important)
- Joint evaluation of research result among R-E-F
- KEEP RECORDS OF EVERY MEETING (Bring pen and notebook, do not discard the recorded documents)
- Record PROCESS

Keeping written record at each step is essential. Make sure to bring a pen and notebook when visiting fields and having meetings.

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COMMUNICATING FRG OUTPUTS

USERS	TYPE OF INFORMATION	MEANS	FORUMS
Extension workers (GO, NGO..)	Practical application; Field mgmt practices, operation, source of information	Technical manuals, leaflets, case studies, extension aids	ADPLAC, training
Farmers	How to manage, use, obtain, apply, sale, store, Advantage,…	Poster, leaflet, Audio visuals	Extension meeting, field day, training, demonstration
Private Sector	Cost, specification, size of demand	Research report, promotional flyers	Review meeting, visit to research centres, trainng
Scientific community	Finding/result, remaining gap	Research reports	Review meeting, conferences, workshops
Policy makers	Significance of the research output- impact on the mass, required policy env't	Media, news letter/ brief, farmers' reflection	Field day, REAC, Media

According to different targets, required types of information, means of communication, and possible forums are different.

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Extension material production

- Aim
- Target audience
- Objective of the material
- Type of material
- Key message
- Content
- Design

*The details of how to prepare simple extension materials will be shown in another session

There will be another independent session for simple extension material development in the 2nd step FRG approach training. Also, "Extension material development guideline for researchers (2014, FRGII)" describes the details of how to develop extension materials.

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V Gender consideration

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Gender consideration: Why?

1. Men and women are engaged in different activities in a specific farming activities. Thus, they have different experience and information in a specific farming activities.
2. Since men and women have different access to/ control over resources, it is important to know them and design the research activities reflecting real situation.

Gender consideration itself is not the purpose. It is one effective method to improve the quality of the research. Thus, we do not end up only involving female household members as FRG members. We need to make use of the information and experience they have in relation to the target technology of the research.

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What is Quick Gender Assessment Workshop?

- Quick gender assessment workshop is one of the useful tools for making participating farmers and researchers to be aware of gender difference within a household, which needed to be considered during research activities.
- In QGA workshop, gender difference in activities in specific agricultural production activities and access to and control over resources related to them are identified.

Actual exercises for QGA are two:

(1) Assessing gender difference in specific agricultural production activity, and

(2) Access to and control over resources related to them.

Details of each exercises are shown in 5-3-5., 5-3-6., 5-3-7. of this booklet.

Objective of quick gender assessment

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- To identify who in the household is involved in which activities in specific agricultural activities so that appropriate information source/ target of the training to be identified.
- To identify who in the household has access and control over related/ required resources for the testing technologies so that research/ activity/ training design more appropriate to the specific target areas.

* How to conduct quick gender assessment will be shown in another session

The information we will be collecting through QGI needs to be specific to the target technology of the research. The collecting information should not be general. Because general information do not help much to improve the contents of the research activities.

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VI Coordination of FRG process

Coordination of FRG process

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- Desirable research result is not only a result of employing appropriate research methodologies but also depends on effective coordination of:
  - Activities within a team and between other stakeholders
  - Resources for efficient use and achievement of better outputs
- Coordination is a key issue in the entire process of FRG research

→ See “Process management”

Since FRG approach involves different stakeholders, good coordination is an essential key for successful research output.

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VII Criteria for Evaluation of FRGs Process

Criteria for Evaluation of FRGs Process (1/2)

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Performance criteria	Performance indicator
Social capital (bonding)	Cooperation, trust, collective action, cohesion, compliance, diversity, heterogeneity/homogeneity
Human capital	Technical knowledge of members, new farming, self-esteem and confidence, skills, attitudes, innovativeness
Group organizational capacity	Formation, objectives, leadership, structure, norms and rules, regulation, decision making, meetings, activities, records, dynamics
Participation process	Meetings, activities, decision making, communications, dynamics, women

To come to the successful goal, it is important to know where you are standing so that you can make necessary adjustment of the activities to achieve the research objectives.

Criteria for Evaluation of FRGs Process (2/2)

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Performance criteria	Performance indicator
Experimentation/ research activities	Experiments, technologies, farmers, researchers, extention, output
Social capital (bridging)	Contacts, initiatives to contact, collaboration, exchange visits, field days, visits
Reach or dissemination	Community relations, information sharing, farmer-to-farmer dissemination, sharing experience
Sustainability	Financial contribution, diversification, **vertical links**, initiatives, plans, external dependence

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VIII Foreseeable Challenges and possible measures

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Challenges and measures 1/4

- Gender consideration→ meet the convenience of the female farmers
- Linkage with private sectors: responsible engagement→ involve them from the initial planning stage
- Extension material: taking knowledge and experience off the shelf→ design the research activity considering how the final outputs will be delivered to the farmers

- To promote participation of the female members, consider time and location so that they can easily participate.
- If you involve anybody from half way, you cannot expect their serious engagement. Thus, involve them from the beginning.
- Often, researchers face challenges upon preparing extension materials upon interpreting scientific output into the information needed by farmers.

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Challenges and measures 2/4

- Research Team/ farmers' group management → Clarify the responsibilities within the teams and groups. Respect willingness
- Giving PR a more scientific edge → stick with the fact. Collect evidence. Keeping written record of every activity is critical.
- Ensuring sustainability → consider the mechanism from the beginning

- Clarified responsibilities is the key of successful team work.
- Keeping record is essential to make your research output reliable. Make raw data available at any time.
- Do not consider the sustainability at the end. Design your activity considering the sustainability.

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Challenges and measures 3/4

- Farmers knowledge and experience often overseen→ Equal emphasis to management practices
- Institutional setup→ make use of the set up as much as possible
- Inadequate involvement of DA and other stake holders to the expected level and DAs turnover → go through upper level, willingness and capacity of upper level is also important criteria upon selecting sites

- Do not focus only on the new inputs for topic selection. Also consider management practices for improvement which normally is accumulated among farmers.
- Establishing new set up for research activity requires time and effort, and not sustainable.

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Challenges and measures 4/4

- Farmers' expectations(Looking for an immediate benefits) → clarify cost sharing mechanism and your responsibility. Do not work with unwilling farmers with what you can offer. Differentiate you and other service providers.

- Clarify what you can and cannot offer to the farmers. If the other service providers can provide what you cannot provide, and farmers are complaining about it, explain the difference between you and the other ones in the way farmers can be convinced.

3-3-3. Visit FRG farmers/ Q&A/ Discussion

At organizing the field visit, consider the farmers' convenience. Avoid market days and religious days. Inform participants what kind of farmers they will be visiting in advance so that they can prepare the questions to ask farmers in advance. Regarding the farmers to be visited, try to involve female farmers as well so that the visiting researchers can observe different angles of farmers' comments. The number of the farmers to be visited should be between 3 and 5 considering facilitation of the Q&A and discussion.

Lead the discussion in the way that the visiting researchers can learn from farmers in FRG approach than technical aspects. Also, it is important to ask farmers about the involvement of different stakeholders other than research-farmer linkage.

3-3-4. Practical experience of FRG approach

Appoint some of the participants to prepare the presentation on their experience in FRG approach research activities in advance. Limit the numbers of slides for time management. Also, request the appointed researchers to describe the process of working with farmers so that the other participants can learn from their experience. The experience does not have to be perfect one. Let the participants compare what they have learned in the previous day and actual application of the approach.

At presentation, the discussion tend to focus on technical aspects and it often ends up with nowhere because of not having any senior researcher to give conclusion. To avoid such unproductive discussions, lead the participants to discuss more on the process and approach itself.

3-3-5. Model proposal presentation and discussion

This activity is followed by group work to develop mock FRG research proposals. To provide the participants with clear idea of what information should be incorporated and what attention should be paid at designing FRG research activities. Clarify DOs and DON'Ts.

3-3-6. Group exercise to develop FRG research proposal

Split the participants into groups with 4-6 members. Let them select the topic freely. Check the progress of group work so that they can develop organized proposal within limited time.

3-3-7. Group presentation of developed FRG research proposal

Each group will select a representative and he/ she presents the developed proposal. Give priority for discussion and questions in approach and process of farmers' participation rather than technical aspect. This does not mean that FRG approach pay less attention to technical aspect of the research. FRG approach requires scientific explicitness as much as conventional researches do. However, since we cannot assure the conclusions of the technical discussion without senior researchers presence and literature, we focus on discussion on the approach and farmer' participation.

Especially, give priority to discuss on following points:

(1) Multidiscipline
(2) Farmer participation
(3) Stakeholders' participation
(4) Collective action
(5) Capacity development
(6) Gender and youth considerations
(7) Information sharing
(8) Cost sharing
(9) Clarify the hypothesis of proposed research activity

3-3-8. Wrap up session

In the end of the basic approach training, make sure the remaining questions of the participants to be addressed. Also, encourage the participants to start whatever they can apply the essence of FRG approach into their routine activities rather than waiting for "Projects" to fund their activities. Inform the participants that there will be following sessions of step 2 and 3 trainings.

3-4. For overall improvement of the training on FRG approach

Provide the day evaluation form and collect comments from the participants. You could request comments on the organization and arrangements of the training, program of the training and FRG approach itself. Check the collected evaluation sheets in the same day while your memory is still fresh. Consider the given comments for the future improvement of the training and FRG approach. Since there are many more aspects for consideration to improve the approach, and the approach need to keep evolve, it is important to listen to different researchers opinions.

4. FRG approach training (Step 2)

4-1. Objective of the Basic FRG approach training

This training is targeting those researchers who participated in the Basic FRG training.

This training is expected to facilitate the researchers to share the experiences and give more information by observing one of the on-going FRG based research site and discuss on the actual cases. Besides, simple extension material (Process Description manual/ PD manual) development skill is covered to help smooth communication with farmers.

4-2. Program of the training

A model timetable of 2nd step training on FRG approach (tentative)

*The participants are advised laptops and digital cameras which will be needed for the exercise on Day 2 and 3 for PD manual development

Day 1:			
Start	End	Program	Remarks
8:00		Participants meet in front of XXX Hotel, XXX (The service bus arranged)	Contact: XXX XXXX (0916 XX XX XX)
8:30	8:40	Registration	
8:40	8:50	Opening	
8:50	9:00	Self introduction	Facilitated by XXXX
9:00	9:10	Briefing on the training	Facilitated by XXXX
9:10	10:10	5 minutes oral presentation on what participatory research activities the participants are involved (individual experiences), discussion(60min)	Participants
10:10	10:40	Break	
10:40	11:40	Presentation on on-going participatory research activities by a participant 1(including Q&A) (60min) Ms. XXXX XXXX, XXXX ARC	Facilitated by XXXX
11:40	12:40	Presentation on on-going participatory research activities by a participant 2(including Q&A) (60min) Mr. XXXX XXXX, XXX ARC	Facilitated by XXXX
12:40	13:40	Lunch	
13:40	14:40	Group discussion on common issues to all participatory research activities such as Group 1: field day Group 2: exchange visit Group 3: tips to work with farmers (60min)	Facilitated by XXXX
14:40	15:25	Presentation on the group discussion, Q&A, discussion (45min)	Facilitated by XXXX
15:25	15:55	Break	
15:55	16:55	Group discussion on common issues to all participatory research activities such as Group 1: How to facilitate wives participation to FRG research Group 2: How data should be collected and how can we keep the scientific quality Group 3: How to involve the DAs in FRG activity (60min)	Facilitated by XXXX
16:55	17:25	Presentation on the group discussion, Q&A, discussion (30min)	Facilitated by XXXX
17:25	17:40	Evaluation	

Day 2:			
Start	End	Program	Remarks
8:00		Participants meet in front of XXX Hotel, XXX (The service bus arranged)	Contact: Mr. XXX XXXX (0916 XX XX XX XX)
8:30	8:45	Registration	
8:45	9:45	Presentation on visiting FRG site (60min)	XXXX
9:45	10:00	Q&A (15min)	Facilitated by XXXX
10:00	11:00	Move to the site (60min)	Mr. XXXX
11:00	12:00	Site observation, Q&A, wrap up (60min)	Facilitated by XXXX
12:00	13:00	Move back to the venue (60min)	Mr. XXXX
13:00	14:00	Lunch	
14:00	15:00	Presentation on PD method, How to compress pictures, Q&A (60min)	Facilitated by XXXX
15:00	16:00	Group work (60min)	Facilitated by XXXX
16:00	16:30	Break	
16:30	17:10	Presentation by each group (4group x 10min)	Facilitated by XXXX
17:10	17:25	Evaluation	Facilitated by XXXX

Day 3:			
Start	End	Program	Remarks
8:00		Participants meet in front of XXX Hotel, XXX (The service bus arranged)	Contact: Mr. XXX XXXX (0916 XX XX XX)
8:20	8:30	Registration	
8:30	10:00	Group formation, group work 2nd round on PD method(90min)	Facilitated by XXXX
10:00	10:30	Break	
10:30	11:30	Presentation by each group (5group x 10min + Q&A 10min)	Facilitated by XXXX
11:30	12:00	Q&A, discussion (30min)	Facilitated by XXXX
12:00	12:15	Evaluation	
12:15	12:30	Closing	
12:30	13:30	Lunch	

4-3. Contents of the each program and how to proceed/ facilitate

4-3-1. Five minutes oral presentation by each participants

To know what background the participants are coming with, inform the participants in advance to prepare 5 minutes oral presentation. The oral presentation should include information of the participatory activities he/ she is involved which he/ she can apply essence of FRG approach. Since presentation with the PowerPoint tend to be long, let participants present orally only. Make sure to inform participants to present (1) title of such activity, (2) source of fund of the activity, (3) for how long the activity is being conducted and (4) any additional information. If a participants do not have any activity to present, let them speak out their expectations to this training and how they can contribute to this training.

Besides, some of the participants might suggest to make it as group presentation by one representative from each research centers. Do not accept such offer and let each individual present their own experiences because the experience as a research centers do not matter much here.

4-3-2. Presentation on on-going participatory research activities by a participant

At inviting the participants, check how many of the participants are willing to present their experience in FRG. Appoint two of them to present their experiences in the training.

The presentation should include the research title, period, materials and methods, process of the interaction with the farmers, results, and conclusion. Emphasize the importance of the process of the activities with farmers and let them prepare in the way that the presentation can raise some points of discussion. To make sure if the contents fits to the purpose, you had better interact with the appointed presenters and check the presentation slide prior to the training.

The discussion, once again, should focus on the process of the research activity and the approach. Avoid discussion on the importance of the research activity in technical aspects because the discussion will not be concluded there.

4-3-3. Group discussion on common issues to all participatory research

The possible topics would be “what you should pay attention when you organize field day/ exchange visits”, ”tips to work with farmers”, ”how to avoid dependency syndrome by farmers”, ”how to facilitate wives’ participation”, ”how to assure the scientific edge of the participatory research”, ”how to involve agricultural extension agents” etc. To promote the discussion, it is recommended to break the participants into groups with 4-5 people. Try to guide discussion to focus on what to do, or what they can do, rather than how it should be.

4-3-4. Presentation on the group discussion

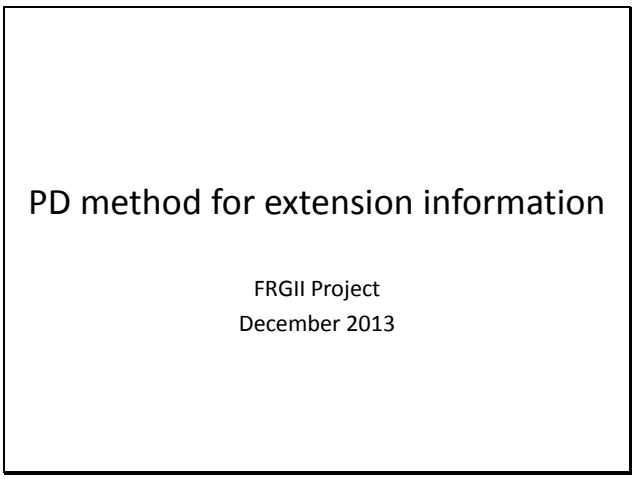
Again, facilitate the presentations and discussions to stick with what to do based on the given reality, not the ideal situations of how things should be. Give priority to discuss on actual specific experiences rather than general information without details. It is not productive.

4-3-5. Field visit to FRG farmers/ Q&A/ Discussion

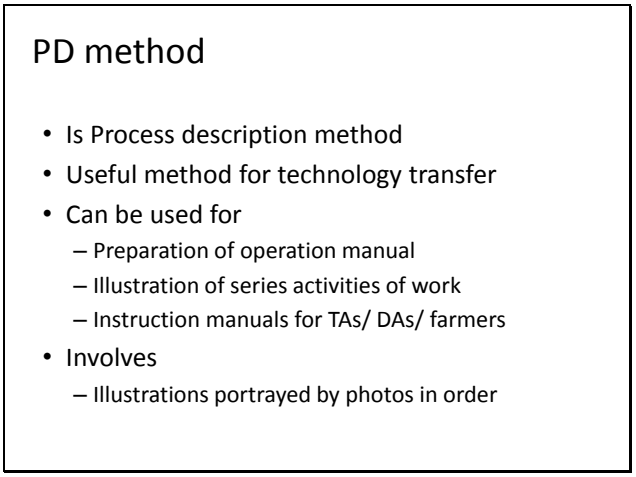
Do not visit the farmers you visited at Basic training. At organizing the field visit, consider the farmers' convenience. Avoid market days and religious days. Inform participants what kind of farmers they will be visiting in advance so that they can prepare the questions to ask farmers in advance. Regarding the farmers to be visited, try to involve female farmers as well so that the visiting researchers can observe different angles of farmers' comments. The number of the farmers to be visited should be between 3 and 5 considering facilitation of the Q&A and discussion.

Lead the discussion in the way that the visiting researchers can learn from farmers in FRG approach rather than technical aspects. Also, it is important ask farmers about the involvement of different stakeholders other than research-farmer linkage.

4-3-6. Presentation on PD method



"PD" stands for "Process Description". Thus, it is useful to prepare manuals describing the process of doing something step by step.



One of its characteristic is the use of the picture.

PD method

- The PD manuals consist of two parts
  (1) Explanatory part
  (2) Pictorial part
- For this training, we will be focusing on developing PD manual with only (1) materials/ equipments, (2) procedure, and (3) pictorial part

A sample of the PD manual will be shown later in this presentation.

PD method: Explanatory part

- Apparatus/ equipment
- Procedure
- References

PD method: Pictorial part

- Pictorial part consist of photo, description and remarks as follows;

Photo	Description	Remarks
	Mix the feed resources uniformly.	
	Put the materiel and fill it by pressing as much as the bottle can contain.	Please don't break the bottle.

Advantages of manual by PD method

- Produce “manual” and “power point” for technology transfer and teaching.
- Manuals are easy to make
- Easy to read
- Easy to revise
- Easy to copy
- Easy to use
- Inexpensive
- Many usages

You can apply this method for

- Simple manual for DAs/ farmers/ TAs
- Basic information to develop extension materials

Use Microsoft PowerPoint for PD manual preparation.

EXPERIMANTAL SILAGE MAKING

By
Ngo Dinh Tan, Vietnam
Mohamed Ben Lakhal, Morocco
Firew K. Esho, Ethiopia

Obihiro, November, 2011

This is a sample PD manual on experimental silage making. The objective of this presentation is to demonstrate what PD manual is like. Thus, do not explain the details of this example manual. Use this example simply to show the participants so that they can how it looks like and what information should be included in PD manuals.

Materials

- Glass bottle
- Cutter or chopper
- Balance
- Plastic tape
- Plastic trays, Pens / Marker, Scissors
- Material for pressing
- Feed resources

List all of the materials to be used here so that the readers can prepare before starting the process.

Equipment


Glass bottle


Balance


Plastic tray


Scissors


Chopper


Thermometer


pH meter


Marker


Vegetable waste


Rice straw


Pressing material


Plastic tape

Visual information is also helpful for the readers to see how they look like. It is especially effective for those who cannot read.

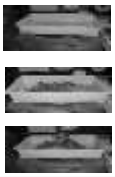
Procedure

1. Clean the glass bottles (or materials to be used for ensiling).
2. Wilt and chop the feed resources.
3. Measure the weigh of empty bottle in three or four replicate.
4. Put feed resource in to the bottles as much as possible by pressing gently.
5. Take the weight of filled bottles with the silage material close it tightly.
6. Write the weight, material and date of ensiling on the bottle filled with silage materials.
7. Role up caps with plastic tape to prevent opening and exposure to oxygen
8. Keep the bottle for certain period (1 – 3 months) based on environmental condition.
9. Open the bottles and test the silage quality by evaluating pH, Temperature, Smell and Texture.

Make sure all of the items appeared in the “materials” and “equipment” appear in this part.

Picture	Description	Remarks
	Clean bottles to be used and make all equipment available.	Buckets, pipes, plastic bags and other air tight materials available can be used.
	Measure the weight of empty bottle to know the density.	Get the data of volume of the bottle.

The lay out of the pictorial part PD manual is just like this. All of the steps shown in “Procedures” slides go into “Description” column.

Picture	Description	Remarks
	Wilt, and chop the feed materiel in to smaller pieces in order to increase the density.	Please take care of your fingers.
	Measure zero the weight of empty tray and add feed materiel.	

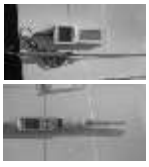
To avoid congested information, use two rows per one slide.

Picture	Description	Remarks
	Mix the feed resources uniformly.	
	Put the materiel and fill it by pressing as much as the bottle can contain.	Please don’t break the bottle.

You do not read all the information in these slides. Just make sure the participants understand how it look like and how the manual should be prepared. Do not forget to explain what information should be put in the “remarks” column. Use “remarks for safety precautions and additional detailed specification.

Picture	Description	Remarks
	Measure the weight of bottle filled with silage materials and label with date and ratio of feed materials.	Can be used to calculate the density.
	Roll up the cap with plastic tape and make your experiment in three or four replicates.	

If pictures are large enough and clear enough, you could use two pictures for one step of description (see left “Roll up the cap with plastic tape and …”)

Picture	Description	Remarks
	Keep the bottles for certain period.	
	Evaluate the quality of silage after opening of the cap: Test for pH, Temperature, Smell and Texture.	Please refer to previous manual how to evaluate quality of silage.

References

1. Lecture notes of Dr. Hanada, Associate Professor of Animal Feeding Management in Obihiro University.

Make sure you refer the source of information you used for the manual development.

Picture taking skill (1)
: quality of pic

- No need of using high resolution pictures
- You can compress the picture files (shown later)

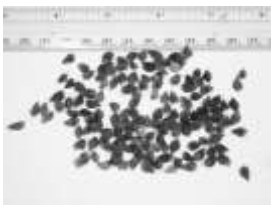
Picture taking skill is one of the most important skills to produce extension materials, which is not limited to PD manuals.

Picture taking skill (2)
: picture orientation

Picture	Description	Remark
		
		

Avoid unnecessary part. You can trim or rotate pictures to reduce unnecessary information in a picture. In that sense, the picture above is better than the one in the bottom.

Picture taking skill (3)
: focus on the target subject

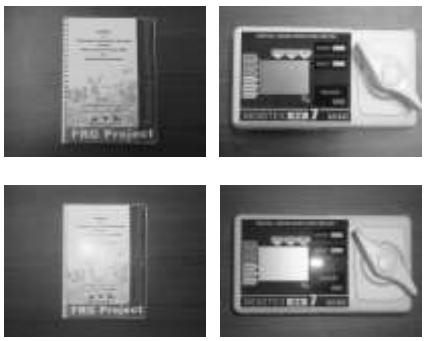



Again, avoid unnecessary information by clarifying the focus of the picture. To describe the seeds, the picture on the right is better since it has a scale, contrasting background color to clarify the shape and color of the object. The picture on the left has much unnecessary information and we cannot see the size, shape and color of the target object.

Picture taking skill (4)
: angle of the shooting

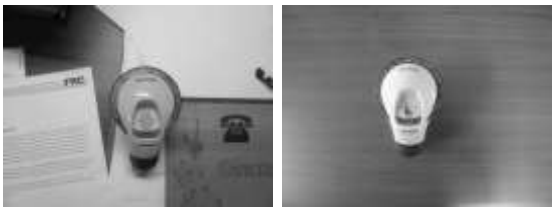
Angle of taking picture is also important. Select the camera angle which can give the image of the objects' best describing shape.

Picture taking skill (5)
: Flash



Reflection of the flash light is also something you need to control. It gives light to make the object more visible. But sometimes it gives unnecessary reflection to disturb the image of the object. In such case, switch off the flash of the camera.

Picture taking skill (6)
: background



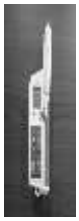
Avoid messy background. To give the readers correct visual information of the object, choose simple background as much as possible. You can move the target object if it is small. If the target object is large, yourself move and adjust position so that you can have simple and clear background.

Picture editing skill (1)
: compressing

- Use microsoft office picture manager to compress the picture files before editing
- You can reduce the size of the file to use for the PD manuals
- Smaller size files are easy to handle (editing, e-mailing)

Compressing picture files can make handling of the completed file easier. But be noted that reducing file size means reducing the quality of the picture. If you do not want to reduce the quality of the picture, do not compress the files.

Picture editing skill (2)
: resizing

To make the material look professional, do not deform the pictures. Always keep the original proportion by dragging the edge/ corner of the picture files rather than the side, bottom or top.

The steps

1. Decide the title/ topic
2. Identify the steps
3. Identify the materials necessary in each steps
4. Take necessary pictures to explain the process of each step
5. Fill the boxes of process description

Here is the actual steps of work for you to develop a PD manual.

Step 1: Decide topic/ title

- Be specific as much as possible
- If the title/ topic is not specific, the following process will not go smoothly.

Since the objective of producing manuals is to make readers become able to do by reading it. Thus, make the title as much specific as possible so that the contents can be specific.

Step 2: Identify the steps of procedures

- List the steps of process you go through

List the every single steps to complete the process which you are going to explain with this manual.

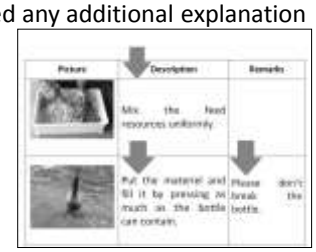
Step 3: Identify the materials necessary in each steps

- Follow the procedure carefully and list out the items appear on the whole process of steps

List the materials to be used by looking at the procedures.

Step 4: Work on the process description

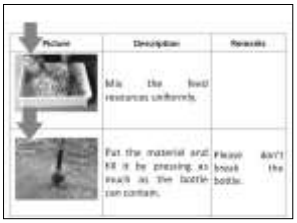
- Be specific as much as possible
- Make manual self-explanatory so that you do not need any additional explanation



Try to address possible questions in the manual because when the readers practice what is written in the manual, they would have no one to assist them there. If it is difficult, the topic is likely to be too general or to broad, check the title once again and set a specific title so that you can describe in detail of the process.

Step 5: Take necessary pictures to explain the process of each step

- Pay attention on the tips of picture taking skills which was presented in previous slides of this presentation



Clarify the information with specific size, amount, volume, time. Do not use “case by case”. If something depends on some conditions, clarify the conditions and how it varies.
Make sure the used pictures are OK with the topics covered in the “picture taking skills”.

Group work (How to do)

- Work in groups
- Each group member should participate actively
- Every group member should have specific role to carry out (photographer, writer, model)
- Simple and clear manuals should be produced in the end
- Do not work on your presentation while other groups are presenting

The group exercise follows the instruction given here.

Group work (What to do)

- Give specific info so that you can guide ALL the READERS to one uniform understanding
- Describe the process starting with verb
- Practice picture taking skill
- 1 slide 2steps of process only

1. Select a topic (that you can explain in detail)
2. List the procedures
3. List the equipments/ materials needed to go through the whole processes
4. Prepare the pictorial manual
   (1) Fill the boxes of description
   (2) Fill the boxes of remarks
   (3) Take necessary pictures and fill the boxes of pictures

Reference

- Reference: Obihoro International Center, Japan International Cooperation Agency. (2011). Manual by PD Method.

Always make sure to credit the source of the information.

4-3-7. Group work on PD manual

One group should be with 3-4 members so that everybody actively participates. If you have more members, it is very much likely to have 2-3 participants doing nothing. Also, go around the groups to make sure if their topic selection is appropriate, preparation of the manuals is on the right track. Do not let them spend too long time to set the titles because it decreases time to be allocated for more important exercises such as picture taking and considering the contents of the manuals..

Do not let participants search for the necessary pictures on the web. It usually requires time and you would not find exact picture you need. It is better for the participants to practice picture taking skill for the future extension material production. So, discourage the participants to search for the pictures and encourage them to act and take pictures.

4-3-8. Presentation of the group work

Typical bad examples of PD manuals are “photo album type” which does not describe the process of doing something, just explaining what is shown in the picture. Make sure the presented manuals are describing the process of doing something.

Besides, make sure the detailed information of doing something (such as specific amount, timing, volume, weight, color) is incorporated in the manuals. Check the used pictures as well if it is considering the points raised during the presentation to explain PD manual. Once again, emphasize that the manuals without specific information is totally useless.

4-3-9. 2nd exercise on PD manual development and presentation

Re-organize the group so that the participants can interact with different people and so that we can avoid “the same people always do the work”. Assign the groups to work on the new topics rather than repeat the topics covered during the first session. To develop skills of doing something, it is important to practice it repeatedly. After experiencing the first session and getting comments and questions on the group presentation, the produced manuals in the 2nd session should be better than the first session. If the quality of the manuals developed during the 2nd session is as poor as the 1st one, or about in the same quality, you should suspect that the participants might not understand what you have explained.

4-3-10. Q&A, discussion on overall training

Address the remaining questions of the participants before closing. Again, encourage participants to practice what they have discussed today in relation to FRG approach or extension material development in their daily routine activities. Announce the participants that there will be a follow up session of FRG approach training which will be the final session.

5. FRG approach training (Step 3)

5-1. Objective of the Basic FRG approach training

This training aims to provide the researchers with opportunity to further discuss and exchange experiences on the actual issues upon conducting FRG based research activities as a final stage of the 3-phase trainings on FRG based research approach. This training also aims to equip the participants with practical skills to be able to conduct Quick Gender Assessment with farmers groups.

The expected participants are the researchers of Universities and Research centers who already participated in both of (1) Basic FRG training and (2) 2nd phase training.

5-2. Program of the training

Timetable of 3rd phase FRG training(tentative)

Day 1			
Start	End	Program	Remarks
8:00		Participants meet in front of XXX, XXXX Town (The service bus to the venue arranged)	
8:30	8:50	Registration	
8:50	9:00	Opening	
9:00	9:05	Introduction of the participants	
9:05	9:15	Briefing on this specific training	
9:15	10:15	0. Group work: identification of challenges and solutions in FRG based research by group work (60min)	Facilitated by Mr. XXXXX
10:15	11:15	Case study 1. How to involve female household members and other household members (20min presentation 40min Q&A)	Presented by one of the participants who is appointed in advance
11:15	11:45	Break	
11:45	12:45	Case study 2. Differentiating between demonstration/ promotion, on-farm trial and participatory research - How can we improve the research contents by farmers' participation?- (20min presentation 40min Q&A, discussion)	Presented by one of the participants who is appointed in advance (or invite resource person)
12:45	13:15	Plenary discussion	
13:15	14:15	Lunch	
14:15	15:15	Briefing on the Quick Gender Assesment WS (Division of labor, Daily activity calendar, Access& control over resources, action plan: 90min)	Facilitated by XXXX
15:15	15:45	Break	
15:45	17:45	Group work, presentation and discussion	If there is enough time for discussion
17:45	17:55	Evaluation	
17:55	18:00	Closing	

Day 2			
start	end	Program	Remarks
8:30		Meet at XXXX, XXXX town	
8:30	9:30	Move to the farmers (60min)	
9:30	12:30	Quick Gender Assessment WS with the farmers (3hours)	Facilitated by XXXX
12:30	13:30	Move back to the venue/ lunch on the way (60min)	
13:30	14:30	Lunch	
13:30	14:30	Plenary discussion	

14:30	14:45	Evaluation	Facilitated by XXXX
14:45	15:00	Closing	Facilitated by XXXX

5-3. Contents of the each program and how to proceed/ facilitate

5-3-1. Group work: identification of challenges and solutions in FRG based research

Split the participants with a few groups with 5-6 members. Let them discuss on the actual challenges they experienced in relation to application of FRG approach after taking part in the Basic and 2nd step trainings.

The solutions for the raised challenges need to be discussed among the group members to come up with practical and useful solutions. Since there could be two or more solutions, be flexible and encourage the participants to suggest different idea.

5-3-2. Case study1: How to involve female household members and other household members in the activities

Inform one of the participants in advance to prepare a PowerPoint presentation on his/ her own FRG research experience especially focusing on how they promoted female participation in their research activities.

In our experiences, many researchers ended up explaining the experience of FRG activities having female farmer members simply without really explaining how and process of involving female members. If the prepared presentation by the appointed participant does not include essential information of HOW they managed to involve female members, lead the discussion in the way that they can disclose what they have actually done to promote female farmers participation.

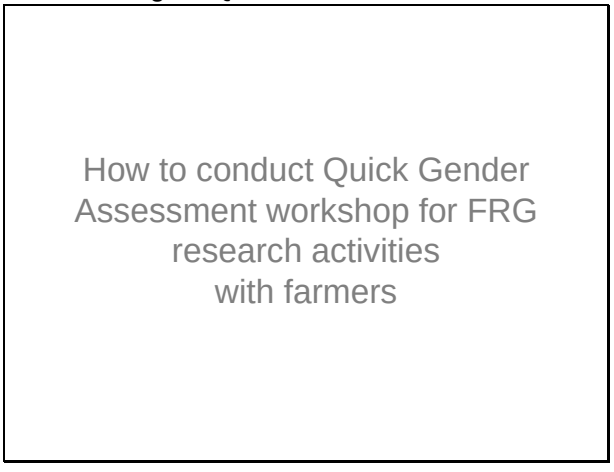
5-3-3. Case study 2: Differentiating among demonstration/ promotion, on-farm trial, and participatory research

Inform one of the participants in advance to prepare a PowerPoint presentation on his/ her own FRG research experience especially focusing on the approach they adopted so that the other can try to categorize the activity and see what characteristic difference it has comparing to the others such as on-farm trial, demonstration/ promotion and FRG research. This session was set to clarify the difference between participatory research activities and extension activities among the participants because these two are frequently mixed in the agricultural research system in Ethiopia.

5-3-4. Plenary discussion (1)

Recap the raised topics of discussion at previous sessions. Address un-responded questions and comments. Spend time for discussing what and how actually we can do the things rather than discussing on ideal situations.

5-3-5. Briefing on Quick Gender Assessment workshop



There are 18 slides. Manage time accordingly.

Training objectives

At the end of this training, you will be able to:

- Understand the necessity of the gender assessment workshop in FRG research activities
- Understand how to conduct Quick Gender Assessment (QGA) workshop

The objective is not general such as "create awareness about the importance of gender consideration" or "improve the rural livelihood of the female formers". Our objective is to collect essential information related to the specific technology which you will be conducting research.

Gender and FRG research activities

Brainstorming questions among researchers:

- Why do we involve farmers?
- Who are "farmers"?
- Why we need to know different responsibilities taken care by men and women in research activity?

Ask these brainstorming questions to the participants.

What is Quick Gender Assessment Workshop?

- Quick gender assessment workshop is one of the useful tools for making participating farmers and researchers to be aware of gender difference within a household, which needed to be considered during research activities.
- In QGA workshop, gender difference in activities in specific agricultural production activities and access to and control over resources related to them are identified.

Be sure once again that our objective to consider is very much specific. Explain the participants that we will conduct this exercise with the farmers tomorrow and the participants will be facilitating the session. The participants will also be preparing necessary materials for tomorrow's session with the farmers.

Why we should consider gender in research activities?

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1. Men and women are engaged in different activities in a specific farming activities. Thus, they have different experience and information in a specific farming activities.
2. Since men and women have different access to/ control over resources, it is important to know them and design the research activities reflecting real situation.

Objective of quick gender assessment

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- To identify who in the household is involved in which activities in specific agricultural activities so that appropriate information source/ target of the training to be identified.
- To identify who in the household has access and control over related/ required resources for the testing technologies so that research/ activity/ training design more appropriate to the specific target areas.

Preparation for QGA workshop (1/3)

7

- Timing

The assessment workshop is to be conducted at the beginning of the FRG implementation so that critical issues that are connected with gender are raised among group members, which will facilitate female farmers' participation in FRG as well as more appropriate research output.

- Selection of target households

Both male and female FRG members should participate in the workshop (does not have to be many. 3 each up to 6 each would be enough.)

- Venue

Where to conduct the workshop (consider time, location)

This is general information about the Quick Gender Assessment.

8

Preparation for QGA workshop(2/3)

Adequate preparation for the workshop

- Preparation of workshop program (shown in next slide), budget, list of materials required, flipchart sheets to be used , timely invitation of participant farmers
- Selecting facilitator and record keeper

Proper facilitation of the workshop

- Keep it short (always assume farmers are busy)
- Giving brief introduction
- Creating interactive environment for sharing ideas
- Encouraging participation of the participants
- Encouraging discussions
- Concluding discussion points

9

Preparation for QGA workshop(3/3)

Sample program

	Program	Start	End	Duration	Remarks
1	Opening remark	9:00	9:10	10 mins	
2	Orientation	9:10	9:20	10 mins	
3	Group work 1: Division of labor	9:20	9:50	30 mins	
4	Group work 2: Access to & Control over resources	9:50	10:20	30 mins	
5	Presentation by each group	10:20	10:50	30 mins	
6	Discussion	10:50	11:20	30 mins	
7	Closing	11:20	11:30	10 mins	

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Program of QGA workshop (1/2)

1. Welcoming the participants
2. Giving brief explanation about the exercises to be conducted
3. Introduce the facilitators(researchers) and the objectives of the session
4. Explain about the exercises to be carried out and how to do it.

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Program of QGA workshop (2/2)

5. Divide the farmers into a men and a women groups.
6. Make the group conduct the exercises
7. Presentation of results of the group exercises
8. Discuss how the information obtained from this session can be used to improve the specific FRG research activity and share it with the farmers

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Group work with farmers 1: Division of labor

Objectives:

- Understand the roles and responsibilities of women and men in the household related to specific farming activity

Methods

- Ask farmers if there is any activity to be added to the chart prepared by the researchers.
- Ask the groups to identify which productive activities are done by women or men in relation to specific farming activity.
- If more than one person is involved in the activity, tick two in the column of a main contributor and tick one for those involved less in the activity.

This is the first activity the training participants will be doing with the farmers.

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Productive activity(maize production)

Drawing/ pictures are important because the result of the exercise will be presented by the farmers and if they cannot read, it discourages the farmers to become a presenter. So, make sure you include drawing/ pictures.

14

Today's Group Exercise for researchers (1)

Select one FRG research topic and show the productive role of men and women in relation to the topic

(Tick will be marked during the session with the farmers tomorrow)

After this presentation, for the participants to prepare tomorrow's session, the participants will prepare the chart shown in the previous slide. When you start this exercise with the farmers on the following day, ask them if there is anything missing, or anything unnecessary. Sometimes, what researchers know can be different from reality.

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Group work with farmers 2: Access to and control over resources

Objectives:

- Identify who in the household has access to and control of particular resources in relation to the research topic

Methods

a. Clarify what is resource, access and control mean (see gender sensitization workshop guideline 2013 page 5).

b. Ask group which family members – women and men have more access to each resource listed.

- If men and women have an equal access, tick one in both columns. If both have an access but either has more access, tick two in the column for more access while tick one for less access.

c. After finishing all resources with access, continue with control.

This is the second activity the participant researchers will be doing with the farmers tomorrow. Make sure that all of the participants are clear on the difference between "access" and "control". If the researchers do not understand the difference well, they ae very much likely to confuse farmers at tomorrow's session.

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Access to control over resource (maize production)

Drawing/ pictures are important because the result of the exercise will be presented by the farmers and if they cannot read, it discourage the farmers to become a presenter. So, make sure you include drawing/ pictures.

17

Today's Group Exercise for researchers (2)

List the resources related to the selected FRG research topic and show who have access to and control over those resources

(Tick will be marked during the session with the farmers tomorrow)

After this presentation, for the participants to prepare tomorrow's session, the participants will prepare the chart shown in the previous slide. When you start this exercise with the farmers, ask them if there is anything missing, or anything unnecessary. Sometimes, what researchers know can be different from reality.

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After coming back from field

- After coming back from QGA workshop, discuss among the research team on the research topic once again on:
  - What to consider in research activities based on today's discussion with farmers
  - What to do to reflect the information you obtained from farmers into your research activities

This could be done at the village also. But try to minimize taking farmers' time. Have discussion after you close the session and let farmers go.
Since this is the most important part to reflect the information you obtained from the farmers into your research activities, do not miss this process.

5-3-6. Group work for Quick Gender Assessment workshop on the following day

The participants are expected to prepare

(1) Productive activity chart with pictures
(2) Tick box chart for male and female

2 sets of (1) and (2) to be used by both male group and female group

(3) Resource chart with pictures
(4) Tick box chart for male, female, access, control

2 sets of (3) and (4) to be used by both male group and female group

Make sure that all of the chart will be prepared with drawings/ pictures because the result of the exercises (Productive activities and Access/ control over the resources) will be presented by the farmers in the end and if the farmers cannot read, they would be discouraged to stand in front and give presentation on their results.

Additionally, make sure to prepare all the necessary charts here. Do not think you can prepare some of the remaining sheets at farmers place tomorrow. It will take time and waste farmers' time. Do not waste farmers' time.

5-3-7. Quick Gender Assessment workshop with farmers

Bring all the prepared chart and conduct the Quick Gender Assessment sessions. One of the participants can facilitate male farmers' group and the other can facilitate female farmers' group. The other participants can provide necessary supports such as posting the charts. The number of the farmers does not have to be large. 5 male and 5 female would be appropriate. Before starting each activity, explain the farmers that they will be the one who will

presenting the result to the other group in the end.

As previously mentioned, ask farmers if there is anything to be added or anything inappropriate in the charts you prepared in the previous day. Remember they know more about farming and rural livelihood than you do.

Facilitate the sessions in the way that all of the participant farmers have almost same opportunity to speak.

5-3-8. Plenary discussion (2)

Recap the field visit and address questions and comments for the Quick Gender Assessment session with the farmers. Make sure the participants understand it well so that they can conduct the session on their own from the next time.

If any participants have still remaining question or things to discuss in relation to FRG approach, discuss it here.

Remind the participants that the essence of FRG approach can be applied in any participatory research activities or research activities in their daily routine.

6. Evaluation of each training

Make sure to distribute evaluation sheet in the end of each day session. It is important to collect the opinions and comments of the participants to improve the contents of the training for the future. The filled evaluation sheets should be quickly shared among the resource persons and facilitators in the same day while the memory is still fresh so that feedback for improvement can be effectively utilized. Critical comments are very important for the future improvement.

7. Other related issues

It is important for the facilitators of FRG trainings to know that the approach shown in the guideline still leaves rooms of improvement based on actual application. Thus, it is essential to keep the training style interactive so as to enrich the approach. It is also important to keep notes of the feedback by the participants for further improvement of the guideline. Since the guideline is the summary of the essence of the approach, it cannot provide the readers with all the instructions of what to do. However, by enriching the contents of the guideline by feeding back the practical experiences the guideline and approach would become more pragmatic.

Reference

FRG Project, 2009. Guideline to Participatory Agricultural Research through Farmer Research Group (FRG) for Agricultural Researchers

Annex

Annex 1. A sample of FRG research report (Assosa ARC), from 2013 FRG research report

Title: Participatory evaluation and determination of N and P fertilizer Application rate on yield and yield components of Upland Rice (NERICA-4) at Bambasi district in Benishangul-Gumuze regional state.

Team members:

Getahun Dereje (principal investigator and Agronomist - BSc in plant science)
Regasa Dibaba (BSc in Agricultural Economics)
Alemu Dabi (Bsc in plant science)
Dereje Alemu (Diploma in plant science TA)

INTRODUCTION

The cultivation of rice in Ethiopia is of more recent history than its utilization as a food crop. The cultivation of rice in Ethiopia was first started at the Fogera and Gambella plains in the early 1970s. Currently, the Fogera, Gambella, Metema, and Pawe plains located in the northern, north western, and western regions are developing into major rice-producing areas in Ethiopia (Mulugeta Seyoum, 1999). Several research activities have been conducted at such rice producing areas.

Benishangul-Gumuz Regional State (BGRS) is one of the potential regions in Ethiopia with ample rainfall i.e. for six months and conducive environment which are suitable for rice production. It is estimated to be 4.9 million hectare of land is potential for rain fed rice production (MoA) (The Federal Democratic Republic of Ethiopia, Ministry of Agriculture, 2010). About two million hectare is highly suitable and the rests are suitable and moderately suitable both for upland and low land rice ecosystems.

Rice production in Bambasi wereda was first realized by settler community through informal rice seed exchange from other regions. Following this, on station and on farm research activities were started a few years back under rain fed condition in other similar weredas of Assosa zone. Except the breeding, other research components like agronomic aspects of rice are found at infant stage. Across location, varietal selection research activities reveal that rice is a well adaptable commodity for the region because of long rainfall duration (MoA). The Agro ecology allows for several crops production and rice can be the main demand driven item for the areas.

Rice research activity has been conducted in the region for the past few years and some promising varieties have been adopted. Among the released NERICA varieties, NERICA-4 had better yield advantage over others under on-station and on-farm conditions (Assosa ARC, Completed activity Report). Yet, improvement of its production has not been possible due to low soil fertility and inadequate nutrient management among other factors (Heluf Gebrekidan and Mulugeta Seyoum, 2006). Continuous cropping, high proportions of cereals in the cropping system, and the application of suboptimal levels of mineral fertilizers by farmers aggravates the situation in the area (MoA).

So far efforts regarding to the determination of optimum fertilizer level of upland rice in the area is minimal. Among major plant nutrients, Nitrogen (N) and Phosphorus (P) are the most determinant nutrients available in Ethiopia[1]

[1] Potassium (K) is also an essential element but not available in the form of chemical fertilizer in Ethiopia.

as they are required in large quantity by the crop. However, there are no scientific findings for N and P fertilizer application rates for the area. These further imply the need for participatory evaluation and determination of optimum rate of N and P fertilizers for upland rice production and for the improvement of farmers' knowledge and skills on optimum utilization of inputs (fertilizers).

In order to solve the above mentioned problems, FRG based research activity was conducted on Farmer's Training Center (FTC) and farmer's field condition in collaboration with relevant stake-holders to select and evaluate the best performing fertilizer rates.

Objectives

- ✓ To determine the optimum N and P fertilizer rates for upland rice (NERICA-4) in the area in terms of yield increase and economic return.
- ✓ To evaluate the effects of applied N and P fertilizer rates on yield and yield components of upland rice (NERICA-4 variety) under Nitosol condition.
- ✓ To enhance farmers knowledge about using optimum rates of fertilizer for rice production.
- ✓ Identify advantages and disadvantages of utilizing FTCs for participatory research activities.

Target area/potential impact area: Bambasi district

1. MATERIAL AND METHODS

1.1 Implementation site

A field experiment was conducted under rain fed conditions during the main rainy season (May to October) .The site is located at Bambasi woreda in the BGRS at Sonka FTC and one FRG around Sonka FTC villages. Bambasi woreda found 45 km away from the capital city (Assosa) of the region. The altitude ranges from 1300-1470 m.a.s.l. The Bambasi area receives an average annual rainfall of 1358mm of which 1128.5mm were received between May and October during the cropping season. The average yearly minimum and maximum temperatures are 14.5 and 28.8 ^{o}C, respectively (Annex 10).

1.2 FRG group formation

Discussions were held with the DAs and local leaders whereby the nature of the activity was explained and the host farmer for the activity were identified. Accordingly; Innovative and volunteer 15 (5 females and 10 men) farmers from the village were selected. A targeted community within the targeted area where identified needs were derived based on representativeness, willingness and capability of managing trial, willingness on share cost, consensus among the members and commitment.

Farmers research group (FRG) were formed based on the procedures indicated in the guide line (Guideline of FRG, page 36-39). During FRG formation not only men but women and young farmers were taken into consideration and agricultural experts at district and Kebele levels participated during farmers' selection. Training was given for farmers and agricultural experts on FRG concepts and rice production both theoretical as well as practical. The members

were divided into three sub-groups where the experimental trials were conducted.

1.3 Treatments and design of the field

The fertilizer treatments considered in the study was consist of four levels of N (0, 46, 92,138 kg N ha^{-1}) and four levels of P (0, 23, 46, and 69 kg P_2O_5 ha^{-1}) and their complete factorial combinations. The experiment was then conducted using a factorial experiment laid out in a randomized complete block design (RCBD) with three replications at Sonka FTC and on three farmer's field consisting of a total of 16 treatments. The same set of the treatments was also conducted on three farmers' field of FRG suitable members (one site –Sonka kebel, one site – Mender 49 & one site –Mender 46). Agro ecology of the three farmers' field is found in bambasi district where rain fall 1150-1358 mm and Temperature 22-28^{o}c. The experiment allocated to FTC site was managed and conducted by team of researchers but replication that are allocated on three members' land of FRG farmers was managed and conducted by the member of FRG groups through discussion.

The field was oxen plowed two times before laying the experimental plots on the field. A 3m × 3m ($9m^2$) plot size was used as an experimental plot. Sowing of NERICA4 variety was on June 27, 2013 made on farmers' calendar by hand drilling the seeds at a rate of 60 kg ha^{-1} in rows spaced 20 cm apart. Nitrogen was applied in three equal splits, where is 1/3 of the N rate was applied basal at planting, 1/3 at beginning of tillering (07/08/2013) and the remaining 1/3 was applied at panicle initiation stage (18/09/2013) as urea (46% N). Panicle initiation is the start of reproductive phase for rice variety which comes after stem elongation or as in general after vegetative phase. So that 1/3 UREA applied just after the vegetative phase is accomplished and the reproductive phase is started. (70 days after germination). Unlike N, the total dose of P was applied basal as triple super phosphate (46 % P_2O_5) during sowing.

1.4 Yield and Agronomic Data Collection and Analysis

The whole agronomic parameters: date of emergence, date of heading, date of maturity, number of tiller per plant , plant height, panicle length, number of panicle per plant, number of effective tiller per plant, number of filled grain per panicle, number of unfilled grain per panicle, 1000 seed weight and yield per plot and kilogram per hectare were recorded. The whole trials have been harvested (16-17/11/2013) manually by FRG members and finally the seeds was properly cleaned and weighed and the data collected from the treatments were analyzed by SAS.

1.5 Economic data collection and analysis

Economic analysis was performed to investigate the economic feasibility of the treatments (fertilizer rates). A partial budget, dominance and marginal analysis were used. The average yield was adjusted downwards to reflect the difference between the experimental plot yield and the yield farmers were expecting from the same treatment. The average open market price (Birr kg^{-1}) for rice and the official prices of N and P fertilizers were used for analysis.

2 RESULTS AND DISCUSSION

2.1 One FRG has been formed

Discussions (13/05/2013) were held with the DAs and local leaders whereby the nature of the activity was explained and the host farmer for the activity were identified. Accordingly; FRG consisted 15 (5 females and 10 men) farmer were created based on FRG approach. For effective communication, group representative were selected. i.e. DAs and extension experts selected farmers in each district, collected information concerning performance, farmers & opinion and quantitative data , information sharing within the group and farmers-to-farmer exchange between FRG & non-FRG members and so on. FRG members executed the recommended and local practice for the trial, kept record of their observation and experience and produce seed, return in kind of the same quantity, distribute the seeds to the surrounding farmers. The formed group had vital contribution for evaluation and monitoring of the experimental sites, skill and knowledge sharing, mutual discussion and technology dissemination in general. It also created an access to involve famers in research activities and to share experience among multidisciplinary research teams, agricultural experts.

2.2 Other stakeholders' participation

Farmers, development agents (DAs), agricultural experts, multidisciplinary research teams, administrators and other relevant stakeholders like Benodur PLC that participate on rice production (private sectors who are engaged on agriculture) participated in the monitoring and evaluation.

2.3 Extension material preparation

An extension material was prepared in Amharic and English in the year of 2012 and 2013 respectively to popularize FRG research activities and importance of fertilizer rate application based on information obtained from the end of the research activities and hence its objective was to popularize the unique feature of selected fertilizer rate application and dispatched to agricultural offices at regional, Woreda and Kebelle levels. The brochure has given due emphasis on evaluated N and P fertilizer rate and entitled with "Optimizing Nitrogen to Enhance Rice Production".

Table 1. List of dispatched extension materials

A. Leaflet in 2012 & 2013

Office dispatched	Copies	Remarks
Bambasi Woreda Agricultural Office	**150**	
Assosa Woreda Agricultural Office	**80**	
Keshmando kebele	**30**	
Sonka kebele	**60**	
Mender 46 kebele	**60**	
Mender 49 kebele	**60**	

2.4 Interaction with farmers in the research process

Awareness was created on FRG concepts and management practices of rice production during theoretical and practical training. Participatory evaluation of N and P fertilizer rate application was conducted during field day (07/11/2013) and a numbers of non-FRG farmers (39 men and 11 females) and agricultural experts (3 men) have learned from experiences of FRG members (10 men and 5 women). (See list of participants during Field day). Periodical meeting (Table 3), exchange visit (Table 4), group discussion (Table 5) and further consultation (Table 6) were held with FRG.

Table 2. The periodical meeting with farmers

Date	Agenda	# of male farmers	# of female farmers	Venue	Remarks
21/08/2013	Evaluation and discussion on the status of the research activity	18	5	Sonka FTC and Sonka Kebel.	include the research team
02/09/2013	Evaluation and discussion on the status of the research activity	15	6	Mender 49 and Sonka FTC	

Table 3. The exchange visit

Date	Agenda	# of male farmers	# of female farmers	Venue	Remarks
08/08/2013	Evaluation of the progress of the research activity.	15	4	Sonka FTC and Sonka Kebel	include the research team
05/09/2013	Evaluation of the progress of the research activity.	13	6	Sonka FTC and Mender 46	

Table 4. Group Discussion

Date	Agenda	# of male farmers	# of female farmers	Venue	Remarks
07/08/2013	Second urea treatment and evaluation of the research activity.	15	4	Sonka FTC	
18/09/2013	Third urea treatment and evaluation of the research activity.	13	3	Sonka FTC	

Table 5. Further consultation

Date	Agenda	# of male farmers	# of female farmers	Venue	Remarks
13/05/2013	How is the sustainability of the project?	13	4	Sonka FTC	

2.5 **Soil Physical and Chemical Properties Prior to Cropping**

The textural classes of the soils were clayey, with varying proportions sand, silt and clay. According to the rating of Landon (1991), the soil used for this study ranges from the strongly acidic (pH 5.91) to neutral (pH 6.73) class indicating the possibility of Al toxicity and deficiency of certain plant nutrients. The exchangeable K of the soil before

the application of the treatments ranges from 0.07 cmol(+) kg^{-1} to 0.79 cmol(+) kg^{-1}. Except one location, all experimental soils had deficient to adequate K content. According to Landon (1991), available (Bray II extractable) soil P level of less than 10 ppm is rated as low, 11-31 ppm as medium and greater than 18 mg kg^{-1} is rated as high. Thus, most trial location had very low to medium available (bray II extractable) P. Following the rating of total N of > 1% as very high, 0.5 to 1% high, 0.2 to 0.5% medium, 0.1 to 0.2% low and < 0.1% as very low N status as indicated by Landon (1991), All the experimental soils qualify for medium total N. Similarly, the organic carbon (OC) content of the soil was also very low in accordance with Landon (1991), who categorized OC content as very low (< 2%), low (2- 4%), medium (4-10%), high (10-20%) (Annex 3).

2.6 Yield and yield components

Yield and yield components were taken into consideration to analyze the research results that were conducted by FRG. The whole parameters were recorded and analyzed by SAS. Without active participation of farmers, generated technology could not be sustainable. Therefore farmers actively involved in this participatory evaluation and determination of fertilizer application rate. FRG and non FRG members evaluated the treatments based on their criteria and it was almost similar to the result obtained by SAS analyses. Farmers' criteria evaluation was focused on morphological expression of plants such as plant vigor, number of tillers, leaf color, plant height, estimate panicle length, and yield (Annex 2). Farmers preferred recommended fertilizer rate gives rice which have large plant height & panicle length, many tillers, deep green leaf color, & short maturity date. (Annex 5). At vegetative growth stage, tillering stage and maturity stage, the comparison undertaken between fertilizer rates based on scoring for Evaluation criteria and by ranking.

Analysis of variance for two factors randomized complete block design revealed significant difference between 92 kg N ha^{-1} with the control treatment due to the main effects of N fertilizer application for means of number of fertile tiller, plant height, 1000 seed weight, and straw and grain yield of rice on mother trial (Annex 4 & 6). However, on the baby trial plant height, straw and grain yield of rice were significantly different due the application of N fertilizer between 92 kg N ha^{-1} with the control treatment (Annex 7 & 8). Straw and grain yield on the mother trial, number of grain per panicle and fertile tiller per plant on baby trial had significant difference with the P fertilizer application between 46 kg P_2O_5 ha^{-1} with the control treatment (Annex 4 and 7). The mean squares due to NxP interaction were significant only for straw yield on mother trial between 138 kg N & 69 kg P_2O_5 ha^{-1} with the other treatments. While the interaction has no effect for other parameters.

Nitrogen has a marked effect on grain yield of rice. Grain yield highly significantly increased ($p<0.01$) from 1442.8 to 2264.9 kg ha^{-1} and from 1738.5 to 2486.1 kg ha^{-1} with increase in the level of N from the control (0 N) to 92 kg ha^{-1} on mother and baby trial, respectively; and decreased with further increase of applied N fertilizer (Annex 6 and 8). This could mainly be attributed to increase in number of grain per panicle. On other hand, increasing panicle length and plant height might have increased grain yield indirectly by increasing the number of grain per panicle. The magnitude of increase in grain yield over the control due to application of 92 kg of N ha^{-1} were 56.9 % (822.1 kg/ha)

and 43.0% (747.6 kg ha^{-1}) on mother and baby trial, respectively.

Application of phosphorus fertilizer also significantly ($p< 0.05$) increased the grain yield of rice up to the applied level of 46 kg P_2O_5 ha^{-1} (Annex 6 & 8). However, the response of grain yield obtained at 46 kg P_2O_5 ha^{-1} of P did not show significant differences compared with application of 23 kg ha^{-1} of P_2O_5. The magnitude of increase in rice grain yield over the control due to application of 23 kg & 46 kg ha^{-1} were 12.04 % (340.5 kg ha^{-1}) and 33.2 % (553.5 kg ha^{-1}) and 25.5 % (466.1 kg ha^{-1}) and 34.23 % (624.9 kg ha^{-1}) on the mother and baby trial, respectively.

The interaction effect of applied N and P levels only on straw yield (Annex 5) was significant on mother trial ($p\leq0.05$). While the interaction has no effect for other parameters. The highest mean straw yield 6461.1 g $plot^{-1}$ was obtained with the applications of 138 kg N ha^{-1} and 69 kg P_2O_5 ha^{-1}, representing an increase of 54.9 % (3548.2 g $plot^{-1}$) over the control treatment on mother trial.

2.7 Economic analysis

The economic analysis indicated that the 92-46 N-P_2O_5 kg/ha rate was found to be the first profitable rate followed by 46-23 N-P_2O_5 kg/ha, and 46-46 N-P_2O_5 kg/ha fertilizer rates (Annex 9). In cases where farmers face economic difficulty, money shortage at the time of planting, 46-23 N-P_2O_5 kg/ha and 46-46 N-P_2O_5 kg/ha rates could be used as second and third alternatives, respectively.

3 CONCLUSION

The results indicated that using 92-46 kg N-P_2O_5 ha^{-1} fertilizer application rate consistently producing higher yield, have better yield components and capacity resistance to disease.

Participatory evaluation of N and P fertilizer application rate was conducted during field day and a numbers of non-FRG farmers (39 men and 11 females) and agricultural experts have learned from experiences of FRG members (10 men and 5 females). Out of this; **9 males** & **4 females** FRG members and **29 male and 5 female** non FRG members agreed using 92-46 kg N-P_2O_5 ha^{-1} fertilizer application rate was the best profitable and hence recommended rate for rice. The economic analysis agreed that by investing 7,068.47 ET birr it gains the net benefit 14,349.77 ET birr per hectare (Annexe 9). However, the affordability of the investment needed may be a challenge without credit access. Besides, two year research activity may not be enough to decide the final research outputs it has to be continued to come across a concrete deduction for the project outputs.

References

Heluf Gebrekidan and Mulugeta Seyoum , Effects of Mineral N and P Fertilizers on Yield and Yield components of flooded lowland rice on vertisols of Fogera Plain, Ethiopia,Journal of Agriculture and Rural Development in the Tropics and subtropics Volume 107,No.2,2006,Pages 161,176

Channabasavanna, A. S. and Setty, R. A. 1994. Response of broadcast rice (*Oryza sativa*) to level of nitrogen, phosphorus and potassium and time of N application; *Indian J. Agron.*; 39(3):457–459.

Dalal, P. K. and Dixit, L.1987. Response of newly developed medium duration and high yielding rice genotypes to nitrogen; *Indian J. Agron.*; 30(1):114–116.

Mulugeta Seyoum. 1999. Rice: Potential crop for food security in Amhara Region; Agri-Topia: The quarterly newsletter of Ethiopian Agricultural Research Organization; 14(3/4): 1-2.

Panda, S. C., Panda, P. C. and Nanda, S. S.1995. Effect of levels of N and P on yield and nutrient uptake of rice; *Oryza*; 32:18–20.

Thakur, R. B.1993. Performance of summer rice (*Oryza sativa*) to varying levels of nitrogen;*Indian J. Agron.*; 38(2):187–190.

The Federal Democratic Republic of Ethiopia, Ministry of Agriculture(MoA), 2010. National Rice Research and Development Strategy of Ethiopia, Addis Ababa, Ethiopia.

Guideline to participatory Agricultural Research through FRG for Agricultural Researchers, June 2009

Annexes

Annex 1. Actual yield obtained from investigation fields

Treatment combination	Adjusted grain yield at 14% moisture content (kg/ha)										
(N-P_2O_5) kg/ha	Baby Trial								FTC Mean		Total Mean
	Farm 1	Rank	Farm 2	Rank	Farm 3	Rank	Mean	Rank	FTC	Rank	
(0-0)	448.9	16	1448.7	16	1866.7	16	1254.8	16	1312.0	16	1283.4
(0-23)	905.3	12	1855.1	15	2472.2	12	1744.2	15	1757.5	13	1750.9
(0-46)	628.6	15	1979.9	14	2838.0	5	1815.5	14	1635.1	14	1725.3
(0-69)	955.7	11	2156.6	13	2444.7	14	1852.3	13	1399.9	15	1626.1
(46-0)	1294.9	7	2467.3	11	2729.0	8	2163.7	10	2025.4	10	2094.6
(46-23)	1409.6	5	2661.0	9	3136.4	2	2402.4	6	2155.4	8	2278.9
(46-46)	1400.0	6	3115.7	7	3039.8	3	2518.5	4	2106.4	9	2312.4
(46-69)	1893.3	2	2592.5	10	2647.7	9	2377.8	7	2181.4	7	2279.6
(92-0)	809.9	14	2299.2	12	2805.0	6	1971.4	12	1760.9	12	1866.2
(92-23)	1209.3	8	3323.0	5	2511.2	11	2347.8	8	2434.8	3	2391.3
(92-46)	1896.7	1	3475.6	4	2905.5	4	2759.3	1	2698.0	1	2728.6
(92-69)	1718.6	3	3528.4	3	2602.6	10	2616.5	3	2349.2	4	2482.9
(138-0)	839.3	13	3624.6	1	2011.1	15	2158.3	11	1902.6	11	2030.4
(138-23)	1196.9	9	3547.1	2	3236.5	1	2660.2	2	2494.0	2	2577.1
(138-46)	1062.9	10	3016.8	8	2739.6	7	2273.1	9	2198.9	6	2236.0
(138-69)	1590.2	4	3301.4	6	2452.1	13	2447.9	5	2316.1	5	2382.0

Annex 2. Fertilizer rates rank by farmers at three site at Bambasi *Woreda* at maturity stage growth.

No.	Fertilizer rate		Criteria				
	N	P	Plant height	Panicle Length	Disease resistance	Tillering Capacity	General criteria selection of farmers
1	0	0	16	16	16	16	15
2	0	23	14	15	14	14	16
3	0	46	15	12	15	12	14
4	0	69	13	11	12	13	10
5	46	0	4	5	13	15	11
6	46	23	12	14	3	9	13
7	46	46	11	13	10	11	4
8	46	69	2	1	9	10	3
9	92	0	7	10	8	6	7
10	92	23	3	4	4	5	5
11	92	46	1	3	2	1	2
12	92	69	6	2	5	8	12
13	138	0	10	7	6	7	6
14	138	23	8	9	11	4	9
15	138	46	9	10	7	2	8
16	138	69	5	6	1	3	1

Annex 3. Some soil chemical characteristics of sample taken before planting

	Sonka Village	**Village 46**	**Village 49**	**Sonka FTC**
Available P(Bray II)	12.43	15.43	18	5.57
Total N %	0.29	0.21	0.21	0.224
K	0.79	0.66	0.07	0.64
CEC	16.8	12	17.4	14.6
Organic carbon %	2.72	1.8	2.72	3.6
pH	6.73	6.29	5.91	6.17

Sonka FTC Trial

Annex 4. Mean squares of phenological, growth parameters, and yield and yield components as influenced by nitrogen, phosphorus and their interaction at Sonka FTC during 2012& 2013 main cropping season

Source of variation	d.f	PL	PH	NGP^{-1}	$NFTP^{-1}$	TGW	SY	GY
Replication	2	4.62^{Ns}	0.90^{Ns}	4096*	6.00^{Ns}	4.51^{Ns}	4666.6^{Ns}	255126.01^{Ns}
N	3	3.69^{Ns}	490.45*	32.97^{Ns}	18.64*	14.94*	48470602.08**	6341837.496**
P	3	0.84^{Ns}	179.09^{Ns}	343.1^{Ns}	2.16^{Ns}	6.14^{Ns}	3206006.37*	667252.360*
N*P	9	0.14^{Ns}	11.84^{Ns}	409.9^{Ns}	0.34^{Ns}	0.76^{Ns}	4108901.61**	180793.985^{Ns}
Error	30	8.69^{Ns}	106.59^{Ns}	1009.6^{Ns}	6.68^{Ns}	3.58^{Ns}	585542.7**	264033.36**

Annex 5. Straw Yield of rice as affected by N x P interaction at Sonka FTC during the 2012 & 2013 main cropping season.

N (kg ha^{-1})	P_2O_5 (kg ha^{-1})			
	0	23	46	69
0	2912.9^{e}	3314.5^{cde}	3445.2^{cde}	3098.1^{de}
46	3492.8^{cde}	4488.6^{bcde}	4363.5^{bcde}	4563.6^{bcde}
92	4210.6^{bcde}	4828.1^{abcd}	5395.8^{ab}	5044.5^{abc}
138	4363.5^{bcde}	5835.7^{ab}	4842.6^{abcd}	6461.1^{a}
N x P interaction*				

Means followed by the same letter within a column or row are not significantly different at 5% level of significance; LSD (5%) = 335.9 g/plot to compare N x P interaction; *= indicates significant difference at 5% level of significance; and CV (%) = 26.9

Annex 6 : Yield and yield components as influenced by Nitrogen and Phosphorus during 2012 & 2013 cropping season Sonka FTC

Treatments	PL	PH	NGP^{-1}	NFTP	TGW	SY	GY
N (kg ha^{-1})							
0	16.9	62.4	100.6	4.6	23.8	1674.3	1442.8
46	16.8	66.4	106.8	5.3	23.6	2604.4	2009.4
92	17.8	67.1	109.6	5.3	23.2	3208.8	2264.9
138	17.3	68.8	106.5	5.8	22.6	3458.8	2131.5
F-test	Ns	*	Ns	*	*	**	**
P_2O_5(kg ha^{-1})							
0	16.8	62.8	107.3	4.6	23.3	2238.3	1666.9
23	17.1	67.6	100.7	5.1	23.4	2803.0	2007.4
46	17.2	66.6	106.1	6.0	24.0	2985.7	2220.4
69	17.2	67.6	105.5	5.4	22.6	2919.3	1953.9
F-test	Ns	Ns	Ns	Ns	Ns	*	*
LSD	1.41	4.9	14.9	1.26	0.92	335.91	298.23
CV (%)	16.7	15	18.7	3.7	8.13	26.9	16.49

** = Highly significant at P < 0.01 probability level; * = Significant at P < 0.05 probability level; Ns = non-significant at P < 0.05 probability level; LSD = least significant difference; and CV = Coefficient of Variation, PL=panicle Length(cm),PH=Plant Height(cm),NGP^{-1}=Grain Per Panicle, TGW=Thousand Grain Weight(g), SY=straw Yield(g $plot^{-1}$)&GY=Grain Yield(kg ha^{-1})

Annex 7. Mean squares of phenological, growth parameters, and yield and yield components as influenced by nitrogen, phosphorus and their interaction at Baby trial during 2012& 2013 main cropping season

Source of variation	d.f	PL	PH	NGP^{-1}	$NFTP^{-1}$	TGW	SY	GY
Replication	2	27.3**	646.58**	5369.39*	107.1**	42.96*	213212283.8**	10533435.45**
N	3	1.07^{Ns}	544.42**	904.2^{Ns}	0.22^{Ns}	27.5^{Ns}	77690245**	5136706.30*
P	3	4.5^{Ns}	58.1^{Ns}	1764.86*	13.3*	0.56^{Ns}	23431394^{Ns}	2228586.84^{Ns}
N*P	9	0.02^{Ns}	0.63^{Ns}	92.66^{Ns}	2.23^{Ns}	7.42^{Ns}	1870472.5^{Ns}	10422.50^{Ns}
Error	30	2.22**	48.22**	595.95*	3.59**	7.9*	3043627.3**	817937.46**

Where; **, * = indicate significant differences at 1% and 5% level of significance, respectively; Ns =non-significant at 5% level of significance; d.f = degree of freedom; N = Nitrogen; and P = Phosphorus PL=panicle Length(cm),PH=Plant Height(cm),NGP^{-1}=Grain Per Panicle, NETP= Number Effective Tiller Per Plant, TGW=Thousand Grain Weight(g), SY=straw Yield(kg ha^{-1})&GY=Grain Yield(kg ha^{-1})

Annex 8: Yield and yield components as influenced by Nitrogen and Phosphorus during 2013 cropping season for Baby trial.

Treatments	PL	PH	NGP^{-1}	NFT	TGW	SY	GY
N (kg ha^{-1})							
0	18.7	67.5	103.0	6.3	24.6	4544.8	1738.5
46	18.2	69.8	103.4	7.6	24.6	5546.3	2231.4
92	18.4	72.2	110.6	6.6	23.6	6220.7	2486.1
138	18.9	73.8	109.8	6.5	23.4	7002.1	2384.9
F-test	Ns	*	Ns	Ns	Ns	**	*
P_2O_5(kg ha^{-1})							
0	19.0	69.0	102.0	6.8	24.4	4978.3	1825.8
23	18.2	70.6	104.5	7.1	24.0	5979.4	2291.9
46	18.5	71.9	105.2	6.0	23.7	5923.6	2450.7
69	18.4	71.8	115.0	7.2	24.1	6432.6	2272.5
F-test	NS	Ns	Ns	Ns	Ns	*	*
LSD	0.84	3.93	13.3	2	1.62	993	508.94
CV (%)	7.9	9.68	21.79	11.97	11.7	29.7	20.1

** = Highly significant at P < 0.01 probability level, * = Significant at P < 0.05 probability level, Ns = non-significant at P < 0.05 probability level, LSD = least significant difference, and CV = Coefficient of Variation, PL=panicle Length(cm), PH=Plant Height(cm),NGP^{-1}=Grain Per Panicle, TGW=Thousand Grain Weight(g), SY=straw Yield(g $plot^{-1}$) & GY=Grain Yield(kg ha^{-1}).

Annex 9: Partial Budget Analysis of NP fertilizer application rates on rice at Bambasi Woreda

Treatments			Total cost (TC) (ETB)/ha	Adjusted grain yield to 14%/ha	Net benefit (ETB)/ha	Dominance analysis	Marginal rate of return (MRR %)
	N kg/ha	P_2O_5 kg /ha					
1	0	0	3375.00	924.039	10023.56		
2	0	23	4312.50	1260.628	13966.61		420.6
3	0	46	5250.00	1242.196	12761.84	D	
4	0	69	6187.50	1170.793	10789.00		
5	46	0	4760.00	1364.103	15019.50		235.3
6	46	23	5221.46	1568.788	17525.97		543.2
7	46	46	5683.47	1664.962	18458.49		468
8	46	69	6144.51	1641.336	17654.87	D	
9	92	0	6145.00	1343.629	13337.63	D	
10	92	23	6606.04	1721.745	18359.26		
11	**92**	**46**	**7068.47**	1964.6	21418.24		**661.5**
12	92	69	7529.51	1787.662	18391.59	D	
13	138	0	7530.00	1461.915	13667.77	D	
14	138	23	7992.43	1855.491	18912.20		
15	138	46	8453.47	1609.909	14890.21	D	
16	138	69	8914.51	1715.051	15953.73	D	

N.B: Prices - Urea= 13.85 birr/kg, DAP=14.65 birr/kg, TSP=18.75 birr/kg, Paddy Rice=14.50 birr/kg, Seed=10 birr/kg & Labor cost =25 birr/ person for 8 hours, TC=Total cost, Income=price /kg* Grain yield in kg and Benefit = Income - TC

Annex 10: The climatic conditions during the growing season (2013) around Sonka FTC

No.	Months	Total RF	Temperature(C^0)		Relative Humidity
			Max.	Min.	
		-	31.2	-	36
2	February	-	33.3	15	29
3	March	-	33.6	16.5	29
4	April	26.3	32.1	17.2	42
5	May	182.4	28.8	15	66
6	June	192	25.6	13.7	78
7	July	188	24.3	13.3	87
8	August	230.7	24.5	14.9	86
9	September	157.4	26	14.6	83
10	October	96.1	27.6	13.4	76
11	November	60.6	28.2	13.9	62
12	December	5.1	30	11.7	46
*	Mean	1138.6	28.767	14.473	60

Source: Assosa ARC meteorology station

About FRGII

THE PROJECT for Enhancing Development and Dissemination of Agricultural Innovations through Farmer Research Groups (FRGII Project, G.C. 2010-2015) was to enhance the capacity of researchers to take part in innovations through Farmer Research Group approach (FRG approach).

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