

**Guideline
to
Participatory Agricultural Research
through
Farmer Research Group (FRG)
for
Agricultural Researchers**

June 2009

**Melkassa Agricultural Research Centre
Adami Tulu Agricultural Research Centre**

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Foreword

Participatory research with farmers has thrived under the test of time. In its earlier stage many remained sceptical if it can really deliver the kind of required outputs in a scale demanded by overriding agricultural development challenges. Nonetheless, it evolved from one to another and reached to its current shape where scholars started to recognize that it is a necessary approach to come up with an innovation customized to resource poor farmers who basically live in a complex environment. The physical and socioeconomic setup of such farmers cannot be captured without letting them take part in the design and development of technologies that will be appropriate to them. Better than the traditional technology transfer make up, participatory methods claim to achieve increased confidence of farmers and local people in their own knowledge, improved capacity of clients to innovate and experiment, and an enhanced ability to cope with change.

Within such strong premises, a project on strengthening technology development, verification, transfer and adoption through Farmer Research Groups (shortly FRG project) was launched in 2004 aiming at addressing the limitations of conventional approaches through enhanced functional and institutional linkage. It was organized in a way to put in place institutional and functional arrangements involving both policy makers as well as research and development institutions at higher level and research centers, district agricultural offices, NGOs, private companies and farmers working in a team at functional level thereby ensure institutionalization of the approach into the existing research and extension system.

This Guideline presents the concepts and required steps in setting up of FRGs for agricultural researchers, who wish to follow FRG approaches. It was developed based on the concrete experiences of FRGs established in diversified topics ranging from crops, livestock, natural resource management, farming tools and marketing. It is hoped that the Guideline would take participatory approach, particularly FRG, a step further and will be instrumental in facilitating the institutionalization of the FRG approach in the Ethiopian Agricultural Research System, which will eventually lead to the realization of the significance of participatory approach in making agricultural research responsive to development needs of the rural communities.

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Preface

In order for agricultural research to properly address farmers' bio-physical and socio-economic constraints and be impact oriented by addressing the needs of its clients, it has to be participatory. The Ethiopian Agricultural Research System (EARS) has been trying to promote participatory research to develop and promote technologies with farmers' active involvement. Encouraging results have been observed in the process, particularly by improving interaction among stakeholders. This has brought up a need to further improve and institutionalise participatory research in the research system for quick and tangible research impact on the client. Owing to this, the Project on Strengthening Technology Development, Verification, Transfer and Adoption through Farmers Research Group (FRG Project) was launched in 2004 and has been under implementation by two Agricultural Research Centres (ARCs) in the East Shewa Zone, lately covering part of Arsi and West Arsi Zones. It is being overseen by a consortium of institutions, i.e. the Ethiopian Institute of Agricultural Research (EIAR), Oromia Agricultural Research Institute (OARI) and Japan International Cooperation Agency (JICA).

The Melkassa Agricultural Research Centre (MARC) of EIAR and Adami Tulu Agricultural Research Centre (ATARC) of OARI, both located in East Shewa Zone, have been conducting farmer participatory research using FRG approach on subjects ranging from crop to livestock, natural resource to livelihood improvement and farming tools to marketing. Between 2004 and 2009, the two centres have established 80 farmer research groups with more than 1400 members including 800 female farmers. More than 50 researchers from nearly 20 disciplines formed a number of multidisciplinary teams and conducted 41 research topics in partnership with development workers and farmers as well as many other public and private sectors.

This Guideline has been made possible by those who were involved in FRG research activities including researchers, extension workers and experts, farmers, village leaders, district officials, NGO staffs, private traders, manufacturers, and many others. Mr. Amare Hagos, Mr. Shelif Akiy, Mr. Zalalem Beleyneh, Mr. Daba Feysa, Mr. Yeshitla Merene and Mr. Solomon Bizuayehu made comments to the guideline's earlier version. Dr. Teklu Tesfaye provided his valuable comments and suggestions. EIAR directors, Dr. Fasil Reda, Dr. Tolosa Debele, Dr. Adefris T/wold and Mr. Seyoum Bediye undertook the task of final reviewing of the Guideline. The editors are grateful to their support.

The Editors, June 2009

List of acronyms and abbreviations

ARDO	Agricultural and Rural Development Office
ARC	Agricultural Research Centre
ATARC	Adami Tulu Agricultural Research Centre
CDR	Complex, Diversified and Risk prone
COR	Client Oriented Research
DA	Development Agent
DARDO	District Agricultural and Rural Development Office
EARS	Ethiopian Agricultural Research System
EIAR	Ethiopian Institute of Agricultural Research
FFS	Farmer Field School
FTC	Farmer Training Centre
FPR	Farmer Participatory Research
FRG	Farmer Research Group
FSR	Farming Systems Research
JICA	Japan International Cooperation Agency
M&E	Monitoring and Evaluation
MARC	Melkassa Agricultural Research Centre
MBP	Mouldboard Plough
MUB	Molasses Urea Block
NGO	Non Governmental Organisation
OFR	On Farm Research
PR	Participatory Research
PRA	Participatory Rural Appraisal, (Participatory Reflection and Action-we may not need to put these two together)

PLA	Participatory Learning and Action
PTD	Participatory Technology Development
REAC	Research Extension Advisory Council
SMS	Subject Matter Specialist

Glossary of terms and meanings

Appropriate technology: Technology, which is compatible with resources, such as labour, skills, materials and capital, available to target farmers and products that are suited to targeted community as well as the market. The technology is usually characterised with easiness of use, minimum costs, and simplicity.

Cost sharing: It is an agreement to divide the input costs expended for trial activities among concerned parties including farmers who are expected to benefit from the activities. The nature of cost sharing could either be in cash (e.g. payment for inputs) or kind (e.g. labour contribution)

Development Agent (DA): DA is an extension worker situated at the lower level in the hierarchy of government extension system in Ethiopia. He/she is posted at villages and Farmer Training Centres.

Exchange visit: It is one of the experience sharing and learning tools whereby farmers visit each others' farms to learn from good, as well as worse, practices.

Expert: A technical staff in agricultural extension system specialised either in crop, livestock, natural resource management or extension. They are posted at district, zonal, regional and federal agricultural offices. They are also called as "Subject Matter Specialist (SMS)"

Extension material: Leaflets, posters, manuals, samples, audio visuals, etc. that are used to disseminate information on agricultural technologies.

Extension worker: Extension worker is personnel who provide technical service on agriculture to farmers. It includes Development Agents, experts (SMS), NGO field staff, etc.

Farming system: The production and consumption pattern common to a group of farms with similar environmental conditions which are managed in similar manner with regard to types of enterprise and farming practices.

Farmer Training Centre (FTC): A place where training for farmers, demonstration of improved technologies and provision of agricultural information are carried out.

Farmer Research Group (FRG): A group of farmers involved in joint problem identification, experiment/trial designing/planning, execution and monitoring and evaluation in the process of technology generation, evaluation and transfer.

Field day: An event on which an area containing successful (why only successful?) farming practice is open for people to visit and learn.

FRG approach: One of the research approaches, in which a group of farmers, extension workers and a multidisciplinary research team jointly participate in agricultural technology generation, verification, and improvement so as to meet farmers' needs and improve farmers' production and management practices.

FRG research team: a team of researchers who are drawn from different discipline who work together to implement an on-farm participatory research applying the FRG approach to come up with comprehensive solutions.

Gender: It refers to the differences between men and women determined by social and cultural aspects (Moser 1993). Gender is different from sex which is connected to the biological and physical differences. When focusing on gender, the difference between men and women shaped by ideological, historical, religious, ethnic, economic and cultural determinants are looked at.

Gender sensitisation: Awareness raising process of both men's and women's various responsibilities, including productive, reproductive and community roles, access to and control over resources as well as decision-making.

Innovation: Ways of doing something referring to changes in thinking, products, processes and/or organisation perceived as new at least by some segment of a society (Meckeown 2008).

Innovation system: A network of organisations, enterprises, and individuals focused on bringing new products, new processes, and new forms of organisation into economic use, together with the institutions and policies that affect the system's behaviour and performance (Rajalahti et al. 2008: 3).

"kert": A unit of area, equivalent to 0.25 hectare, used mainly in Oromia Region

"kebele": An administrative unit with public employee at village level. It consists of a number of "got" (hamlets).

Multi-stakeholder platform: A forum whereby different institutions (individuals, groups, organisations, etc.) come on board to deal with a particular issue which is related to them.

On-Farm Research (OFR): Trials and experiment which are conducted on farmers' field. It is an attempt to test technical options under real farmers' condition.

Participatory Research (PR): An approach that enables clients to involve at all levels of the research steps/process in one way or another including decision making.

Participatory Rural Appraisal/Participatory Learning and Action (PRA/PLA): While the former focus more on identifying situation, the latter emphasise methodological pluralism (Chambers 2002). In practice, they are not used with clear distinction.

Research Extension Advisory Council (REAC): A platform for planning, monitoring and evaluation of agricultural research and development activities carried out (more or less) in one administrative zone and district (*warda*). There are also REACs at national and regional levels.

Scale up/out: Expansion of proven technology at both vertical and horizontal levels

Stakeholders: They are individuals, groups or organisations who are in a position to influence your work or place demand on you or who are affected by your work.

Subject Matter Specialist (SMS): They are also called "Experts".

Technical manuals: One of the extension materials which describes how to make use of particular technology for particular target group (extension workers, manufacturers, etc.).

Technology development: Verification, generation, and improvement of technology

Well functioning FRG: A farmer group who is capable, through self initiative, to analyse the situation, collect necessary information, come up with possible solution, try out new technology and advice other farmers.

1. Introduction

Ethiopia's history in participatory research goes back to Farming Systems Research in the 1980s where participation, although in its rudimentary form, was exercised. More recently, there were a number of research projects which emphasised participation. To name some, Farmers' Research Project (1991-1999), Participatory Research in Agro-climate Management (1997-1999), Institutionalisation of Farmer Participatory Research (1999-2002) and Indigenous Soil and Water Conservation Project (1997-2001). It is the experiences of individuals and institutions to make changes on technology generation and adaptation from which the Farmer Research Group (FRG) Project has been trying to work on further.

This guideline is one of the outputs of the FRG project which has been implemented at Melkassa Agricultural Research Centre (MARC) of Ethiopian Institute of Agricultural Research (EIAR) and Adami Tulu Agricultural Research Centre (ATARC) of Oromia Agricultural Research Institute (OARI) in East Shewa, West Arsi and Arsi Zones of Oromia National Regional State under the FRG Project between 2004 and 2009. The contents of the guideline are based on experiences gained from research, extension and development activities carried out by multidisciplinary research teams, extension agents, farmers and other stakeholders.

Who is this guideline prepared for?

The guideline is intended primarily to be used by agricultural researchers who are working at federal and regional research centres in Ethiopia to enhance the use of FRG approach while working with farmers, extension workers and other stakeholders, thus contribute to the improvement of the farmers' livelihood effectively.

How is this guideline used?

The guideline is divided into two sections. Section 1 explains the concept of the FRG approach and provides some background information on participatory research. Section 2 walks readers through practical steps of planning, implementing and monitoring and evaluating research and development activities using the FRG approach providing some tips and examples in the process indeed. Useful forms in various kinds are also attached at the end for immediate use or modification to fit into each requirement. It is expected that the guideline will help researchers employ the FRG approach properly but not limit them to one method and/or approach. It needs to be used flexibly and it is expected that it will evolve further through practices.

Section 1

Concept of Participatory Research and FRG Approach

Technology and innovation

Participatory research

FRG approach

2. Technology and innovation

Technology can be equipment, tool, machine, variety, management practice, information, organisation or a combination of either of these which brings about improvement in production, productivity, profitability, quality and/or reduce/mitigate risk. It can be developed as new or by modifying existing practices, equipments etc. or by validating practices, equipments etc. that are developed elsewhere or under different circumstances.

Technology needs to be **appropriate**, which is compatible with resources, such as labour, skills, materials and capital available to target farmers and products that are suited to targeted community and market. The appropriateness of the technology is important as there has been a shift of perspectives on the reason of non-adoption of technologies by farmers. The 1960s saw the non-adoption due to farmers' backwardness so transfer of technology was a dominant approach. It was understood in the 70s and 80s that constraints occurring at the farm level were attributes of the problem so their removal was the focus of the research and extension. In the 90s, some researchers started to realise that the problem was not farmers but inappropriate technologies which they provided (Chambers et al. 1993).

Innovation is a new way of doing something in thinking, products, processes, and/or organisations (Mckeown 2008). It is an application of knowledge, which is acquired through learning, research or experience, and many other sources, for desired social and/or economic outcomes. Unless it is applied more or less successfully, it cannot be considered as an innovation (Hall et al. 2004) **Innovation system** is a network of organisations, enterprises, and individuals focused on bringing new products, new processes, and new forms of organisation into economic use together with the institutions and policies that affect the system's behaviour and performance (Rajalahti et al. 2008: 3). Small scale farming is, in general, complex, diverse and risk prone (known as CDR agriculture, Chambers 1997), requires a systems perspective, which contrasts to a conventional notion of agricultural research characterised by specialisation, standardisation and maximisation.

Technology development and innovation are often used interchangeably. While technology development usually deals with a particular area of subject, innovation includes whole process where changes, either rapid or gradual, are brought by successful adoption and application of an improved technology or a set of improved technologies and further improvement of such technologies. Innovation system is also characterised by consistent and continuous improvement.

3. Participatory Research

Participatory Research (PR) is a research typology that enables clients to involve at all stages of the research process taking the leadership in making decisions. In the context of agricultural research, PR promotes the idea of joint needs assessment (problem identification), designing of solutions and/or strategies, conducting of experiments/trials, validation, monitoring and evaluation and transfer and utilization of technologies. Participatory research fosters innovation system through enabling technology generation and transfer to make sure that it is appropriate and can be adopted by targeted farmers.

PR emerged in recognition that conventional research and transfer-of-technology models could not meet all the farmers' needs. Particularly for small scale, resource poor farmers, development, adoption and use of technology need to be tailored to meet their specific needs and conditions. There are many names describing the same or similar approaches such as farmers participatory research (FPR), farmer-first-and-last-research, participatory technology development (PTD), etc. In a broader sense, Farmer Field School (FFS) and client oriented research (COR) are also included in the participatory approach family.

PR or FPR attributes the low level of farmers' technology adoption not to farmers' resistance but to inappropriate technologies and the process in which they are developed. It emphasises researchers' perspective on subjects as an important factor. PR's/FPR's tenets are interaction among researchers, extension workers and farmers, working on farmers' priority problems, developing technologies at farm level, tapping farmers' own technical knowledge, and fostering their ability to innovate through the participation including other stakeholders in the process.

Degree of participation may vary according to nature of research topic, level of researchers' facilitation skills, experience of farmers in on-farm trial and level of mutual trust between researchers and farmers. The level of participation is often described by a scale as researcher managed, consultative, collaborative and farmer managed.

Researcher-managed on-farm trial: Trials are conducted on farmers' field. Researchers are decision makers on setting research topics, designing and implementing trials and evaluating results. Trial design is often similar to on-station research. Farmers' participation on decision making is limited. Possibility of farmers' adoption of technology is very limited.

Consultative researcher-managed on-farm trial: Researchers consult farmers to identify needs for setting research topics and opinions on trial results. Farmers' participation is usually limited to provide land, labour and information required by researchers for their research objectives. It is difficult to ensure farmers' adoption of research results.

Collaborative farmer participatory research: Researchers and farmers work together to design, implement and evaluate trials. It combines local knowledge of farmers and scientific knowledge of researchers for meeting farmers' needs, balancing participation for achieving the objectives of farmers and researchers.

Farmer managed participatory research: Farmers are decision makers throughout the process of experimentation. Researchers are to assure utilisation of farmers' experimental capacity fully by linking them to necessary information which is not available locally.

Some claim that the former two levels are on-farm trial but not regarded as farmer participatory research. "Collaborative" or "farmer managed" participatory researches are ideal. However, each on-farm trial is a process where researchers and farmers learn from their experience and interaction. It is possible that "researcher-managed" on-farm trial can evolve into "consultative" and "collaborative" and end up sharing much of its outputs by researchers and farmers.

Participatory research approach through farmer groups, which is the theme of this guideline to ensure appropriate coverage, offers learning environment and ensures the impact of technologies generated to reach out more farmers.

4. FRG approach

4.1 What is FRG approach

FRG approach is a research approach by which a **multi-disciplinary research team**, **extension workers** and **groups of farmers** jointly conduct research on selected topics based on farmers needs on farmers' field. Researchers facilitate the involvement of extension workers and farmer groups in all the process of the research from planning through to implementation and from monitoring to evaluation and sharing of outputs or results. The approach also involves other stakeholders when it is necessary.

FRG approach is one of the participatory research approaches for agricultural researchers to actively and efficiently conduct research activities so that their contribution to improving farmers' production and management activities, and reducing risks in their practices are realized.

4.2 Objectives of FRG approach

The main objective of the FRG approach is to enhance the technology generation, verification and adoption process.

More specifically;

- 1) To generate new technologies, modify technologies developed on station, introduced from outside or indigenous ones to fit to a new set of situations at specific area so that the technology can be easily adopted and disseminated.
- 2) To develop a set of technologies which enable farmers to achieve desired production and income under their complex, diverse and high risk conditions.
- 3) To provide a platform for concerned stakeholders to collaborate easily to find appropriate solutions along value chain to solve farmers' problems.
- 4) To foster innovative farmers to analyse their situation and to develop measures for solving problems and/or improving the situation they face with their own initiatives.

Farmers' as well as stakeholders' participation is crucial in the entire process.

4.3 Cornerstone of FRG approach

The FRG approach is promoted with the following principles in mind.

4.3.1. Multidiscipline

Researchers from different disciplines form a team to work on selected topic(s) so that the complex and diversified situations of farmers can be taken into account when solutions are found, selected, developed and/or modified. Normally, different multidisciplinary teams are formed at a given research centre level. In order for the multi-disciplinary teams to work effectively and stimulate entire FRG activities, coordination among the teams at the centre level is important. The coordination is usually done by the centre manager or the head of socio-economic/research extension division/coordination office.

4.3.2. Farmer participation

FRG member farmers are involved starting from planning stage so that their real needs are reflected in the plan and they will have ownership feeling about the activities. Farmers also do research so that their knowledge and skills of farmers are combined with those of researchers and outputs become more appropriate to their circumstance.

4.3.3. Stakeholders' participation

There are other stakeholders who play important roles to generate solutions for farmers' problems. Their involvement will make the approach's outputs more comprehensive and sustainable in technology's scale up. Possible stakeholders include NGOs, processors, manufacturers, mass media, traders/brokers, etc.

4.3.4. Collective action

Farmers participate in group. Each farmer group is expected to function as an institution to bring about changes to the community. Their collective activities play important roles in (1) technology development and improvement, (2) technology dissemination, (3) marketing and (4) promoting cooperatives.

4.3.5. Capacity development

FRG activities are geared towards developing farmers' capacity to innovate and extension workers' capacity to facilitate the innovation. Thus, capacity development of the participating stakeholder needs to be an integral part of the FRG approach.

4.3.6. Gender and youth considerations

Not only men but women and young farmers are important forces in agricultural transformation to take place in the community. FRG approach involves gender and youth consideration so that their needs and interests are taken into account for technology generation.

4.3.7. Information sharing

Every experience of FRG is a valuable resource for other farmers, extension workers and researchers. In order for experience to be effectively disseminated, the activities need to be recorded, analysed and reported properly.

4.3.8. Cost sharing

Farmers are direct beneficiaries of FRG activity. In order for FRG member farmers to have ownership on the activity thus ensure sustainability of technology to be generated, it is a necessary condition to agree with farmers for their share of costs necessary for trial activities. The government's extension package system or any other forms of credit system can be used for delivering inputs.

Box 1 Example: Cost sharing

Revolving seeds (MARC/ATARC)

At MARC and ATARC, the research centre procures necessary materials which then are provided to farmers on credit bases. Refunded cash or in kind is pooled for purchasing materials for next experiments. For example, seed equivalent to the value of the inputs is collected in kind and used in a revolving way in the community. Collected payments can be used for lately established farmer groups. Alternatively, collected seed can be sold and income is used for additional research topics which are discussed with the farmers.

Credit on inputs for vegetable (MARC)

The arrangement is set with the MARC vegetable FRG member farmers to pay 50% of the input costs used in conducting participatory trials. The consensus among the farmers and the centre was to pay back the farmers' share at the end of harvest. For that purpose each input used for FRG purpose is registered by the FRG research team and the farmer himself/herself.

Credit on inputs for maize seed production (ATARC)

Cost sharing arrangement for ATARC maize FRG between farmers and the centre was made with farmers to pay back 40% of the input costs used in conducting the trial. The trial was conducted for two consecutive years. The research procured necessary materials covering all the costs required for the first year trial with a condition that the farmers would pay back their share (40% of the total cost) in the following year. The logic behind this was that farmers could afford the payment from the income generated during the first year activities.

4.4 Linkages in the FRG approach

4.4.1. Functional linkages

The FRG approach makes the participation among researchers, extension workers and farmers, as well as with other stakeholders, realising a functional linkage. REAC is a institutionalised linkage in which farmers' representatives and some farmer organisations involve in identifying major issues and setting priority areas at national, regional, zonal (centre) and *wareda* levels. The linkage brought by the FRG approach is practical and useful to create technologies and innovations which are required in farmers' day to day activity.

Functional linkages by effective communication among researchers, extension workers and farmers and by making use of farmers' experience and their capacity for experiment, indigenous knowledge, ensures the appropriateness of technology and provide researchers, extension workers and farmers with opportunities to develop their capacity to deal with problems and potentials under specific situation.

It also offers stakeholders with a platform to form necessary linkages and alliance, and to deal among them. It is particularly important for considering value chain in technology development process (Figure 1).

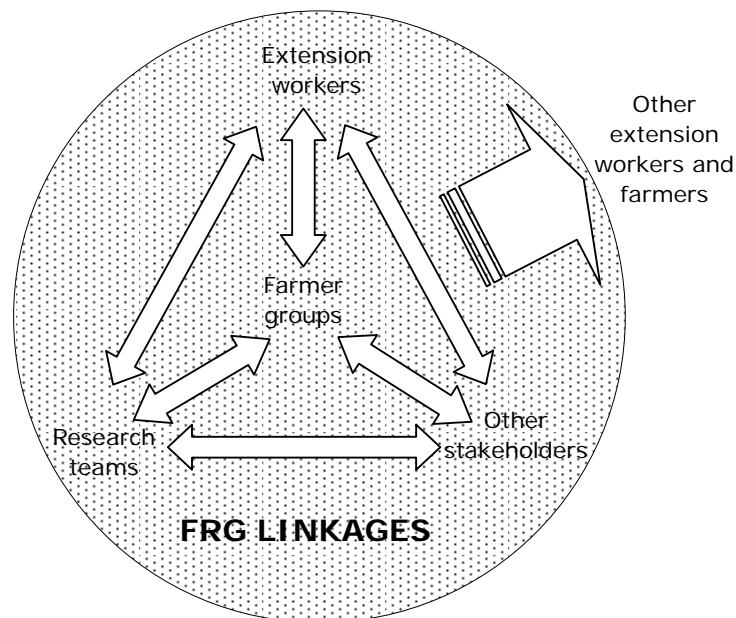


Figure 1 Functional Linkages and outputs in FRG approach

Table 1 Roles in the functional linkages in the FRG approach



From \ To	Farmer group	Research team	Ext. workers	Other stakeholders
Farmer groups		Training, technical information and guidance	Training, support organising farmer groups, facilitate linking farmers with other partners	Market information and market channels
Research teams	Local knowledge, information of local situation, feed back on new technology		Support consolidating scientific information	Market information such as quality, etc.
Extension workers	Feed back on new technology	Training, technical guidance for		Market information
Other stakeholders	Marketable commodity	Training, information of potential commodity	Linking them to farmer groups	

4.4.2. Interaction between researchers and extension workers/farmers in the FRG approach

Four modes of participation are explained in the Chapter 3. Although, “farmer managed” participatory research is regarded as a desirable for agricultural innovation, it does not mean that researchers’ role is less important. Their ways of involvement has decisive influence in the FRG approach and its outputs. Since, not every researcher is experienced and has skills and desirable behaviour and attitude for dealing with farmer participatory research, it is important that researchers gain experience and realise the importance of change in the way of communication with farmers while they are implementing trials.

Table 2 describes the characteristics of research and the behaviour and attitude of researchers at both ends of FRG research, researcher dominated, similar to on-station trials (A) and (B) farmer managed innovation system. The FRG approach is also a process of fostering capacity of farmers and extension workers. They will be able to handle the technology by themselves in course of time (Figure 2). A FRG research can start at anywhere between A and B using technical options come from research, local knowledge or outside sources. When researchers withdraw from the FRG research, the technology is either self-spreading of farmers and extension workers can continue managing innovation by themselves.

Table 2 Research characteristics and researchers' behaviour and attitude in FRG research

	Characteristics of research	Behaviour and attitude of researchers
A	<ul style="list-style-type: none"> - Single issue - Single commodity - Hardware technology - Standardised research - Researcher dominated 	<ul style="list-style-type: none"> - Dominate in decision making - Teaching - Regard farmers as ignorant
		
B	<ul style="list-style-type: none"> - Complex issues - Integration in the farming system - Software technology - Flexibility - Farmer managed 	<ul style="list-style-type: none"> - Sensitive - Mutual trust - Listen - Fostering farmers' confidence

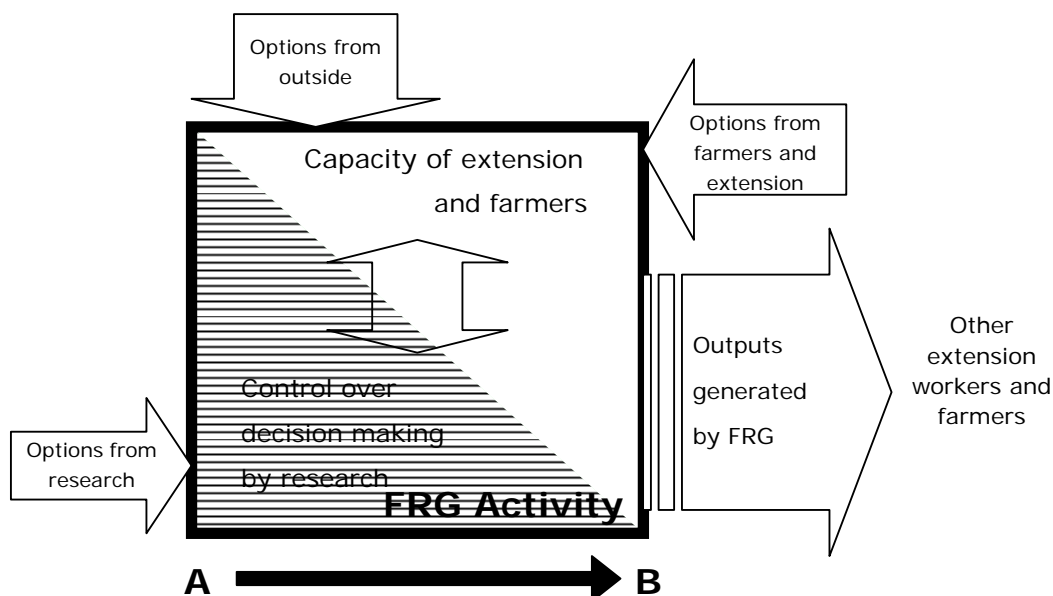


Figure 2 Capacity of farmers and extension workers and control over decision making by researchers in FRG approach

4.5 Farmer group in FRG approach

4.5.1. Why farmer group in FRG approach?

Farmers participate in FRG approach as a farmer group. Member farmers of the group share a same or similar farming system and common needs, either problem of opportunity. They usually come from the same community or geographical area. The farmer group takes collective actions and share information efficiently among them.

Use of group has many advantages. The group approach ensures an **appropriate coverage** of situations where the technology is tried, improved and verified for solving particular problem. The group approach also offers reflective **learning environment** in which farmers and researchers can discuss, learn from each other and decide collectively a course of action for technology development. Because members of the group have similar problems and work on topics chosen by them, the group will continue working together and **influence** to reach out more number of farmers, speeding up of scaling up/out and create pressure on institutions to satisfy group demand.

4.5.2. What roles do farmer groups play in technology development?

Farmer groups can act as a forum for different purposes such as technology development, extension, training, marketing, and many more for agricultural and community development.

FRG approach uses farmers group as means for technology development. Member farmers are expected to reflect the reality they face in technology development process so as to make the technology as much practical, lower risk, and more effective outputs as possible.

Through involvement in technology development activities, farmer groups develop the capacity to innovate so that they will be catalysts for technology scale up/out.

4.5.3. What is well functioning farmer research group?

Farmer research groups which meet the following criteria are regarded as well functioning farmer research groups

- 1) Capable to diagnose, analyse and come up with possible solutions for problems through self-initiative
- 2) Capable of collecting necessary information from outside for solving problem
- 3) Capable to try out, evaluate and improve new technology
- 4) Capable of conducting, planning, monitoring and evaluating of group activity
- 5) Capable to help and advice other farmers

Table 3 Level of farmers groups

	Different level		
	Level 1	Level 2	Level 3
Features	Newly established group Require more technical and input support from research/extension, not sure what will it take to work with groups, and may tend to be expectant of free gifts	Worked for at least one year on a particular topic May take calculated/minimum risk while conducting trials	Worked on more than one topic for at least two years Ready to take risk while conducting trials (already built some confidence to share cost) Willing to explore more other topics with minimum guidance & technical support
Criteria			
1.Capacity to diagnose and analyse situation	Can only identify problem Not sure what are its causes	Can diagnose and find solutions if with close assistance from DAs and researchers	Can diagnose and analyse the situation by themselves
2.Capacity to collect information and improve farm management	Can only articulate their observation Not sure how to trace sources of important information	Can collect information with close assistance from DAs and researchers	Can collect relevant information on the trial Capable to locate source of information
3.Capacity to test new technology and modify/improve it	Can test new technology if it is simple and supervised well by extension workers or researchers	Can test and evaluate new technology and improve it with close assistance from DAs and researchers	Can test new technology and improve it by themselves
4.Capacity to run group activity (planning, management, marketing)	Can form a group and discuss necessary activity	Can run group activity with close assistance from DAs	Can run group activity by themselves and organise field day
5.Capacity/culture of sharing information and advice to other farmers	Can understand the necessity of information sharing But not know how it can be done	Can share information with and give advice to other farmers with arrangement by DAs	Can share information with and give advice to other farmers

4.6 Entry point to FRG research

FRG activity can start differently, depending on subjects, situations and target farmers. It is a matter of where the entry point is but the ultimate goal is to match farmers' needs and available technical options that come from researchers, farmers or other sources. Entry point can be based on available technology with researcher for its easiness but several topics may continuously emerge in the course of FRG approach. The topics are not mutually exclusive as one entry topic may address farmers' needs and/or may also research in development issues. Following four entry points are available. (Please refer to Chapter 6, which discusses how initial ideas are collected and narrowed down to formulate a proposal.)

- 1) **Available technology based:** Choose potential technologies available with researchers then select target group for which the technology can have the most impact.
- 2) **Farmers' needs based:** Identify farmers' need first and then select possible technical option.
- 3) **Farmers' technology based:** Farmers practice their traditional method of farming among which some are appropriately fit to the situation. Some innovative farmers even modify these traditional technologies or, in some cases, recommended technologies further to meet their present needs. Such farmers' technologies may be better to be proved scientifically and improve them further.
- 4) **Research and development based:** Collaborate with ongoing agricultural/rural development projects and deliver solution to the problem identified by the project.

Box 2 Examples of different entry points

Available technology based

Improved milk churner (ATRAC): A team of researchers have been working on dairy improvement with FRG member farmers in two villages. During the implementation period, researchers observed that women's work load was high as milk churning using traditional clay pot requires more than one hour, sharing much of women's already busy time. Researchers introduced an improved milk processing technology to these dairy farmer groups. Farmers, extension workers, researchers and private manufacturer worked together and made continuous modifications on the equipment. The equipment has been proved to reduce churning time from more than one hour to around 30 minutes. The structure of the churner without agitator inside has made handling of butter easier. The farmers accepted the idea and actively involved in improving the churner further.

Sweet potato (ATARC): Shortage and uneven distribution of rainfall is the major challenge for farmers in the Rift Valley areas. Understanding the existing situation, researchers at Adami Tulu District, thought the possibility of screening for adaptable drought tolerant sweet potato varieties. Accordingly, an adaptation trial was conducted with FRG member farmers for the last two years.

Farmer need based

Community based seed multiplication (ATARC): Maize is one of the dominant crops and has multiple purposes for farmers as food, income source, feeds and construction material in Adami Tulu District. Since drought is a serious problem in the area, drought tolerant varieties are important for the farmers but most of them do not have access to recently introduced varieties. Therefore, the farmers developed interest to produce maize seed by themselves. Thus, community maize seed production technology trial was conducted for the last two years. The group with 10 farmers in the community has produced 100 quintals in the first year which was distributed to 10 villages in the area.

Farmers' technology based

Onion plant density (MARC): Farmers in the Central Rift Valley had been using very dense spacing to produce onion bulbs which was different from research recommendation. Different spacing (2, 4, 6, 8 and 10 cm) was tested and found that medium density (4-6 cm) can maintain high productivity level.

Research in development

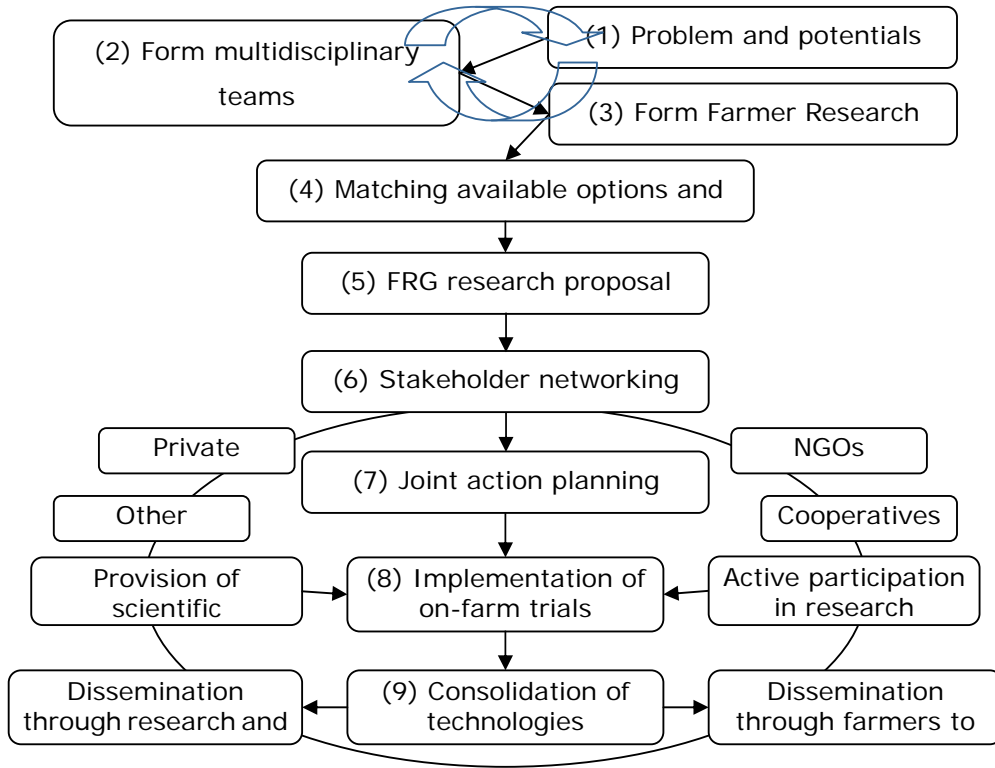
Drip irrigation and water harvesting (MARC): The government and NGOs were widely involved in digging water harvesting ponds but most of the ponds were not used due to limited water storage capacity. So, a research was initiated to add value by testing water saving technology, drip irrigation, using harvested water for growing cash crops mostly vegetable and fruit crops with already established scheme.

4.7 Necessary steps in following the FRG approach

There is no strict rule for the steps followed in FRG approach. Basic one is as described below and depicted in Figure 2. For more detailed explanation of the steps, see Chapter 6 "Planning", Chapter 8 "Implementation", Chapter 9 "Monitoring and evaluation" and Chapter 10 "Communicating FRG outputs".

- 1) **Problem identification:** Farmers' situation is analysed, understood and needs and problems are identified and prioritized. (See Chapter 6, 6.3)
- 2) **Establishing multidisciplinary team and identifying technical options:** According to the identified problem, a multidisciplinary team is established at the research centre and various technical options are identified, discussed and agreed upon for proposing them to farmers later. (See Chapter 6, 6.4 and 6.5)
- 3) **Forming farmer groups:** Form farmer groups with whom FRG research is to be carried out. (See Chapter 6, 6.6)
- 4) **Matching needs and options:** Farmers' needs/potentials and possible/available options are matched to select FRG research topics. (See Chapter 6, 6.7)
- 5) **Formulating FRG research proposal:** Formulate research proposal by researcher for securing budget. (See Chapter 6, 6.8)
- 6) **Networking stakeholders:** Identify important stakeholders and start establishing linkage among them. Discussions on cost sharing start this time. (See Chapter 6, 6.9)
- 7) **Making joint action plan:** Make an action plan jointly by researchers, extension workers, farmers and other stakeholders to make sure that the activity is owned by them. Make sure how the cost is shared among them. (See Chapter 6, 6.10)
- 8) **Implementing field activity:** The activities including on-farm trials, training (at different timing of the cropping season or livestock cycle), field days and exchange visit are carried out jointly by or shared among researchers, extension agents, farmers and other stakeholders. (See Chapter 8)
- 9) **Monitoring and evaluation:** Monitoring and evaluation are carried out at various levels and stages by the research teams, stakeholders and the member farmers. (See Chapter 9)
- 10) **Consolidating and communicating FRG outputs:** Comprehensive set of technologies which are well incorporated into the farming system. Technical outputs are converted into extension materials for wider impact of the technology. (See Chapter 10)

Figure 3 Steps of FRG approach



Section 2

Practicing the FRG Approach

Coordination

Planning

Gender consideration

Implementation

Monitoring and Evaluation

Communicating FRG outputs

5. Coordination

5.1. What is coordination?

Coordination consists inter-relating the various parts of FRG activities to maximise efficiency of their outputs and further progress. It involves coordinating the various job roles and responsibilities of among researchers within the research centre, other stakeholders, such as agricultural and rural development Offices, NGOs, cooperative society, etc., and the broader community. Coordination among different research teams within the research centre is essential for efficient use of resources and information available at the centre. FRG activities should be linked to and be part of agricultural development activities of the government and NGOs as well as private sector in the area for consistency in development.

5.2. Why is coordination necessary?

Desirable research result is not only a result of employing appropriate research methodologies but also depends on effective coordination of all activities within a team and all the stakeholders, which directly or indirectly influences your overall research implementation. Well coordinated activities achieve effective use of resources and stimulate active interaction among researchers from different disciplines and stakeholders.

5.3. How to coordinate?

5.3.1 Who coordinates?

Coordination of FRG research activities which, in principle, are implemented in multidisciplinary way is better to be done by someone who can communicate and network with different people. Coordination within a research team is usually done by the team leader.

Coordination among different FRG teams within a research centre is recommended to be a responsibility of the centre manager assisted by research extension or socio-economics researchers.

5.3.2 Coordination of research teams

FRG research teams are multidisciplinary teams at research centre level. The teams are composed of researchers from different disciplines. One researcher can be the member of one or more teams. The activity of FRG research teams need good communication for better performance by periodically sharing information and discussing, within and among FRG research teams, on issues which may be faced in

the process of implementing research activities. It is recommended that each team meets at least once a month (see Box 3).

Box 3 Example: Schedule for multidisciplinary team meeting, August 2008 (MARC)

Mon	Tues	Wed	Thu	Fri
4	5	6	7	8
Maize FRG team meeting		-	FRG Guideline preparation meeting, ATARC	Agro forestry team meeting
11	12	13	14	15
Tef F ₁	Parthenium control	Marketing	MBP(row planting, haricot bean promotion, bean weed control)	Vegetable team
18	19	20	21	22
Monthly team Meeting*		Maize team meeting		Agro forestry
25	26	27	28	29
Tef F ₁	Parthenium control	Marketing	MBP	Vegetable team

*NB. Each team leader present progresses and all FRG research team members have to attend. The team members share the implementation status of the activities among themselves and suggest measures if there is any issues.

5.3.3 Coordination of resource utilization

Resources need to be utilised in most efficient way. Similar FRG activities can be grouped/combined and jointly implemented for appropriate utilization of physical, financial and human resources.

For example, management of vehicle allocation for different activities is a crucial aspect of coordination. As vehicle is usually a scarce resource, this necessitates different teams and activities to be brought together. Box 4 is an example of vehicle sharing schedule from MARC.

Box 4 Example: Weekly vehicle arrangement sheet (MARC)

	Centre manager	Head SE-RE
Signature		

Date and day		Vehicle 1	Vehicle 2
Monday (Jan 1)	Morning	Dairy: data colle., Bishola	Veg.: farmer mtg. Berta Sami
	After noon		-- do --: Meki
Tuesday (Jan 2)	Morning	Agro-fore. + Maize: data collection, Melkassa	-- do --: Ziway
	After noon	-- do -- Adama	-- do --: Aris Negele
Wednesday (Jan 3)	Morning	Haricot: farmer mtg, visit <i>wareda</i> off., Ziway	Tef + agro-fore.: Boset
	After noon		
Thursday (Jan 4)	Morning	-- do --: Siraro	
	After noon	-- do --: Shala	
Friday (Jan 5)	Morning	-- do --: Berta Sami	Veg. + haricot + dairy: procurement, AA
	After noon		
Saturday	(Jan 6)		
Sunday	(Jan 7)		

The vehicle arrangement basically deals with bringing together the trip requests of different FRG research teams according to activities they undertake and places visited. The request is collected early by one week and announced on Friday for the next week. On the program, research team and places to go are listed; activities to be performed is shortly indicated and the period also mentioned (including morning and or afternoon time as per request).

5.3.4 Coordination of monitoring and evaluation activities

There are different tools that can be used to monitor and evaluate FRG activities:

- 1) Regular meetings
- 2) Joint M & E visits (once or more per season among stakeholders)
- 3) Farmers' and extension workers' evaluation meetings (once per season by each research topic and once per year among

Proper implementation of monitoring and evaluation (M & E) is a must for easy coordination thus effective implementation and better outcome of FRG activities. M&E should be a part of action plan.

Regular meeting is for sharing, activity schedule, progress and important issues to have common understanding among researchers. It is conducted weekly or bi-weekly by each research team. General meeting is conducted monthly or quarterly by all the research teams.

Joint M & E visit is to have field observation together among stakeholders to check the relevancy of the activity in the development contexts of the area and promote the technology. The visit is implemented once per season by each research topic.

Farmers' and extension workers' evaluation meeting is to collect feed back for FRG member farmers and extension workers particularly on the activity management aspects in addition to sharing their experiences with other farmers and extension workers. It is conducted once per season by each research topic and once per year by all the research topics.

5.3.5 Coordination with stakeholders

Participation of relevant stakeholders is important particularly for FRG research activities to have tangible results and wider impact. Bringing all the important stakeholders together requires establishing a platform.

Joint action planning among the stakeholders is one of the activities to bring about good coordination (joint action planning is explained in Chapter 6). Submission of the joint action plans to respective District Agricultural and Rural Development Office (DARDO) in official manner brings all the concerned district officials on board and the DARDO acts as coordinator.

While the coordination for detailed actions is maintained at the district level, attending to zonal extension meetings and reporting the progress of FRG researches helps the FRG research to have broader impact.

5.3.6 Coordination with extension activities

FRG researches which have promising results after verified by FRG member farmers and ready to be transferred to extension have coordinated pre-extension/initial extension activities such as field days and training for extension workers in a similar area. It is particularly important when generated/improved technologies are to be integrated within the farming system of the area.

6. Planning FRG research

6.1. What is planning

Planning is the process of identifying targets and organising resources as well as set of activities in a systematic way (in time and space) as a means to reach a desired end.

6.2. Why planning is important for FRG research?

FRG as a participatory approach focuses on meeting expressed needs of the targets farmers. Defining priority needs and devising appropriate ways to improve/change the situation demand a lot of organisation/arrangements both from farmers' as well as other actors' side (research, extension, NGOs, etc). FRG, as a platform for different stakeholders to converge and interact, involves negotiation and clear definition of roles and responsibilities within the mandate as well as interest of the stakeholders. The quality of the output also depends on the quality of the planning process. Hence, planning stage is indispensable edge of FRG research approaches.

6.3. How does planning take place?

6.3.1 The start up

Any FRG research should have a general background/base, which provides insight about the existence and nature of certain gap/problem in a given agro-ecology/region. The idea/issue may be too general, yet it is important to have some cause to start with. This will also be useful frame while refining it to a well defined researchable topic through joint discussion at grassroots level.

Once an existing need (felt or unfelt) is recognized based on observation of current practices, potentials or farmers' demand, it can be used as entry point to initiate FRG research activities with a newly established group. Accordingly, the entry point in early stage of an FRG can be based on available potential technologies, expressed needs of farmers, farmers' own practices, or value addition to ongoing development projects.

Nevertheless, for already functioning FRG research, the progress and experiences of previous activities as well as outputs of ongoing interactions with different stakeholders and emerging problems can serve in identifying issue to design follow up actions.

Followings are possible sources of ideas for starting FRG research.

- 1) Discussions and reports of Research Extension Advisory Councils (REACs)

- 2) Communication with farmers and extension agents
- 3) Experiences of researchers
- 4) Documents (research/study reports)

After having ideas from different sources, then, they are narrowed down to few. Consider the entry points discussed at "4.6 Entry points to FRG Research" for setting sights for an area of your FRG research.

When it is necessary and the situation allows, conduct a preliminary survey to collect information and discuss with key persons on the idea.

6.3.2 Why and how target areas are defined?

Purpose: Defining target area is useful to understand the coverage of the problem and the width of applicability of the output of the research activity, i.e. the potential area where the output can be used and bring impact. It helps to reduce the temptation of (researchers) selecting a topic with little significance in terms of coverage and to avoid investing meagre resources on topics/issues/problems that are not common to many. In general, it helps to identify areas where the experience gained and/or the output can be potentially extrapolated

How to define target areas: Try to confirm how big the coverage of the problem by considering the different categories of farmers affected (secondary sources including reports of ARDO at different levels can be useful in this case).

Areas that share the same background to the common problem are usually potential impact area by the solution. It is, however, necessary to look at the candidate solution and its characteristics as it solves the problem partially or requires some conditions which not all the farmers in the area can meet so that the impact may be limited.

6.3.3 Problem identification

Tentative list of problems are made and, if necessary, organise a farmer's meeting to discuss the problem. Following tools, seasonal calendar and resource mapping, are used to analyse the situations and problems.

Seasonal calendar

Seasonal calendar lets farmers to recall the activities through out the year. It will demonstrate farmers' ability to convey useful information that are understandable for both literate and illiterate. Examples are shown in Box 5 and 6.

Objective: Together with farmers, to grasp the farming system, its changes over the course of a year, discover correlations and connections between different seasonal

patterns and analyse constraints and opportunities.

Materials: Locally available materials (stones, sticks, leaves, etc.)

Time: 1-2 hours

Procedure

- 1) Divide the farmers into small groups of around 5 people composed of men and women.
- 2) Select, either by you or by farmers themselves, a key informant. Ask the key informant to create a calendar of cropping pattern of major crops, diseases to start with.
- 3) The remaining farmers provide additional information to help the key informant.
- 4) Informant can be changed in turn among the participants.
- 5) Information drawn on the calendar is to illustrate trend and changes in activities, events, environment over the course of a year.
- 6) Based on the calendar, farmers identify constraints and potentials.

Checklist for seasonal calendar

- 1) Weather (rainfall pattern, temperature)
- 2) Availability of water,
- 3) Availability of inputs
- 4) Disasters and prevention activities,
- 5) Time management,
- 6) Market prices,
- 7) Cropping pattern,
- 8) Pest and diseases,
- 9) Problems in crop husbandry,
- 10) Extension activities/plan,
- 11) Workload of men and women,
- 12) Labour requirement,
- 13) Community events,
- 14) Control of cash,
- 15) Diet,
- 16) Income generation activities, etc.

Box 6 Example: Crop-Livestock mixed farming calendar (ATARC)

No	Major activities/resource	Months in a year											
		Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1.	Rain fall	■	■	■	■	■	■	■	■	■			
2.	Availability of water	■	■	■	■	■	■	■	■	■	■	■	■
Maize													
	Land preparation	X											
	Obtaining seed		X										
	Plantation		X	X									
	Weeding			*	***								
	Harvest and									X	X		
	Marketing										X	X	
	Market price		■	■	■	■	■	■	■				
	Disease and/ or	*	*	***	*	*							*
Dairy													
	Availability of			■	■	■	■	■	■	■	■	■	■
	Availability of crop	■	■	■					■	■	■	■	■
	Feed collection								*	**	**		
	Time of feed												
	Milk price												
	Butter price	■	■	■	■	■	■	■	■	■	■	■	■
	Cheese price	■	■	■	■	■	■	■	■	■	■	■	■
Cattle fattening													
	Fattening period						X	X	X				
	Selling time	X	X	X	X	X	X	X	X	X	X	X	X
	Market price	■	■	■	■	■	■	■	■	■	■	■	■
Goat fattening													
	Fattening period	■	■	■	■	■	■	■	■	■	■	■	■
	Selling time	■	■	■	■	■	■	■	■	■	■	■	■
	Selling price												
Livestock Diseases													
	Cattle			**	*								
	Small Ruminant			**	**	*							
	Off Farm Activities							**	**	**			
	Labour												
Work load													
	Men	**	**	**	**	**	**	**	**	**	**	*	*
	Women	*	*	*	*	*	*	*	***	***	***	*	*

Resource mapping

Resource mapping is taken to identify activities taken and resource available at different areas. An example is shown in Box 7.

Objective: Farmers will grasp the farming system over geographical areas, and discover trend and differences and correlations between different areas. It will help farmers to identify constraints and potentials in their farming systems. It will also demonstrate farmers' ability to convey useful information that are understandable for both literate and illiterate.

Materials: Locally available materials (stones, leaves, sticks, etc.)

Time: 1 hour

Procedure:

- 1) Divide the farmers into small groups of around 5 people.
- 2) Select, either by you or by farmers themselves, a key informant.
- 3) Ask the key informant to start drawing boundaries, main road, and main water stream at first.
- 4) Add other features. Remaining farmers help key informant to draw map. Informant can be changed in turn.

Checklist for resource mapping

Boundaries, roads, rivers, crop fields, common land, houses, forests, market, soil types, soil degradation, source of water (irrigation/domestic), community facilities (schools, dispensary, churches and mosques, market place, shops), etc.

Box 7 Example: Resource map of Awash Bishola, April 2005 (MARC)



A map was first drawn on the ground by farmers and transferred to a paper later by the extension worker.

Other tools

Before-now chart

Before-now chart is used to accommodate changes which farmers experienced over time, farmers attempt to solve some of difficulties and their results into problem analysis.

Before, it was.....

Now, it is.....

Compare before and now, and discuss why.

Gender analysis

Gender analysis is conducted to accommodate different perspectives among family members. There is diversity in problems as well as in potentials among gender groups. Discussion on the subject include both men and women. Simplest gender analysis is to prioritise problems separately between men and women.

Box 8 is an example from MARC activities. See Chapter 7 for more detailed discussion on gender consideration in FRG approach.

Box 8 Example: Gender division of labour of a nuclear family farm household of a vegetable FRG in Adama (MARC)

		Husband	Wife	Boy(s)	Girl(s)
Productive	ploughing land	X			
	Planting	X			
	Cultivation	X			
	Weeding	X	x	x	x
	Harvesting	x	x	x	x
	Threshing	x		x	x
	Collecting	x	x	x	x
	Marketing crop produce	xx	x		
	Looking after live stock	x	x	xx	x
	Milking cows		xx		x
	Cleaning cattle barn		xx		x
	Selling milk products		x		
	Selling animals	xx			
	Feeding cattle	x	x	x	x
	Reproductive works	Child care		x	
Food preparation			x		x
Collecting fire wood			x		x
Care for sick and elder			x		x
Fetching water		x	xxx	x	xx
Community works	Seedling rising	x			
	Attending funeral ceremonies	x	x		
	Gulley rehabilitation	x			
	Rural road maintenance/paving	x			

6.4. Establish multidisciplinary team

6.4.1 Purpose

Based on the information collected and discussed during the meeting with farmers, multidisciplinary research team is formulated. Basically one team is formed for each FRG topic. The team members can be added whenever necessity arise. The team is going to identify possible technical options from multi-disciplinary perspective. Box 9 shows examples from Melkassa and Adami Tulu Agricultural Research Centres.

Implementation order between “establishing multidisciplinary team” and “identifying technical options” can be reversed.

6.4.2 Coordinator

The Socio-economics, Research Extension Farmer Linkage Coordinator takes charge as a coordinator of each multidisciplinary team.

6.4.3 Management

Maintain participation in team activities. Role of each researcher is defined clearly. Minutes of meetings are produced each time.

Box 9 Example: FRG research team compositions

MARC

Disciplines	Research teams											
	Vegetable	Agro-forestry	Pulse	Tef	Maize	Sericulture	Marketing	Weed control	Drip irrigation	Water harvesting	Dairy	Plant protection
Research Extension	X	X	X	X	X	X	X	X		X	X	X
Socio-economics						X	X					
Plant protection	X		X					X				X
Horticulture	X											X
Agronomy	X		X	X	X			X	X			
Fruit	X	X							X			
Forestry		X										
Entomology			X									
Pulse			X									
Mechanisation			X									
Maize			X		X							
Food science			X									
Tef				X								
Sericulture						X						
Weed science						X		X				
Natural resources						X			X			X
Agro-pastoral						X					X	

ATARC

Disciplines	Research teams													
	Beehive	Groundnuts	Maize	Vegetable	Forage seed	Chopper	Gender	Sweet potato	Agro-forestry	F1 heifer	Milk churner	Marketing	Cattle fattening	Water harvesting
Research Extension	X	X	X	X	X		X	X	X	X	X		X	X
Socio-economics	X	X	X	X	X	X	X	X	X	X		X	X	X
Horticulture	X	X	X	X			X	X	X					X
Animal health	X									X			X	
Animal production	X				X	X				X	X		X	
Animal nutrition	X				X	X		X		X	X		X	X
Animal breeding										X			X	
Natural resources									X					X

6.5. Identifying technical options

6.5.1 Feasibility, risks and capacity

Technical feasibility: it is practical possibility of applying a proposed solution or option in FRG research activity. It deals with easiness to apply and handle the solution within the capacity, skill and knowledge, of FRG members at the end of FRG research activity.

Farming system compatibility: Matching technical options to be identified with the farming system in terms of production system, resource requirement (labour availability, time allocation patterns and other inputs) and the whole value chain of the commodity should be considered.

Economic feasibility: It deals with affordability, cost effectiveness and profitability of a proposed research activity to the farmers.

Social feasibility: It is suitability or acceptability of proposed research option in the existing social arrangements e.g. division of labour, in a community.

Research period: The time required to conduct the trial to check the applicability of the option under farmers' condition should be short.

Expected risks: Associated risks to emerge as a result of the trial, e.g. effect of chemicals, introduced varieties/breeds' effect on the local ones, should be considered.

Research capacity: Researchers' capacity and available research facility should be considered against necessary level of trials.

6.5.2 Characterise options

It is important for researchers to have clear ideas what each option's advantage, disadvantage and possible impact will have on farming. Summarise them in a table for presenting them to extension workers and farmers later for their prioritisation and selection.

6.6. Farmer group formation

6.6.1 Identifying target group

Select a target community within the target area where identified needs are derived from based on representativeness, accessibility and commitment. Target farmers are selected within the selected community in collaboration with DA, *Kebele* leaders and/or holding a community meeting. FRG research is not aiming community development directly but to generate agricultural technologies which will be essential for the community development.

6.6.2 Size and number of farmer group

Size of each farmer group is recommended between 15 and 20 households. Depend on subjects, the group size may differ. Less than ten for livestock topics and more than 20 for weed management and marketing subjects are generally recommended (Box 10). Number of sites which usually not more than three and number of farmer group is one or two at each site.

Box 10 Example: The sizes of different farmer groups for FRG research (ATARC)

FRG research title	Group size
Goat fattening FRG	10
Maize seed FRG	20
Marketing FRG	30

6.6.3 Equal chances

Basically, chances should be given equally to those who want to join a farmer group. If many households want to join, the criteria in 6.6.5 are used to discuss with the community so that the community members themselves can decide who should be members of the farmer group.

6.6.4 Gender, age and wealth

Consider balances on age, sex and wealth as far as they are willing to join the farmer group. Both husbands and wives of the selected households are farmer group members and will participate in all the FRG activity. Gender sensitization workshop may be organised for the selected FRG members to think why gender consideration is important for technology development. Wealth distribution among the members is important to guarantee the appropriateness of technology generated and not narrowing the gap among the community members further.

Do not create unnecessary jealousy within the community. It is important to spend enough time to discuss the purpose of FRG research, which is not aiming at contributing to particular individual farmers but entire community.

6.6.5 Criteria for selecting farmer group members

- 1) Composition of group members: Gender, geographical and wealth representativeness.

- 2) Interest/initiative: Select farmers who are ready to try out new innovation. Information can be from extension workers and from the participants of the village meeting
- 3) Willingness to contribute: Select farmers who are ready to share information and contribute to the community understanding that doing so eventually benefit him/her.
- 4) Community consensus: It is important that consensus among the community on the selection of farmers based on their awareness and responsibility.

Once farmers are selected, compile the farmers' basic information (Box 11).

6.6.6 Organisation of farmer group

After a group is formed, select a chairperson and a secretary of the group. The chairperson is responsible for coordinating among the group members and liaison between the group and the researchers. The secretary is responsible for record keeping. Organise farmer group meetings, together with the stakeholders if necessary.

6.6.7 Farmers meeting

Having a good meeting with farmers needs careful preparation and facilitation.

Preparation among researchers

- 1) Make all the researchers who attend the meeting to know why you are organising the meeting.
- 2) Agree among the researchers on what each of them are doing during the meeting (facilitation, record keeping, photo taking, etc.).
- 3) Arrange transport.
- 4) Prepare flip charts for the visualization.

Preparation for farmers

- 1) Let the farmers group know the time you arrive and leave.
- 2) Check if the meeting date is convenient to all the FRG members (busy time of the day, market day, women's time, etc.).
- 3) Let the farmers know why you are coming.

During the meeting

- 1) Confirm with the farmers about ending time.
- 2) Confirm the purpose of the meeting with participants.
- 3) Arrange sitting pattern for better communication. Rearrange according to activities during the meeting.
- 4) Facilitate women to contribute but not to pressurise too much.
- 5) Check if the farmers have resource for follow up activity.

At the end of the meeting

- 1) Select a contact person among the farmers
- 2) Agree next meeting date and time.

Box 11 Example: Farmer group composition Haricot bean FRG at Shala (MARC)

	Name of household head	Position in the group	Age	Sex	No. of family members	Land (ha)	
						Own	Rented in
1	Kedir Shufi	Member	33	M	16	2	
2	Negewo Shufi	Member	30	M	6	1.5	0.5
3	Amina Ereso	Member	45	F	8	3	
4	Gemechu Huse	Member	36	M	11	2	
5	Shukuri Mede	Chair	39	M	3	2.5	
6	Kurfo Chakiso	Member	38	M	10	1	
7	Aliyu Endris	Member	34	M	15	0.75	
8	Weya Gemadi	Member	32	M	7	1.25	
9	Jemila Ousma	Co-chair	40	F	4	3	2
10	Rameto Dabe	Member	35	M	9	2	1.5
11	Abdela Amule	Member	30	M	8	2.5	
12	Hange Delfa	Member	55	M	15	3.75	
13	Edaso Chakiso	Member	42	M	6	0.75	
14	Beyene Goben	Member	32	M	12	1	0.2

*Their wives are FRG members.

6.7. Matching options and needs to define FRG research topic(s)

Discuss among farmers, extension workers and researchers on all the research options and farmers need. Considering technical, economic and social feasibilities, research capacity and possible impact on farmers, Researchers, extension workers and farmers reach consensus on which topic to be worked on. Box 12 shows an example of a table used for matching options and needs during the discussion among the dairy research team, the extension worker and the dairy FRG member farmers.

Selecting detailed research topics are discussed during a Joint Action Plan session (see 6.10), while more general research topics are tentatively set by researchers for submitting a research proposal for a purpose of requesting budget.

Box 12 Example: Matching of needs and option: case of dairy FRG at Bishola and Wake Tiyo (MARC)

FRGs	Problem identified	Options listed	Selected options	Trial activities implemented	Expected output
Dairy FRG	Lack of availability of enough feed in dry season-poor milk productivity	<ul style="list-style-type: none"> • Produce feed crops in a separate plot using irrigation • Produce feed in integration with existing irrigated crops (vegetable) • Making silage 	<ul style="list-style-type: none"> • Silage making using maize produced during rainy season for fresh cob • Planting feed crops along the border or intercrop within irrigated crops (vegetable) 	<ul style="list-style-type: none"> • (As part of forage component) On farm production and evaluation of improved maize (Melkassa 2) for food/income and silage making with farmers • Evaluation of intercropping versus border cropping feed crops in irrigated plots of onion 	<p>(1) Practice of feed production in combination with vegetable introduced and adopted</p> <p>(2) Dry season availability of feed improved</p>

Some of the options, such as producing feed crops in the off season together with their high value crops as onion, were not easily endorsed by the farmers. Thus a study visit was organized to farmers involved in dairy production in other places where the FRG member farmers witnessed the possibility of integrating feed crops and vegetable. Accordingly, the plan to intercrop/border plant the feed crop with vegetables was accepted for trial activity.

6.8. Developing FRG research Proposal

6.8.1 Criteria of a good FRG research proposals

Consider the following criteria when FRG research proposals are formulated.

- 1) **Farmers' problem is clearly stated.** Source of information or actual case are cited.
- 2) The list of activities with a **high probability of tangible outputs** which benefit farmers directly.
- 3) **Research does not require a long research period.** Each research is completed within 2 years. For livestock and forestry, set short term targets so that the final goal will be met after few phases.
- 4) **Cost of research is low.** On-farm activities should not be a reason for more budgets per topic. The budget can be minimised by working with extension workers and FRG framers. (The case of FRG project, 2005-2008, average budget per topic was less than 20,000 Birr.)
- 5) **Required investment is low.** Initial inputs by farmers to adopt new technology should be minimised for enabling majority of farmers to benefit from it.
- 6) **Responsibility is clearly stated.** Roles of farmers, extension workers and researchers in FRG researchers are clearly defined.

6.8.2 Contents of FRG research proposals

Layout should be clear and understandable by the farmers. The layout should be clear to show the difference between any two or more compared treatments with control no treatment (no new treatment).

The area for participatory demonstration should be set by discussion with the group. In general, farmers do not like very small area such as 10m x 10m. They prefer full or at least half length of their field. This is for purpose of economic benefit not only trying out something new for learning purpose. For cereals like maize half a *kert* (0.125 ha) is reasonable area to show the performance and give economic benefit of a new variety.

1. Process/Case
2. Research title
3. Case team (leader and team members and disciplines)
4. Background (Farmers' situation with constraints and potentials.)
5. Justification (Reasons for attempting to introduce the technical options with technological, sociological, economical and environmental feasibility.)
6. Objectives (Practical, specific and tangible objective is described.)
7. Expected outputs
8. Target area/potential impact area
9. Research design (Research is broadly designed with a room for modification after more detailed information is identified.)
 - Material used (inputs, technical information, etc.)

- Method used (plot size, plot design, treatment, etc.)
- Data to be collected and method of collecting data
- Expected roles of each actor (researchers, extension workers, FRG member farmers, FRG trial farmers, and others) in the trial.

10. Trial location

11. Duration

12. Work plan

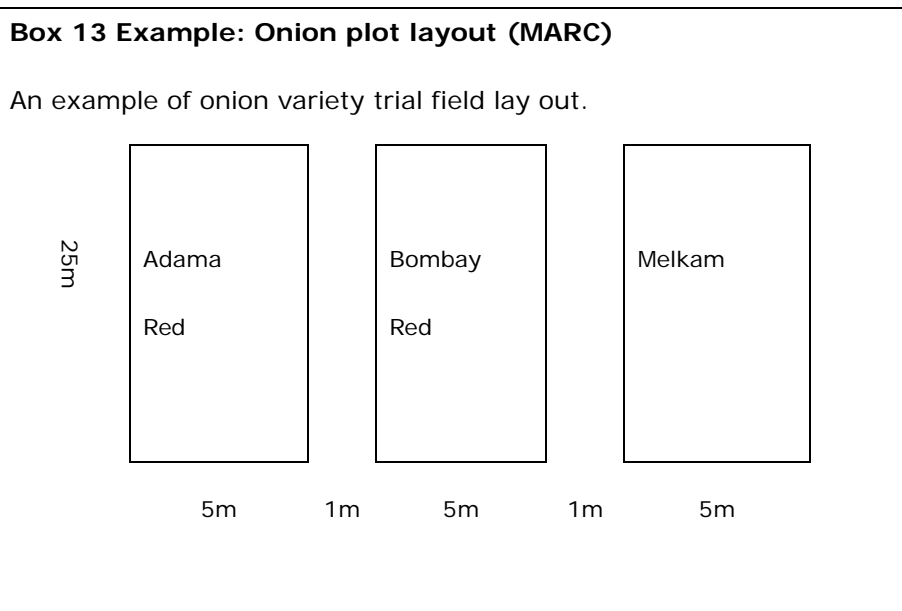
13. Estimated financial requirement

6.8.3 FRG research design

Researchers have to have a clear plan on expected outputs, how they can be obtained, what data should be collected to proof them and what kind of inputs are required and allocated over the time. Accordingly, treatments, plot design and data to be collected and timing of data collection and method of data analysis are determined. Box 13 shows an example of an onion plot layout.

Simple trial: Treatments are designed simple. Avoid too many treatments and isolations of a particular technical aspect which may have difficulty later to integrate into the technology set. There should not be more than three treatments.

Comparison and improvement: Compare recommended set of technologies with farmers' practices or between two sets of recommended technologies. While new technology is compared with a traditional one, improving the new technology to fit into the specific environment is important so the research is designed to find how such improvement is possible.



6.8.4 Roles of farmers, extension workers and researchers

The research proposal needs to state clearly the roles of each partner. Their roles will be discussed and confirmed during the joint action plan session (see 6.10).

Farmers are expected to (a) provide land for trials, (b) manage trials, (c) discuss progress among FRG member farmers, (d) provide information to other farmers, and (e) keep activity record.

Extension workers are expected to (a) mobilise resource, (b) facilitate activities among farmers, (c) linking other farmers and FRG member farmers, (d) keep activity record.

Researchers are expected to (a) listen to what farmers comment, (b) provide appropriate technical information, (c) help farmers analysing situation and trial results, and (d) process data to verify the results.

Farmer training is also included in the activity to enhance their capability to innovate. An ideal goal is that farmers will be more innovative so that they can find solution to their problems by themselves.

Box 14 and 15 show examples of summarised FRG research proposals from ATARC and MARC.

Box 14 Example: Cattle fattening (ATARC)

Research Topic: Evaluation and Demonstration of dry season fattening feed for Zebu breed with FRG member farmers around Adami Tulu district

Objective: To demonstrate and evaluate dry season fattening rations for cattle with FRG member farmers in Adami districts

Materials and Methods

Research Site: Villages of Anano, Iddo kontola, Gerbi, Anano and Bulbula

Animal Breeds: Worked Arsi Bale oxen

Farmer selection:

Three farmers from each site , a total of totally 12, and who can contribute 2 oxen will be selected. In Bulbula site the already formed fattening cooperative will be used.

Animal feeding:

Crop residue will be treated using urea and molasses by ensiling in plastic sheet for two weeks at farmers back yard. After two weeks, the feed is carefully opened and feed to the animals. In addition 1kg of MUB (molasses urea block) and 1kg of wheat bran will be supplemented after the animal feed on treated crop residue. Supplementation will be done by breaking MUB in to pieces and mixing with wheat bran.

Animal management;

The animal can be tied around the house or at backyard or small shelter can be made

from locally available materials. This should fulfil the following conditions: Comfortable to feed stand and lie down, has simple sewage structure, feeding trough, easy movement for the animals and the feeders

Monitoring and Data collection

Each site will be monitored once a week and feed will be prepared twice each month while data will be collected once a week from each site. Multidisciplinary approach will be formed to implement, monitor and collect all the necessary data.

Demonstration:

The rest FRG member farmers and non-FRG member farmers in the surroundings will participate in demonstration. Demonstration will be arranged two times during the fattening period in the mid and at the end of the trial, one for feed conservation techniques and the other to display the result.

Roles of each actor:

(1) Farmer: keep records , prepare required materials, execute recommended practices, and control, arrange and hold meetings & visits by members, mobilize group members to participate in the activity (2) DAs: keep records, arrange and encourage visit to FRG member farmers trial site by non FRG member farmers, help researchers in arranging visits and field days, follow up the trial (3) researchers: monitor proper implementation of the trial, confirm participation of all stakeholders in the activity, organize training farmers, DAs and others, collect data, analyze and communicate ongoing results to farmers and concerned actors

Data to be collected;

(1) Amount offered (2) Left over (3) Feed intake (4) Heart girth (5) Wt gain (6) Feed cost (7) Sell cost of the oxen

Data analysis:

Data will be analyzed using appropriate statistical tools where mean of the varieties Compared to individual variety performance.

Duration: 1 year

Involved Research Discipline:

Animal Nutrition, livestock production & Management, Animal Health, Socioeconomics & Research and Extension

Box 15 Example: Haricot bean row planting (MARC)

Research topics: Evaluate haricot bean row planting in selected districts in the Central Rift Valley

Objectives: (1) Evaluate row planting using the row planter at farmers' condition, (2) Find a way to scale up row planting in the respective districts.

Research sites: Villages of Shala, Duguda, and Adami Tulu

Materials and methods

Varieties:

Nasir, Awash, Roba 1, Tabor, Gobie, Zebra (Each site selects appropriate varieties)

Field design:

(1) Preferred varieties is planted in row and compared with local method on non replicated plot, (2) minimum of 0.25ha plot size agreed with farmers, (3) 3-4 trial farmers at each site, (4) all the farmer group members, extension workers, experts and researchers are involved at planting and regular field evaluations, (5) the farmer groups are subdivided into the number of trial farmers.

Field management:

Improved/recommended practices are applied to the improved varieties.

Extension component:

(1) Discussion oriented training is organised for extension workers and farmers, (2) field day and field are organised for surrounding farmers and concerned bodies.

Roles of actors:

(1) Farmers: keep record, execute recommended practices, encourage visit by others, (2) extension workers: keep record, encourage other farmers to visit the plot, arrange farmers' meetings, follow up the trial, (3) researchers: explain trial objectives to all the concerned bodies, incorporate farmers' ideas in the trial, regular visit, organise training, collect data, share outputs with all the actors.

Data to be collected:

(1) Yield, (2) date of emergence, (3) establishment rate, (4) weed infection, (5) labour inputs, (6) farmers assessment.

Data analysis:

Descriptive analysis and cost benefit analysis

Duration: 2 years

Expected outputs:

(1) FRG member farmers acquainted with row planting, (2) awareness among other farmers and extension workers on improved planting pattern. **Originally, the outputs was summarised by (1) year, (2) outputs, (3) intended beneficiaries, (4) outcome and (5) impact.*

6.9. Stakeholder identification and networking

Identify stakeholders of each FRG and invite them to the joint action planning. Possible stakeholders include (1) District Agriculture and Rural Development Office (DALDO), (2) FTCs, (3) NGOs, (4) traders operating in the area, (5) input suppliers, (6) farmers' cooperatives and (7) local administration.

6.10. Joint action planning

Preparing an action plan for FRG research trials is an important activity in FRG research process. The action plan is usually prepared for new and on going research activities jointly by researchers, extension workers and farmers. The following are points to be included in the action plan.

6.10.1 Objective of joint action plan

After having consensus among researchers, farmers and extension workers on subjects and potential technologies to be tested and improved, detailed activity plan is formulated jointly among them. Other stakeholders also participate the planning session if necessary.

Farmers, extension workers and researchers reconfirm the core problem and why it exists and potential area to remove the problem.

6.10.2 Research activity in context

If it is the second or third year of a research project, review the progress in the previous years. Identify what is achieved and not achieved. Remaining as well as emerging problems are research topics for the year.

6.10.3 Trial options and expected outputs

Possible solutions are disintegrated into trial options and list out respective expected output. Farmers, extension workers and researchers discuss their feasibility. They can agree all or reject some of them.

6.10.4 Select trial plots/farmers

Visit fields with farmers and select trial plots and trial farmers. Criteria for selection of trial farmers should consider the following:

- resource rich or poor,
- male or female,
- old or young,
- leadership,
- geographical distribution,
- field condition, etc.

The selection of trial farmers can be done after Joint Action Plan is made.

6.10.5 Roles and responsibilities in trials

The roles described in the section 6.8.4. are discussed among farmer, extension workers and researchers by identifying all the activities and responsible person, group and institution. Roles of stakeholders, who have been identified by the time of the joint action plan making, are also thoroughly discussed and agreed too. Box 16 shows an example of agreed roles during the Mouldboard FRG research Joint Action Planning.

Box 16 Example: Stakeholders' roles and compositions for "Mouldboard plough (MBP) promotion" (MARC)

The following list of stakeholders and their roles are for the activity on mouldboard plough on-farm demonstration, evaluation and establishment of the tool's manufacture-marketing-maintenance system. The activity was carried out as a part of haricot bean promotion FRG research.

District Office of Agriculture and Rural Development (DARDO): **DAs and extension experts**

(1) Selection of farmers in each district, (2) identify preferred varieties for the research activities, (3) collection of information concerning performance, farmers' opinion and quantitative data, (4) information sharing within the group and farmers-to-farmer exchange between FRG and non-FRG members, (5) organise field days jointly with the research centre, (6) involve in joint evaluation meeting, (7) identify demand for improved MBP, (8) distribute improved MBP to farmers

NGOs (Self Help Development International, Christian Children Fund)

(1) Provide financial support for purchase of improved MBP through district offices, (2) provide financial support for farmers' training and field days, (3) organise field days jointly with the research centre and DARDO

Manufacturers (Rural Technology Promotion Centres, private companies and small artisans)

(1) Manufacture and maintain MBP and spare parts, (2) make feasible modification based on farmers experience

Research centre (Melkassa Agricultural Research Centre: MARC)

(1) Prepare data collection formats for extension workers and farmers, (2) provide training for extension workers, farmers, manufacturers on manufacturing and operation of improved MBP, (3) regularly visit the FRG research sites in a team and interact with farmers and extension workers, (4) analyse data and discuss the result with farmers and extension workers, (5) facilitate interaction among stakeholders, (6) organise exchange visit among FRGs

Farmers (FRG members)

(1) Keep record of their observation and experience, (2) execute the recommended and local practices for the trial, (3) purchase improved MBP towards the end of the activity if it is proved to be useful, (4) produce seed, return in kind of the same quantity, distribute the seeds to surrounding farmers

Other programme (Bean Seed System Project)

Provide seeds of required variety to participant farmers through farmers cooperative unions and DALDOs

6.10.6 Term of cost sharing

Mode of cost sharing can be cash or in kind. Farmers can meet full cost or a part of it. The payment can take place at the beginning or after harvesting. The government's extension package system or any other forms of credit system can also be used for delivering inputs.

6.10.7 Formalising FRG Joint Action Plan

The joint action plan is distributed to all the stakeholders and *Wareda* Agricultural and Rural Development Offices (DALDOs) with official letter for confirming the responsibility and insuring their smooth involvement particularly of extension workers.

Box 17 is an example of mouldboard plough on farm demonstration, evaluation and promotion-cum-bean seed production of MARC.

Box 17 Example: Joint Action Plan of Mouldboard Plough on farm demonstration, evaluation and promotion-cum-bean seed production (MARC)

Activity	Target	M	J	J	A	S	O	N	Bud- get	Responsible person
		a	u	u	u	e	c	o		
		y	n	l	g	p	t	v		
Organise stakeholder meeting	Farmers, extension workers, researchers and other share responsibility	●							Abbr.	(Researchers' and extension workers' names are indicated here)
Identify sites	Researchers and extension workers observe the sites	●								
Monitor land preparation	Properly prepared plots		●							
Prepare inputs	30 quintals of seeds		●							
Planting	@0.5ha x 30 plots planted		●							
Training	15 farmers and 4 extension workers		●							
Survey on utilisation	Bean utilisation at home and in the area			●						
Develop recipes	Bean recipes			●						
Training	30 farmers, 3 extension workers and 3 restaurant owners				●					
Monitoring	Progress of skills gained and utilisation of beans		●	●	●	●				
Prepare posters	Posters on bean prod. And utilisation				●	●				
Field day	300 participants from farmers, extension workers, NGOs, etc.					●				
Post activity survey	Utilisation pattern of beans							●		
Evaluation meeting	Participation of all the members farmers and their comments							●		
Documentation	Report and extension materials						●	●		

Responsibilities

Researchers: Collect scientific data, analyse them, share the results with farmers and DAs, and produce extension materials based on the results. Provide necessary training for DAs and farmers.

DAs: Monitor activities at trial sites by farmers through visiting the trial plots, meeting farmers and organising FRG member farmer meetings. Organise field days to involve other farmers.

FRG member farmers: Trial farmers, the owner of trial plots, are responsible for day to day management of the trial plot. They make sure that all the information regarding the trial are recorded and shared with other non-trial farmers.

6.10.8 Follow up

Joint action plan should be regularly checked by team leaders as well as through team meeting and this has to be indicated in terms of time benchmark. Box 18 provides some useful tips for stakeholder meeting.

Box 18 How to insure farmers' and extension workers' participation in every FRG activity?

Maintaining participation of all the partners (extension workers and farmers) in FRG activity needs careful management of your FRG activities. It is useful to ask all the partners during DA-farmers-researchers meetings the following questions.

- Do I know what I am doing?
- Do I know why I am doing what I am doing?
- Do I know how I am doing what I am doing?

If any of them have any doubt, they should raise questions to clarify the doubt.

7. Gender consideration

7.1. Why gender should be considered in FRG?

Men and women are important in agricultural activity. Gender in FRG research looks at the differences between men and women shaped by socio-economic determinants.

Women's contributions to the agricultural production tend to be overlooked and consequently their involvement in the research and development is considerably low. As agricultural production is done by both men and women, it is critical to consider gender roles and relationships for improving household productivity and profitability, which will eventually lead to betterment of their livelihoods.

7.2. How to consider gender in FRG research?

Gender sensitisation can be done in many ways. Gender sensitization workshop is one of the useful tools for making participating farmers to be aware of gender difference within a household and a possibility to learn from each other. It is also a tool for researchers and extension workers to identify some of the important issues, which are associated with gender.

Objective of gender sensitisation workshop is to raise awareness of men's and women's contributions to productive and reproductive activities in the household and communities. It is important that both men and women be it husbands and wives attend the gender sensitisation session, so as to facilitate the effective participation of women in FRG activities. For more details, refer to the 'Gender Sensitisation Session Guideline (FRG Project: 2007).

How to organise gender sensitisation workshop

1) Timing

Ideally, the 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 bring about positive attitudes towards female farmers' participation in FRG.

2) Selection of target households

Male and female headed households are considered when selecting targeted farmers as members of FRG. There are two major reasons for this. Firstly, needs of male headed households and female headed households often vary. Secondly, access to a new technology, which can be introduced and/or generated by your FRG activity should be balanced among them.

After selecting targeted households, both husbands and wives are registered as members of FRG and both are invited to all the activities.

3) Preparation for the workshop

Objectives and schedule are confirmed among the organisers.

The following flipcharts are prepared

(1) List of major productive activities, (2) list of major reproductive activities, (3) list of major resources related to the FRG subject, (4) daily activity calendar (either circular or burner-style calendar).

4) Workshop agenda

Introduction

Objectives and the day's exercise are explained to the participants. The following points are, for instance, important to consider for "dairy cow management".

- 1) Pointing out the flipchart "Productive Activity", tell the group that it is the list of a series of activities involved in the dairy cow management. Ask them if there is any major activity to be added in the list.
- 2) If the group agrees to add another activity in the list, request one volunteer to come forward to draw the picture of such activity.
- 3) After the group decided no more activity to be added, move to the "Reproductive Activity" to do the same as the "Productive Activity".
- 4) After the Reproductive Activity is finished, move to the "Access to and Control of Resources".
- 5) Clarify definition what is resource, access and control. Make sure participants clearly understand the concepts.
- 6) Ask the group if there is any major resource related to the dairy cow management to be added in the list.
- 7) If the group agrees to add another activity in the list, request one volunteer to come forward to draw the picture of such resource such as source of water (river, well, etc.) and feed (pasture, residue of other farm products, etc.)
- 8) After the group decided no more resource to be added, move to the "Daily Activity Calendar".
- 9) Explain the group briefly about how to undertake the "Daily Activity Calendar" exercise.

Exercise 1: Division of labour

The exercise aims for the participants to understand the roles and responsibilities of women and men in the household.

Ask the groups to identify, which productive activities are done by women or men. 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 in the activity.

After finishing all productive activities, move to "Reproductive Activity" to do the same.

Exercise 2: Access to and control over resources

Identify who in the household has access to and control of particular resources.

Ask group which family members—women and men—have more access to each resource. If men and women have 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 but one for less access.

After finishing all resources with access, continue with control.

Exercise 3: Daily activity calendar

To understand the roles of man and woman at household and the time spent to carry them out

Ask a women group to illustrate a typical day for a woman in the community and a men group for a man; a typical day in the peak as well as the slack season.

Discussion

Participants share the outcomes of the exercises among all the participants. The session makes the participants aware of the existing gender disparities and the problems caused by such disparities.

Ask each group to select four members to present the outcome of each exercise.

Ask the presenters to present the outcome.

Discussion

After the presentation, ask participants if they agree with the outcomes of the other group.

Let them be aware of (1) women are busy throughout the day while men have more leisure time; (2) women are fully engaged in the dairy cow management but men are given more opportunities to participate in the training; (3) Women are fully engaged in the dairy cow management but they have little control over the relevant assets and little decision-making power.

Then, discuss on: (1) What would be the negative impact that women, main caretaker of dairy cow, are not given an opportunity to participate in the research activities as well as to upgrade their technologies/skills on dairy cow management?; (2) What would be the negative impact that women are not able to share the decision-making power with men to decide on the issues related to the dairy cow management? (3) What could be done to overcome the perceived negative impacts above?

Women's participation in the FRG activities should be facilitated and their husband should be well informed of the training so that a husband will be more likely to support the ideas and decisions made by his wife on the matter.

Exercise 4: Gender action plan making

Objective of the exercise is to devise a plan to overcome the identified problems in the discussion above.

Through the exercises 1, 2 and 3 above, the group should be clearly aware of the problems caused by the unequal sharing of roles and responsibilities as well as the decision-making power between men and women. Discuss what needs to be done to maximize the benefit from the FRG activities and fill out the form below.

Gender action plan include (1) objectives, (2) strategy/activity, (3) time of implementation, (4) resource required and (5) persons responsible.

Discussion/closing

Close the workshop by summarising the outputs by organiser, confirming what the participants have agreed and comments from few participants. Box 19 shows examples from MARC and ATARC.

Box 19 Example: Gender action plans

Sweet potato FRG (ATARC)

Objective	Strategies / Activities	When	Person responsible
To get women attend the training	Men take over the household activities during the absence of wives <ul style="list-style-type: none"> - Looking after children - Fetching water - Keeping animal from farm - Collecting firewood 	Whenever wives attend the training	Men

F1 dairy FRG (MARC)

Objective	Strategies / Activities	When	Person responsible
Reduce women's workload	<ul style="list-style-type: none"> - Looking after animals in feeding and watering - Taking care of children - Guiding children to cover activities - Preparing fast food - Undertaking social activities (<i>idir</i> payment) - Fetching water and firewood 	When women are on training / not around	Men
	<ul style="list-style-type: none"> - Washing cloths/dishes 	At slack time	Men
	<ul style="list-style-type: none"> - Sharing information - Discussion with wives before decision-making 		Men

8. Implementation

Implementation is a stage in FRG research process where FRG research plan is put into action. It is a stage at which FRG trials, meetings, field days, field visits and trainings are conducted, data are collected and analysed and reports are produced. The following are the activities to be conducted under this stage.

8.1. Orientation

8.1.1. What is orientation?

Orientation is giving directions of the general procedures or steps of activities for the target farmers and extension workers about what, why, when, where, how and by who it is going to be done.

8.1.2. Why orientation

Orientation is meant to promote understanding of FRG approach among participating farmers and extension workers. It is also about making farmers aware of the necessary procedures to be followed before the start of actual field implementation.

8.1.3. How to carry out orientation?

Orient the target groups based on the formulated joint action plan on the following.

- 1) Clear procedures
- 2) Clear on term of cost sharing
- 3) Beginning of each season
- 4) Reconfirm what the farmers understand (Q&A session)
- 5) In the field
- 6) Face to face discussion
- 7) DA to be involved

8.2. Establishment of trials

8.2.1. Selecting trial farmers

All group members should have equal opportunity to conduct trial. Trial farmer is selected with the group's full involvement and should not be selected based of one's financial capacity.

Criteria for selecting trial farmers

- 1) Representativeness
 - 2) Willingness and capability of managing trial
 - 3) Interest to topic
-

-
- 4) Willingness to share cost
 - 5) Consensus among the members
 - 6) Willingness to share information with other members
-

When consensus cannot be reached, use lottery though discussion is the mode.

8.2.2. Selecting trial sites

Criteria for selecting trial sites

- 1) Representativeness
 - 2) Accessibility
 - 3) Consensus among the group members
-

Defining the target area will have less value until a careful selection of trial site is made to represent the area and the people being affected. This will have strong connotation on the value and applicability of the output.

Representation needs to accommodate the potential variations of soil type, gender, amount of resource available to the farmer that may exist in the target area.

The sites should also strike a balance between being **accessible** (based on the facility available with research) and **strategically located** to provide for other farmers/target beneficiaries (even in a relatively remote areas) to observe, raise question, interact and learn. It is important to take note of excessive road side bias.

This has implication how geographically disperse the trials/ the farmers group members could be in relation to the potential cost implication

In some case, selection of trial sites can be done together with selecting trial farmers.

8.2.3. Field preparation

Field preparation is done by farmers selected for specific trial. Before field preparation, there are cases when it requires studying the cropping history of the field and its slope in order to minimize pest incidence. So, technical staff from research should verify such issues, take the measurement of the area and make general observation of the selected field and the neighbouring fields to see for crops grown, see if there are some pest (disease, insect and weed) incidences and tillage frequency.

In vegetable crops seed bed preparation has to be attended by researchers at times when the farmer is not well experienced. Because seedling establishment is a sensitive stage in vegetable production and highly affected by seedbed preparation and management. Hence, seed bed preparation and water supply need attention prior to planting.

8.2.4. Procure inputs

Once the trial is determined, it is necessary to list out required inputs and make preparation and arrangement to procure them. Inputs are provided by both research and farmers. These may include seeds, planting materials, fertilizers, farm implements, feeds, labour, etc.

8.3. Conduct trials

8.3.1. Data collection and on-spot analysis

Data collection sheets are prepared for researchers, extension workers and farmers separately according to their capacity. Farmers' literacy level and extension workers' capacity are important parameters in data sheet preparation. It is advisable to prepare the sheets in local language (Box 20, 21 and 22).

Orientation on how to fill data sheet should be given to farmers and extension workers. Data recorded should be regularly monitored by researchers for ensuring the quality of data.

Information collected is regularly checked by looking at differences and trends, making comparisons and making discussions with the farmers for better understanding of the research to strengthen final analysis.

Box 20 Example: Data sheet format for farmers (ATARC)

Research title: Participatory evaluation of community based forage seeds/cuttings production in central rift valley of Ethiopia

Village name: _____ Farmer Name: _____

Enumerator name: _____ Site: _____ Date: _____

Agronomic data collection sheet

Parameters	Penisitum	Alfalfa	Pigeon pea	Leucnea	Sesnania	Lablab	Remarks
Land size allocated							
Seed rate, number of cutting, seedling number							
Date of plantation							
Disease occurrence (type)							
Plants dead							
Plant survived							
Date of onset flowering							
Date of 50% flowering							
Date of peak flowering							
Seed yield							
Weight of crop residue after harvest							

Economic data collection sheet

Parameters	Penisitum	Alfalfa	Pigeon pea	Leucnea	Sesnania	Lablab	Remarks
Land size allocated							
Cost for land preparation							
Cost of plantation							
Cost of weeding 1 Cost of weeding 2 Cost of weeding 3							
Cost of chemical spray							
Cost of fertilizer							
Cost of seed							
Cost of harvesting							
Seed yield (kg)							
Selling price of seed per kg							
Herbage yield (kg)							
Cost of herbage per Kg							
Cost of herbage transportation							
Frequency of irrigation							
Fees (or cost) for irrigation							

Box 21 Example: Data sheet for DAs on Gender Based Data (MARC)

Site: _____ Reporter: _____ Site: _____ Group name: _____

Production analysis

Enterprise activities	Household type														Problems & solutions
	Richer				Middle				Poor						
	W	M	Others	Inputs used	W	M	Other	Inputs used	W	M	Other	Inputs used			
Crop type: _____															
Site selection															
Land clearance															
Tillage – hand															
Tillage – oxen															
Seed selection															
Planting/sowing/															
Fertilising/ manuring															
Weeding															
Spraying															
Hiring labour															
Harvesting															
Threshing															
Winnowing															
Processing/ value added															
Storing															
fencing															
Main labour peak and coping mechanism															

Note others to indicate children (CH), hired labour (HL), reciprocal exchange labour (REL) or festive work group (FWG),

Box 22 Example: MBP trial data sheet for DA (MARC)

It describes the title of the trial, objective, field plan, what and when different management practices are required, and when and how each one of the parameter will be recorded.

የሙከራው አርዕስት: በባህላዊ ማረሻ ላይ የሚገጠም የገልባጭ ማረሻን ከገበሬዎች ጋር የመገምገም ሙከራ
ሙከራው የሚካሄድባቸው አካባቢዎች: ሻላ (አዋራና በቀለደያ ቀበሌ)፤ አዳሚቱሱ (ሆርፋሎሌ ቀበሌ)፤ ዱግዳቦራ (በርታ ሳሚ ቀበሌ)
የሙከራው ዓላማ:

1. ገልባጭ ማረሻንና ባህላዊ ማረሻን ገበሬዎችን፣ ልማት ጣቢያ ሰራተኞችንና የኤክስቴንሽን ባለሙያዎችን በማሳተፍ ማወዳደር/መገምገም
2. በገልባጭ ማረሻ ላይ ያለውን ግንዛቤ መጨመር

የሙከራው አዘራር

ሙከራው በ2 የተለያዩ እኩልና ጎን ለጎን በሆኑ ቁራጭ ማሳዎች (ፕሎቶች) በሚከተለው መልክ ይሰራሉ፡፡



በመሬት ዝግጅት ወቅት መደረግ ያለባቸው ቅድመ ዝግጅት

- ▶ ሁለቱም ማሳዎች በተለያዩ ማረሻ ለየብቻ መዘጋጀት ይኖርባቸዋል
- ▶ በዘር ወቅት ግን ሁለቱም ላይ ባህላዊ ማረሻን በመጠቀም ይዘራል

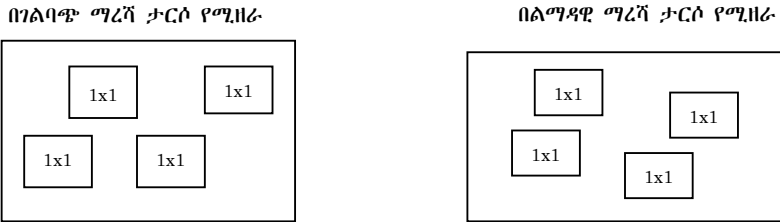
ማዳበሪያ አጠቃቀም: በሄክታር 100ኪሎ ግፕ በዘር ወቅት እና እንደ አፈሩ ለምነት ሁኔታ 50ኪሎ ዩሪያ በዘር ወቅትና ከማበቡ በፊት በመስመር ሲዘራ፡ በመስመር መካከል 40ሳሜና በዘር መካከል 10ሳሜ ርቀት እንዲኖር ይጠበቃል-

የመሬት ዝግጅቱ: ከዘር በፊት እስከ 3 ጊዜ መታረስ ይኖርበታል

የዘር መጠን: 80-100ኪሎ በሄክታር

ለእያንዳንዱ ማሳ የሚወሰዱ መረጃዎችና አወሳሰባቸው

1. የብቅለት ጊዜ: ይህ መረጃ ዘር ከተዘራ በኋላ ከእያንዳንዱ ቁራጭ ማሳዎች ላይ ቢያንስ በእይታ ከ50ፐርሰንት በላይ የበቀለበት ቀን የሚመዘገብበት ሲሆን አዚህ ላይ በ3ቱም ቁራጭ የሙከራ ማሳዎች ላይ የተዘራው ዘር ተመሳሳይ የብቅለት ጊዜ ላይኖረውም ሊኖረውም እንደሚችል ማሰብ አስፈላጊ ነው፡፡
2. አረም: ይህ ከዘር በኋላ እያንዳንዱ ቁራጭ ማሳ አረም የታረመበት ቀንን የሚያመለክት ሲሆን ከተዘራ በኋላ ቢያንስ ሁለት ጊዜ ይታረማል ተብሎ ይጠበቃል፤ ይሁን እንጂ የአረም ድግግሞሽ ከማሳ ማሳ ሊለያይ ይችላል፡፡ ይህ ከመሳሪያው ጠቀሜታ አንጻር ወሳኝ መረጃ ሲሆን ድግግሞሹ በሚገባ ሊመዘገብ ይገባል
3. የጸደቀ ተክል መጠን: ይህ ከታች እንደተመለከተው ከማሳዎቹ የተለያዩ ቦታዎች ላይ 1ሜትር በ1ሜትር የሆነ ስፋት ላይ የበቀለ የባሎቱ ተክሎችን ቁትር የምናሳይበት ሲሆን ከአንዱ ማሳ ላይ በተመሳሳይ ስፋት(1ሜበ1ሜ) ነገር ግን በተለያዩ ቦታዎች እስከ 4 ጊዜ ተቆጥሮ ይመዘገባል፡፡ ይህ መረጃ ዘር ከተዘራ 1 ወር በኋላ ይወሰዳል፡፡



4. በሽታና ተባይ: ይህ በእያንዳንዱ ቁራጭ ማሳ ላይ የታየውን በሽታ/ተባይ ምልክቱን በመግለጽ ያደረሰውን የጉዳት ደረጃ በቁጥር ማሳየት፡ 1 ማለት-ዝቅተኛ፣ 2 ማለት-መካከለኛ፣ 3 ማለት-ከፍተኛና 4-ማለት እጅግ ከፍተኛ በማለት በአንጻራዊ መልኩ ማሳየት ነው፡፡ የበሽታው/ተባይ የጥፋት ደረጃ በ2ቱም ማሳዎች ላይ እኩል ሊሆንም ላይሆንም እንደሚችል ማስታወስ ያስፈልጋል
5. ሰብሎ የደረሰበት ጊዜ: ይህ ሰብሎ እድገቱን ጨርሶ ለመሰብሰብ የደረሰበትን ቀን ያመለክታል፤ በ2ቱም ማሳዎች ላይ ሰብሎ የሚደርስበት ጊዜ ተመሳሳይ ሊሆንም ላይሆንም እንደሚችል ማስታወስ ያስፈልጋል
6. ምርት: ሰብሎ ከተሰበሰበ በኋላ ከ2ቱም ቁራጭ ማሳዎች ላይ የተገኘው ምርት ተመዝኖ በኪሎ የሚቀመጥ መረጃ ነው፡፡
7. የገበሬ አስተያየት: ይህ ከዘር ጊዜ ጀምሮ እስከ ምርት ድረስ በተለያዩ የሰብሎ የእድገት ደረጃ ገበሬዎች (ሙከራውን የዘራውም ሆነ ሌላ ገበሬ) በ2ቱም ቁራጭ ማሳዎች ላይ በተለይ ከአዘራሩ(ከመዘሪያ ማሽን አመቺነት፣ ጠቃሚነት...) ጋርና ከአያያዙ ከምርቱ ወዘተ ጋር በተያያዘ የሚሰጣቸውን ማንኛውንም (ጠንካራ ወይም ደካማ ጎን) አስተያየት መመዘገብን ያመለክታል

፩ የልማት ጣ. ስራተኛ አስተያየት፡ ይህ ደግሞ በተለያዩ ጊዜ ጉብኝት ሲያደርጉ የል.ጣ.ሰ ያዩትንና በአዲሱ (በመዘራያ ማሽን)ና በነባሩ አሰራር ላይ ራሷቸው የተረዱትን ማንኛውንም (ጠንካራ ወይም ደካማ ጎን) በአስተያየት መልክ የሚገልጹበት ነው።

a. እነዚህ በተ.ቁ. 9 እና 10 የተገለጹ መረጃዎች ስለቴክኖሎጂው (ስለ አዲሱ አሰራር ጠቀሜታም ይሁን ደካማ ጎን) ለማወቅ ልክ እንደሌሎቹ መረጃዎች ሁሉ ትልቅ ጠቀሜታ አላቸው

የሙከራው አርዕስት፡ በባህላዊ ማረሻ ላይ የሚገጠም የገልጻዊ ማረሻን ከገበሬዎች ጋር የመገምገም ሙከራ

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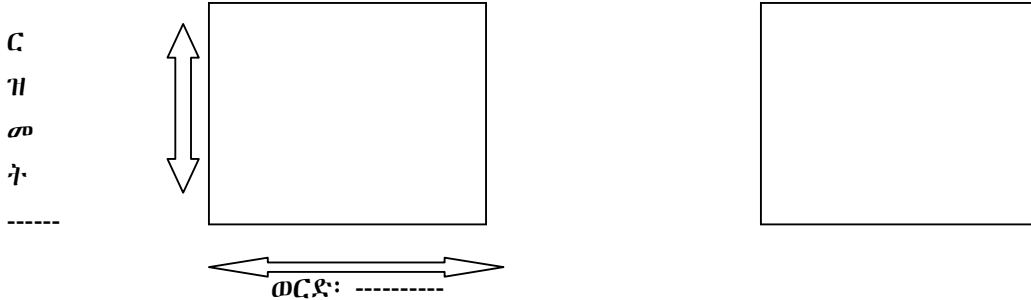
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8.3.2. Physical activities in the fields

A physical activity includes several activities performed in the field to get intended benefit. These can be the works of different actors involved in the FRG. Box 23 shows an example from MARC of responsibilities shared among farmers, extension workers and researchers. Box 24 is an activity schedule from ATARC.

Make sure that each activity is well understood by the farmers and extension workers.

Box 23 Example: Responsible stakeholder for each activity of Vegetable FRG (MARC)

No	Activities	Responsible		
		Farmers	Researcher	DAs
1	Site selection	x	x	x
2	In put preparation	x	x	
3	Land preparation	x		
4	Making layouts for trials	x	x	x
5	Seed bed preparation	x	x	x
6	Planting on the seed bed	x	x	
7	Transplanting/planting	x	x	x
8	Cultivation	x		
9	Weeding	x		
10	Watering-irrigation water application	x		
11	Pesticide and insecticide application	x		
12	Putting sign board		x	x
13	Field monitoring	x	x	x
14	Field day organization		x	x
15	Harvesting	x		
16	Data collection at each step	x	x	x
17	Marketing	x		
18	Report writing		x	x
19	Presenting the result	x	x	x

Box 24 Example: Field activity schedule of groundnut FRG (ATARC)

Participated by: farmers, DAs, experts and researchers

Major activities	Detailed activities	Time frame			Responsible actors	Roles
		Month	Week	Day		
Field management	Weeding	July	2 nd	Mon & Thur.	Farmers DAs	-DAs monitor day to day activities -Trial farmers mobilize group members to participate
	Pest inspection	July- Nov.	All the week	All the day	Farmers DAs	-Farmers have to record the incidence of diseases & report to DAs and take action -if severe problem DAs report to researchers
	Earthing up	July- Nov.	All week	Mon & Thur.	Farmers DAs	-Farmers do earthing up -DAs show them how earthing up is to be made -DAs check active involvement of member farmers
Field days	-Selection of participants -field arrangements -poster & leaflet preparation -conduct field day	Nov.	2 nd	Thur.	Farmers MoARD DAs NGOs Researchers & others	-farmers explain all the activities they are doing up to the end & DAs provide guidance -All the participants share their experience & expected to reflect their feelings & learn -DAs & researchers make arrangement, support farmers explaining all production practice, importance of the crop (general background of crop for attendant) and also involve in leaflet and poster preparation.
Field evaluation	-Germination rate -Flowering rate -Tolerance to weeds	July- Nov.	Once per week	Thur.	Researchers DAs Farmers	-meet together & evaluate the performance of each varieties -set criterions for selection
Data collection	-rain fall distribution -Germination rate -flowering stage(rate) -yield etc.	July- Nov.	All the week	At all time	Researchers DAs Farmers	-researchers prepare data recording sheets for all and distribute before July to farmers and DAs -Researchers give orientation on how and what to record for farmers & DAs -farmers, DAs & researchers collect data, give their own judgments, see at differences & trend, and document the data

8.4. Training

8.4.1 Why training in FRG research

Farmer training is one of the important components of the FRG approach. Training is meant to introduce a new way of doing things and/or to fill observed gaps in performance or undertaking some agricultural activity. Training is also given to farmers and extension workers when some basic knowledge and skills is required to carry out planned trials (We may need to say sth about TNA here). Training can be

given at different times in the course of FRG research activities (see Box 37).

Orientation and training are different. Orientation is to explain what to do and create clear common understanding on research and development purpose and activities among farmers, extension workers and researchers.

Training can be given at different times in the course of joint activities. Training can be done mainly in villages for easy transport and simplifying logistic issues.

8.4.2 How to plan training

It is always advisable to have a training plan with purpose/objectives, outputs, method of training, trainer and schedule. Farmer training is ideally carried out at farmers' field and/or FTC unless there is a specific necessity to hold it at the research centre. This considers those who have difficulties finding time to come to the research centre.

The following are necessary points to be included in training plan (see Useful form 14, 15 and 16).

Having clear Training topic: introduction to the training, objective (what gaps to be filled), outputs, methodology and schedule.

Setting training contents

Organizing Logistics: Budget estimation and requests, space arrangement, refreshments.

Informing persons involved in the training: Trainees, resources persons and supporting staff.

Materials required for the training: Practical training, teaching aids (Picture, specimen and model).

Session plan: Instructor who is responsible for each subject prepares a session plan. After the session, the plan is used for self evaluation. These exercises effectively accumulate experiences and lessons learnt for subsequent training activities.

8.4.3 Implementation of training

Arrangement: confirmation of participants, trainers, schedule, training materials, equipment

Monitoring: attendance sheet, Picture (group on training)

Action plan/assignment: at the end of the training, the participants list up what they are going to do.

8.4.4 Evaluation, certification and follow up of training

Evaluation: Evaluation of training is necessary for future improvement. Evaluation can take the following different forms.

Evaluation of Participants' performance

By simple test

Evaluation by participants:

Each session

Entire training programme

Evaluation by researchers/organiser:

Each session by the instructor

Peer-review of each session

Entire training by the organiser (researcher team).

(See forms for Plan and Evaluation of Session and Evaluation of Session).

Certificate: paper of recognition can be distributed to the farmers depending on the intensity of the training and expected performance to motivate farmers. The recognition may take different form as well. This can be appreciation in front of people, some material awards and so on. However, this can be an optional activity and should not be done every time.

Follow up: Training is meant for improvement in a future performance. It needs follow up from the training organizing institution or team. In the follow up, the following points are considered. (1) Reconfirm the action plan made by the participants (what a trainee is going to do by him/her or their group after the training). (2) Evaluate whether the trainee applied what he/she trained on?

Figure 4 shows the cycle of training. Training at each time takes up relevant topics of the time. Topics can be fixed before the season and/or specific ones raised during the trial activities. At the end of training, assignments to be completed by the next training are agreed by the participants. Target of each training should be set accordingly.

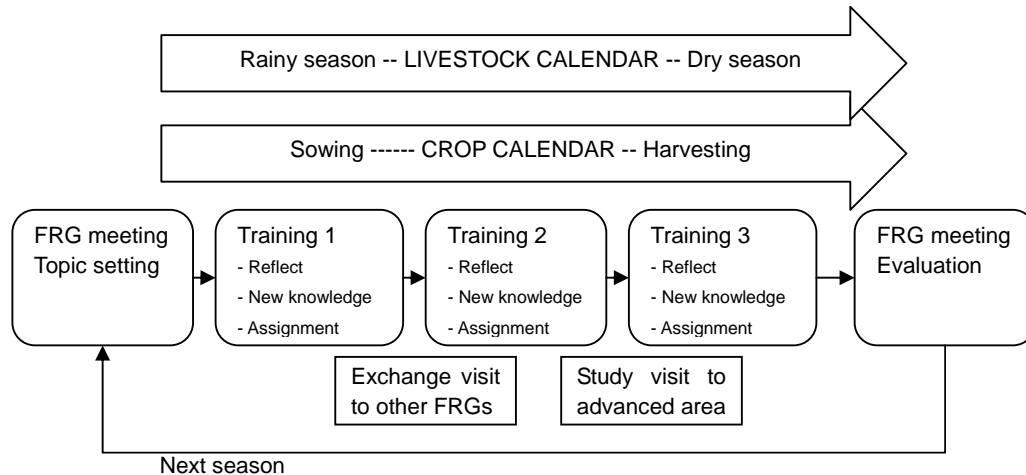


Figure 4 Timing of farmer training

8.5 Field day

8.5.1. What is field day?

Field day is an event on which better as well as worse examples of farmers' practice are open for people, such as non FRG member farmers within and outside of the community, other stakeholders particularly who are working in extension, to visit and learn.

8.5.2. Why field day?

Field day can exhibit good technologies side by side with local practices to relatively large number of people. By observing the technology with the way it is being managed, interacting with hosting farmers and among participants, it is expected to achieve the following outputs.

- 1) Participants learn new technologies by observing personally and ask about successful farming practices.
- 2) Participants interact with each other fostering linkages necessary for scaling up the technology.

For a field day held on farm, the host farmer should play a prominent role in the discussion and explanation about technologies and practices. While the facilitators' work is clarify the technical points. Field day needs a thorough preparation.

8.5.3. Steps of planning and implementing field day

- 1) Defining the purpose of field day

By answering the following questions about the field day, it will be clear about the issues which are handled during the field day.

- What farming practice to be exhibited on the field day?
- What do you want to achieve by the field day?
- How are you going to achieve the target?

2) Planning field day

A plan of the field day/visit is made using following format.

- Date
- Site
- Organisers (Names of FRG member farmers, extension workers and Researchers)
- Role of each organiser
- Main target (other farmers in the community)
- Other invited guests (*Wareda* officials, NGOs, etc.)
- Objective
- Expected outputs
- Methods used
- Materials/logistics prepared
- Method of evaluation
- Schedule of the day (s)

3) Conducting field day

The following information is recorded so that evaluation of the field day and its follow up is carried out. Recording can be done by writing and/or audio-visual.

- Date
- Site (villages, site descriptions)
- Participants (at each site, male/female, young/old, where they are from [villages or institutions])
 - Researchers
 - Extension workers
 - FRG member farmers
 - Other farmers
 - Others (NGOs, CBOs, private, etc.)
- What was explained? (by who?)
- What was commented? (by who?)
- What was replied? (by who?)

- What was agreed?
- What was not agreed?

4) Evaluation

At the end of the field day, the organiser, either researchers or extension workers or both together, conduct an evaluation of the event based on what they have observed and information recorded. The following questions are useful for the evaluation.

- How was the plan?
- How was the logistics?
- How was the general reaction of the participants?
- What difficulties did we have during the programme?
- What lessons have we learnt this time and how can we improve them next time?

8.6 Exchange visit

8.6.1 What is exchange visit?

Exchange visit is one of the experience sharing and learning tools by farmers visiting each others' farms where good, as well as worse practices, is observed and discussions are made.

8.6.2 Why exchange visit and study tour?

A trial usually conducted with more than one trial farmers placed at different locations within a given village or district. Experiences with trial performance, therefore, may not be the same as it is determined by locations, farmers' experience and so on. Hence, it is very important to enable farmers learn from each other and share different experiences through arranging exchange visits.

8.6.3 How they are carried out?

Defining the purpose of the exchange visit

In defining the purpose of your exchange visit, it is important to be clear with points like; why the exchange visit is to be prepared and what to achieve.

Making plan

In making the plan, consider the following points: date, site, name of hosting farmers, extension workers and researchers, objective of the visit, expected outputs, method used, materials prepared, roles of each organiser, methods of evaluation and schedule of the day.

Recording

Collect and record information of date, site, participants (at each site, male/female, young/old, FRG/non FRG, DAs, researchers and others), where they are from, and issues discussed among participants.

Evaluation

At end, conduct evaluation on how were the plan, logistics, and general reactions of the participants, difficulties and lessons learnt for improvement.

8.6.4. Follow up

Focusing on lessons learnt for improvement, important comments will be documented for proper follow up of improvement in the trial farmers' field condition.

9.1.2 General FRG research team meetings

Monthly and quarterly meetings are organised among FRG research teams at each research centre. The purpose of the meeting is to report progress, share experience to improve each other's activities, help each other if there is problem.

Frequency of the meeting depends on the necessity, though, once a month is recommended.

9.1.3 Farmer-extension worker-researcher meetings

It is recommended that farmers, extension workers and researchers hold regular meetings for having common understanding and finding gaps if any to fill. Frequency depends on FRG topics.

- Date
- Site (village, site description)
- Participants (list of participants with male/female, young/old, FRG/non-FRG, occupation/organisation)
- What was explained and by who?
- What was commented and by who?
- What was replied and by who?
- What was agreed?
- What was not agreed?

9.2. Joint monitoring and evaluation visit

Joint monitoring and evaluation visit is aimed at evaluating the activity objectively by inviting observers. It is recommended to organise the visit at least twice a season.

- 1) Identify participants. Participants are usually team leaders, senior researchers, supervisors from DARDO.
- 2) Prepare plan and visit schedule.
- 3) Prepare feedback form in advance.
- 4) Inform hosting farmer groups/farmers to make them ready a head of time.
- 5) Inform participants.
- 6) Conduct the visit.
- 7) Collect feedback from participants. Collected comments are summarised and presented at the next general FRG team meeting.

9.3. Farmer and extension worker evaluation meetings

At the end of each cropping season, a meeting with farmers and extension agents is organised to reflect how the FRG research is carried out, what is gained by each

stakeholder and what needs to be improved for better way of conducting the FRG research. It is also an opportunity to share the outputs among the stakeholders and discuss how it is going to be scaled up.

- 1) Preparation of the meeting schedule
- 2) Informing the schedule to responsible researchers
- 3) Inviting farmers and extension workers
- 4) Conducting the meeting
- 5) Compile results of the meeting in a report and present at the next general FRG team meeting.

9.4. Evaluation reports

Record keeping and report writing are integral part of FRG research process. Hence, it is important to record all the events including activities, participants, achievements, targets not achieved, comments made by participants, points agreed upon during discussions, etc. The information to be collected should include both qualitative and numerical information such as number of participants in sex, number of participants for pros and cons, etc. Evaluation reports are compiled and communicated to the stakeholders regularly.

10. Communicating FRG outputs

10.1. Sharing FRG outputs at different forums

Technical information produced from the FRG outputs is expected to be used efficiently in the process of extension activities for scale up/out. Major users of the information are those who are operating in agricultural development and extension at different levels. Research and Extension Advisory Council (REAC) is one of the forums where such users have regular contacts and a good opportunity for the research centres to distribute the information. Practically, the information is used at field day, consultation workshop, experience sharing, training, day to day extension activities and further research activities. Therefore, the information produced from the FRG outputs need to be in various forms. Table 4 shows how FRG outputs are conveyed to different potential users.

Table 4 Kinds and means of conveying FRG outputs to different users

Users	Information on:	Information in:	Communicate at/by:
Extension workers	Field management practices, operation, source of information, how to explain farmers	Technical manuals, leaflets, case studies and various extension aid	NGOs, DARDOs, REAC, training
Farmers	How to manage, use, obtain, utilise, sale, store	Posters, leaflets	Extension workers, field days, training, demonstration
Private sectors	Cost, specifications, size of demand	Research reports	Contact with researchers
Researchers	Remaining issues	Research reports	Review meetings
Policy makers	Potential impact on the mass, necessary policies	Recommendations	Field day, REAC

10.2. Contribution of FRG research for technology scale up/out

Continuity in supply of technologies and making follow up is important to sustain innovation at farmers' level. The contribution of FRG research for technology scale up/out can be secured by joint and well coordinated activities between research and extension as well as with other stakeholders and is more fundamental to the FRG research.

The following sections explain some of the important points for writing scientific papers and developing extension materials.

10.3. Research report writing

10.3.1. Analysing and synthesising of results

All the biological and socio economic results including farmers' observation and opinions are consolidated to reach conclusions of the trial and draw recommendations.

Research activity conducted with FRG deals with wide discipline areas. So, all these issues should be covered. During preparation of the result the organization of the activities accomplished and arrangements made with institution and farmers should be presented. The physical outputs have to be presented in common units with reasonable level of scientific analysis using common statistical parameters, and employing presentation tools (graphs, charts).

Socio-economic parameters (profitability and acceptability) should be included to improve the worthiness of the results. The result has to include farmers' observations and opinions in a systematic way. Finally there should be conclusions and recommendations from the farmer participatory research conducted as lesson for research and development.

10.3.2. Information sharing at different levels: interpreting research outputs

Collected data are not the property of researchers alone but they belong also to farmers, extension workers and any others who are involved in the research. It is therefore a principle that the data are disclosed to the stakeholders. However, it is necessary that raw data are processed so that the stakeholders, particularly farmers, can understand what they mean.

There are different forms of presenting research results, which help farmers and extension workers to understand.

- 1) Pictures comparing the result of different treatments
- 2) Data are summarised in tables.
- 3) Data are plotted in graphs

Research data cannot be understood directly by farmers and they should be interpreted into simpler form. For example, use of farmers' quantification methods is easiest way to translate research results into practical use.

10.3.3. Seminar

Organising seminars at research centre level is encouraged for hearing findings and seeking additional views from researchers before finalising the research results. The

seminar can also invite outsiders if it is appropriate. It is desirable that the seminars are initiated by the multi-disciplinary teams. Each research centre can regularise such seminars.

10.3.4. Scientific paper for scientific community

Leader of each FRG research team is responsible to coordinate the team members to compile a completed report for the respective research topic.

The most important feature of the FRG approach is that researchers carry out technology development activities in collaboration with farmers. Therefore the papers and presentations should emphasise how the collaboration is created and managed, what contributions the researchers and farmers make, what is the output and what it means to the farmers, and what are farmers opinions about the output.

The scientific paper should include information as indicated in Box 26.

Box 26 Contents of scientific research report

- 1) Project title
- 2) Authors (*research centre and division for each author and co-author at footnote*)
- 3) Abstract
- 4) Problem statement
- 5) Objectives and expected outputs
- 6) Methodology
 - Framework of experiment (*period, sites, FRG member farmers and their background*)
 - Technical (*experimental design, treatments, materials used*)
 - Organisational (*arrangement of the farmer group, roles of trial farmers and other member farmers, linkage with DA and agricultural office, scheduled meetings, trainings, field visits and field days*)
- 7) Implementation process (*what it actually happened*)
- 8) Outputs (*data/information collected, analysis of the data which correspond to your expected outputs and objectives. Special emphasis should be given to farmers' opinion and appropriateness of the technology in farmers' situation. Costs, expected return, manageability and availability of the technology are good indicator for the appropriateness.*)
- 9) Important lessons drawn
- 10) Future focus, emerging challenges and opportunities
 - On technical aspects
 - On participatory research
- 11) References

10.4. Extension material development

10.4.1. Why extension materials are important?

Unless technologies are reached and used by farmers, they mean nothing. Therefore, verified technologies must be extended to end users. One of the simplest and effective methods of extension is through extension materials in local language if they are prepared well and meet clients' need.

10.4.2. Technical manual for extension workers and Subject Matter Specialists

Technical manual for extension workers and subject matter specialists includes technical instruction, operational instruction, guidance and/or technical package with necessary data, illustrations. Technical manual enables extension workers and subject matter specialists to clearly understand and demonstrate specific technology.

10.4.3. Developing extension materials

Extension Material is one of the basic methods to disseminate and up-scale outputs of FRG research outputs.

The following are criteria for a good extension material development.

- 1) It is either half fold/three fold pamphlet with a size which fit into a pocket.
- 2) Local language is used.
- 3) It contains selected information which is essential for farmers to practice the technology.
- 4) Pictures or drawings are used for describing the technologies and its impact.
- 5) It indicates inputs required and expected outputs in terms of volume of produce or economic term at a reasonable level (not too exaggerated but not too conservative).

Some of the basic information extension materials need to contain are:

- 1) Background (brief explanation of the problem and measures being recommended)
- 2) Description of the technology
 - Required inputs and conditions
 - Work sequence
 - Variation if any
 - Risk if any
 - Expected outputs (in quantity or in economic gain)
- 3) Trial sites and trial farmers
- 4) Contact researcher, DA or farmers for further information

Low literacy rate is one of the constraints of disseminating improved technologies to larger number of farmers. Extension material for farmers needs, instead of stuffing up a lot of technical information in it, reducing text and using visuals which explain concepts and/or steps. Such materials are effective when extension workers provide technical information orally.

Develop extension materials with range of interested groups such as farmers, extension workers, researchers from other disciplines and other stakeholders to make sure the materials are more appropriate and practical to the specific situation.

The following is a plan for extension material development.

1) Aim of material

Describe background, target problem and necessity of the material.

2) Target audience

Analyse target group, their characteristics, their size and learning style.

3) Objective of material

“The material helps farmers to understand _____ and apply _____ for better _____.”

4) Type of materials

Type: flip chart/pamphlet/poster. Etc

Size: A4, A3. etc.

Language: English/Amhalic/Afaan Oromo

Quantity:

Colour: black and white/colour

5) Key message of the material

Important messages the material is intending to convey to the target group.

6) Contents of material

Contents need to attract attention and interest of the target group. The technical information contained should be practical and easy to understand for users, extension workers and/or farmers, (Box 27 for an example).

7) How to use the material (5W1H)

- When is the material used?
- Where is the material used?

- Who is the material used by?
- What is the material used for?
- How is the material used?

8) **Produce materials**

9) **Pre-test**

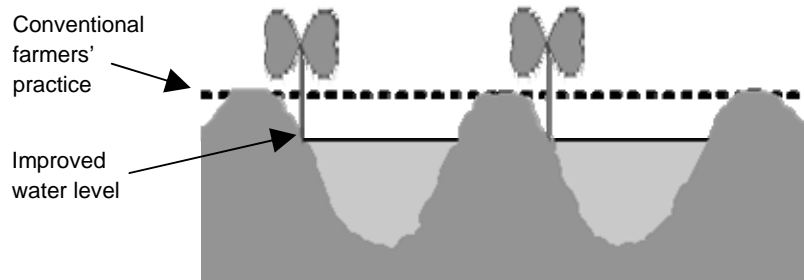
Before make distribution, the developed extension material needs to be pre-tested to make sure that appropriate language, style, flow of text and others are used.

10) **Distribution plan**

A plan should be made for who and how the produced materials are distributed.

Box 27 Example: Water management for irrigated vegetable production (MARC)

A FRG worked on improved irrigation water management for vegetable production. Existing farmers' irrigation practice uses too much water, which caused more prevalence of diseases, lower quality of fruit thus more cost for fuel to operate pump longer hours. Researchers measured water amount to adjust at appropriate level by looking at soil moisture content. Farmers assessed appropriateness of the depth and frequency of water according to the status of the plants. Farmers confidently claim now that 3/4 of water at every 4 days instead of flooding the field every 2 days* is appropriate (Plant Protection Group at Meki).



X
every 4 days
(previously every 2 days)

* This is just an example. Appropriate level and frequency of irrigated water depends on specific soil type and crop.

Useful forms

2 Quarterly monitoring sheet

Date		Period		Reporter	
Topic					
Expected outputs of the topic					
Activities (methods, materials, tools used)	Achievement (outputs, impact)			Constraints	
Budget	Planned		Expenditure of the quarter	Balance	
1. Materials purchased ()					
2. Transportation					
3. Per diem					
4. Others ()					
Activities necessary for next quarter	Target				

3: Record of situation and problems analysis

FRG no	Wareda	Kabele	Villages	Date
Participants Farmers, extension workers, researchers, others	Past activities, group compositions, major crops, issues identified during the past farmers' meeting, etc.			
Venue				
Farming system				
Major commodities produced		Major technical practices		
Identification of the problem and prioritisation				
Major problems		Ranking		
Analysis of the selected problem				
Selected problems	Causes of the problem	Possible technical options	Conditions required for the options	

5 Weekly arrangement of vehicle at MARC

	Centre manager	Head AE-RE
Signature		

Period: from to

Date and day		Vehicle 1	Vehicle 2
Monday	Morning		
	After noon		
Tuesday	Morning		
	After noon		
Wednesday	Morning		
	After noon		
Thursday	Morning		
	After noon		
Friday	Morning		
	After noon		
Saturday			
Sunday			

6 Background of FRG (for farmers meeting)

FRG Topic	Wareda(s)	Kebele(s)	Date
Background of the groups	Past activities, group compositions, major crops, issues identified during the past farmers' meeting, etc.		
Description of core problems			
Stakeholders	No. of FRG members (a list attached) Names of trial farmers Names of extension workers Names of researchers Other stakeholders		

7 Summary of the past activities

1 st year	2 nd year	3 rd year
Problems worked	Problems for the year	Problem for the year
Remaining problems Emerg ed problems	Remaining problems Emerg ed problems	

8 Problems, options and trial activities

Problems	Technical options available	Expected outputs	Trial activities	Materials needed	Feasibility
Problem 1	Option 1	Output 1	Activity 1		
			Activity 2		
		Output 2	Activity 4		
			Activity 5		
	Option 2	Output 3	Activity 5		
			Activity 6		
		Output 4	Activity 7		
			Activity 8		
Problem 2	Option 2	Output 5	Activity 9		
			Activity 10		
		Output 6	Activity 11		
			Activity 12		
	Option 2	Output 7	Activity 13		
			Activity 14		
		Output 8	Activity 15		
			Activity 16		

9 Responsibility sharing

	Responsibility
Trial farmers	
Other member farmers	
extension workers	
Researchers	
Others	

10 Selection of trial farmers

Trial farmers names	Village and location of plots	Other background of the farmer

11 Tentative Research Design

(Detailed design is made later by researchers)

Treatments			
Number & size of plots			
Parameters collected			

12 Joint Action Plan

(Research topic: Period: Planned by:)

Major steps	Detailed activities	Target	Time				Materials and costs	Responsible person
1.Planning and monitoring Farmers meeting Stakeholder meeting M&E								
2. Field activities Material preparation Plot preparation Sowing Weeding D&P identification Harvesting Group activity								
3.Farmers and DA training Training (1 st , 2 nd , 3 rd) Field day Exchange visit								
4.Data collection By farmers By extension workers By researchers								
5.Monitoring & evaluation								
6. Data analysis Evaluation meeting Research result sharing and discussion								
7.Report writing and extension material development								
8. Others								

13 Gender action plan

Objective	Strategies / Activities	When	Resources	Person responsible
	(what can be done)	(until when)	(any resources needed)	(who is responsible for the implementation)

14 Training Plan

Training programme organizer: _____

FRG Research title: _____

Training topic:

Target groups: (farmers, extension workers, farmers + extension workers, researchers, etc.)

Training objective

This training is intended to

Expected outputs

At the end of this training the participants should be able to:

- 1.
- 2.
- 3.

Training contents

Topic 1

Sub topics

Instructor

Material needed

Method used in the session (lecture, practical, visit)

Topic 2

Sub topics

Instructor

Material needed

Method used in the session (lecture, practical, visit)

Evaluation

Method of evaluation

Schedule

(As attached sheet)

16 Plan and evaluation of training session

Name of Trainer		Organisation:	
Date:	Training topic:		
Time of session:	Name of the session:		
Lecture/Practical/Visit/Discussion/others ()		Language:	
Plan of the session		Result of the session (self evaluation)	
Objective of the session		Was the plan of the session/contents alright?	
Contents of the session:		Was your handling of the session alright?	
Materials should be prepared in advance by the lecturer/instructor:		Was the preparation/use of training materials alright?	
1 Handout/PPT/Slide films/Video		Measures to be taken to improve the future session:	
2 Other materials			
Comments by the course organiser:			

*Result of the session and feedback is filled after the session

17 Evaluation of session

Training session Evaluation Form

Name of the trainer: _____ Date: _____

Subject: _____

Overall score _____ out of 100

1: very poor, 2: poor, 3: satisfactory, 4: good, 5: excellent

A. Content

(_____/ 40)

Introduction

The purpose is clear 1 2 3 4 5

The organisation of the presentation is clear 1 2 3 4 5

The introduction catch the participants' interest 1 2 3 4 5

Analysis/description

Is the situation or background clear? 1 2 3 4 5

Are causes and effects clearly presented? 1 2 3 4 5

Is the subtopics relevant to participants? 1 2 3 4 5

Conclusion

Are ideas/topics effectively summarised? 1 2 3 4 5

Is the conclusion persuasive? 1 2 3 4 5

B. Delivery

(_____/ 45)

Eye-contact 1 2 3 4 5

Gestures, body language 1 2 3 4 5

The voice is heard and clear 1 2 3 4 5

The term/language used easy to understand 1 2 3 4 5

The question properly answered 1 2 3 4 5

There is enough interactions with the participants 1 2 3 4 5

Using of visual aid/samples/spacemen 1 2 3 4 5

Hand-outs 1 2 3 4 5

Time management 1 2 3 4 5

C. Attitude

(_____/ 15)

Confident 1 2 3 4 5

Enthusiastic 1 2 3 4 5

Gender consideration 1 2 3 4 5

Comments

18 Plan of FRG field day

Date of plan made:	Name of planner:
FRG topic:	
Site(s)	
Date of field day	
Organiser	Roles
Researchers: (names)	
extension workers: (Names)	
FRG member farmers: (Names)	
Objective of the FIELD DAY/VISIT	
Expected outputs (End of the day, you want the participants to be able to...)	
Materials required	
Evaluation (prepare questions according to the objectives)	
Schedule (As ' Schedule of field day ') 	
Remarks	

19 Schedule of field day

Day/Time	Activity	Responsible person	Materials needed

20 Field visit plan and record

Plan for site visit					
Purpose of the visit		Plan prepared by		Appointment	
		Planned date of visit		Material preparation	
Record of site visit					
Date		Reporter		Farmers & extension workers contacted	
Site visited		Researchers accompanied			
Researchers' activities (methods, materials, tools used)		Activities and response of farmers and extension workers		Other stakeholder	
Remarks (constraints/problems, counter measures/action to be taken, major learning)					

21 Evaluation of field visit

(by farmers, extension workers and researchers)

Name of the FRG:

Name of the village:

Date:

Reported by:

Day's outputs (collected information):

Day 's evaluation

What did I do today?

What did farmers do today?

What difficulties did you have today?

What lessons have I learnt today?

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Feedback sheet

Your comments are submitted to the coordinator of FRG research activities at your centre using the format below.

Comment based on your experience will be incorporated into next version of the guideline.

Your name:

Your FRG topics:

Your FRG sites:

Comments: (background, your actual cases, modifications, additions with your examples [pictures, flip chart, data, etc])

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Project on Strengthening Technology Development, Verification, Transfer and Adoption through Farmer Research Groups (FRG Project) is implemented in cooperation among following institutions.

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Oromia Agricultural Research Institute (OARI)
Japan International Cooperation Agency (JICA)

