PROLINNOVA SOUTH AFRICA

PROMOTING LOCAL INNOVATION IN ECOLOGICALLY-ORIENTED AGRICULTURE AND NATURAL RESOURCE MANAGEMENT

Picture by: Hannes de Villiers

TRAINING MANUAL

PARTICIPATORY INNOVATION DEVELOPMENT
Training of Stakeholders

Facilitators: Vusumuzi Sithole & Hannes de Villiers

14-16 SEPT 2004, Pietermaritzburg

MODULE OUTLINE

Statement of specific learning outcomes

Participants will gain competence in recognizing and supporting innovation by resource poor farmers, and use Participatory Innovation/Technology Development as approach to engage farmers, researchers, extension workers and other development practitioners in local innovation processes that result in sustainable agriculture and natural resources management practices.

At the end of the module, participants are able to:

- Recognize strengths and weaknesses of approaches used in South Africa to support farmer innovation
- Recognize the importance of approaches that encourage and facilitate farmer experimentation
- Develop and apply a framework to identify, support, document and disseminate farmer innovation;
- Apply and integrate learning from the module in their work and their organization
- Draft an action plan for training and coaching of peers in PID/PTD.

List of content topics

- PROLINNOVA: principles, processes and programme
- Conceptualising innovation
- Reflecting on practice
- Key concepts in innovation
- Engaging with farmers
- Inventorizing farmer innovation in South Africa
- Institutionalising PID/PTD

Types of delivery and estimated notional study hours per type

Learners activity		Number of notional hours for the whole module:	
Lectures	20	Resource based learning	16
Practicals & Field trips	20	Field work	40
Subtotal: Contact hours	40 hrs	Subtotal: Self study	56 hrs

TEACHING - LEARNING METHODS

- The module is taught in two blocks of three days (September 04) and two days (November) respectively
- Experiential learning: discussions, small group work, researching and analyzing information, and written and verbal presentations
- Self study
- Fieldwork to identify farmer innovations

Statement of assessment criteria

At the end of the module, Participants are expected to:

- Develop an argument for Participatory Innovation/Technology Development to support farmer innovation
- Apply a framework to promote farmer innovation, and contribute to an inventory to document farmer innovation in South Africa
- Establish more effective partnerships between farmers, researchers, extension workers and other development practitioners

Methods of assessments

- Group field report
- Individual and group presentations
- Contribution to inventory
- Learning journal

Educational provision made to support learners

The participatory nature of the module allows for ongoing development of skills essential not just in the academic world, but also in life in general such as communication and interpersonal skills. Support is given to learners needing to consult facilitators in areas of difficulty, through face-to-face contact during and after course. Reading notes are provided as hand-outs

General conduct

Participants are expected to be courteous and respectful to peers and facilitators. The facilitators are available for guidance and supervision. This is especially important during work on assignments. Participants are expected to be able to work independently, to be proactive in asking for assistance when needed, and not to wait until the deadlines to discuss problems or issues. Attendance of both sessions (Sept and Nov) is compulsory, as is submission of assignments at deadlines set. In case of an emergency, participants are requested to consult with the facilitators. Final deadlines are not negotiable as these are dictated by funding requirements and monitored by PROLINNOVA International.

Communication

Important notices and changes will be communicated through e-mail. Facilitators maintain bi-weekly contact to monitor progress of learners on tasks.

Facilitators

Matters relating to the module should be addressed to the facilitators.

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MODULE OVERVIEW

Session 1	Introduction
Session 2	PROLINNOVA
Session 3	Contextualizing innovation
Session 4	Reviewing methodologies
Session 5	Defining key concepts
Session 6	Engaging with farmers: a day in the field
Session 7	Inventorizing farmer innovation in South Africa
Session 8	Action planning
Session 9	Institutionalising PID/PTD
Session 10	Planning for capacity development
Session 11	Evaluation

Feedback workshop 10 - 11 November 2004

SESSION 1 INTRODUCTION

LEARNING OUTCOMES

At the end of the session, participants:

- Are acquainted with each other and facilitators
- Have an overview of the module
- Articulate their learning objectives
- Recognize the each others experiences and expectations

SESSION GUIDE

Step 1	**Who is who in the zoo**
Method	Individual work & plenary presentations
Materials	Flipcharts & markers
Time	30 min
Step 2	**Module outline**
Method	Lecture and question/answer session
Materials	Hand outs
Time	15 min
Step 3	**Learning objectives**
Method	Individual work & plenary
Materials	Cards & markers
Time	30 min

BACKGROUND READING

- How to be an Effective Participant
- Role of the participant in Group Discussions

ACTIVITIES

STEP 1 WHO IS WHO IN THE ZOO

Participants are tasked to make a drawing of who they are, where they work, and what makes them tick. Results are presented in a plenary session.

STEP 2 MODULE OUTLINE

The facilitator presents the outline for the module, allows time for questions, and reaches agreement about logistics.

STEP 3 LEARNING OBJECTIVES

Participants are tasked to write on cards what they hope they learn in this course. Results are discussed in small groups, who summarize and present results on a flip chart. The facilitator gives a brief response and highlights what areas will and will not be covered in the module.

SESSION 2 PROLINNOVA

LEARNING OUTCOMES

At the end of the session, participants:

- Understand background, objectives and work of PROLINNOVA International and South Africa
- Recognize key stakeholders in Prolinnova internationally and in South Africa
- Identify similarities and differences in PID/PTD

SESSION GUIDE

Step 1	**PROLINNOVA**
Method	Plenary presentation
Materials	Power point, OHP, Transparencies, Hand outs
Time	30min
STEP 2	**PTD/PID in practice**
Method	Plenary Presentation
Materials	Power point (Sudan, Nepal), Video (Nepal *(2)*), Hand outs
Time	60min

BACKGROUND READING

- PROLINNOVA briefing document
- Participatory development of the donkey drawn plough in Western Sudan

ACTIVITIES

STEP 1 PROLINNOVA

The facilitators introduce background, principles and activities of Prolinnova. They will present the countries and stakeholders involved in the programme, and outline the stakeholder meetings that led to this initiative: Rambouillet (near Paris) in 1999, the Conference Dresden (Germany) in May 2000, GFAR in Rome in April 2001.

PROLINNOVA aims to build on and scaling up of good practice – many pioneered by NGOs in participatory research and development(R&D) Focused on promoting local innovation. Programme activities planned and implemented are presented. Specific attention is paid to the South African programme.

STEP 2 PID/PTD IN PRACTICE

Two case studies from Nepal and Sudan are presented. Participants are tasked to observe similarities and differences in approached used. Results are discussed in a plenary.

SESSION 3 CONTEXTUALIZING INNOVATION

LEARNING OUTCOMES

At the end of the session, participants:

- Identify strengths, weakness, opportunities and limitations in their work with regard to farmer innovation

SESSION GUIDE

Step 1	**Defining farmer innovation**
Method	Individual and group work
Materials	Flipchart, markers
Time	30min
Step 2	**Innovation in context**
Method	Individual and group work
Materials	Flip charts, markers
Time	30min
Step 3	**SWOL analysis**
Method	Individual, group work and plenary
Materials	Flip charts, markers
Time	30min

BACKGROUND READING

None

ACTIVITIES

STEP 1 DEFINING FARMER INNOVATION

Participants are asked to reflect on the interactions they have had with farmers in their work and list:

- innovations they have come across
- describe why they consider it an innovation

STEP 2 INNOVATION IN CONTEXT

Participants are tasked to reflect on the following two questions, and take notes:

- How do farmer innovation fits into your work?

STEP 3 SWOL ANALYSIS

Participants form groups according to the institution they represent. Single representatives form a separate group so that no one works alone. Groups are tasked to

do an analysis of strengths, weaknesses, opportunities, and limitations (SWOL) in their work with regard to supporting farmer innovation. Results are presented in a plenary. If time is limited, an information market can be held where participants visit each other's flipcharts and discuss results.

SESSION 4 REVIEWING METHODOLOGIES

LEARNING OUTCOMES

At the end of the session, participants

- Recognize approaches used by their organisations
- Reflect on their interactions with farmers
- Review in how far their approach accommodates farmer innovation

SESSION GUIDE

STEP 1	**Reviewing approaches**
Method	Lecture, group work and plenary
Materials	Power point, hand out
Time	20min
Step 2	**Facilitation farmer innovation**
Method	Individual, group work and plenary
Materials	Flip charts, kokies, prestik
Time	40min

BACKGROUND READING

- New orientation for farmer participatory action research: Experiences of Agri Service Ethiopia (Amanual Assefa, Agri - Service Ethiopia (pgs, 75-80)
- Constraints and Challenges of participatory approaches as perceived by different stakeholders (pgs, 20 – 24)

ACTIVITIES

STEP 1 REVIEWING APPROACHES

The facilitator will introduce the session by giving a brief on approaches used and their importance in engaging with farmers.

STEP 2 FACILITATING FARMER INNOVATION

Participants form groups and review approaches their institutions employ and to what extent these accommodate farmer innovation. Results are presented in a plenary. This is followed by a discussion on how to improve current approaches to encourage and facilitate farmer innovations.

SESSION 5 DEFINING KEY CONCEPTS

LEARNING OUTCOMES

At the end of the session, participants:

- Agree on terminology and concepts in PID/PTD initiatives
- Articulate challenges they have encountered in working with farmers

SESSION GUIDE

Step 1	**PTD/PID concepts**
Method	Plenary presentation
Materials	Handouts, Power Point presentation
Time	15min
Step 2	**Clarifying terminology**
Method	Group work and plenary
Materials	Flip chart, kokie pens, prestik
Time	45min

BACKGROUND READING

- Defining key concepts
- Prolinnova – Some key concepts
- Concept paper on: Participatory Innovation Development (PID): *A changing Paradigm in Agricultural research and extension approach*
- Key features and Roles of field staff in PTD

ACTIVITIES

STEP 1 PTD/PID CONCEPTS

The facilitator will give a background and justification for farmer participation in technology development. The main characteristics of approaches to technology development will also be compared. The roles of field staff in PTD will also be under discussion.

STEP 2 CLARIFYING TERMINOLOGY

Participants will form groups and are tasked to define the following concepts:

- What is an innovation?
- Who is an innovative farmer?
- What is Local Innovation?
- What is Indigenous Knowledge?
- What is a Participatory Approach
- Explain challenges they are facing in working with farmers in technology development

Results are presented in a plenary. Consensus is reached on terminology.

SESSION 6 ENGAGING WITH FARMERS: A DAY IN THE FIELD

LEARNING OUTCOMES

At the end of the session, participants:

- Recognize and appreciate innovation of farmers in Bulwer District
- Articulate the relevance of farmer – researcher partnerships, and engaging with farmer innovators
- Apply key concepts in PID/PTD

SESSION GUIDE

Step 1	**Preparing for the field**
Method	Lecture and group work
Materials	Power Point presentation, notebook, pens
Time	30min
Step 2	**Field work**
Method	Group work
Materials	Notebook, pens, flipcharts, markers
Time	120min
Step 3	**Analysis and discussion**
Method	Group work and plenary
Materials	Flip chart, kokie pens, prestik
Time	90min

STEP 1 PREPARING FOR THE FIELD

The facilitators outline purpose and process of field work the following day. Groups are formed who review the list of guiding questions. They allocated tasks and responsibilities, and agree on techniques used to engage in a dialogue with farmers and households.

GUIDING QUESTIONS FOR DIALOGUE WITH FARMERS AND HOUSEHOLDS

Given the limited time available for this interaction with the farmers, the following questions serve to provide focus to the PTD/PID participants in their dialogue with the farmer during the visit. The focus is anchored on the following learning objectives:

Learning objectives: At the end of the activity, the participants will be able to:

1. Identify and differentiate between innovations and indigenous knowledge
2. Realize the farmer's own ability to address problems and constraints using their knowledge and abilities
3. Determine links/gaps between farmers development practitioners (researchers & extensionists)
4. Determine the value of innovations in agricultural development

The questions below are meant to be a guide rather than be asked in a structured way. Hence, the participants are encouraged to be as natural as possible in engaging the farmers in this dialogue in a manner that is flexible, creative, meaningful and enjoyable for both the participants and the farmers.

1. Describe the circumstances/situations when you have interacted with agricultural/rural development professionals and the reasons for the interactions.
2. How did the interaction help you?
3. What knowledge, skills and attitudes of those agricultural/rural development professionals have helped you in developing innovations in your farm?
4. What knowledge, skills and attitudes of those agricultural/rural development professionals have hindered you from developing innovations in your farm?
5. What mechanism/practices are in place that you find helpful in working with the agricultural/rural development professionals
6. How did the innovation assist you to address a constraint or a problem?
7. What constraint did you solve through your innovation?
8. Does other people in the area know about it and do you talk about it?
9. How many people in the area are using the idea at their homesteads?

The dialogue with the farmers may start by a brief introduction to each other and by sharing of their experiences on innovations/experiments in their farms.

Field group composition

Thank you present to farmers - token of appreciation for their time

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STEP 2 FIELD WORK

Groups spend one morning interacting with selected farmers and their households.

STEP 3 ANALYSIS AND DISCUSSION

Groups analyse results, which are presented and discussed in a plenary session.

SESSION 7 INVENTORIZING FARMER INNOVATION IN SOUTH AFRICA

LEARNING OUTCOMES

At the end of the session, participants have:

- Identified existing or new initiatives (pilot sites, themes, projects and resources) for inventory of farmer innovations
- Identified possible or various ways of identifying farmer innovations
- Appreciated the value of documenting innovations and reached consensus on standard format

SESSION GUIDE

Step 1	**Documenting innovations**
Method	Group work and plenary
Materials	Flipcharts, markers, and power point presentation,
Time	120min
Step 2	**Identifying sites**
Method	Plenary, individual, group work
Materials	Flip charts, kokie pens, prestik
Time	

BACKGROUND READING

- Examples of inventories used in PROLINNOVA
- Creating Synergies in PID/PTD among Stakeholders in South Africa

ACTIVITIES

STEP 1 DOCUMENTING INNOVATIONS

Participants work in groups to reflect on the fieldwork, and draft a format to recognize, and document farmer innovation. Results are presented and discussed in a plenary. The facilitator will then present some examples of how other countries have documented innovations. Consensus is reached on a format that participants will use to develop an inventory of farmer innovation in South Africa.

STEP 2 IDENTIFYING SITES

Participants identify criteria to select sites to identify farmer innovation. Participants form groups per region who use the criteria to identify appropriate sites. Participants are encouraged to create synergies with existing initiatives, and review work done, or in progress. However, new initiatives may be undertaken provided time and resources are available and results can be obtained within PROLINNOVA'S timeframes

SESSION 8 ACTION PLANNING

LEARNING OUTCOMES

At the end of the session, participants have:

- Developed action plans based on the learnings from the course to complement their on going work – projects and programs
- As individuals or groups identified pilot sites and themes for farmer innovation inventory
- Identified potential obstacles to the proposed action plans and ways to deal with these
- Informed and appreciated the importance of meeting reporting deadlines in Prolinnova program

SESSION GUIDE

Step 1	**Purpose of an action plan**
Method	Plenary presentation
Materials	Power point presentation
Time	10min
Step 2	**Who does what, where & when?**
Method	Indiv /G work: Action Plan, Obstacles and Possible solutions
Materials	Flip charts, kokies, prestik
Time	40min
Step 3	**Plan presentation**
Method	Plenary presentation: Individual/Group work
Materials	Flip charts, kokies, prestik
Time	30min
Step 4	**Deadlines for reporting**
Method	Plenary presentation
Materials	Power point presentation
Time	10min

BACKGROUND READING

None

ACTIVITIES

STEP 1 PURPOSE OF AN ACTION PLAN

The facilitator will introduce the session and state the aims of an action plan:
1) identify areas of focus for fieldwork after the training
2) improve or strengthen an existing activity, project or program
3) develop a new activity, project, or program or its components which can be shared and further discussed with colleagues

4) document strengthened or changed perspectives on innovations or innovation development.

The action plan is based on the learnings and insights from the course, however, relating this to new/existing situations (programmes and projects)

STEP 2 WHO DOES WHAT, WHERE & WHEN?

The participants will in groups or individually describe the background of the project or program to which the action plans complement.
1) Participants will also mention what exactly they propose to do, where in the country and when can the Prolinnova Program expect the outcomes.

2) Supporting conditions: participants will list conditions that favour the implementation of the proposed action plan

3) Potential obstacles to the proposed Action plan and ways to deal with these: in this section participants may discuss problems or difficulties that they foresee in the implementation of their action plans and how they proposed to address them in cognisance of the supporting conditions identified above.

STEP 3 PLAN PRESENTATIONS

Plenary presentation of action plans: Roles;
1) The presenter; will:

- Plan and prepare presentation to ensure a well defined presentation
- Ensure that presentation does not exceed 10 minutes
- Present action plan and respond to questions, comments, recommendations or suggestions

2) Co –participants will listen to presentation, make clarifications and give comments and suggestions as necessary

3) The facilitator will facilitate the interaction between the presenter and other participants and ensure that there is adequate time for consolidated collective reaction to all presentations and wrap up the whole activity.

STEP 4 DEADLINES FOR REPORTING

Time frames will be presented to participants as agreed by the Prolinnova Core Team. A clear agenda of a way forward, feed back systems and tools will be identified. Bi-monthly or fortnightly contacts as back up support could also be proposed. A follow up workshop is scheduled for 10/11 November 2004, see table below.

Time frame

Time	Event
14 – 16 September 2004	Training on PID/PTD for stakeholders
End September 2004	Identified farmer to study innovation
Mid-October	Studied innovation, documented and forwarded to Prolinnova Core Team
End October 2004	Comments back to participants to address and to prepare final document to be presented at Feedback Workshop
10 – 11 November 2004	Feedback Workshop – Presentations to be included in book on Farmer Innovations in South Africa

SESSION 9 INSTITUTIONALIZING PID/PTD

LEARNING OUTCOMES

At the end of the session, participants have:

- Identified critical issues in institutionalising PID/PTD approaches

SESSION GUIDE

Step 1	**Institutionalising PID/PTD approaches**
Method	Panel discussion
Materials	Power point presentation
Time	60min

BACKGROUND READING

- Widening the space: Institutionalising PTD: Participatory Technology development for Agricultural Improvement: *Challenges for institutional integration*, International Institute of Rural Reconstruction, ETC Ecoculture
- Strategies for institutionalising PTD/PID
- PROLINNOVA paper on Institutionalising PID/PTD (website)

ACTIVITIES

STEP 1 INSTITUTIONALIZING PID/PTD OR OTHER APPROACHES

Since the mid-1980's many research and development institutions have developed, applied and experimented with PID/PTD approaches to further agricultural development. Yet, in many instances few practitioners use these approaches within an institution.

Participants examine practical experiences of agricultural professionals who have been involved in promotion and institutionalisation of PID/PTD related approaches within their organization. Strategies used, challenged faced and achievements reached are reviewed. Drawing on their own practical experiences, participants will have the opportunity to raise questions, discuss issues and share their own perspectives in an open forum.

Speakers will talk on the following topics:

- Partnerships and networking
- Capacity development
- Institutional arrangements
- Attitudes and behaviour of professionals

SESSION 10 PLANNING FOR CAPACITY DEVELOPMENT

LEARNING OUTCOMES

At the end of the session, participants have:

- Identified critical competencies to advance PID/PTD in their work
- Identified support mechanisms and conditions that could positively contribute to PID/PTD processes within their organization
- Described capacity development approaches that could be relevant and appropriate in sharpening conceptual understating of PID/PTD processes
- Internalised appropriate behaviours towards PID/PTD

SESSION GUIDE

Step 1	**Critical competencies**
Method	Plenary presentation & Group or Individual work
Materials	Power point, flip charts, kokie pens, prestik
Time	30min
Step 2	**Support mechanisms for PID/PTD**
Method	Plenary presentation & Group or Individual work
Materials	Power point, flip charts, kokie pens, prestik
Time	30min
Step 3	**Action planning**
Method	Plenary presentation
Materials	Power point, flip charts, kokie pens and prestik
Time	30min

BACKGROUND READING

- Important competencies in PID/PTD (by: Merissa Espineli)
- Capacity Needs Assessment for PID (by: Merissa Espineli)

ACTIVITIES

STEP 1 CRITICAL COMPETENCIES

Participants are tasked to identify key competences; they regard as important for effective implementation of PID/PTD. The facilitator will then distribute handouts to participants to work in groups. Competencies presented in the handout are categorized according to steps involved in PTD. This will be discussed in a plenary, followed by a summary by the facilitator.

STEP 2 SUPPORT MECHANISMS FOR PID/PTD

Participants will then identify support mechanisms they perceive important for their organisations/ themselves to effectively implement/institutionalise PID/PTD. This exercise is done in groups. Results are presented and discussed in a plenary. Having identified the required support mechanisms, participants will in plenary propose how these mechanisms could accomplished.

STEP 3 ACTION PLANNING

Participants discuss who can offer what, how, and when, in terms of providing capacity for stakeholders involved in the Prolinnova Programme in South Africa. All suggestions and comments are captured on a flipchart, and reviewed in viability in terms of resources available through PROLINNOVA South Africa, and additional fund raising

SESSION 11 EVALUATION

LEARNING OUTCOMES

At the end of the session, participants have:

- Articulated learning from the module

SESSION GUIDE

Step 1	**Evaluation**
Method	Individual work
Materials	Evaluation forms, pens
Time	30min
Step 2	**Closure**
Method	Plenary
Materials	None
Time	30min

BACKGROUND READING

- Learning objectives from session 1
- Evaluation form

ACTIVITIES

STEP 1 EVALUATION

Participants are tasked to review their learning objective formulated in Session 1. They receive an evaluation sheet to rate all aspects of the module: facilitation, course content, materials, time management, venue, etc. The forms will be collected for analysis.

STEP 2 CLOSURE

Words of thanks are said by the facilitators and members of the Core Team. Participants will also be requested to nominate one or two co-participants to speak on their behalf.

HOW TO BE AN EFFECTIVE PARTICIPANT

Come to the Meetings with Questions in Mind.

Make note of the problems or questions and offer them for discussion. Study the agenda in advance.

Listen Thoughtfully and Critically to Others.

Try hard to get the other person's point of views. Don't accept ideas which seem unsound, but remember on almost every question, there are several points of view.

Speak Your Mind Freely.

The meeting is yours – a chance for you to say what you think. **SAY IT!**

Don't Monopolize the Discussion.

Don't speak for more than a minute or so at a time. Make your point in a few words, then give someone else a chance. Don't make a speech. Speak so everyone can hear.

Don't Let the Discussion Get Away From You.

If you don't understand, say so. Ask questions or for examples and cases.

Don't Engage in Side Conversations With you Neighbor.

It is rude and distracting.

Take Part in Friendly Disagreement.

When you are on the other side of the fence, say so and tell why. But do it in a friendly way. Avoid win-lose contests.

Strike While the Idea is Hot.

If you wait until "later" you may forget your point, or it may no longer be relevant to the discussion.

Be Action-Minded.

Try to relate discussion to action.

Above All.

Try to develop in yourself that rarest of all communicative arts – the art of listening.

After the Meeting.

Ask yourself, "**WHAT DID I CONTRIBUTE**?" Resolve to do more next time.

BACKGROUND READING

Session 1

How to be an Effective Participant

Role of the participant in Group Discussions

Participatory Innovation Development: Training of Facilitators' Course
An Undertaking of the Prolinnova Programme
Y.C. James Yen Center, IIRR, Silang, Cavite, Philippines
June 14-25, 2004

Session 2

PROLINNOVA briefing document

Participatory development of the donkey drawn plough in Western Sudan
Source: Advancing Participatory Technology Development

Participatory Technology Development (PTD): A case study from Nepal
Source: Participatory Innovation Development: Training of Facilitators' Course
An Undertaking of the Prolinnova Programme
Y.C. James Yen Center, IIRR, Silang, Cavite, Philippines
June 14-25, 2004

Session 4

New orientation for farmer participatory action research: Experiences of Agri Service Ethiopia (Amanual Assefa, Agri - Service Ethiopia (pgs, 75-80)

Constraints and Challenges of participatory approaches as perceived by different stakeholders (pgs, 20 – 24)
Source: Promotion of Farmer Innovations and Experimentations in Ethiopia (PROFIEET), National workshop proceedings, August 25 –27, 2003, Ethiopian Management Institute, Debreziet, Ethiopia

Session 5

Defining key concepts

Prolinnova – Some key concepts

Concept paper on: Participatory Innovation Development (PID): *A changing Paradigm in Agricultural research and extension approach*

Key features and Roles of fieldstaff in PTD:
Source: Developing technology with farmers: *A Trainer's Guide for Participatory Learning*

Session 7

Creating Synergies in PID/PTD among Stakeholders in South Africa

Session 9

Widening the space: Institutionalising PTD: Participatory Technology development for Agricultural Improvement: *Challenges for institutional integration*, International Institute of Rural Reconstruction, ETC Ecoculture

Strategies for institutionalising PTD/PID

PROLINNOVA paper on Institutionalising PID/PTD (website)

Session 10

Important competencies in PID/PTD (by: Merissa Espineli)

Capacity Needs Assessment for PID (by: Merissa Espineli)
Source: Participatory Innovation Development: Training of Facilitators' Course
An Undertaking of the Prolinnova Programme
Y.C. James Yen Center, IIRR, Silang, Cavite, Philippines
June 14-25, 2004

Session 11: Evaluation form and Closure

The Role of the Participant in Group Discussions

(Source: The Business Case Method: An Introduction)

Participants in a management training course have several tasks to perform. Perhaps the most pervasive assignment is to continually make choices and decisions, inside and outside the classroom. As in the actual development world, decision-making is a critical and integral part of a management course. An understanding of the decision-making process will enhance your ability to approach situations effectively.

What Prevents Effective Group Discussions?

The process of choosing among competing alternatives is influenced by many factors which may operate to prevent an objective discussion. Subjectivity must be kept within useful bounds to improve choices. Certain values and attitudes are important and useful in this kind of activity. But objectivity is what we strive for in group discussions.

There are mental factors in each of us which operate to reduce our objectivity and subsequent efficiency. To gain some appreciation for what these factors are and how they might affect your decision in class, consider the following psychological roadblocks to objective, goal-oriented decisions.[1]

1. **Your Biases Can Blind You**. You are a product of your interaction with the social units to which you now belong and to which you have belonged in the past. Your culture affects your thinking, as does your involvement with formal and informal groups such as churches, business organizations, professional organizations, schools and clubs, and your family. Each group contributes to the formation of personal values, attitudes, and beliefs. In addition, the norms of these social units and the roles you play in them have a profound effect on your decision-making activities.

   It is important that you recognize that you may have a natural tendency to align yourself with others who think as you do – that is, others who have

[1] For a more complete and academic discussion of the psychological roadblocks to objective, goal-oriented decision-making, see Daniel Katz and Robert L. Kahn, The Social Psychology of Organizations, (New York: John Wiley and Sons, 1966), pp. 284-290. Our discussion of the roadblocks is based on fed Luthans, Organizational Behavior, (New York: Harcourt, Brace and Jovanovich, 1973), pp. 203 – 204

similar values, attitudes and beliefs. This roadblock can lead to non objective decision-making, especially if you project your views, attitudes and beliefs onto others who, because of membership in different social units, have different perspectives. Remember that individuals with different backgrounds and experiences will perceive and act differently than you, in a given situation.

2. **Stereotyping Hinders Analyzing.** Along the same line of thought, don't assume that you know how an individual will act merely because he or she belongs to a particular group. In other words, do not stereotype persons because of group membership. Stereotyping is an example of the management danger of over-simplification. Oversimplification results in easier and more convenient decision-making. But by and large, this is a short-term benefit which may cause unfortunate long-term problems.

3. **Absolutes Often Hide the Truth.** Another form of oversimplification is the tendency to regard situations, things, people or events as good or bad, black or white, right or wrong. This superficial categorizing of people and issues allows you to "shelve" the problem and move on, but it is inaccurate most of the time. Decisions based on such oversimplification are usually "poor" decisions because they lack analytical rigor. Most decisions are made in "gray" areas, not black and white. The world isn't that simple-your decisions should be simple either.

4. **Responding to the Obvious Can Be Naïve.** Do not grab on to the obvious point in a situation and assume that you have identified the problem. You need more than a firm grasp of the obvious to successfully analyze cases. Rarely is the obvious problem the problem. In most instances, what appears to be a problem is really a symptom of some underlying deficiency – that is the cause. Take steps to ensure that what you have identified is the problem and not just a symptom. Trace symptoms back to their underlying cause and develop solutions that treat the cause. The key here is to continually ask yourself questions. The better your answers, the better the next question should be.

These psychological roadblocks interfere with objective, goal-oriented decision-making. Try to keep them in mind and fight these tendencies when thinking about a case. Until you have familiarized yourself with these roadblocks referred to them when an important decision must be made. Unless you can keep them in mind and avoid their impact on your decision-making thought process, objective choices are not likely to be made.

Participatory Innovation Development: A Training of Facilitators' Course
An undertaking of the ProInnova Programme
International Institute of Rural Reconstruction, Y.C. James Yen Center, Silang, Cavite, Philippines
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INTRODUCTORY SESSION
Hand-out

What is PROLINNOVA?

PROmoting **L**ocal **INNOVA**tion
in ecologically-oriented agriculture and natural resource management

PROLINNOVA is an NGO-led initiative to build a global learning network on promoting local innovation in ecologically-oriented agriculture and natural resource management (EA/NRM). The focus is on recognising the dynamics of indigenous knowledge and learning how to strengthen the capacities of family farmers to adjust to changing conditions: to develop and adapt their own site-appropriate systems and institutions of resource management in order to gain food security, sustain their livelihoods and safeguard the environment.

With support from IFAD (International Fund for Agricultural Development), multi-stakeholder platforms in three countries have designed their own PROLINNOVA programmes, co-ordinated by the following NGOs:

- **Ethiopia:** AgriService Ethiopia (ASE), Addis Ababa; contact person Amanuel Assefa (ase@telecom.net.et)
- **Ghana:** Ecumenical Association for Sustainable Agriculture and Rural Development (ECASARD), Accra; contact person King-David Amoah (ecasard@africaonline.com.gh)
- **Uganda:** Environmental Alert, Kampala; contact person Fred Kafeero (envalert@imul.com).

Several NGOs in other countries are spearheading similar initiatives. The Netherlands Government supports the building of partnerships to promote local innovation in Cambodia, Ethiopia, Ghana, Nepal, Niger, South Africa, Sudan, Tanzania and Uganda, with a focus on combating land degradation.

PROLINNOVA in a nutshell

PROLINNOVA builds on and scales up good practices – many pioneered by NGOs – in participatory research and development (R&D) focused on promoting local innovation:

- discovering what farmers are doing in their own informal experimentation and how they develop and test new ideas to make better use of natural resources
- supporting these initiatives through joint experimentation with farmers in a process of participatory innovation development, integrating internal and external knowledge
- increasing farmers' influence on R&D by giving them the central role in planning and implementation, leading to their involvement in governance

PROLINNOVA seeks to:

- demonstrate the effectiveness of user-led innovation for sustainable development
- build strong farmer-extension-researcher partnerships
- increase capacities of farmers, researchers, extensionists and policymakers in participatory approaches, and of trainers who can continue facilitating the process
- integrate participatory approaches to farmer-led innovation and experimentation into institutions of agricultural research, extension and education
- pilot decentralised funding mechanisms to promote local innovation·stimulate national and regional policy dialogue to favour local innovation
- establish a global platform for reflection, analysis and learning about promoting local innovation.

Participatory design of PROLINNOVA

The PROLINNOVA Global Partnership Programme is being built from the ground up. At country level, inventories of stakeholder collaboration in identifying indigenous innovation and promoting farmer-led experimentation are being made, indicating what has been achieved and what needs to be done to scale up these approaches. In each country, stakeholders have designed PROLINNOVA programmes tailored to their specific situation, based on their own analysis. Planners of the country programmes share and learn from each other's experiences, define common needs, and plan and implement international activities. In each country, the coordinating units are NGOs, guided by steering groups that include representatives from NGOs, development projects and institutions of research, extension and education. International research institutes are linked with the national programmes.

Linking decentralised activities

The programme is set up in a very decentralised way. Most activities are implemented through national sub-programmes, which may be defined semi-autonomously and funded directly from different sources. Through PROLINNOVA , these sub-programmes are being linked, using mechanisms for sharing and mutual learning such as interactive databases, electronic conferences, workshops and publications. A small unit "animates" the network, facilitates exchange, systematises information, and stimulates formulation of national and international PROLINNOVA activities / programmes. Apart from helping to launch new programmes to promote farmer innovation in various countries and regions, PROLINNOVA seeks collaboration with existing programmes working along these lines and encourages their active involvement in the network. The experiences that have already been made offer valuable examples for others interested in this approach, and serve as sources of inspiration and learning. Moreover, these often isolated initiatives can learn much from each other and can join forces in lobbying for institutional and policy change in mainstream research, extension and education.

Farmer-led research and development

As PROLINNOVA aims to encourage and support innovation by farmers and rural communities, farmer organisations must play a central role in local planning and implementation of activities. The ultimate influence of farmers will be expressed through governance of funds. PROLINNOVA will therefore develop mechanisms for partnership in decision-making about the use of R&D funds.

Main thrusts of the programme

Specific activities are being planned during the current inception phase but, in general terms, the PROLINNOVA programme includes the following components:

1. Identifying and documenting local innovations and innovation processes related to agro-ecological techniques at field/farm level and to institutions for collective management of natural resources at landscape level
2. Establishing farmer-extensionist-scientist partnerships to further develop local innovations, to encourage other farmers to experiment with them and to scale up processes of farmer innovation
3. Creating awareness and training researchers, development administrators, policymakers, extensionists and farmer promoters in these participatory approaches and methods
4. Incorporating PROLINNOVA approaches into major research, extension and education programmes, supported by mechanisms that give farmers greater influence over these programmes
5. Mutual learning by jointly analysing

    - the R&D approaches and methods used in PROLINNOVA;
    - the educational approaches, tools and curricula for PROLINNOVA and,
    - case studies on policy and institutional conditions conducive to PROLINNOVA

6. Building up regional and global R&D networks (multi-stakeholder learning groups) on promoting local innovation in EA/NRM in similar agro-ecological zones or on similar types of techniques or institutions. As much as possible, PROLINNOVA will make use of existing channels for communication and publication. Links will be made with existing websites and databases for documenting methods, approaches and processes of promoting farmer innovation.

How the programme developed

In December 1999, people from several organisations engaged in rural development in North and South met in Rambouillet near Paris and drew up a concept for global "Knowledge Management for Local Innovation" consisting of three initiatives:

- PROLINNOVA, to make participatory innovation development more widespread in agricultural R&D
- InterDev, to develop an internet-based system for sharing local innovations, initiatives and practice-proven EA/NRM techniques; and
- PolicyNet, to address policy and institutional issues related to local innovation processes, by way of research and information dissemination.

The concept paper by the Rambouillet Group "New mechanisms for strengthening partnerships in research and development of EA/NRM" was presented and discussed during the GFAR conference in Dresden, Germany, in May 2000. An issue of the ILEIA Newsletter (now called the LEISA Magazine) focused on "Grassroots Innovation" (July 2000, in English, French and Spanish) included an article on PROLINNOVA and accounts of several related experiences. Responses to this concept paper and article – mainly expressions of interest by NGOs and field-based projects in the South – came to ETC Ecoculture, and communication was to find out more about the current activities and comparative strengths of these groups.

A strategy planning meeting of NGO stakeholders in PROLINNOVA, InterDev and PolicyNet was hosted by the GFAR in Rome in April 2001. InterDev and now also a sister programme, InterSard are being developed by organisations primarily in Africa and Asia that are experienced in

information and communication technology, while PROLINNOVA is being developed by organisations involved in supporting agricultural development building on local innovation. PolicyNet is being incorporated through linkages with organisations involved in action-oriented policy research and dialogue.

A PROLINNOVA inception phase was proposed to allow for involvement of a wider group of organisations and to develop a detailed operational plan for PROLINNOVA that has been defined and is fully supported by numerous partners in various parts of the world. In a growing number of countries and regions, the programme is building on local partnerships for developing and implementing PROLINNOVA activities. These partnerships, which vary in composition and dynamics, include innovative and interested farmers/communities, national or local NGOs and community-based/farmer organisations, international development-support NGOs, national agricultural research and extension agencies, regional networks, and international research centres dealing with agro-ecosystems and related policy research.

For the start-up phase, the Rambouillet Group asked ETC Ecoculture to serve as a catalyst: bringing potential partners together, helping them define programmes and activities, and exploring and testing the networking mechanisms. The small facilitating unit at ETC will be guided by a Programme Coordination Group to be set up at the international workshop to define the GPP. The workshop participants will define the mandate of the facilitating unit during the further development of the PROLINNOVA programme.

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Past achievements and events

International Workshop to design a Global Partnership Programme

The PROLINNOVA Global Partnership Programme (GPP) is being built from the bottom up on the initiative of NGOs involved in agricultural research and development (R&D). With support from IFAD (International Fund for Agricultural Development), NGOs in Ethiopia, Ghana and Uganda are facilitating the participatory design of their own PROLINNOVA programmes. NGOs in several other countries have prepared proposals to launch a similar process. In March 2004, the planners of the national-level programmes will gather at a workshop in Ethiopia to design an international programme to strengthen their local activities.

Netherlands contributes to expansion of PROLINNOVA

As of January 2004, DGIS (Netherlands International Cooperation) is contributing to the building up of multi-stakeholder partnerships to promote local innovation also in Cambodia, Nepal, Niger, South Africa, Sudan and Tanzania, with a focus on combating land degradation. Over a period of four years, this will help PROLINNOVA function as an international network convened by civil-society organisations seeking to institutionalise participatory approaches towards environmentally sound use of natural resources.

PROFIEET profiled at the GFAR meeting in Nairobi

Amanuel Assefa from AgriService Ethiopia (ASE), the NGO that is coordinating PROFIEET (PROmoting Farmer Innovation and Experimentation in EThiopia), addressed the GFAR (Global Forum on Agricultural Research) in Nairobi, Kenya, in October 2004. He described the process of reviewing Ethiopian experiences in Farmer Participatory Research and Participatory Technology Development at the national PROFIEET workshop, held in Debre Zeit, Ethiopia, in August 2003, and the action plan that was developed at the workshop. He stressed the importance of the international learning platform PROLINNOVA for the work of PROFIEET, and announced the news of Netherlands support to PROLINNOVA. His paper and Powerpoint presentation are also on the GFAR website (www.egfar.org).

National PROLINNOVA programmes designed at African workshops

With IFAD support, multi-stakeholder steering groups coordinated by local NGOs in Ethiopia, Ghana and Uganda held national-level workshops to analyse their own experiences in promoting local innovation and experimentation through participatory research and extension. Action plans drawn up during the workshops are now being formulated at national proposals for PROLINNOVA programmes.

PROLINNOVA experiences can be shared through InterSard

NGO partners in India, Philippines, UK and Netherlands, with ETC as focal point, have established InterSard-ASIA to manage information on community development and sustainable NRM. This EU-supported web-based network plans to expand to Africa and Latin America and will be an important channel for sharing PROLINNOVA experiences.

PROLINNOVA at the GFAR conference in Dakar

At the Second Triennial Conference of the Global Forum on Agricultural Research (GFAR) on 22–24 May 2003 in Dakar, Senegal, PROLINNOVA was presented both as a poster and as a PowerPoint paper by Monica Kapiriri during the session on "Rural Knowledge Systems and Innovation Processes". Monica was formerly with Environmental Alert in Uganda and is now with the Aga Khan Foundation based in Tanzania and is the spokesperson for NGOs in the GFAR Steering Committee. Already when she was a member of the NGO Committee (NGOC) of the Consultative Group on International Agricultural Research (CGIAR) in 2000–2002, she was involved in developing the concept for PROLINNOVA. Environmental Alert is now the NGO in Uganda that is facilitating the multi-stakeholder process of designing a PROLINNOVA programme in that country.

New book! "Advancing Participatory Technology Development"

Participatory approaches to research and extension have received increasing attention in recent years, but their application has been mainly confined to specific projects outside of or on the margins of the large formal institutions meant to serve agricultural development. The challenge now is to integrate these approaches into the day-to-day operations of such institutions. In different parts of the world, pioneering efforts are being made to address this challenge. Some cases were documented and analysed in an international comparative study that culminated in a workshop in late 2001 on "Advancing Participatory Technology Development (PTD)" in the Philippines. In 2002, IIRR and ETC Ecoculture published a synthesis of the study-cum-workshop output, together with abstracts of the cases, in the booklet "Participatory Technology Development in agricultural improvement: challenges for institutional integration". Now, a larger book has been compiled with edited versions of selected case studies that describe attempts to integrate PTD approaches into institutions of agricultural research, extension and education.

Participatory development of the donkey-drawn plough in Western Sudan

Mohammed Majzoub Fidiel[1]

Photo by: Annie Bungeroth, ITDG.

Women being trained in using the donkey-drawn plough.

This case study documents the process of developing animal-drawn ploughs in North Darfur, Western Sudan. It also reflects on how this process led to strengthening farmers' and blacksmiths' capacities to engage in Participatory Technology Development (PTD) and attracted the interest of formal institutions of agricultural extension and training in this approach to technology development. The process involved looking into previous experiences in the surrounding geographical areas and as far as the United Kingdom, and drawing on the valuable inputs of local blacksmiths (who made the ploughs), project engineers and the farmers themselves, the end users of the product. Lessons are drawn from the experience made in institutionalising both the technology and the process of developing it.

Introduction

The work on animal-drawn ploughs started in the Kebkabiya area in 1988/89 under the Oxfam-supported Kebkabiya Smallholders Project (KSP), and was later extended by the Intermediate Technology Development Group (ITDG) into two more areas, Jebel Si and Dar Elsalam, under the project Linking Indigenous Knowledge Support (LINKS). In 1998, a further extension of LINKS started under the name Darfur Livelihood Integrated Project (DARLIVE), and the Azagarfa and Kutum areas were added on.

Context

Geography and climate

The Greater Darfur Region, with a population of 3.5 million people, is divided into three states: North, West and South Darfur. North Darfur lies in the Sahel zone on the southern edge of the Sahara desert and has a population of about 1.4 million, with 70% or around 159,000 families living in poverty. Forty percent of these families are vulnerable to disasters such as drought, loss of animals etc; the other 60% are constantly threatened by food insecurity. The area is characterised by extreme remoteness, poor communications, minimal infrastructure and poor public services.

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Kebkabiya is one of the four provinces in North Darfur. Provinces are divided into local councils and village councils. Each village council is formed of 2-7 villages. Kebkabiya Rural Council is situated in the southwest of the State and experiences nine arid months a year; annual rainfall is 350-400 mm and highly variable. The area has been hard hit by successive droughts since the early 1980s, resulting in long-term deterioration of the people's livelihood base, reflected in a severe decline in crop production, mass death of livestock, reduced range productivity and widespread ecological degradation.

Kebkabiya's dominant soil type is the hard-surface sandy loam locally called *nagaa* or *gardud*. Many families in the area own wadi land with seasonal water flow, which is more fertile but limited in area than the other land types. Jebel Si has a mountainous topography and *Gardud* or *wadi* land is very limited. In Dar Elsalam, soils are predominantly sandy (*goz*) and sandy loam (*gardud*) crossed by few seasonal streams where alluvial soil dominates.

The farming system and local economy

Access to land and size of holdings. Land for cultivation is the basic resource of the households. The farm unit is based on a nuclear family or families including married sons who, after three years of marriage, form their own household. Women head 25-40% of the 5000 households in the area. Tenure types include communal or tribal land, family- or clan-owned land, village-owned land and individually owned land. Access to land is easily gained through inheritance, sharecropping or borrowing from relatives or friends for 1-2 years. Land is not rented or sold in the area. Ninety percent of the women in the area own fields and have land titles. The main constraint to the amount of land cultivated is labour availability, and in terms of cultivated area, the most successful households are the larger polygamous ones. Each family owns several plots, each plot ranging from 2 to 4 *makhammas*. The average size of holding varies between 2 and 10 *makhammas*. (1 *makhamma* is 0.74 ha.)

Cropping patterns. Millet, and to a very limited extent, sesame and sorghum are grown on sandy and sandy loam soils. Millet is the main staple food, grown mainly for home consumption, and covers 80% of the area cultivated annually. Tomato, okra, chickpea, cowpea and groundnut are grown both for consumption and cash on *wadi* land. Some farmers have started to grow tomato, okra and groundnut on the *gardud* soil on terraces. The main tools used for cultivation are hand hoes.

Local economy. The economy is based on rainfed subsistence farming. The better-off farmers normally practise dry-season small-scale irrigation on alluvial soils of wadi land where the water table is high. Goats and sheep are raised as a means of saving and investment; donkeys are used mainly for transportation and only recently as draught animals. Off-farm activities include collection of grass fodder, building materials, firewood and wild fruits; charcoal making; petty trading and handicrafts. Opportunities for non-farm income are limited to seasonal or semi-permanent migration of men to mechanised-farming areas, urban centres in central Sudan and abroad to Libya. Remittances from migrant relatives are the primary source of non-farm income.

Main constraints to farming. Farmers in North Darfur face three main constraints: poor availability of seed, inadequate labour and lack of extension services.

- *Seeds*. Traditionally farmers used to preserve their seed requirement from the previous harvest. Seed depletion has taken place due to repeated crop failures. Pest attacks after planting is another constraint. When this happens, farmers need to plant more than once. Without emergency seed reserves, they have to borrow or buy seed at high prices to avoid losing the season. Moreover, re-sowing demands additional labour inputs.
- *Labour*. For poor farmers, family members are the main source of agricultural labour for land preparation, planting, weeding and harvesting. More affluent farmers with larger holdings depend on wage labour in peak periods. Hiring out labour is an important source of cash for most poor households. Farmers sometimes sacrifice part of family labour needed at critical times to secure off-farm cash earnings. A coping strategy practised by farmers to fill in the labour gap is polygamy. New wives, their sons and daughters are potential sources of family labour.
- *Extension services*. The entire state has a small extension core staff stationed in the capital El Fashir with no transport or other resources to extend their services to the farmers. Communication is extremely poor. Farmers are unable to obtain accurate information about a host of farming and marketing activities ranging from the use of seed dressing to the current crop prices at the nearest urban market. They depend on their own links in gathering news and information from visiting neighbouring villages or periodical markets.

The Kebkabiya Smallholders Project

After the major drought and famine in 1984/85, Oxfam started a seed distribution programme to help people, mainly small subsistence farmers, secure their food requirements in the 1985/86 season. Through continuous dialogue with farmers, the agency became aware of the many constraints in seedbed preparation, planting and weeding. Most of the poor farmers cultivated sloping land with hard-surface sandy loam soil that restricted water infiltration and led to runoff. Under such conditions, cultivation with the traditional hand hoe is difficult and time-consuming, particularly for women who perform 75% of the cultivation operations.

Although the average household sows 2-4 *makhammas* of millet, it manages to weed only 2 *makhammas*. The maximum period available for timely weeding is three weeks. The average production per *makhammas* is about 3 sacks. This means that the average household produces only 6 sacks of millet from 2 *makhammas*, half the average annual requirement per family (12 sacks).

The arduous tasks in farming coupled with other household tasks exert mental and physical pressures on women, adversely affecting their health. Time-consuming farming operations prevent other family members from working for better-off farmers after cultivating their own fields and from non-farm income-generation opportunities.

The Kebkabiya Smallholders Project (KSP) started in 1986 with the goals of increasing food security, increasing local control over available resources, and empowering the most disadvantaged social groups, especially women. The operation of a seed-bank

facility to secure sustainable supply of seed, pest control, extension and widespread introduction of animal traction were the designated interventions. Animal traction was regarded central for realising the three goals. The plough was a clear option, especially because some of the farmers had seen the benefits of the camel plough used by affluent farmers in adjacent areas.

The technology development process

The history of animal traction in the area

In the 1960s, nomadic camel traders brought a buffalo mouldboard plough from Egypt to Greater Darfur. In the 1970s, traditional Darfur blacksmiths modified the plough to suit the camel. The plough was used in rainfed plots but only by the few farmers who could afford to rent or buy it. In the mid 1980s, a steep rise in the value of camels led to an upsurge in camel theft. The use of camels became less popular, and the focus shifted to donkeys.

The role of development projects. The Jabal Marra Rural Development Project (JMRDP), which had been involved since 1971 in the Jabal Marra area, had adapted the design of the traditional mouldboard camel plough to suit the loamy clay soils of South Darfur, using the donkey for draught power. Also the Western Savannah Development Corporation (WSDC), which operated from 1974 to 1994 in Darfur, had done research in animal traction and developed the donkey-drawn seeder/weeder.

Oxfam's role. Oxfam's early work in Kebkabiya built on these experiences. Implements designed on the basis of those used by JMRDP and WSDC were tested in Kebkabiya in 1986 and 1987 and proved unsuccessful. Later a mouldboard donkey plough was brought over from Britain. Oxfam contacted a blacksmith in Nyala to train seven Zaghawa (a large, socially marginalised ethnic group occupying a vast area in North Darfur) blacksmiths from Kebkabiya area to make the plough. The aim was to transfer knowledge and skills in animal-traction technology to the village blacksmiths in order to empower them.

For experimenting with the mouldboard ploughs, Oxfam established four demonstration farms in four villages in the Kebkabiya area on land allocated by the village councils. However, very limited success was achieved with this plough. Oxfam and the pioneer farmers concluded that it was too heavy for the donkey and did not speed up cultivation significantly. Nevertheless, farmers saw it as a step forward. By mid 1988, it became clear that Oxfam had limited experience with animal-drawn implements. For this reason, ITDG was contracted to provide technical support in identifying, testing and developing a suitable donkey implement for ploughing.

ITDG's involvement. ITDG was involved in the activity from mid-1988 until 1990 and then again from 1992 to date. One staff member from Oxfam and another from the Regional Ministry of Agriculture (MoA) joined ITDG for this project. The specific tasks of ITDG were to:

- develop a donkey plough suitable for the poor farming communities;
- develop a training package to ensure that farmers gain the necessary skills and knowledge to make effective use of animal-drawn implements;
- follow a PTD approach in developing, disseminating, institutionalising and assessing the wider impact of the technology in the least possible time.

This third objective was to be achieved by getting the participation of farmers to ensure that the innovation met their needs and working with and training local blacksmiths so that they could produce the implements without external support. The blacksmiths were regarded as the only option to ensure local manufacturing and maintenance of the ploughs, an element that was key for the sustainability of the technology.

The process of participatory plough development

The approach

ITDG adopted the following approach in the process of designing and developing the animal-drawn implements:

- understand better the prevailing situation (through technical and socio-economic surveys) and work with the local stakeholders to strengthen their skills and organisations;
- regard technology development as a process and not a time-oriented task;
- offer the farmers several technology options.

From the beginning, the ITDG team was aware of the great restrictions in terms of implement design. Effectively, the need was to identify implements that were:

- affordable to the majority of farmers;
- suitable for cultivating the specific soil types under consideration;
- suitable for the operations that farmers found excessively hard;
- suited to the draught power available;
- capable of being manufactured using locally-available skills and materials.

Designing and developing the ard chisel plough

To reduce the need for large quantities of scarce steel, a wooden-frame implement was thought to be most suitable. In December 1988, ITDG hired a consultant engineer to develop and test some basic ideas for a simple wooden-framed implement based on a Middle Eastern ard (an ancient tool dating back to the earliest days of settled farming), and its Ethiopian version, the *maresha*. This work was done in England at the University of East Anglia's Rural Technology Unit. Two promising tine designs - one a scaled-down version of an Ethiopian *maresha*, the other a simple chisel plough with sweeps - were taken back to Sudan for blacksmiths in the Kebkabiya area to copy. A further brief evaluation of these in Kebkabiya demonstrated the suitability of the tine with sweeps, and no further work was carried out with the *maresha*.

The next stage involved working with blacksmiths in Kerikir village, near Kebkabiya. Some modification to the tine was necessary, as the blacksmiths found it difficult to

copy exactly the design of the English blacksmith. By now, the Zaghawa blacksmiths in Kerikir were far more interested in the work than they had been initially and developed their own solution to the fabrication problem. The blacksmiths came up with ideas of their own, and the job of project staff shifted from showing them designs to maintaining steady progress in the work. It was a clear step towards local institutionalisation of the PTD approach when the blacksmiths themselves began testing their modifications and products in the field near the village. By the end of March 1990, 20 ards had been manufactured for distribution to farmers for use in the 1990 cultivation season.

Designing and developing the mouldboard (the Kebkabiya plough)

The mouldboard plough is not a particularly suitable implement for a low rainfall area such as Kebkabiya. It inverts the soil so that soil moisture is lost to a greater degree than when some form of chisel plough is used. A further disadvantage of the mouldboard plough is that it has a higher draught requirement than, for example, a simple tined implement. In addition, the mouldboard requires a higher quantity of steel, which is always in short supply in the Darfur area.

Despite these disadvantages, development of a more suitable mouldboard version was continued due to other considerations. Firstly, the farmers and blacksmiths needed several alternatives to experiment with, so that they could choose the most appropriate technology option. In the early stages of introducing a new technology, experimenting with several alternatives can lead to good and quick results. Secondly, it was clear that the training of blacksmiths in manufacturing the ard would take some time. It was doubtful if large numbers of ards would be ready in time for the forthcoming wet season.

Experimentation in the 1987 wet season with the latest mouldboard version proved that the plough performed poorly. Farmers observed that the plough was too heavy for the donkey, it was not steady and stable on the ground (it jumped out of its path), the mainframe was weak and bent during operation, and ploughing was slow. Work continued to correct the above-mentioned defects to develop a mouldboard plough that suited the local conditions, met farmers' requirements and could be manufactured by village blacksmiths. By early 1989, the mouldboard plough had been improved.

The two Zaghawa blacksmiths based in Kerikir village near Kebkabiya town were responsive to the idea of working with the plough. The blacksmiths in Kebkabiya were more interested in making gates, windows and hand tools for the town dwellers. Although the Zaghawa blacksmiths were skilled artisans, the process of developing a suitable mouldboard design took some time. The design had to be modified several times to avoid welded joints but also to use the steel section that was available in Darfur at the time.

At this stage, it became clear that the Zaghawa blacksmiths in Kerikir, being few in number and busy making the ard, would not be able to manufacture a large quantity of ploughs before the wet season. The project then commissioned the Nyala blacksmith to mass-produce 100 ploughs. However, these ploughs resembled more the JMRDP plough than the plough developed locally by the project together with the blacksmiths and farmers. This experience confirmed that future plough manufacture would be far more satisfactory if local blacksmiths could do it.

Developing a suitable harness

The leather harness used by the project in its demonstration plots was considered unsuitable as it had to be made to measure, and was too expensive, even if made locally. Therefore several simple harnesses were investigated. The project team considered that a breast-band harness would be the best bet, as this style suits equines (e.g. donkeys), which - unlike bovines (e.g. oxen) - can pull from the chest. A breast-band harness is easier to make than a collar, and it is fairly simple to ensure a good fit on the animal. Nylon webbing was used to make the harness as it was cheap, freely available and did not cause damage to the animal's skin by chaffing. A double layer, stitched along the edges and stuffed with cotton, rags or straw, crosses the donkey's chest. This is attached to single straps across the donkey's shoulder to keep the harness in place. The traces to the implement are tied to each end of the strip around the chest. This harness works well, is easy to adjust and is now being promoted among farmers using donkey ploughs.

Training of village extension agents

The project and its partner Oxfam realised the need for extension services and offered to build up a participatory extension system. The village development committees (VDCs) nominated some of their members, who were then trained as village extension agents (VEA) to deliver advice and services. The VDCs initially started as informal groups of active community members. The project then helped them to register as legal community-based organisations (CBOs).

Distribution of ploughs and training of farmers

By the end of March 1990, there were enough ploughs in stock (two mouldboard designs and the ard) to concentrate on distribution and farmers' training and testing.

Distribution of ploughs

Distribution was made through the Kebkabiya Smallholders Charitable Society (KSCS). The society started in 1986 as a semiformal project management committee to link the Oxfam project team and the beneficiaries at the grassroots. Centre committees were established at village-council level, primarily to help deliver inputs and services, to facilitate implementation of other project activities and to take over implementation in the future. It was registered as a charitable society in 1990.

Based on the results of the 1989-90 socio-economic survey and in keeping with its philosophy that dissuades outside assistance or subsidies, the project offered the mouldboard plough to farmers at a fixed price of Ls 450 ($US 22.50). It was expected that the first ploughs would be bought by those most able to bear the financial risk involved and that, if proven successful, other farmers would follow in subsequent seasons. The project also had a strategy for providing the less affluent households with ploughs at a later stage. A different approach was proposed for the ard. As this was an untried

technology, it would be offered to interested farmers on a sale or return basis. This would permit farmers to try them out without having to take the financial risk.

The project area was divided into 16 centres covering a total of 65 villages. Centre committees in the 13 centres with suitable soils for animal traction were asked to select farmers who would buy the 173 ploughs on sale. Twenty ards were distributed on a sale or return basis.

Giving equal access to women farmers was not as easy as anticipated as many female-headed households are among the least affluent in the community. In addition, many women expressed doubts in their ability to manage ploughs. There was however an instance where the women's committee pooled resources to purchase a plough that could be shared. Later it was revealed that the ploughs obtained by male family members were also used by women (sister or wife) to cultivate their plots.

Training of farmers

Distribution and training started in March 1990. Training was conducted with the cooperation of the project's extension officers and VEAs. In each village, training started with plough distribution and continued for two days, covering the following aspects:

- the three types of ploughs, their different parts and characteristics;
- how to train the donkey to pull the plough;
- making the harness and the most appropriate material to use;
- donkey feeding;
- how to attach the plough to the donkey and then to operate it.

Farmers' responses

The farmers were not satisfied at all with the ard plough. The responses and comments of both men and women were much the same: the ard was difficult to adjust, and the ridges formed were very small and washed out with the first showers. Accordingly, the ard chisel plough was rejected already in the first season of testing.

With regard to the mouldboard, the six farmers who were interviewed responded positively. The main benefits identified were improved infiltration of rainfall as the plough broke the soil's surface crust, and the large size of the ridges, which resisted washing out by runoff, thus preserving more water. Some farmers mentioned that the ploughing made subsequent weeding easier. Although the number of farmers interviewed was small, the positive responses were quite encouraging. Farmers' experiences are the most valuable and informative means of evaluating the performance of the various designs in the field, as they use the implements under realistic conditions that cannot be exactly replicated in the trials done by project staff.

Despite the positive responses, farmers mentioned the followed drawbacks of the mouldboard plough:

- heavy for the donkey;
- mouldboard and plough frame bend during operation;
- defects in manufacture and finishing of the ploughs (mass-produced by Nyala blacksmith).

Nevertheless, the farmers continued to use the plough because of the benefits realised in terms of productivity and increased area of cultivation.

Dissemination of the plough in the project area

By November 1991, farmers had more complaints about the drawbacks of the mouldboard plough in terms of its heavy weight, poor finish and the quality of steel. ITDG therefore became involved again as of January 1992. From this time onwards, the work was focused on disseminating the plough technology by:

- training more village blacksmiths;
- improving the quality of ploughs produced through training;
- ensuring more reliable supplies of steel;
- institutional capacity building.

In February 1992, training of local blacksmiths was started in Kassara village (30 km west of Kebkabiya) under the supervision of the ITDG engineer, first with the two blacksmiths who had already worked with the project. As a result of this additional training, 18 Kebkabiya ploughs were produced. ITDG supplied the raw materials. Through the training process, the blacksmiths' knowledge about plough manufacturing and operation improved. They were applying their own new ideas and considering farmers' observations to improve the plough. Car scrap springs and scrap steel sections were used for the first time.

All 18 ploughs were distributed on credit in the 1992 season through KSCS. Payment was in two instalments, 50% down payment and the balance to be paid at harvest. Project staff together with VDC members and VEAs used different methods to monitor farmers' responses, such as:

- feedback from farmers during training;
- visits by project staff to farmers in their villages immediately after cultivation;
- facilitating VDCs to organise meetings for the farmers and blacksmiths in the presence of project extension officers and agents;
- informal meetings of project staff with farmers and blacksmiths during market days.

Farmers gave very positive observations regarding overall performance of the ploughs compared to the 1990 batch manufactured in Nyala. Still, they made some negative observations about bending of the frog, which was made from light steel section, and the plough arm (handle), which was too short and required additional effort from the farmer to cultivate in a straight line.

In early 1993, the two trained blacksmiths from Kassara worked with another group of seven blacksmiths from Sigring village in overcoming the defects of the frog and handle. Heavier steel sheets were used to make the frog and the handle was lengthened. They made 70 ploughs. As before, ITDG supplied the raw materials and KSCS paid for labour and distributed the ploughs on credit. The fund accumulating from plough sales was managed by KSCS and used as seed money for a revolving fund. In this year, farmers' complaints related to finishing were very minor and blacksmiths immediately

made repairs. As of 1994, demand for ploughs started to increase. Table 1 shows the number of ploughs manufactured and distributed between 1990 and 2000 by KSCS through 13 village centres.

Table 1: Number of ploughs distributed by KSCS

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total
No.	193	109	18	70	95	260	250	55	63	101	150	1364

Source: KSCS records

Training of blacksmiths continued, using trained blacksmiths as trainers. By 2001, there were 30 trained blacksmiths in Kassara alone. The village had become a source of trainers, facilitating technology dissemination in KSP project villages and in villages covered by the LINKS project.

The number of ploughs manufactured and distributed during the lifetime of KSP was greater than the number in Table 1, as blacksmiths started to manufacture and sell ploughs on their own. The drop in number of ploughs distributed by KSCS between 1997 and 2000 was mainly due to the fact that the blacksmiths' society and its members were selling directly to farmers without KSCS support. KSCS used to contract blacksmiths as an informal group to manufacture ploughs. It provided raw materials and paid for the labour against the delivery of ploughs. In this process, a blacksmith's return to labour (i.e. net profit) was Ls 5000 per plough. As of 1998, the blacksmiths started to manufacture and sell ploughs outside of the KSCS contract, realising a net profit of Ls 17,000 per plough.

Scaling up plough dissemination

Spreading beyond Kebkabiya

Dissemination of the animal-traction technology to other areas in and beyond Kebkabiya province was continued through the LINKS project after the end of KSP. It built on the work with KSCS and disseminated more widely the technology options and experience gained. The role of ITDG was to facilitate this process. In addition to animal traction, terrace cultivation and use of contour lines were introduced as adaptations of ploughing techniques from KSP, with the aim of minimising soil erosion and increasing the moisture retention capacity.

The LINKS project was designed and implemented in the period 1996-98, and covered three areas:

1. Dar Elsalam Rural Council (about 89,000 people) in the southern and southwestern part of El Fashir Province;
2. Jebel Si Rural Council (about 11,000 people), about 100 km west of El Fashir, a hilly and very isolated area;
3. Azagarfa Village Council (about 2450 people), 40 km west of El Fashir.

Scaling up plough manufacturing and distribution

ITDG organised training in making and using ploughs in all three project areas. The number of blacksmiths trained initially by skilled blacksmiths from Kassara was 10 from Jebel Si, 10 from Azagarfa and 8 from Dar Elsalam. There are now 25 trained blacksmiths in Jebel Si, 30 in Azagrfa and at least 8 in Dar Elsalam, all manufacturing ploughs. Table 2 shows the number of ploughs manufactured and distributed in these three areas. Ploughs were distributed through farmers' or blacksmiths' societies on various credit arrangements and conditions determined by the CBOs.

Table 2: Number of ploughs distributed between 1997 and 2000

Area	1997	1998	1999	2000	Total
Jebel Si	65	63	102	102	332
Azagarfa	-	42	65	14	121
Dar Elsalam	149	20	98	152	419
Total	214	125	265	268	872

Source: LINKS evaluation report

Scaling up through networking

Out of its office in Khartoum, ITDG Sudan coordinates and networks with many institutions in a range of technology areas including food production and animal traction. ITDG has organised workshops and exhibitions in Khartoum to demonstrate its fieldwork including the work on the plough. Many NGOs showed interest in replicating the success of the plough. Recently, FAO and UNICEF negotiated the possibility of training blacksmiths in, among other things, plough manufacturing in southern Kordufan and southern Sudan. ITDG advised them to regard the PTD approach as a major determinant of success in adapting any new technology, especially to ensure that the technology development process is sustained in the rural areas.

Institutional and capacity building of CBOs

When the project began, the staff first met the community leaders and organised group meetings with them. Once the leaders were sure that the outsiders would help them, they collaborated and nominated the members of their informal committees. Later, the formation and support of CBOs became the project approach. Through time, the number of CBOs has grown to six blacksmiths societies, three societies for manufacturing and selling intermediate means of transport and 63 village committees. Many of the CBOs are actively involved in developing their communities by identifying needs, establishing links, seeking and managing funds, developing technologies, mobilising members, and running and managing necessary campaigns.

Blacksmiths Charitable Societies. In 1999 the Kassara blacksmiths formed and registered a charitable society with the main aims to supply its members with steel and to assist them in marketing. The total membership is 64 blacksmiths, of which 30 are trained in plough manufacturing. By 2001, the society's assets were worth Ls 14,000,000 in cash, raw materials or finished products (99 ploughs in stock). In addition to seed

ITDG provided training in book-keeping and management. As a result of this training, the society now maintains satisfactory records for all its financial transactions and inventories.

The Azagarfa Blacksmiths Society was registered in 1998 with 43 members, 34 of whom are trained in plough manufacturing. ITDG support was similar to that of Kassara. The society had completed the following contracts in 1998 and 1999:

- 72 ploughs manufactured for the Azagarfa Farmers Society, which were sold on credit basis to farmers in the area; 78% repayment was achieved despite the drought experienced in 2000;
- 100 ploughs and 2000 hand tools (used to build terraces) produced for Dar Elsalam Farmers Society;
- 6 donkey ploughs and 6 camel ploughs produced on request for Oxfam to be sent to Eastern Sudan for dissemination there;
- 35 ploughs manufactured and sold to individual farmers.

In 2000, the 46 blacksmiths who were trained from within and around Jebel Si formed a charitable society, which is being supported by ITDG in terms of logistics, access to raw material and management training, including book-keeping and credit management.

Blacksmiths societies in the making. In 1999, 20 blacksmiths were trained in Kutum and provided with the necessary support. Kutum Agricultural Extension Society (KAES) monitors and gives field support to the Kutum blacksmiths who received technical support from ITDG. KAES and ITDG have obtained a plot of land from the local authorities in Kutum market and built a blacksmiths' shed. The group now consists of 47 blacksmiths, who are trying to register as a charitable society.

Thirteen of the 36 blacksmiths in the Dar Elsalam area were trained through ITDG. They are spread throughout numerous villages. The project is now working to train more blacksmiths in the area and to help them form an association.

Village Development Committees. ITDG has worked in 186 villages through their VDCs. In all the villages in which ITDG works in North Darfur, it supports VDCs by, for example, building premises including seed-/tool-banks, providing the necessary tools and seeds, and giving training in management and agricultural extension. All VDCs are now capable of planning and executing the development activities of their village.

Results and impacts

The introduction of the animal-traction technology into the area has had a multitude of beneficial impacts on the farmers, blacksmiths and the environment.

Impacts on farmers

To date, over 3000 implements have been distributed to farmers. More farmers are expected to apply animal traction as the technology becomes more widespread in farming. Use of the plough has resulted in improved tillage and seedbed preparation; increased water infiltration and timeliness in land preparation, weeding and planting; reduced drudgery; and savings in labour and time. By using the plough, some farmers have cultivated and planted simultaneously. Others report that ploughing has made subsequent weeding easier. Furthermore, the introduction of rainwater harvesting combined with animal traction has helped to improve yields and to extend the growing of tomato, okra and pulses from wadi land to land with sandy loam soils.

Time and labour savings and timeliness in agricultural operations has allowed farmers to increase cropping area by 100% and to diversify crops to include, for example, groundnut, sesame and chickpea. Groundnut production, which has high labour requirements for planting and weeding, was first commenced with the use of the Kebkabiya plough. Farmers now sell the crop raw for immediate cash or extract oil from it using the service offered by owners of small presses in the area. Part of the oil is kept to meet household needs and the rest is sold, generating more cash as a result of the value added to the produce. This practice is now widespread in the area for both groundnut and sesame.

The increases in total production and crop diversity have led to increases in both food production and farmers' income. The household asset base for livelihood security has also improved in terms of savings, increased ownership of livestock and larger reserves of millet. These effects were reflected in reduced household vulnerability to droughts. In meetings held in February 2001, farmers in Shouba (Kebkabiya) and Bardi (Jebel Si) reported that, compared to the famous drought of 1984, seasonal migration in dry years dropped after the plough became widely used for cultivation and new crops were introduced. Farmers in Bardi said that most of the families stayed in the village because they had some millet reserves from the previous season. They added that diversification in crops gave them new sources of income such as dried tomato, dried okra, cooking oil and onion. Because they had additional income from selling crops and savings from producing other foods (oil, onion, cowpea, chickpea etc), they could buy millet and sorghum from the market for daily consumption and keep their own produce for bad years.

Impacts on blacksmiths

Zaghawa Blacksmiths in the area face social marginalisation and exclusion. They have their own village or a separate camp in a village; they suffer from lack of representation in local community institutions and are often subject to discrimination in allocation of resources such as land. By enhancing the recognition of blacksmiths' skills and increasing their value, the blacksmiths' market has become diversified, their social status has improved and their income has increased. Blacksmiths benefit from the animal-traction technology not only as producers of ploughs, but also as users of the implements - as they farm themselves.

Azagarfa blacksmiths estimated an average net return of Ls 300,000 per individual in the main season (June-August) in 1997, before they started making ploughs. Afterwards, the estimated average was Ls 416,000 per main season, an increase in seasonal income of 38%. Kassara blacksmiths who work on their own realise Ls 17,000 return to labour per plough.

The size of market for the plough will continue to grow, as there is high demand for it in Darfur, and will grow even further if demand is created in adjacent areas with similar climatic and soil conditions. The Azagarfa blacksmiths have developed a larger version of the mouldboard to be drawn by a camel and have already received some requests. This also reflects the creativity of the blacksmiths, a talent that was refreshed after they received recognition from the people around them.

Evidence of the social impact on the marginalised blacksmith community is starting to appear in Kassara villages. People have begun sending their children to school. In 1999, only one child from the community was in school; the number increased to six in the year 2000. Sixteen blacksmiths reported that they managed to purchase wadi lands, which is more fertile and expensive. Seventy percent of those who used to migrate during the off-season to earn some income are now settled as a result of a year-round secured income in the village.

Impacts on the environment

Access to the plough is not expected to increase the cultivated area dramatically, as this is dictated by the maximum area that a household can weed. Use of the plough in the sandy loam hard-surface soils increases water infiltration, reduces run-off and reduces soil erosion, compared with hand hoeing. Combining rainwater-harvesting techniques with ploughing has enhanced these advantages. Use of the plough encouraged farmers to shift from the fragile *goz* soil to the fertile *wadi* soil, giving the sandy soils time to recover.

Tractor use is not recommended for the local soils. It is also an expensive option. The donkey plough has limited the use of tractors for tillage, because the cost of hiring a tractor is ten times more expensive. Some farmers of Azagarfa who had been using a tractor for ploughing have not done so for two years since the introduction of the donkey plough.

Gender impacts

The introduction of the plough has had a positive impact on women. The project ensured that 40% of the ploughs went to women during the distribution. This has facilitated women's access to ploughs and supported women's autonomy within their families and communities. The use of the plough has reduced time in many farming operations in which women played major roles. For instance, time spent in land preparation has been reduced by 50-80%. Also less time is spent in weeding as, in many cases, the women use the plough itself for weeding. In cases of manual weeding, pulling grasses became easier as a result of the ridges made by the plough. As a result of time saved, women have been able to attend literacy classes.

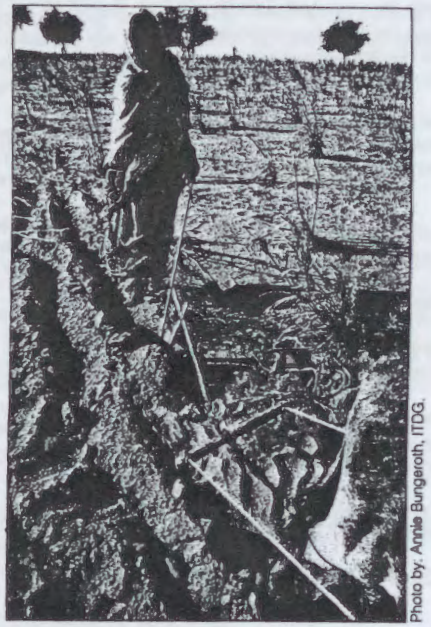

Photo by: Annie Bungeroth, ITDG.

Woman using improved plough.

As the plough reduced the need for family labour, there is a tendency to reduced polygamy. Recent findings show that men's savings are now used for acquiring houses in urban centres rather than for marrying additional wives. Local perceptions as to whether this change is good or bad differ.

Fifty percent of the members of VDCs are women as per their constitutions. The roles played by women as members of their village development societies has enhanced their social status and given them recognition within their communities and with the local authorities.

Institutionalising the technology and the PTD approach

ITDG uses the term "institutionalisation" to refer to both a technology and the approach to developing it.

Developing roles and skills to sustain the technology

Institutionalisation of a technology occurs when a demand for it is created among the users and its supply (in terms of the final product, raw materials, technical knowledge and other related services) is in equilibrium with demand.

In Kebkabiya, institutionalisation of the technology is heading towards maturity. Different institutions have participated in the process since the early stages of technology development. International NGOs (Oxfam and ITDG) provided technical expertise and financial resources, while CBOs (farmers' associations, KSCS and blacksmiths associations) provided their vocational skills, experience, experimentation and observation capacities, and feedback.

ITDG realised the importance of long-term training so that the development, production and marketing of the plough through normal marketing channels could be sustained. During the course of the project, three technicians and engineers were trained in technology development. Two of them are still involved and their knowledge has been retained in the area, as they are from the region. A total of 120 local blacksmiths were trained in plough manufacture. They work in pairs in 60 workshops in the area producing ploughs and other implements. Selected members of their associations were trained in procurement and transport of raw materials from as far as Khartoum, and other members in book-keeping and management of revolving funds. The market, without any external assistance, drives the process of dissemination and ensures sustainability of the technology.

In many villages, the project developed seed- and tool-banks. The villagers built the stores with project support. The stores were then stocked with some seeds and a variety of tools such as hoes, shovels, wheelbarrows and ploughs. Farmers can access seeds and tools by purchasing in cash, in kind or on credit, by renting and even by borrowing.

Introducing PTD within the curricula of centres of education

Involvement of universities and research institutions in the process of technology development came late, because the intervention started as a consultancy with an agreed output of a report on a technical and socio-economic survey.

In 1998 and 1999, respectively, the Faculty of Agriculture of Khartoum University and the Rural Extension Department of the Faculty of Agriculture of Sudan University developed a curriculum for "Appropriate Technology" including sections on "Animal Traction" as part of an "Agricultural Tools" course. Both approached ITDG for support in curriculum development and acquisition of necessary literature. The course is intensive and incorporates knowledge of all agricultural tools and equipment, their relevance to the physical and socio-economic environment, and methods of technology development, including the PTD approach. In 1999, the University of West Darfur approached ITDG for a cooperation programme involving, among other things, development of hardware technology, including the plough. El Fashir University came on board in 1996 after the evaluation of the project's first phase and organised a workshop to present the findings. It agreed to participate in development of hardware technology, but a restructuring of the university, which led to its split into El Fashir and Nyala Universities, brought these good intentions to an end. Later, El Fashir University signed a memorandum of understanding to work on developing technologies appropriate to the region. Financial constraints prevented full realisation of the above-mentioned agreements, but the chance still remains to pursue them.

In 1999, the Rural Development Department of Gezira University drew up a curriculum on NGOs' roles in rural development, including their methods and approaches such as participatory needs assessment, participatory monitoring and evaluation, and PTD. The main example is the Kebkabiya Society with its case of plough development.

Recently, the agricultural research station at Gezira, Central Sudan, was contacted by the project and was given an oxen mouldboard plough for testing and fabrication. The Gezira University will also be involved in this process.

Strengthening the community to sustain the process

The structures set up by the ITDG project, particularly at the level of farmers and blacksmiths, play a crucial role in sustaining the PTD process. The VDCs and their VEAs have convinced their communities to take part in the process. They have assisted in nominating farmers and allocating land for experimental and demonstration plots, and have liaised between the farmers, the project engineers and the blacksmiths throughout the process. Now they provide advice to farmers and serve as a link between the farmers and the extension head office in El Fashir. As such, a much-needed participatory extension service has been built up in the area.

Through their societies, the blacksmiths respond to the needs of the farmers communicated to them through VEAs. The capacity building provided by ITDG has helped them to become independent entrepreneurs, capable of managing the process of technology development. They also operate their own funds, keep records and monitor their business progress.

Lobbying and advocacy of the plough and the process

The government was involved since the very early stages in 1988/89, when ITDG and Oxfam approached the Darfur State MoA. The first national agricultural engineer, who still works for the project, is on secondment from the MoA. Since then, the MoA has continued to show interest in the technology and the PTD approach, including dissemination.

After the evaluation of the first animal-traction project in 1993/94, ITDG organised two workshops in El Fashir and Khartoum, where the evaluation findings were shared with other interested NGOs and institutions. The very positive results encouraged many institutions, mainly governmental, to think along the same PTD lines. The MoA very recently established a Department of Technology Development led by a professor in agricultural engineering from the research field. Last year, the State Government supported 200 poor farmers by acquiring ploughs through a Government Grant Fund. The draft strategy of the Federal MoA has incorporated an output of promoting ploughs in relevant geographical areas in the country.

Cost effectiveness of the work

In the 13 years that the project has been operational, approximately GBP 300,000 has been spent on the animal-traction work. The benefits derived include at least 3000 ploughs produced, sold and being used by farmers, many more farmers using the plough through rental agreements and nearly 120 blacksmiths in business. Also included are the economic, social and environmental aspects mentioned earlier. Assuming the 3000 ploughs as the only output, then the cost per plough is about GBP 100. If the 3000 ploughs would be regarded as the only output, the cost per plough is about GBP 100. If the above-mentioned achievements of the plough are quantified, then GBP 100 per plough is very cost-effective, without even considering its multiplier effect.

Lessons learnt

Among the important lessons learnt through the long years of involvement in developing and disseminating the plough through a PTD process are:

- The valuable support received by the Kebkabiya Smallholders Project through the training of staff and other stakeholders, and the offer of credit to the blacksmiths to produce the ploughs and to the farmers to acquire them. This support was important for the success in developing appropriate technology in a PTD process.
- A careful needs assessment is key for the success of any project, especially one involving technology development. The early surveys determined precisely what type of tool was required, what power is ubiquitously available, how much people

can afford to pay for the tool, and what channels of production, marketing and dissemination can be used.

- The farmers' and blacksmiths' CBOs proved to be essential elements in pushing the PTD process forward. Without their combined efforts, the plough would never have been developed.
- CBOs formed through natural growth from informal bodies are more successful than those started formally. This requires relaxed timeframes that do not force the pace of forming and developing groups to fit an external project framework, and should be taken into consideration in project strategies.
- Technology development is a long process that starts with needs identification and ends with a sustainable process working effectively through normal market channels.
- Manufacturers in general and blacksmiths in particular can be empowered to show their own creativity in developing the technology further.
- Institutionalisation of PTD is an important ingredient in the exit strategy of an intervention project. The project would have had even greater impact in institutionalising the PTD approach had this concern been built into the project design from the beginning, e.g. by involving government services and universities much earlier. As it is, the greatest impact has been in strengthening capacities for PTD in local-level institutions.

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Participatory Technology Development (PTD)

A case study from Nepal

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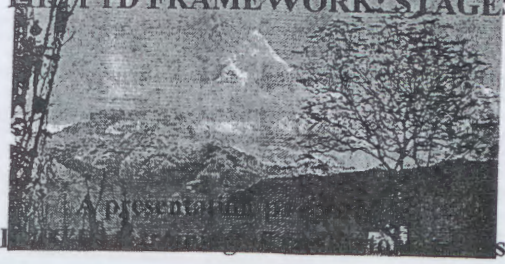
THE PTD FRAMEWORK: STAGES



Session outline

Description	This session explains the different stages of PTD and their elements. The methodolgy and approahces adopted in different stages will be shared.
Objectives	At the end of sessions, participants will be able to: • differentiate and understand the stages PTD: • relate the different methods and approaches relevant to the stages of PTD from their experiences

PTD: Steps

PVS

- Step 1: Getting started
- Step 2: Understanding the problems and opportunities — Situation Analysis
- Step 3: Looking for the things to try — Searching varieties
- Step 4: Experimentation — On-farm Experiment
- Step 5: Sharing the results
- Step 6: Sustaining the PTD process — Scaling up Process products

Step 1: Getting started

- Rapport building with farmers
- Exploration of farmer collaborators
- Gathering and analysing the secondary data
- Preparation of situation analysis
- Setting agenda with famers and building relation with local people for future collaboration

Methods and techniques for Step 1: Getting started

- •Informal visits and discussions
- •Inventorizing farmer groups and other stakeholders
- •RAAKS (Rapid Appraisal of Agriculture Knowledge Systems)

Step 2: Understanding the problem & opportunity

- Situation analysis
- Supporting farmers identifying problems and opportunities (cause and effect analysis)
- Clarification of problems and opportunities
- Discussing the context of problems and opportunities (e.g., socio-economic, agro-ecology)

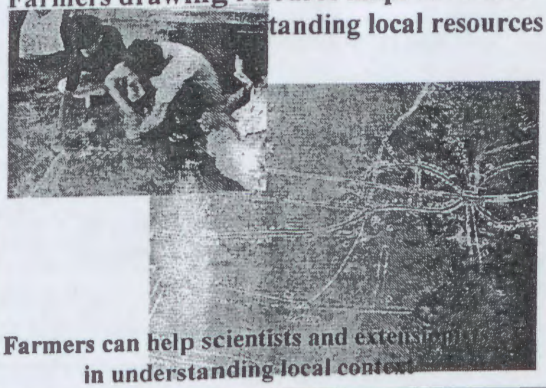
Step 2: Understanding the problem & opportunity

- Priotizing the problems and opportunities

Methods and Techniques

RRA, PRA, Focus Group Discussions, Key Informants interveiws, Secondary data analsysis, Brain storming, Need assessments, Problem tree analysis, Transect walk, Observations

Farmers drawing resource maps for understanding local resources



Farmers can help scientists and extensionists in understanding local context

Step 3: Looking for things to try

- Detail analysis of information
- Identifying the possible relevant solutions and opportunities from local knowledge, resources, and then search technologies from outsiders only
- Use farmers criteria for selecting and developing technology such as sustainable and integrated systems

Step 3: Looking for things to try

- Critical review of selected solutions for advantages and disadvantes to local conditions
- Developing an understanding of need for the experimentation with the possible options
- Setting research questions in farmers language

Methods and techniques for Step 3: Looking for things to try

Brain storming, Reviewing farmers recent innovations, Farmers selection criteria for techology, Village level workshop, Innovators/farmers workshop, Study tours, Exchange visit

Step 4: Experimentation

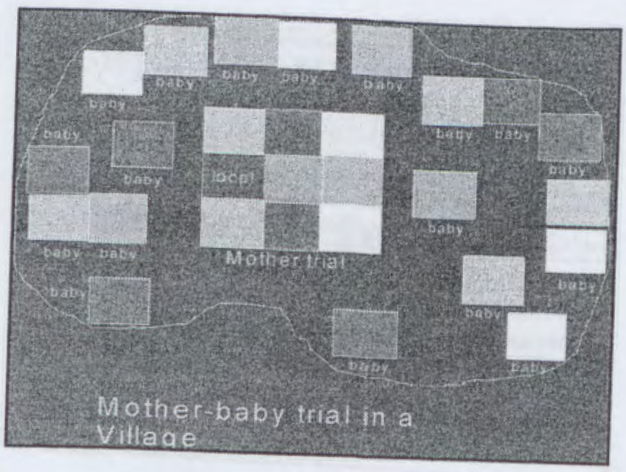
- Reviewing farmers existing experimentation
- Setting experiments under farmers managment
- Setting evaluation criteria and monitoring mechanisms/tools
- Supporting experimenter farmers if needed
- Building capacity of participating and non participating farmers on PM&E (data recording)

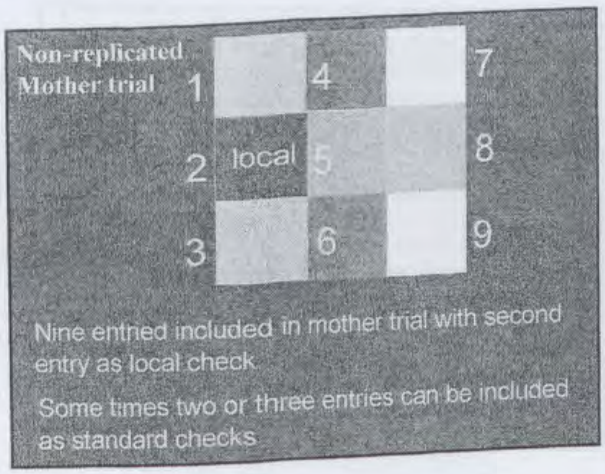
Step 4: Experimentation

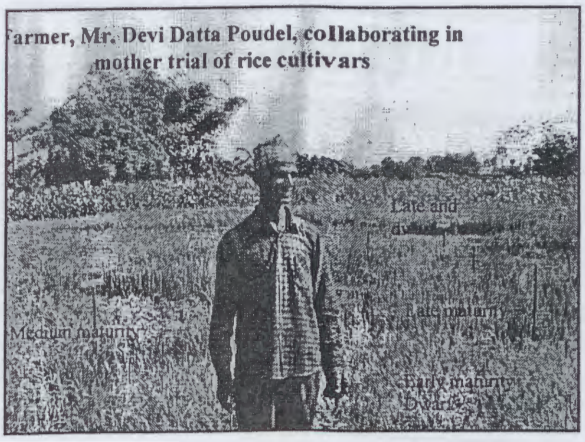
- Evaluation of results by the farmers/extensionist researchers
- Review the experience of participating and non-participating farmers on experimentation
- Post experimentation evaluations (e.g., post harvest evaluations, operation of machinary

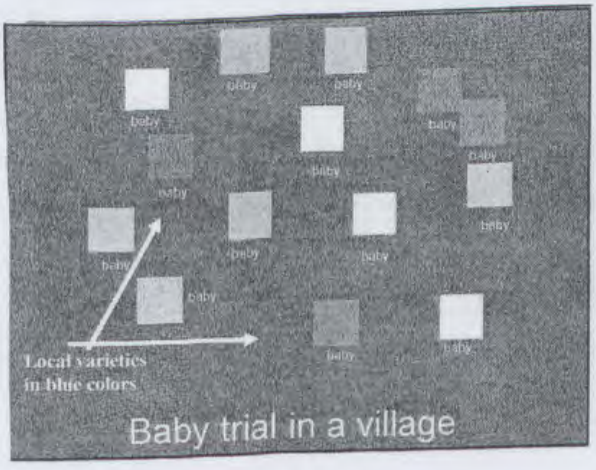
Method and technique of Step 4: Experimentation

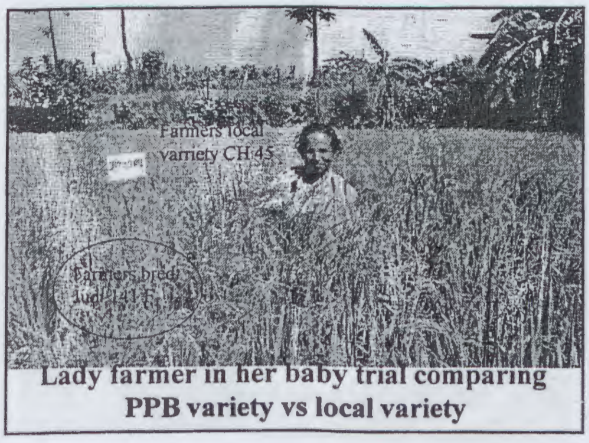
Mother-baby trials, Traveling seminars,
Key informant interviews,
Direct Observations, Farmer Field Schools,
Participatory Monitoring & Evaluation











Traveling seminar

Step 1. Traveling seminar planning with farmers
Step 2: Informing all stakeholders with detail information of experiments
Step 3: Transect walk along the trials / experiments
Step 4: On spot evaluation, brain storming of the experimentation and results
Step 5: Discussion on results and synthesis for future
Step 6: Sharing the synthesis to farmers

Step 5: Sharing the results

Sharing and learing through farmers-farmers

Dissemiantion of results (process and products)

Sharing outputs through the NGO's, GO's, and other networks

Strenghtening farmer groups linkages for dissemination of outputs

Documentation of prossess, development of audio video, use of electornic media

Method and techniques of Step 5: Sharing the results

Farmers Field Day, Diversity fair,
Use of Electronic Media (FM Radio),
Cooperatives,
Farmers Group Mobilisation
(e.g., seed producer, community forestry users)

Step 6: Sustaining PTD

Networking and linkages for PTD, PR&D

Lobbying for supportive policies

Influencing Goverment on integrating PTD appraoches

Method and techniques of Step 6: Sustaining PTD

Involving stakeholdes right from the beginning of the program/projects activities, policy makers field visits, Stakeholder Workshops, Policy briefs publications

Variety release working group: Lobbying for inlcusion of participatory data in vareity release in Nepal

Considerations

Involve stakeholdes right from the beginning of the activities – active participations

Client oriented - proceed with an open mind

Respect farmers knowledge: Nobody knows everything and everybody know something

THANK YOU FOR YOUR KIND ATTENTION

Mother and Baby Trial System - February 2003

1. The Mother and Baby trial system recognises the difficulty of obtaining reliable yield data from many, widely dispersed participatory trials, so in these trials — called baby trials — only farmers' perceptions on yield are collected. If data are collected on yield per plot (without the measurement of the plot area) then farmers' perceptions on yield are still required.

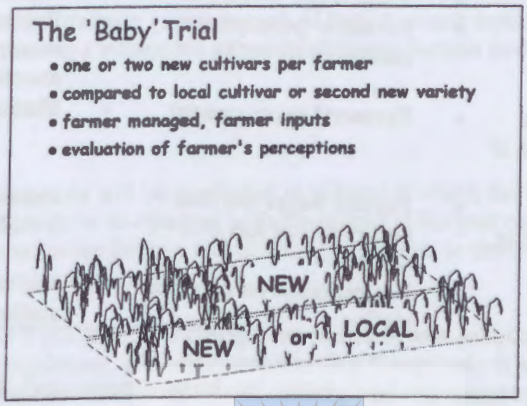


Figure 1. The Baby trial

2. Yield data are collected from Mother trials - carefully managed and monitored trials where all of the entries are compared with each other.

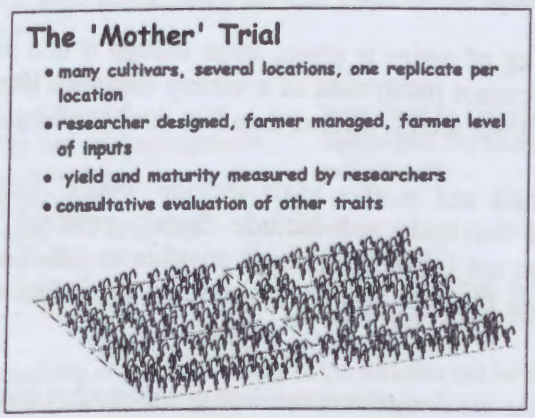


Figure 2. The Mother trial

3. The Mother and Baby trials are followed by methods of popularisation – Informal Research and Development (IRD) and seed sales and dissemination.

Stage	Trial name
Initial	Mother and Baby Trials
Adaptive (can be done simultaneously with mother and baby trials)	IRD
After recommendation by project	Seed Sales and Dissemination

Summary of differences between mother, baby and IRD trials

Mother	Baby	IRD
Obtain yield data	**Obtain perception data**	**Popularise**
• Few trials	• Many trials	• More trials than baby trials
• Researcher designed and supervised	• Simple design - farmer supervised	• No design
• All entries, single-replicate design, small plots	• One or two entries, simple design, large plots	• One entry – the identified variety
• Yield is measured	• Yield is not measured	• Yield is not measured
• Farmers' perceptions usually measured by matrix ranking	• Farmers' perceptions measured by HLQ	• Farmers' perceptions measured informally (by anecdote)
• Farmers' management BUT seed priming and, if needed, more weeding	• Farmers' management	• Farmers' management
• Farmer can be compensated for growing the trial	• Farmer bears the cost and risk (but has free seed)	• Farmer has free seed and benefit
• Repeated on research station as RCBD	• Not repeated on research station	• Not repeated on research station

4. The quantities of seed to be given in baby trials and IRD can vary but it is recommended that, in general, the following quantities be given:

5 kg per trial	1 kg per trial		0.5 kg per trial
Maize	Rice	Chickpea†	Niger
Wheat	Chickpea	Sunn hemp	Black gram
	Wheat†	Horsegram	

†When seed availability is limiting

5. The reason why 5 kg of maize is given, even though it is a large area, is that farmers complain that they cannot retain seed of a variety that they like when a smaller amount is given. However, when seed is limited then less seed can be given.

6. Research station trials and mother trials include 'check' varieties. These checks are essential entries in the trials and include farmer-preferred varieties and promising entries. Unless these are included it is not possible to tell if a test variety is better or worse than the ones that are currently promoted in formal or informal seed supply systems.

7. Detailed protocols for the design and conduct of the mother trials are described below.

Description of the mother trial

Purpose	The mother trial gives statistically analysable data on yield per hectare.
Design	Each trial consists of a single replicate of a randomised complete block design. Hence every mother trial has a separate randomisation. The plots should have a border of the local variety wherever possible. Plot size will vary with the land available but are larger than is normally used in research station trials
Number and location	There are only a few mother trials compared to the number of baby trials. As a minimum, three mother trials are grown in each of two or - much better - three villages. The three mother trials in a village are grown by different farmers in different fields.
Colour coding of entries	Not required.
Selection of farmers	The mother trials will be conducted in villages in which the project is well established. Farmers that have co-operated with the project in the past can be selected. There is no need to change the farmers and locations over years so the trials will become progressively easier to run.
Management	As farmer's practice. Two changes are possible (seed priming to obtain more uniform stand establishment, and additional weeding if required). It is important to explain to the farmer that the mother trial should not be given better management than usual.
Costs	Only for mother trials can the farmer be compensated for the use of his or her land. This is done when (a) farmer is reluctant to devote such a large area of land to the trial or (b) when the project wishes to retain the seed from the trial The estimated amount of produce that would have been obtained from the area of the trial can be paid for, as well as purchased inputs (fertilizer) but the fertilizer dose must still be as farmer's usual practice. Labour is supplied free of cost by the farmer. The seed from the mother trial belongs to the project when compensation has been given, but the fodder from the trial belongs to the farmer.
Responsibilities	*1. Layout of the trial* — project staff *2. Sowing of the trial* — supervised by project staff *3. Growing and trial management* — farmer (but see management above) *4. Trial monitoring and data collection* — project staff *5. Harvesting and threshing* — supervised by project staff *6. Plot measuring* — project staff *7. Plot weighing* — harvest weighed by project staff (whole plot harvest) to determine yield per hectare
Pre-harvest participatory evaluation	A matrix ranking of the performance of the varieties can be done by a group of interested farmers when the varieties are near to maturity.
Post-harvest participatory evaluation	Can be done if the participating farmer is allowed to retain some of the harvest. A post-harvest interview to rank the varieties is very useful, as it includes all of the traits.

The mother trial is repeated on the research station as a conventional three- or four-replicate, randomised, complete-block design (RCBD). Additional check and test varieties can be added to the trial if desired. In an overall analysis, a replicated on-station trial counts as a single location.

Description of the baby trials

Purpose

The baby trials give statistically analysable data on farmers' perceptions and acceptance of varieties.

Design

Design 1 – single test entry.
Single variety per farmer compared to local control.
Design 2 – two test entries.
Two varieties per farmer†. This method is more powerful, and colour coding helps farmers lay out the trials correctly without staff supervision at sowing time. When there are two test entries there may, or may not be, a *formal* local control. There will always be an *informal* local control (the farmer's own crop, or a neighbour's crop, grown on an adjacent or nearby field, or the farmer's recollection).

Number and location

There are many more baby trials than mother trials. To avoid confusion it is simpler not to have any farmer growing both a mother and a baby trial. As a minimum, trials should be in four villages. Each variety should be tested a minimum of a total of six times (and to get six successful trials more are initially needed). Baby trials are not repeated on the research station.

Colour coding of entries

Required. Varieties are allocated colours (e.g., red, blue, green, yellow, white) and supplied in cotton bags of that colour. The name of the variety, and the year of supply, is also written on the bag. Each bag is supplied with four short bamboo pegs of the same colour for the farmer to mark out the plot.

Selection of farmers

By group meeting of villagers and random allocation of varieties to farmers. All three wealth ranks should be included.

Management

Strictly as farmer's practice.

Costs

Farmers pay all costs. All seed and fodder belongs to the farmer. Only subsidy is that the seed is provided free of charge.

Responsibilities

1. Layout of the trial	farmer (layout is discussed in detail in the group meeting)
2. Sowing of the trial	farmer
3. Growing and trial management	farmer
4. Trial monitoring	project staff complete page 1 of the HLQ (see below) that describes the trial. This needs to be completed whilst the trial is in the field – preferably after the last fertiliser application
5. Harvesting & threshing	farmer
6. Plot measuring	not required
7. Plot weighing	not required

Post-harvest evaluation

Essential. Project staff complete page 2 of HLQ and pages 3 and 4 as well in the case of design 2 (see below). Data in the HLQ is collected on a 'more, same or less' qualitative evaluation. There are powerful statistical methods to analyse such data. By not collecting yield data, many more trials can be conducted to give a more reliable estimate of farmers' perceptions.

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† The number of varieties is low so all possible paired comparisons (n(n-1)/2 can be made. For example, with four varieties there are 6 possible comparisons, with five varieties 10, and with six there are 16 comparisons. However, there is no need to compare every variety with every variety, so when the number of varieties is larger a sample of comparisons (e.g., comparisons where each entry appears twice and comparisons are allocated randomly = n comparisons) can be made and validly analysed.

Data collection

Site data – Mother trials

8. Site data, that includes the management of the trials, is collected according to the format given below.

Non-participatory data – Mother trials

9. Yield data are collected by carefully measuring the area of each plot and the total plot yield. Other traits such as plant height and days to flower or tassel are also recorded. A complete data set (optional traits in italics) will comprise the following.

1. Date of sowing
2. Days to flowering
3. *Days to maturity*
4. Plant stand
5. Yield per plot (kg)
6. Plot area (length and breadth)
7. *Straw yield (kg per plot)*
8. *Incidence of diseases*
9. *Incidence of insect-pests*
10. Comments on the trial e.g., occurrence of drought

Matrix ranking – Mother trials

10. Two examples are given of matrix ranking for mother trials below – one for rice and one for maize. Not all of the characters need to be ranked, only those considered important by farmers. There is no point in trying to rank a trait if farmers say there is little difference between the varieties.

11. It will not be possible to matrix rank the varieties for post-harvest traits unless
    - the participating farmer has been allowed to retain the seed i.e., it has not been purchased by the project.
    - sufficient time has elapsed after harvest for grain processing, consumption and sales.

The Household Level Questionnaire – baby trials

12. The baby trials are monitored by household level questionnaires. This consists of either two or four pages:

For Design 1		For Design 2	
Page 1	Trial details	Page 1	Trial details
Page 2	Test entry versus local	Page 2	Test entry 1 versus Test entry 2
		Page 3	Test entry 1 versus Local variety
		Page 4	Test entry 2 versus Local variety

13. How to complete the question concerning the cross section of the trial on page 1 of the HLQ may not be obvious, so examples are given in Fig. 3.

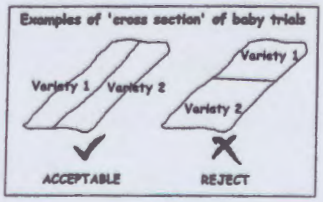

Figure 3. Examples of cross-section of the trial from page 1 of the HLQ of the baby trial.

Trial Information for Mother Trial

The answers in the boxes on this page describe the trial

KEY INFORMATION

Farmer name:		**Village:**		**Falia:**	
State:	**Year:**	**Season:**	*kharif/rabi*/summer	**Crop:**	

Coordinating scientist | **Trial number**

	Entry names	Plot size (m x m)	Total plot area (m^2)
Variety 1			
Variety 2			
Variety 3			
Variety 4			
Variety 5			
Variety 6			
Variety 7			
Variety 8			

TRIAL MANAGEMENT - This is the farmers' management which is recorded below.

Date of sowing:
Date of harvest:

Soil local name:
Slope (score): level / gentle / steep
Slope (%): <10% / 10-20% / >20%

Irrigation

	YES/NO
Was the crop irrigated?	
If YES then how many times?	
If YES at what growth stages or dates?	

Fertilizer application

	FYM	Urea	DAP
Basal			
Topdressing 1			
Topdressing 2			

Agricultural operations after sowing e.g., weeding, interculture

	Operation	Date
1		
2		
3		
4		
5		

Data Recording Sheet – Mother Trial

Farmer name: | **Village:**
State: | **Year:** | **Trial number:**

Plot No	Entry name	Plot area	Grain yield/ plot	Days 50% pollen shed	Days 50% silking	Stover yield	Plant height	Trait 6	Trait 7
1									
2									
3									
4									
5									
6									
7									
8									

MATRIX RANKING OF VARIETIES IN FGDs FOR RICE

Rank varieties on scale where Best = Total no. of varieties being evaluated e.g., 1-5 when there are 5 varieties with 5 = best and worst = 1.
Ranking to be done by group consensus.

Variety	Name
V1	
V2	
V3	
V4	
V5	
V6	
V7	
V8	

Number of participants in FGD =

Parameter	V1	V2	V3	V4	V5	V6	V7	V8
Germination								
Days to flowering								
Days to maturity								
Plant height								
Lodging resistance								
Disease resistance								
Insect resistance								
Ease of dehusking								
Grain yield								
Straw yield								
Grain colour								
Grain type								
Cooking quality								
Taste								
Fodder quality								
Market price								
Additional traits of farmers' liking (1)								
(2)								
(3)								
Overall preference								

Ranking is done so that the highest score (= the number of entries) is the best.

When varieties have equal ranks, the next rank is lower e.g. in a seven entry trial 7,7,5,... not 7,7,6,... (At the most extreme, 7,7,7,7,7,7,1 not 7,7,7,7,7,7,6).

The overall ranks in a mother trial can be analysed by an ANOVA in the same way as any other trait such as yield.

MATRIX RANKING OF VARIETIES IN FGDs FOR MAIZE

Rank varieties on scale where Best = Total no. of varieties being evaluated e.g., 1-5 when there are 5 varieties with 5 = best and worst = 1.
Ranking to be done by group consensus.

Variety	Name
V1	
V2	
V3	
V4	
V5	
V6	
V7	
V8	

Number of participants in FGD =

Parameter	V1	V2	V3	V4	V5	V6	V7	V8
Germination								
Days to silking								
Days to tasseling								
Tasseling silking interval								
Plant height								
No. of cobs								
Cob placement (height)								
Cob size								
Cob filling and husk cover								
Days to maturity								
Lodging resistance								
Disease resistance								
Insect resistance								
Grain yield								
Straw yield								
Grain colour								
Grain type								
Cooking quality								
Fodder quality								
Market price								
Additional traits (1)								
(2)								
(3)								
Overall preference								

Ranking is done so that the highest score (= the number of entries) is the best.

When varieties have equal ranks, the next rank is lower e.g. in a seven entry trial 7,7,5,... <u>not</u> 7,7,6,... (At the most extreme, 7,7,7,7,7,7,1 not 7,7,7,7,7,7,6).

Page 1. Household Level Questionnaire for FAMPAR Baby Trial

The answers in the boxes on this page describe the trial

KEY INFORMATION

Farmer name:		**Village:**		**Falia:**	
State:	**Year:**	**Season:**	*kharif/rabi*/summer	**Crop:**	

Interviewer: **Date of interview:**

	Names of V1 and V2	Colour codes of V1 and V2	V2 is:
Variety 1 (V1):			V1 is a test entry
Variety 2 (V2):			**local / test entry**

TRIAL DETAILS

	Variety 1	Variety 2
Date of sowing:		
Date of harvest:		

Soil local name:

Slope (score): **level / gentle / steep**

Slope (%): **<10% / 10-20% / >20%**

Was the crop irrigated? YES/NO If YES then how many times?

Map of the trial:
Draw the trial layout with the positions of variety 1 and variety 2. Include field name:

Cross section of the trial:
Draw the topography of the trial:

Any other comments on conduct of trial e.g., is weeding, plant population, intercropping the same for Variety 1 and Variety 2?

	FYM	Urea	DAP
Variety 1:			
Variety 2:			

Did variety 1 get:	**more/same/less**	**more/same/less**	**more/same/less**
	FYM than Variety 2?	**Urea than Variety 2?**	**DAP than Variety 2?**

Was Variety 1 grown under the same management as Variety 2? **Yes / No**

Page 2. COMPARE VARIETY 1 WITH VARIETY 2

The answers in the boxes on this page determine if Variety 1 is better, about the same, or worse than Variety 2

Did the crop suffer from a drought period? (In early and late varieties different crop stages can be affected by the same drought period).

Seedling stage	Tillering/ late vegetative	Flowering/ silking and tasseling		Grain filling/cob formation	
Var 1 and 2	Var 1 and 2	Var 1	YES/NO	Var 1	YES/NO
YES/NO	YES/NO	Var 2	YES/NO	Var 2	YES/NO

1. ***Establishment:***
Variety 1 is [better/same/worse] for establishment than variety 2?

2. ***Flowering time (tasseling):***
Variety 1 is [earlier/same/later] to flower than variety 2?

If flowering time (tasseling) is different then by how many days ?
Variety 1 is [ ] days earlier than local **(Either 'days earlier' or**
Variety 1 is [ ] days later than local **'days later' as applicable)**

3. ***Yield:*** **Variety 1 yields [more/same/less] than variety 2?**

If the yield is different provide more information in the box below. Give the farmer's description e.g., in local units, as a proportion (e.g. half as much again), or a percentage.

4. ***Grain quality:*** **V1 is [better/same/worse] in quality than variety 2?**

5. ***Market price:*** **V1 is [higher/same/lower] in price than variety 2?**

6. ***Overall preference:*** **V1 is [better/same/worse] overall than variety 2?**

7. ***Intention variety 1:*** **Will the farmer grow Variety 1 next year? [yes / no]**

8. ***Intention variety 2:*** **Will the farmer grow Variety 2 next year? [yes / no]**
Question 8 applies only if V2 is a test entry. (Otherwise it is assumed the local variety will be grown next year)

Add any other information that the farmer thinks is important. This could include reaction to pests and diseases; particular quality traits such as taste, cooking quality, milling quality; and whether the farmer mentions that he or she has given seed to others.

Variety 1

Variety 2

Page 3. ONLY FOR DESIGN 2 (TWO TEST ENTRIES). COMPARE THE VARIETY 1 WITH THE LOCAL VARIETY

The answers in the boxes on this page determine if Variety 1 is better, about the same, or worse than the local variety

Did the crop suffer from a drought period? (In early and late varieties different crop stages can be affected by the same drought period).

Seedling stage	Tillering/ late vegetative	Flowering/ silking and tasseling		Grain filling/cob formation	
Var 1 and local	Var 1 and local	Var 1	YES/NO	Var 1	YES/NO
YES/NO	YES/NO	Local	YES/NO	Local	YES/NO

1. Establishment:

Variety 1 is [better/same/worse] **for establishment than the local variety?**

2. Flowering time (tasseling):

Variety 1 is [earlier/same/later] **to flower than the local variety?**

If flowering time (tasseling) is different then by how many days ?

Variety 1 is [ ] **days earlier than local** **Either 'days earlier' or**

Variety 1 is [ ] **days later than local** **days later' as applicable.)**

3. Yield: **Variety 1 yields** [more/same/less] **than the local variety?**

If the yield is different provide more information in the box below. Give the farmer's description e.g., in local measures, as a proportion (e.g. half as much again), or a percentage.

4. Grain quality: **V1 is** [better/same/worse] **in quality than the local variety?**

5. Market price: **V1 is** [higher/same/lower] **in price than the local variety?**

6. Overall preference: **V1 is** [better/same/worse] **overall than the local variety?**

Add any other information that the farmer thinks is important. This could include reaction to pests and diseases; particular quality traits such as taste, cooking quality, milling quality; and whether the farmer mentions that he or she has given seed to others.

Comments on the local variety versus Variety 1

Page 4. ONLY FOR DESIGN 2 (TWO TEST ENTRIES). COMPARE THE VARIETY WITH THE LOCAL VARIETY

The answers in the boxes on this page determine if Variety 2 is better, about the same, or worse than the local variety and ranks all 3 entries

Did the crop suffer from a drought period? (In early and late varieties different crop stages can be affected by the same drought period).

Seedling stage	Tillering/ late vegetative	Flowering/ silking and tasseling		Grain filling/cob formation	
Var 2 and local	Var 2 and local	Var 2	YES/NO	Var 2	YES/NO
YES/NO	YES/NO	Local	YES/NO	Local	YES/NO

1. Establishment:

Variety 2 is [better/same/worse] **for establishment than the local variety?**

2. Flowering time (tasseling):

Variety 2 is [earlier/same/later] **to flower than the local variety?**

If flowering time (tasseling) is different then by how many days ?

Variety 2 is [ ] **days earlier than local**
Variety 2 is [ ] **days later than local**

(Either 'days earlier' or days later' as applicable.)

3. Yield: **Variety 2 yields** [more/same/less] **than the local variety?**

If the yield is different provide more information in the box below. Give the farmer's description e.g., in local units, as a proportion (e.g. half as much again), or a percentage.

4. Grain quality: **V2 is** [better/same/worse] **in quality than the local variety?**

5. Market price: **V2 is** [higher/same/lower] **in price than the local variety?**

6. Overall preference: **V2 is** [better/same/worse] **overall than the local variety?**

Add any other information that the farmer thinks is important. This could include reaction to pests and diseases; particular quality traits such as taste, cooking quality, milling quality; and whether the farmer mentions that he or she has given seed to others.

Comments on the local variety versus Variety 2

7. Rank of three varieties: **Rank V1, V2 and local variety in order of preference:**

Rank		Variety name
1	(Best)	
2		
3	(Worst)	

8. New orientation for farmer participatory action research: Experiences of Agri Service Ethiopia

Amanuel Assefa , Agri-service Ethiopia

Introduction and background to ASE

Agri Service Ethiopia (ASE) is a national NGO which was established in 1969. During its inception, ASE was known as a farmers training organisation, mainly through correspondence education. As time goes, ASE has learnt from own experiences and emerging contemporary global knowledge in the area of rural development. As a result, a number of changes took place in the organisation. Having realised that correspondence education was not very effective to work with community groups, where the rate of illiteracy was too high, the major shifts in approach that took place over the past three decades include:

- Face-to-Face Training approach
- Action-Oriented Training approach
- Integrated Rural Development Programme approach
- Integrated Food Security Programme approach

The vision of ASE is to see a rural Ethiopia where poverty is reduced and the environment is protected to the satisfaction of the present and future generations. In order to realise this vision, it has a Mission - to work with the rural poor and ensure food security, improve social services and protect the environment. Across all development phases traversed over the past three decades, "Community training" was the core business of ASE and it is still a cross-cutting function in the present-day mission of the organisation.

The major organisational strategies include community training, participatory action research, targeting the poor, community-based organisation, gender equity, income diversification, capacity building of partners and Community Based Initiations networking and EGS (Employment Generation Schemes). Having traced its track record and studying the development gaps in the country, one of the strategic goals of ASE is to build a centre of excellence in community training and extension. In this connection, the major ongoing activities that are designed to realise the strategic goal include: Formulating solid and effective community training system, Production of quality print materials, Production of educational videos, Radio Education for Rural Mass [REFORM], Correspondence education for literate farmers, Promotion of local

innovations, establishment of training centre, establishment of database on community training and extension, networking and participatory research.

ASE is operational in three regional states, running four fully matured programmes. It has about 140 professional staff. More than 80% of the staff is deployed at field level. The Farmer Innovation approach and Participatory Technology Development (PTD) are the main tools in the extension and research programmes of ASE. It has been working on this for the past five years but it is only recently that the initiative was supported with change in institutional policies and organisational structure. This paper gives an overview of ASE's experiences in the farmer research approach.

Key approaches and concepts

The key approaches and concepts used by ASE in connection with the farmer research approach are basically adopted from various sources over a long time, but the explanation presented here explains the way it is perceived and understood by ASE, given the context in its operational areas.

- **Farmer Innovation Approach** is an approach that helps to discover farmers who are involved in innovation processes by conducting informal experimentation to overcome problem situations or to learn new ways of doing things.

- **Participatory Technology Development (PTD)** is an approach that helps improve the linkage and joint learning of innovative farmers, researchers, extension workers and other stakeholders in the process of technology development.

- **Farmer-led Participatory research** is a type of participatory research in which farmer researchers set the research agenda, and the research process is mainly controlled by it. The participation of outsiders is through building the capacity of farmer researchers and providing technical information and methodological support, which is believed to be unknown by the researcher farmers and yet relevant for the research activity.

- **Expert-led Participatory Research** is a type of participatory research in which the expert sets the agenda in most cases, and the process is controlled by same, while farmers are invited to participate passively at different stages of the innovation process.

- **Farmer Field School (FFS)** is an approach that provides farmers the opportunity to learn from local knowledge and experiences in the open field as well as to do research to improve the proposed technologies or generate new ones. The educational curriculum is designed at the beginning of the activity and those points indicated in the curriculum guide the entry learning process.

- **Indigenous knowledge** refers to all types of knowledge that are developed and shared exclusively by the local people.

- **Traditional knowledge** is that part of indigenous knowledge which is inherited from ancestors and has been in use for at least more than one generation.

- **Local knowledge** refers to all bodies of knowledge either developed by the indigenous people or brought into the system by outsiders (either scientific or traditional) and yet has become part of the local knowledge system.

- **Innovator farmers** are those farmers who are conducting informal experiments using their own wisdom, knowledge and experiences with the aim of overcoming a problem situation or discovering new learning dimensions.

- **Farmer innovation** is adding value to indigenous knowledge through conducting informal experimentation or adopting new ways of doing things through farmers' contextualising the new element precisely to their own world. Innovation does not refer only to technological hardware; also new ways of organising, managing, planning, marketing, communication, networking etc are all included. Any activity – to be considered as an innovation – needs to be "new" and must be able to improve efficiency, effectiveness, management or understanding (generation of new information).

Rationales

Among many other possible rationales why NGOs should get involved in farmer-led research, the following are the main ones:

- Ethiopia is a country of historic and diverse ethnic groups that have survived several forms of crisis, including drought, famine, environmental changes, epidemic livestock and human diseases etc.

Survivors have therefore immense knowledge on how to mitigate crisis.

- The present-day expert/researcher-farmer relationship is based on the assumption that farmers are illiterate, ignorant and helpless and that the expert group is the only responsible body to come up with technologies and new ideas to help farmers. However, the reality is that farmers have good rationales for whatever they are doing and not doing. They have also immense indigenous knowledge that has been in use for many years. Thus, understanding farmers and giving them a chance to explore their way out is the best approach to help them respond to the diverse, specific and complex reality of farmers.

- Looking into expert and farmers partnership in research, we understand that – for any given research agenda or problem situation – there are always bodies of knowledge or information *known by farmers and not known by experts, known by experts and not known by farmers, known by both experts and farmers, and not known by the experts and farmers.* Playing the role of facilitation would therefore help to manage the knowledge system and direct the relationship in the desirable way.

- There are various ways of understanding participation in technology development. When farmers are simply providing information to the expert on a specific subject, there is some level of farmers' participation in the process. When farmers mobilise themselves to identify their own problems, analyse it and start to mitigate the problem issue with little or no assistance of outsiders, this is again another type of participation, which is indeed the most desirable type. Just to learn the reality of how intensive the participation of farmers is in the course of PTD, it is important to critically examine some basic indicators like: who set the research agenda, who makes decisions on the major events of the study, who controls the research process, who owns the information etc. The higher the involvement of farmers in the innovation process, the more the result will be precise, sustainable and affordable.

Key principles for the farmer research approach

- Resource-poor farmers are making their livelihood in a diverse and complex environment and thus we need to look for technologies that respond to the specific realities they are in.

- Farmers and farmlands are not homogeneous. We have always to look for heterogeneous futures, not only in terms of wealth status but also in

style of farm management, interests, natural resources, social factors, gender, labour etc. On the basis of this principle, we have learned that blanket recommendations of technologies are not worth doing.

- We understand that there are always innovative farmers among community members and those innovative farmers are striving to overcome their own problem situations through conducting informal experiments. Assessing who are the innovative farmers and analysing what their innovations look like is the first step towards Participatory innovation Development.

- We believe modern technologies are very useful for farmers but we also believe that new technologies coming to the community have to pass through a series of validation processes by the end users on the basis of own criteria and interests. The persuasive type of extension approach, which presumes "new technologies coming to the system are perfect and thus the only thing farmers should do is accept them", undermines farmers' reality.

- Our role is not to generate technology or teach farmers about new technologies but to facilitate technology generation processes through creating a space for innovative farmers, researchers, extension workers and other stakeholders and to build the capacity of farmers and help them validate new technologies coming into their systems.

Major practices

Overview of Participatory Action Research in ASE

Completed studies (2000-2001)

Five research topics were conducted and include:

i. Comparative effect of compost, farmyard manure and inorganic fertiliser on soil fertility management (Bale, Semen Omo, Lallo Mama Mider and Misrak Gojam)
ii. The interface of exotic poultry breeds and the local management system (Semen Omo and Misrak Gojam)
iii. Effect of leucaena trees on honey bees (Semen Omo)

iv. The effect of herbicides and pesticides on honey bees (bee colonies) (Bale)
v. The effect of *chekata* and *tagatus minuta* on cabbage aphids (Bale)

Ongoing participatory research topic topics

Continued soil fertility management
Participatory Action Research on sheep fattening
Running IPM-FFS on cutworm severely affecting haricot bean (Boloke) and rodents (in 3 Kebeles)

Comparative effect of compost, farmyard manure (FYM) and inorganic fertiliser on soil fertility management (In 3 Kebeles)
The interface of exotic poultry breeds and the local management system (3 KAs)

Research on IPM-FFS in 3 KAs (continuation of 2002)
Testing FFS in ethno-veterinary medicine
Effect of chemical fertiliser, compost and FYM on soil fertility management
Enset verification ***(verification of what? clones? pest-control measures?)*** through PTD.

Case studies of innovative farmers

ASE is working with innovative farmers and also trying to establish linkages and partnerships between farmer researchers and formal researchers. The following cases are some of the innovations to which ASE has paid attention and are being used to demonstrate the good intensions and achievements of the farmer research approach in ASE's working areas.

Farmers' experience with FFS in Gojam

A farmer known as Ato Endeliven presented the FFS case during the workshop. The story was all about a group of farmers who have undertaken an experiment to solve a pest problem in haricot bean. Ato Endeliven is from East Gojjam Zone of the Amhara Region, Enebse Sar Mider Woreda (District), Eneguzi Kebele (Village). Ato Endeliven started his work by forming a committee in the Kebele, after being trained by ASE on FFS. In the beginning of the FFS exercise, the committee discussed the priority problems of the area and identified crop pest attack as a major bottleneck in crop production in the Kebele. They undertook a survey and identified haricot bean pest as the major one.

5. Constraints and challenges of participatory approaches as perceived by different stakeholders

i. General problems

However, participatory approaches to research and development (R&D) in agriculture and natural resource management are not spreading quickly because of:

- Lack of awareness of these approaches in relevant institutions
- Lack of institutionalization of the approaches
- Little information exchange, networking and coordination between the relevant departments and institutions
- Little attention to the development of technologies appropriate for small-scale farms.

ii. Farmers' perspectives

- Researchers give priority to their own pre-determined ideas when they do research together with farmers.
- Many of the research initiatives that involve farmers are short-lived; they have no continuity.
- After farmers have tested technologies brought by researchers and have identified which ones are suitable, they are not easily available to farmers (i.e. technologies have been brought for testing without assessing their appropriateness in terms of input availability, and are not coupled with activities to establish or strengthen input and output markets).
- Farmers who have tested technologies are losing confidence in government institutions because they do not keep their promises.
- Researchers need to be ready to learn from past mistakes

iii. NGOs' perspectives

- Lack of continuity of support to participatory approaches in research and extension work (related only to limited-term projects)
- Top-down approach and quota system in extension, and lack of support from supervisors for another mode of extension
- Little attention to and recognition of the value of participatory approaches in the research centers and therefore low budget allocation to this type of work
- Promotion criteria in research and extension do not favor participatory approaches
- Poor representation of farmers in various committees related to agricultural R&D and therefore little genuine influence of farmers in defining agendas and approaches
- Too much emphasis on efficiency and effectiveness in carrying out research and extension, overlooking the issue of empowering farmers (helping to build their capacities and strengthening their voice in influencing research and extension)
- Most participatory research involves on-farm testing of technologies coming from research stations, while farmers' own experimentation and innovation are overlooked
- Lack of transparency and mutual understanding between research centres and NGOs:
  - Researchers see NGOs only as vehicles for ToT
  - NGOs see researchers as lacking in knowledge of farmers' realities
  - Researchers tend to impose their own interests and priorities when seeking partnerships with NGOs
- Institutional weaknesses within NGOs:
  - Participatory R&D requires long-term engagement but most NGO activities are time- bound; need to influence donors, including supporting agencies in Ethiopia, to make long-term commitment so that NGOs can engage in participatory R&D
  - NGOs have not given enough attention to documenting positive experiences in participatory R&D, disseminating relevant information and scaling-up the activities

  - Many organisations, including NGOs, lack sufficient knowledge and skills about methods of promoting local innovation and PTD at field level

iv. Research and extension Perspectives

- Need for conceptual clarity regarding farmer innovation and participatory research and extension.
- Participation of farmers in research and extension is very limited.
- Farmers are illiterate; this makes it difficult for them to be involved in participatory research.
- Some farmers are not volunteering to share their experiences.
- There is no appropriate organisational set-up at grassroots level below kebele.
- Representation of farmers at *kebele* level is very difficult to achieve.
- There is no recognition, e.g. awards, given to farmers to stimulate them to innovate.
- Farmers are not involved in formulating extension packages.
- Appropriate technologies are absent.
- Extension is focusing on standard packages but not on households and communities.
- Development agents are becoming confused in trying to accommodate different approaches by different intervening organisations and projects.
- Experts are not very well aware of participatory approaches.
- Collection and exchange of information about participatory approaches and experiences is very limited.
- There are no incentives and little commitment for researchers to work in rural areas directly with farmers.
- There is no encouragement within the institutions to develop or pursue new ideas in research and extension.
- Research and extension work is biased to disciplines.

- Research is being pressured from above to adopt different approaches and to produce quick results and is losing focus.
- Many of the right policies are in place, but it is very difficult to implement them.
- Planning to address farmers' needs is more ambitious than practical.
- Participatory approaches are largely limited to projects and demand high inputs in terms of time and budget. There is a shortage of budget and skilled manpower to be able to engage in these.
- Scaling up the work on farmer innovation and experimentation is difficult because of lack of capacity.
- Relations between government and NGOs are not strong, and the linkages between the government institutions themselves are weak.
- There is a need for a marketing policy to support participatory R&D.

v. Policy-related constraints

- Packages are formulated for extension without the participation of farmers.
- Uniform technologies are introduced and promoted, irrespective of agro-ecological and socio-economics conditions and differences in farming systems.
- The marketing system prevailing in this country does not encourage farmers' experimentation and innovation.
- The national aware policy does not stimulate farmers' innovativeness.

vi. Coordination of efforts

- There are weaknesses among all stakeholders in agricultural R&D with respect to coordination, defined as joint work by relevant institutions to achieve similar aims through exchange of information and sharing of resources.
- The relevant institutions usually do not know each other's work well and show little interest in networking and coordination. They do not seem to be aware of the importance of coordination. Each is biased by its own disciplinary interests.

- There is often a lack of professional commitment and transparency in dealings with each other. Coordination is important to avoid duplication of efforts, to make more efficient use of resources, to promote participation of all stakeholders in research and to achieve sustainable development.

vii. Institutionalization

- There have been some attempts already to engage in farmer participatory research but these are not systematically organized within the institutions concerned to ensure continuity.
- There is an absence of good communication within the departments and institutions themselves, let alone between institutions. This constrains internalization of participatory approaches.
- There needs to be systematic efforts to institutionalize farmer-led R&D. This could be helped by a taskforce composed of concerned people from the different organizations who try to learn from each other about how institutionalization of farmer-led research and extension in each of the stakeholder organizations can be stimulated.

DEFINING SOME KEY CONCEPTS

JF de Villiers
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What is an innovation?
Value addition on indigenous knowledge or scientific knowledge bodies through conducting self initiated informal experiments of farmers. Up with improving efficiency, effectiveness, management, workability or understanding (generation of new information).

Rationale
Projects for farmer developments have been coming and going with their failures, but farmers have been surviving, what are they doing?

Who is an innovative farmer?
Are those who have developed or are testing new ways of land husbandry that combines production and conservation while using ideas of their own or from other sources under their own initiatives?

Farmers who are conducting informal experiments using their own wisdom, knowledge and experiences, with the aim of overcoming problem situations or discovering new learning dimensions.

What is local innovation?
Refers to the dynamics of indigenous knowledge (IK), or knowledge that exists and grows within a particular social group

- Local innovation (without and "s") = process
- Local innovations = outcome of innovation process

What is indigenous knowledge?
Indigenous knowledge refers to all types of knowledge that are developed and shared exclusively by the local people.

Indigenous knowledge is the knowledge that people in a given community have developed over time, and continue to develop. It is:

- Based on experience
- Often tested over centuries of use
- Adapted to local culture and environment
- Dynamic and changing.

Other names for indigenous knowledge (or closely related concepts) are "local knowledge", indigenous technical knowledge" and "traditional knowledge".

What is a participatory approach?

Participation in development co-operation is a process in which different actors negotiate and share control over development initiatives and the related decisions and resources, with particular attention being given to involving groups that had been previously excluded or marginalized. Levels of local participation are defined primarily by the degree to which local people ("beneficiaries", "target groups") have the power to make or influence decisions. (Wolfgang Bayer and Ann Waters-Bayer, 2002. Participatory Monitoring and Evaluation (PM&E) with pastoralists: a review of experiences and annotated bibliography)

Farmer participation

In PTD "farmer participation" implies an acceptance that local people can, to a large extent, identify and modify their own solutions to suit their needs. It means that "outsiders" such as researchers and development agents support farmers in their own efforts to change their farming systems. This support focuses on enhancing farmers' capacity to innovate, to experiment, to develop their farming system in a sustainable way and to increase their control over resources and decision-making affecting their farms.

Strong farmer participation in agricultural development is essential if sustainability is to be achieved. Farmer participation is needed:

- to link technology development with farmers' intimate knowledge of the local situation;
- because formal research and development institutes have limited capacity to develop a multiple of locally-specific technology adaptations;
- so that indiscriminate use of external inputs can be "replaced" by farmers' day-to-day observation and decision-making about the use of inputs.

A great number of innovations in farming have occurred without intervention from outside. One may call this "indigenous technology development"

As a reaction to major problems encountered with "Transfer-of Technology" (ToT), participatory approaches to technology development have been developed. "Participatory technology development" stresses the importance of the farmers' role in agricultural innovation and change, which is complemented by formal research.

In indigenous technology development, the farmers control what happens on their farm. All decisions – for example, those about which aspect of their farm system needs to be improved or which new options should be tested – are in their hands alone. In ToT, many of these decisions are taken from them; in some cases of large irrigation schemes, the farmers are little more than labourers on their own land. The PTD approach aims at giving the decision-making role back to the farmers. Where outsiders contribute to farmers' decision-making, this is done openly as equals in dialogue.

The main characteristics of these approaches to technology development are summarized in Table 1.

Table 1 Main characteristics of three approaches to technology development (TD)

Criteria	Indigenous TD	ToT	Participatory TD
Objectives	Secure living, reduce risk	Maximise yield	Farmers' agricultural self-management
Source of innovations	Farmers	Research organizations	Farmers complemented by research organizations
Nature of knowledge	Holistic	Particularistic	Creative tension between holistic & particularistic
Experimental approach	Largely unknown	Scientific procedures	Farmers' methods complemented by simple scientific procedures
Channels of communication	Farmer-to-farmer	Extension service	Multiple system: farmers, NGO, extensionists, etc.
Process of communication	Informal, horizontal	Formal, vertical, top-down	Semi-formal
Role of farmers	Generator of knowledge, communicator, user	Receiver, adopter	Generator, communicator, evaluator of outside ideas, user
Role of field staff	None	Teacher, control compliance with regulations	Multiple: moderator, resource person, co-researcher, teacher

Roles of field staff in PTD

The process of PTD assigns roles to field staff which differ markedly from those played in conventional agricultural research and development. The new roles of fieldworkers are initially as:

- *Facilitators*
  - in analyzing the present farming situation and resource base;
  - in making an inventory of local knowledge and ideas which could provide solutions for identified problems, and other local resources relevant for developing a sustainable farming system;
  - in making farmers' criteria explicit and selecting options to try;

- in making farmers' informal experimental methods explicit and in systematic planning, monitoring and evaluation of new experiments;
- of farmers' self-organisation and self-management.

- *Networkers*
  - by encouraging exchange among farmer-experiments in the local area and beyond;
  - by helping to develop linkages with local farmer organisations and relevant support organisations;
  - by linking farmers with relevant sources of information;
  - by feeding back information about farmers' experiments to formal research;
  - by stimulating greater participation of farmers in programming and assessing formal research.

- *Educators and trainers*
  - by enhancing farmers' diagnostic capacities;
  - by revitalizing indigenous knowledge, cultural identity and self–esteem in farming communities;
  - by helping farmers increase their understanding of the principal processes at work in their agro-ecological system;
  - by facilitating the development of relevant organizational and communicating skills (such as problem-solving, leadership development and functional literacy) of farmer-trainers and PTD group leaders.

- *Co-researchers*
  - by contributing ideas, potential solutions and information from formal research, whenever useful in the PTD process;
  - by replicating farmers' experiments under more controlled conditions;
  - by making additional measurements and observations to support analysis of farmers' experimentation;
  - by documenting the entire process and the final evaluation of socio-cultural and agro-ecological impacts.

As the PTD process develops, fieldworkers gradually assume the role of:

- *External advisors*
  - by participating in the evaluation and planning of group activities at the farmers' request;
  - by supporting leaders of farmer-experimenter group;
  - by assisting in networking and policy lobbying at inter-community and higher levels.

How would you describe the farmer-scientist partnership?

Answer of Prof Oscar Zamora, Agronomy Department at the University of the Philippines, Los Banos

"It is a partnership among equals. The role of the scientists is demystify science and provide the technical backstopping when asked. They are also there to provide the scientific explanation why

practices developed or adapted by farmers work and this should be shared with the farmers. The farmers identify the problems on their farms, conduct experimentation right there on the farm (in consultation with the scientists) and provide solutions to their problems. Experiments therefore are conducted not because they are interested to the scientist, but because the problems are affecting the farmers. Since scientists have more access to new scientific information and issues affecting agriculture, it is the role of the scientists to share this information with the farmers. The farmers can then analyse the information among themselves and judge its relevance to their circumstances"

Talking positively about PTD (Scheurmeier & Sen, 1994):

Say:	Avoid saying:
"We want to discover opportunities for improving the situation"	"We have come to find solutions to your problems"
"We must understand the situation here, and nobody knows it better than you"	"You must tell us what problems you have"
"What could be done? How can we join forces to discover what can be done"	"How can we help you"
Repeatedly explain "We want to combine our skills and knowledge with yours. Hopefully we can then jointly find new useful things that work. We want to do this because we want our work to be useful to you. Otherwise there is no reason for our work"	Avoid talking of material inputs and money. When asked, explain that such things might be needed, but we are interested more in working together. If they are only interested in getting materials and money from us, then we are not interested in doing PTD with them.
"What is the situation here? What can be done about it? How can we join forces to do something about it"	"What do you need"

PID/PTD as defined by Groups which attended a PID: A Training of Facilitators Course in the Philppines, June 2004:

PID – "Innovation initiated by farmers (locals) but developed with outsiders (researchers/NGO, etc.) in partnership with farmers"

PTD – "Technology developed in partnership with clients (farmers/researchers/extension workers, etc.)

PID – Process of adding value to indigenous knowledge

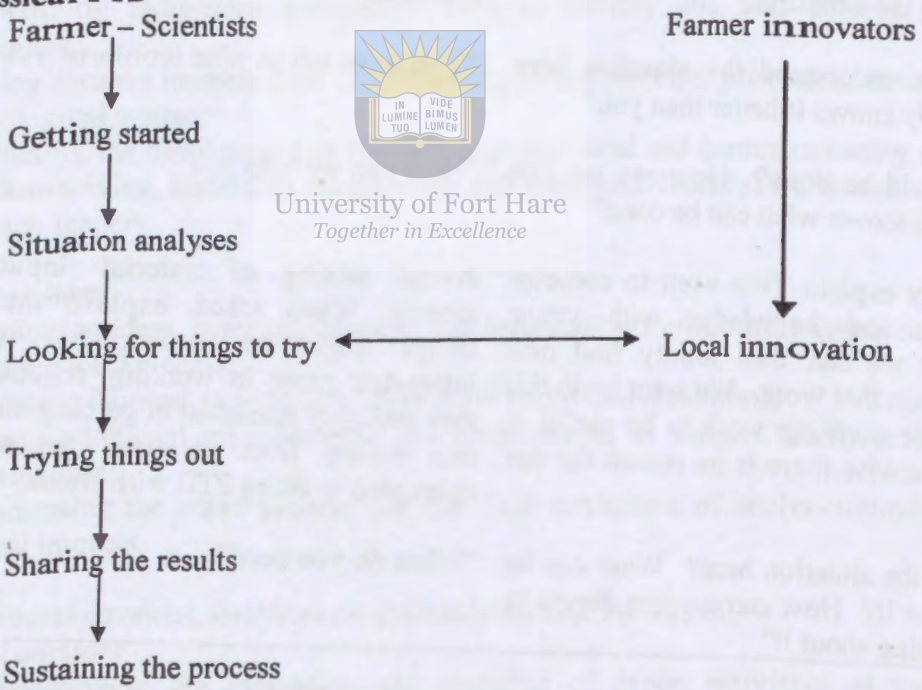
PTD – On-going participatory experimentation, promotion, and dissemination

PTD - Is an approach that helps to improve the linkage of innovative farmers, researchers, extension workers and other stakeholders in the process of technology development.

Steps of PID/PTD:

1. identification of local innovation
2. characterization
3. experimentation
4. validation
5. documentation
6. promotion/dissemination

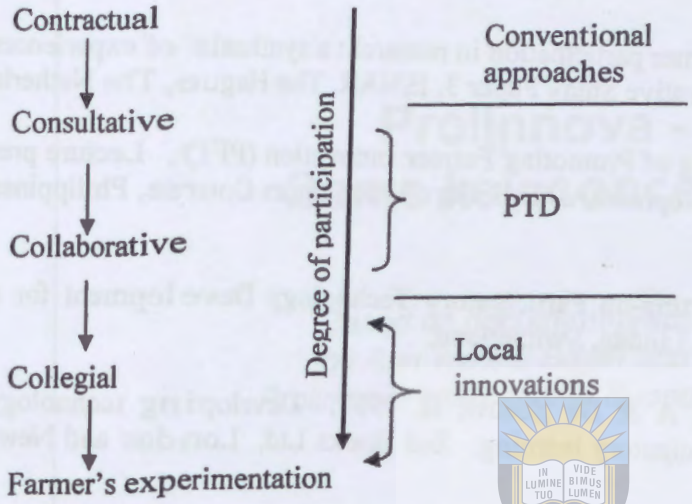
STEPS of classical PTD



Challenges:

- Networking and partnership
- Understanding farmers complex farming system
- Professionals in PTD
- Designing and refining research methodologies
- Practical application of participatory approaches (going to farmers only is not participatory in real sense).

Degree of Participation in conventional, PTD and PID process (Sanjaya Gyawali, Nepal, A Training of Facilitators Course in the Philppines, June 2004)



Types of farmer participation in research (Biggs, 1989):

Mode	Objective
Contractual	Scientists contract with farmers to provide land or service
Consultative	Scientists consult farmers about their problems and then develop solutions
Collaborative	Scientists and farmers collaborate as partners in the research process
Collegial	Scientists work to strengthen farmers' informal research and development systems in rural areas

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Prolinnova - Some key concepts

Based on document prepared by Ann Waters-Bayer and the Prolinnova International Support Team

Local innovation

- Refers to the dynamics of IK, or knowledge that exists and grows within a particular social group
  - Local innovation (without an "s") = process
  - Local innovations = outcome of innovation process
- Recent attention by development professionals to identify and document the innovation process and resulting innovations
- Professional being challenged to develop these further with farmers in joint experimentation
- Local innovations offer entry points for linking indigenous and scientific knowledge

Community-led, participatory R&D

- Starts with recognition of local innovation (s) by giving value to local people's knowledge and creativity
- Local innovations become foci for community groups (not just the individual innovators) to:
  - examine opportunities
  - plan joint experiments
  - explore ideas further
  - evaluation results
- This helps to strengthen community organization for development
- Also strengthens capacities of agricultural services to support community-led initiatives

From PTD to PID

- Six-step PTD framework (getting started, joint analysis of situation, looking for things to try, trying them out, joint analysis and sharing results, strengthening the process)
- Local innovation approach is an entry point to PTD that starts with looking at what farmers are already trying
- Local innovation in Ag/NRM can go beyond technologies to include socio-organizational arrangements
- Term participatory innovation development (PID) embraces this broader understanding of joint R&D, and the term is being used with – or in place of - PTD
- PID/PTD seen as an approach to **research and development** happening between farmers and development agents from research, NGO and government

Institutionalization

- Refers to the integration of local innovation approach into programs & activities of relevant institutions
- Requires a conscious and concerted effort, and adequate time
- May affect management structures and mechanisms and processes of decision-making within organizations, and implies change in these area
- Calls for individual & organizational learning that leads to change in people's attitudes and behavior
- Institutionalizing PID does not aim to replace other R&D efforts, but rather aims to complement them
- Institutionalization is not the same as "scaling-up"
- Many people involved in PID are keen to incorporate the approach into institutes of higher learning so future generations of professionals see and use PID as a mainstream approach

Partnership

- Prolinnova based on the conviction that farmers, development agents, scientists, educators and other stakeholders can be equal partners, bringing their own strengths in to effective R&D processes
- Should be based on a basic common vision
- Implies jointly planning and implementing activities
- Implies negotiation, sharing of resources and achievements and recognizing the value of each partner's contribution to the effort

Concept Paper on: Participatory Innovation Development [PID]

A Changing Paradigm in Agricultural research and extension approach

PRESENTED BY

Amanuel Assefa

PARTICIPATORY INNOVATION DEVELOPMENT: A TRAINING OF FACILITAORS' COURSE
Y C JAMES YEN CENTER, IIRR, CAVITE, PHILIPPINES
14 – 25 JUNE 2004

Background

The increasingly unresolved challenges that we are now facing in rural development have spurred on many professionals to seek more effective approaches and strategies that could help them gain a deeper understanding of and give greater support to the dynamism in the domain of smallholder farmers.

The concept

The core agenda of the initiative is to create space in which formal researchers and extension workers can support the informal experiments of innovative farmers and rural communities. The whole idea is to help farmers come up with cost-effective and ecologically friendly innovation that fit their own realities. This is, indeed, a process of empowering farmers and rural communities. Because, the approach gives farmers more opportunity and self-confidence to make their own decisions about research and development.

In this approach, outsiders [researchers, extension workers, experts etc] respect the proposals, ideas, theories and decisions of farmers not only for the sake of moral reasoning but because the knowledge base of innovator farmers is very powerful and realistic. Of course, outsiders have an extremely important role to play in providing relevant information, methodological support and other forms of assistance for local experimentation, without jeopardising the local innovation processes. This approach does not deny the necessity of basic research. Indeed, there is no intention of replacing the current research and extension approaches in the country. However, it introduces a new dimension of thinking that complements existing approaches and links them with farmers' realities. This approach can be easily accommodated within the framework of current agricultural research and extension systems, without bringing conflicts of interest into the system. Making a logical link and striking a balance between the knowledge worlds of innovative farmers and formally educated experts is central to this initiative.

Almost since the invention of extension science, the Transfer of Technology [ToT] model has been the dominant research and extension approach in the developing world. It is still used extensively in many parts of the world including for example in Ethiopia. This model implies: scientists generate new or improved technologies, which are then transferred by extension agents to farmers. It considers farmers as legitimate receivers of technologies coming from outside. It also considers that most of the smallholder farmers and pastoralists are illiterate, poor and helpless, who deserves the attention of experts /outsiders in order to improve their livelihood. However many of the technologies generated and promoted in this way are too expensive for millions of small scale farmers who can not afford to invest in the packages of required inputs,

such as introduced seeds, genetically improved breeds, fertilizers. Moreover these packages are standardize and promoted country wide with out regarding to agro ecological differences and poorly suited to diverse and variable conditions. Some times farmers appear to be reluctant to adopt the technologies offered by the conventional research and extension.

On the other hand there is immense potential within the farming community and it has to be remembered that, centuries back farmers were the ones who have managed to identify, select and domesticate thousands of plant and animal species, quite long before the institutionalization of modern sciences. Nevertheless, local knowledge and innovation have been ignored in the process of technology development by the formal researchers and this has been one of the reasons for creating gaps between the real needs of the smallholder farmers and the technologies, the social norms and economic capacity of farmers and cost and suitability of the technologies.

Innovation is a broad terminology that can refer to the discovery of a completely new way of doing something or to modifications of existing technologies. Farmer innovation is therefore refers to a new idea/ practice that has been started within the lifetime of the farmer, and not inherited from the parents and grand parents. Traditional knowledge, that is inherited from ancestors and indigenous knowledge, which is a generic term used to refer all bodies of knowledge that emanate from the indigenous people, are often the sources of most of the local innovation of farmers. Farmer innovators are always adding values on the indigenous knowledge they already acquire and they try to make it more relevant, workable, effective, efficient, environment sound and user friendly. Some times they may come up with completely new way of doing things, and this may perhaps mislead that it has nothing to do with indigenous knowledge. Nevertheless it is very difficult to make a hard line distinction between indigenous knowledge and any form of farmer innovation.

Farmer innovators do conduct informal experiments. They in fact start with a problem analysis, formulation of a hypothesis, test their proposals and finally adopt the new finding as long as it is found worth doing. This precisely shows that farmer innovators are following the same procedure like the modern sciences do. However we cannot conclude that the farmer innovators have adopted this procedure from the modern science. It is in fact otherwise true that the modern science has learned quite a lot from the traditional way of technology development. Farmers are often reluctant to tell outsiders that they are conducting experiments. They don't even recognize themselves as farmer researchers, even though they are doing spectacular works in technology generation activities. Outsiders may not also rightly recognize that farmers could conduct experiments in their own domain. But, in reality, in order to cope up with the ever-changing environmental, ecological, policy, market situation, many farmers are under persistent innovation process. Some innovative farmers are indeed doing more

feasible works and it is up to the outsiders to identify those innovative farmers, appreciate their work and begin to work with them for better results.

There are ample opportunities for cross-fertilization of indigenous and formal knowledge in development. It is this characteristic that draws the attention of development practitioners to the use of indigenous knowledge in development. Lack of this focus in the past has led to the failure of numerous projects. During the last decades, particularly in the l990s the role of indigenous knowledge is recognized in the International Agricultural Research centers and multilateral agencies such as the World Bank and the United Nations agencies.

From real life experiences we have learnt that there are some thinkers who take the concept of indigenous knowledge too far and assume that IK could provide answers to every single problem of farmers. On the contrary there are scientists who believe that the role of farmers in technology development process have to be limited to "providing relevant information", whenever they are asked by the researchers. They may not put this statement bluntly but it appears to be the governing attitude of those scientists who are not well informed about the role of IK in development. PID is in fact collaboration of farmers, development agents and scientists [formal researchers] for technology development with a logical mix of the knowledge and skills of farmers with the collaborating stakeholders. The approach therefore seeks to strengthen the existing experimentation capacity of farmers.

The basic assumption behind this approach is that in a given innovation process there is something perfectly known or understood by farmers and not by Scientists; something perfectly understood by scientists and not by farmers and something which is completely not known both by scientists and farmers or fully understood by same. This frame of knowledge analysis tells that there is strong need of facilitating collaborative researches with farmers, particularly with the innovative ones. Innovative farmers are not necessarily "model" or contact farmers; rather S/he creates or tries out new ideas without their having been recommended by extension workers or any development worker. Mekele University shows that, in most cases innovative farmers are old age and experienced farmers and most often the poor farmers tend to be more innovative than the other farmers who could afford buying modern technologies. One of the possible reasons behind this fact is that poor farmers are always striving to overcome problem situations by their own, because they may think that it is not as such easy for them to address the problem situation by importing technological innovations from the science world.

Innovative farmers often are not easily traceable because most of them may not even recognize for themselves that they are doing something new and fascinating. Some of them are also in most cases out of the formal contact of the government extension

services because they might think of trying things differently as that they cannot afford buying the packages. Therefore innovative farmers are in many cases those who are running informal experiments or those who have already achieved something new out of their own informal experiments and yet are not easily traceable unless a well-organized systematic and purposeful survey is conducted. Ones these innovative farmers are identified, the outsiders should start thinking of what value can they add in order to make the process more complete. This implies that formal researchers should not always think of going to the farmers with established research agendas because in the case of innovative farmers they already set the research agenda.

On the other hand there are cases where the agendas are set by the researchers and thereby farmers are given the opportunity to comment, modify or change the original topic to make it more responsive to the local realities. This also applies true to the extension activities that farmers will be in a position to accept it as it is, modify, make substantial changes or reject whatever is provided by the extension services. The process of changing, modifying and then adoption are still considered as process of innovation.

More elaborations on key terminologies

- **Indigenous knowledge** refers to all types of knowledge that are developed and shared exclusively by the local people.

- **Traditional knowledge** is that part of indigenous knowledge which is inherited from ancestors and has been in use for at least more than one generation.

- **Local knowledge** refers to all bodies of knowledge either developed by the indigenous people or brought into the system by outsiders (either scientific or traditional) and yet has become part of the local knowledge system.

- **Farmer Innovation - Approach** - is an approach that helps to explore farmers who are involved in innovation processes through conducting informal experimentations to over come problem situations or learn new way of doing thing.

- **Participatory Technology Development (PTD)** is an Approach that helps to improve the linkage of innovative farmers, researchers, extension workers and other stakeholders in the process of technology development.
- **Participatory Innovation Development (PID)** a synonym for PTD with more border usage of the term "innovation" instead of restricting the process to hard-core technologies. New way of marketing, land use planning, getting organized, networking, learning etc are all innovations that may not be adequately explained

by being a "technology". PID is therefore the most recent and comprehensive expression of PTD.

- **Farmer led participatory research:** -A type of PID in which case the research agenda is set by the farmers and the innovation process is mainly managed and controlled by the farmer researchers. The participation of outsiders is often through building the capacity of farmer researchers & providing technical and methodological information, which is believed to be unknown by the farmer and yet relevant for the innovation process.

- **Expert led participatory research:** is another type of PID in which the experts/scientists set the agenda and the process is mainly controlled by same. Farmers are invited to participate at different stages of the innovation process.

- **Farmers Field School:** An approach, which provide farmers the opportunity to learn from local knowledge and experiences in the open field. It also encourages farmers do researches to improve the proposed indigenous technological interventions or generate new ones. Educational curriculum is designed in the beginning of the activity and the entry point of the learning process is the one indicated in the curriculum.

- **Innovator farmers:** Farmers who are conducting informal experiments using their own wisdom, knowledge and experiences, with the aim of overcoming problem situation or discovering new learning dimensions.

- **Farmer Innovation:** value addition on Indigenous knowledge or scientific knowledge bodies through conducting self initiated informal experiments of farmers. Up with improving efficiency, effectiveness, management, workability or understanding (generation of new Information)

Rationales for using the approach

- Many countries in the developing world have long time history also have diverse ethnic groups that have survived several types of crisis, including, drought, famine, environmental changes, epidemics of livestock and human diseases etc. Survivals have therefore immense knowledge on how to mitigate crisis.

- The present day expert/researcher - Farmer relationship is based on the assumption that the experts group feels that it is the only responsible body to come-up with technologies and new ideas so that to help farmers get out of poverty situations. However the reality is that farmers have also immense indigenous knowledge that have been on use for many years and yet neither

tapped properly nor linked with the modern science. Thus understanding farmers and encouraging them to explore their own way out through developing local innovation and hybridizing with outsider's knowledge the best approach to respond to the diverse, specific and complex reality of farmers.

- In the course of technology/innovation development the degree of participation may be understood by examining some basic indicators like who set the research agenda, who make decisions on the major events of the study, who control the research process, who owns the information etc. The higher the involvement of farmers in the innovation process the more the result will be closer to the reality, sustainable, affordable and responsive to the needs of small farmer.

Key Principles

- Resource poor farmers are making their livelihood in a diverse and complex environment and thus we need to look for technologies that respond to the specific realities they are in.

- Technologies that are generated without the involvement of the end user might sound theoretically correct but may not be always useful to the resource poor farmers because of complexity, cost factor, social reasons, environmental constraints, labor, incompetence, or because it is not the priority need of the farmers. Therefore participation of farmers in the innovation generation process is a key principle to overcome the shortcomings.

- We understand that there are always innovative farmers among community members and these farmers are striving to over come own problem situations through conducting informal experiments. Assessing who are the innovative farmers and analyzing what their innovations look like is a key principle to that help to start up farmer - led innovation development.

- We believe modern technologies are very useful for farmers but we also believe that new technologies coming to the community have to pass through a series of validation processes by the end users own criteria and free will and need to be contextualized to the real life situation of the farmers. Persuasive type of extension approach, which presumes "new technologies coming to the system are perfect and thus the only thing farmers should do is accept it", undermines the reality in the real life situation.

- In this connection, the role of extension workers is not essentially to generate technology or teach farmers on new technologies. But they are expected to facilitate technology generation processes through creating a space for

innovative farmers, researchers, extension workers and other stakeholders. Basically they should also build the capacity of farmers and help them validate new technologies coming to their systems

Conclusions

1. The basic assumption behind this approach is that in a given innovation process there is a knowledge quadrant which explains the manifestation of a knowledge element which is well known or understood by farmers and not by Scientists; something well understood by scientists and not by farmers and something which is completely not known both to scientists and farmers or something fully understood by both groups. This frame of knowledge analysis tells that there is strong need of facilitating and steering collaborative researches with farmers, particularly with those who are innovative and scientists.

2. Innovative farmers are not necessarily "model" or contact farmers; rather S/he creates or tries out new ideas without their having been recommended by extension workers or any development worker. Some experiences of Mekele university shows that, in most cases innovative farmers are old age people as well as and experienced farmers and most often poor farmers tend to be more innovative than the other farmers who could afford baying modern technologies.

3. The idea of farmer innovation and PID brings about lots of recognition and empowerment to farmers and extension workers who are involved in the process. Because, they are officially assuming a new role which could provide them chances to release their potentials. On the other hand it tends to reduce the role of the formal researchers in the process of innovation development and this may cause frustration and socio psychological problems for those scientists who are not ready to accept the new configuration and power relationship of actors in PID.

4. The role of researchers and scientists in the PID process is indeed indispensable if reasonable changes have to come in short period of time and quicker expansion of the approach and the innovation is desired. Winning the confidence of researchers/scientists and causing desirable changes in the research and extension systems of the respective countries should be one of the goals of the countries involved in the PROLINNOVA program.

5. The concepts of PID is not only applicable to research activities but also extension. PID is Indeed a tool that is being used to participatory research and development.

Some of the futures of PID as an extension tool can be explained as, on the one hand what ever the a new technology is coming from any source, farmers involved in PID will have the capacity and attitude to test, modify and then adopt or reject the newly coming technology as the case may be. Secondly there are cases where some of the farmer innovation might not be needed to further research and securitization but could be promoted to other farmers through using the farmer to farmer extension approach. Moreover it has to be remembered that the natural process of PID is a farmer led learning phenomena and thus any one who come across the process have something to learn and something to contribute.

6. The most fundamental and desired impact of PID/PTD is empowerment of farmers, in a sense that decision making of farmers on the research agenda and process will be highly improved and access and ownership of information ensured. The empowerment of farmers however has to be exercised and extended until farmers make sure that they are actively involved in making decisions on the public money that is dedicated for research and agricultural development activities as well as formulation and reform of policies that are relevant to the theme. Indeed one can see PID/PTD from the angle of human right issue, which specifically refers to the article which emphasize the right to get involved in development works. Hence it explains a feature of right based development approach.

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KEY FEATURES

The key features of the PTD approach described above are:

- It encompasses all elements of the *overall technology development process*. It goes beyond appraisal, situation analysis and setting an agenda for action to include experimentation, evaluation, sharing and consolidation.
- It provides a clear *link between farmer-led research and farmer-led extension*, thus integrating research and extension at the farmer level instead of linking these only at the level of formal institutions.
- It recognises and respects in all stages the importance of *men's and women's indigenous knowledge*. Such knowledge is not seen as static. It changes over time, also through deliberate efforts of farmers to try out new ideas. One of the major challenges in PTD is to build bridges between farmers' knowledge, which is holistic by nature, and specialised scientific knowledge (Salas *et al.*, 1989).
- It focuses on *farmer-led experimentation*, rather than demonstration and adoption of innovations. It is during experimentation that farmers' own knowledge and experience are brought together with outsiders' insights, and are compared and analysed to arrive at a locally-appropriate synthesis.
- It aims at *enhancing farmers' capacity* to develop farming systems that are sustainable over time and which conserve and improve local resources. It increases farmers' resilience to changes in their circumstances.

A participatory approach does not guarantee a move towards more sustainable forms of agriculture, nor does it automatically alleviate poverty. Existing power relations – of men over women, of the rich over the poor, of the old over the young – will affect the participation process and prevent equal benefit to all. Conventional agricultural research and extension used to be biased towards male, wealthier and better educated farmers. If PTD is to avoid such biases, certain methods and tools must be applied. These are discussed at appropriate points in Parts 2, 3 and 4. Units 1.E & 1.F – "Respecting Rural Life" and "Gender Sensitivity" – generate the basic understanding needed to make good use of these methods and tools.

ROLES OF FIELDSTAFF IN PTD

The process of PTD assigns roles to fieldstaff which differ markedly from those played in conventional agricultural research and development. The new roles of fieldworkers are initially as:

- **Facilitators**
  - in analysing the present farming situation and resource base;
  - in making an inventory of local knowledge and ideas which could provide solutions for identified problems, and other local resources relevant for developing a sustainable farming system;
  - in making farmers' criteria explicit and selecting options to try;
  - in making farmers' informal experimental methods explicit and in systematic planning, monitoring and evaluation of new experiments;
  - of farmers' self-organisation and self-management.
- **Networkers**
  - by encouraging exchange among farmer-experimenters in the local area and beyond;
  - by helping to develop linkages with local farmer organisations and relevant support organisations;
  - by linking farmers with relevant sources of information;
  - by feeding back information about farmers' experiments to formal researchers;
  - by stimulating greater participation of farmers in programming and assessing formal research.
- **Educators and trainers**
  - by enhancing farmers' diagnostic capacities;
  - by revitalising indigenous knowledge, cultural identity and self-esteem in farming communities;
  - by helping farmers increase their understanding of the principal processes at work in their agro-ecological system;
  - by facilitating the development of relevant organisational and communicating skills (such as problem-solving, leadership development and functional literacy) of farmer-trainers and PTD group leaders.

■ **Co-researchers**

- by contributing ideas, potential solutions and information from formal research, whenever useful in the PTD process;
- by replicating farmers' experiments under more controlled conditions;
- by making additional measurements and observations to support analysis of farmers' experimentation;
- by documentating the entire process and the final evaluation of socio-cultural and agro-ecological impacts.

As the PTD process develops, fieldworkers gradually assume the role of:

■ **External advisors**

- by participating in the evaluation and planning of group activities at the farmers' request;
- by supporting leaders of farmer-experimenter groups;
- by assisting in networking and policy lobbying at inter-community and higher levels.

OBSTACLES TO PARTICIPATION

In promoting farmer participation in technology development, many obstacles have to be overcome. Those most commonly encountered are the following:

■ Local government agencies and bureaucratic forces, despite their rhetoric of support, have reasons to fear farmer participation and may seek to divert the threat. They may appear to accept the participatory programmes, but then take them over and give them a completely different meaning.

■ Some professional agronomists and development workers find it hard to accept that rural people have something to contribute to technology development. Through many years of formal education, they have been led to believe that scientific knowledge is superior to local knowledge. This prejudice is very difficult to overcome.

■ Many organisations, both governmental and non-governmental, lack the flexibility and the internal openness to follow a participatory approach. Where bureaucratic or charismatic leaders dominate and dictate the day-to-day work of their staff, there is little hope that the latter can develop strong participatory interaction with their "target group".

■ A large part of the rural population – women – face special obstacles: heavy labour inputs prevent them from taking part in meetings; cultural restrictions prevail against appearing or speaking at open meetings; their expertise and independent interests are easily neglected in community action. Deviation from the norm, which is implied in experimentation with new ideas, sometimes raises very strong opposition.

■ In most countries, there are disadvantaged minorities which are distinguished by race, religion or ethnic group. The participation of these minorities in development activities may be strongly resisted by the dominant groups.

■ The poverty of certain categories of the rural population and their previous bad experiences with (non-) supporting agencies may have robbed them of any hope for improvement, depleted their self-confidence and increased their distrust of outsiders. This results in a "culture of silence".

INVENTORIZING FARMER INNOVATION AND CREATING SYNERGIES IN PID/PTD AMONG STAKEHOLDERS IN SOUTH AFRICA

Introduction

To accommodate a PID/PTD approach, adjustments will usually be needed both within the organisation and its relations with other organisations.

Farmers involved in a PTD process will look to the support of organisations for suggestions on new technologies worth testing. The organisation must therefore have a strategy of keeping itself informed about new ideas of possible interest to farmers and actively seeking possible explanations for what farmers are finding in their experiments. These innovations and explanations may come from the same region or from other regions with similar conditions, and from either formal or informal research.

Farmer innovators are land users who have acquired a resources management tool/knowledge that they use to increase agricultural production, while they conserve or improve the environment. These are good tools which they use and which should help other land users to realize the value of and to utilize them. It is also necessary that they, together with other farmers, should sharpen the tendency to innovate or discover solutions to their farming and environmental problems.

Building external relations

Most organisations will not be able to implement PTD/PID approaches without cooperating with other agencies. Especially an organisation commencing with PTD will need support from others with more experience. But also, in the ongoing PTD process, various organisations will have different but closely interactive roles to play:

Agricultural research institutes:

- providing information on new technologies;
- participating in fieldwork during situation analysis and the identification of "best-bet" options;
- advising on design and monitoring of farmers' trials;
- carrying out on-station research into field-generated innovations or adaptations or into questions raised by farmers;
- providing specialist services; and
- using their knowledge of farmers' situations and questions to influence the national research agenda.

Government extension services:

- providing technical advice about specific technologies;
- preparing training/extension materials on those technologies;
- providing secondary data (e.g., soils, climate, prices, yields);
- encouraging farmer-to-farmer extension and sharing of results in a wider area; and

- using their knowledge of farmers' situations and questions to influence government extension policy.

NGOs or development projects:

- mobilising farmers and giving them organisational support;
- facilitating farmer-led situation analysis and planning of the local research agenda;
- supporting farmers in carrying out their experiments;
- giving guidance in dealing with gender issues;
- mediating in conflict resolution; and
- encouraging farmer-to-farmer extension.

Farmer organisations:

- identifying and articulating felt needs and current problems;
- coordinating the process of carrying out, monitoring and evaluating farmers' experiments;
- organising farmer-to-farmer visits and exchange, both within their own area, and further afield; and
- eventually assuming responsibility for continuing the PTD process in the area.

In practice, the distinctions are not always so clear. Overlaps occur, and one type of organisation may expand to fill gaps. Periodic "stakeholder" analyses are necessary to ensure that all relevant agencies are involved in the PTD process.

What is an innovation?

Innovation can be both traditional and new practices that enhance the achievement of some or all of the following:

a) Increasing food security at household level
b) Alleviating farmer's poverty
c) Improve/maintain environment condition.

Characteristics of an innovation.

- Low cost practice
- Easy to adopt and practice
- Sustainable
- Environmentally friendly
- User friendly
- Ecologically compatible
- Legally and socially accepted

How do we define 'farmer innovators'?

Farmer innovators are farmers – or more correctly 'land users' – who innovate. That is, they test and try new methods of conservation for production, on their own initiative, often using ideas from various sources. We do not mean 'model' farmers who have been groomed by projects, nor do we refer to part - time 'hobby' farmers who are so well–resourced and so exceptional that they have nothing to offer ordinary farmers. Farmer innovators, largely overlooked as a development 'tool' until now, have been seen to come up with better ideas than many offered by development

agencies. Farmer innovators can communicate better and spread a message/technology faster amongst local communities.

The objective for promoting Farmer innovators

Initiatives by Farmer innovators will be identified, characterized, analyzed and documented. The Farmer innovators will be encouraged to form networks to stimulate exchange of ideas. Furthermore they will be used to disseminate messages to other land users. Research institutions will assist Farmer innovators in keeping useful records that will be used to strengthen documentation and adoption of policy framework of the innovations.

Who are the farmer innovators we are looking for?

Ideally, the farmer innovator we are looking for has the following qualities:

- Practices effective or potentially effective innovations in the area of soil and water conservation, water harvesting, land husbandry, livestock or crop husbandry, agro-forestry and nursery management, pests, diseases, vermin management and environment improvement and protection.
- Uses own initiative but may also bring in ideas from various other sources.
- Able to respond to the stimulus of recognition and demonstrates a willingness to experiment, develop, monitor and disseminate.
- Will often be curious, proud, willing to undertake risks, have a feeling and an understanding for integrating resources to achieve synergy (complementarities).

Farmer innovators will not be:

The one's outside the normal population *e.g.*, over-resourced hobby farmers or 'super men/women' or 'model' farmers, or 'oddballs'.

Their innovations will be:

- Better/modified traditional or introduced system or something new.
- Tried and tested system, or something currently under experimentation.

Identification of Farmer innovators

How do we locate where the Farmer innovators are?

- At exhibits and shows.
- From what we already know among them (the grape vine trace).
- Conducting focused PRA (participatory rural appraisal).
- Through appropriate media.
- During the FFS ground working.
- Identification through agent/stake holders *e.g.*, chiefs, teachers extension officers, other farmers.
- From forums like chiefs' village meetings or church congregations.
- Secondary data from reports.
- They can also be volunteers when they are aware that they are an innovator.

Criteria for recruitment of innovators

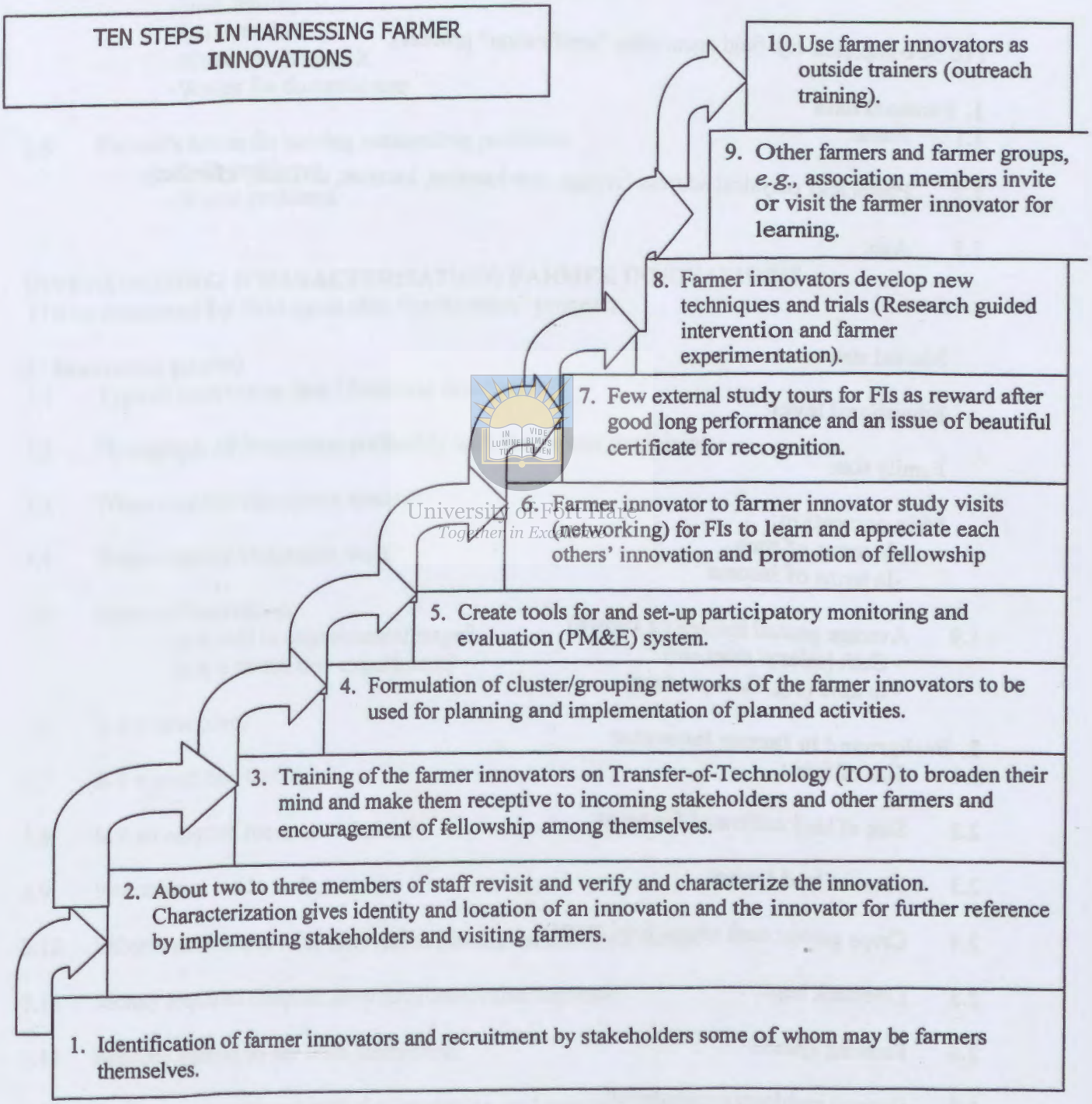
- Full time practicing farmer.
- Farmers who are capable of disseminating information to other farmers.

- Farmers who are social.
- Early adopters
- An average farmer in terms of social status.
- Those practicing many innovations.
- Dedicated to farming.
- Farmers who are ready to endure medium risks in farming.

Why are Farmer innovators useful in research, development and extension?

- They provide a quick and direct entry point into the farming community.
- In soil and water conservation/water harvesting/land management, agro-forestry and nursery management.
- They provide a pre-selected team to work with.
- They respond to recognition and network well together.
- They often prove to be the best farmer-researcher to develop and monitor systems.
- They often enjoy disseminating knowledge.
- They are pro-creative.
- They are ready and early adopters / adapters of technology.

PFI process on a ladder



INVENTORISING (CHARACTERISATION) FARMER INNOVATIONS

(EXAMPLE FROM KENIA)

(To be completed by field agent after "verification" process).

1. Personal data

1.1 Name:

1.2 Postal and physical address (village, sub-location, location, division, district):

1.3 Age:

Sex:

Marital status:

Educational level:

Family size:

Main occupation:
-In terms of time
-In terms of income

1.9 Average annual income (if known)
- Cash (salary/ sales etc)
- In kind (e.g. farm produce)

2. Background to farmer innovator

2.1 Size of farm:

2.2 Size of land cultivated for crops:

2.3 Form of land tenure:

2.4 Crops grown: cash crops/ food crops:

2.5 Livestock kept:

2.6 Farming system:

2.7 General problems encountered:

2.8 Specific problems encountered and what is the farmer doing about them/
- -Soil moisture
- -Soil fertility
- -Soil erosion
- -Water for livestock
- -Water for domestic use

2.9 Farmer's ideas for solving outstanding problems
- -Soil problems
- -Water problems

INVENTORISING (CHARACTERISATION) FARMER INNOVATIONS
(To be completed by field agent after "verification" process)

3. Innovation (main)

3.1 Type of innovation [brief technical description].

3.2 Photograph of innovation preferably with the farmer explaining.

3.3 When was the innovation started?

3.4 Where did the idea come from?

3.5 Status of innovation.
- -Is it still in experimental stage?
- -Is it a concluded experiment?

3.6 Is it a new idea?

3.7 Is it a modified tradition?

3.8 Is it an adapted recommendation?

3.9 Investments made so far:

3.10 Labor used for and with innovation (family labor/ hired labor):

3.11 Money required (implements/fertilizers, other inputs):

3.12 Benefits gained so far with innovation:

3.13 Problems experienced with the innovation and mention ideas for solutions:

3.14 Spread of innovation:

3.15 How many other farmers have copied innovation?

3.16 How did they find out about the innovation and when?

3.17 Photograph innovator at her/his innovation

3.18 Does anything make adoption more difficult?
(Labor/ knowledge/ experience/ culture etc)

4. Mention other observable innovations in the farm.

4.1 Type - describe:

4.2 When was it started:

4.3 Source of innovation:

4.4 Status of the innovation:

4.5 Benefits gained so far from it:

4.6 Problems experienced with innovation.

EXAMPLES OF A FARMERS' INNOVATION CATALOGUE - KENYA.

12 UUNDAJI WA VIJISHAMBA JUU YA SHAMBA LILO LOWA MAJI.

Bwana Mativo Musau

Anuani: Central ,Nzambani,Ithumb,Kamunyuni

Maelezo ya mbinu:
Bwana Musau ni mkulima kijana takiribani umuri wake ni miaka 26. Amepewa shamba na babake ya ekari 3 na karibu hili shamba lote limeloa maji. Yeye hukuza vitunguu via kuuza akitumia njia ya kuunda vijishamba ambavio viko juu ya ardhi ilio loweka. Kwauknda hizi vijishamba yeye hutumia vikingi via makonge na mchanga wa kuletwa kutoka kwingine.

Mr. Musau grows commercial onion on raised gardens above waterlogged land. He borrows soil from outside and piles it to make small gardens that are bound by sisal poles. He can raise or lower the garden beds to improve drainage hence avoid water logging.

The left hand side is written in local language to allow for a majority of farmers to read. The right hand side is written in English to allow other people to read.

14 UVUNAJI WA MAJI YA MVUA YAKUTUMIA KWA KILIMO.

Bwana Divide Munyalo

Anuani: Yata, Kwavonza, Mikuyun,Tanganyika.

Maelezo ya mbinu:
Bwana Munyalo avuna maji ya mvua kutoka kwa barabara na paa za nyumba zake kusudi ayatumie kwa kukuza mimea aina mbalimbali. Yeye husambaza haya maji kwa shamba lake akitumia mitaro vibakuli vinavio, mfano wa V (V-band), na mwingine wa U (U-band).

Mr. Munyalo grows various crops using rainwater harvested from roofs and roadside for supplementary irrigation. He uses contour furrows, V- and U-shaped bands to hold water at the plant base.

The left hand side is written in local language to allow for a majority of farmers to read. The right hand side is written in English to allow other people to read.

Categories and number of innovations and their frequency

Category of innovation	Rift Valley	Coast	Eastern	Total	Fraction %
Water harvesting	20	8	18	46	
Livestock health/ethno-veterinary	13	8		21	
Irrigation	13	4	5	22	
Soil and water conservation	10		10	20	
Biological pest control	3	15	1	19	
Soil fertility management	13	3	2	18	
Livestock management, feeding and breeding	9	4	3	16	
Agro-forestry	9	3	2	14	
Farm tools and machinery	8	1	2	11	
Poultry management	5	5		10	
Beekeeping	6	2	1	9	
Crop management	1	4	2	7	
Water storage	6			6	
Tree crop farming	3	2	2	7	
Seed/crop storage and management		4		4	
Processing of niche for export		4		4	
Crop breeding and seed bulking	3			3	
Agro-processing		3		3	
Water table management	1	1	1	3	
Others	5	5	1	9	
Total number of farmer innovators	**128**	**76**	**50**	**254**	**100**

Material from:

Charles Mburu, 2004. Presentation at the Participation Innovation Development: A Training of Facilitators Course, IIRR, YC James Yen Center, Silang, Cavite, Philippines. (Charles Mburu is the National Coordinator, Promoting Farmer Innovation-Kenya, based in Nairobi)

Laurens van Veldhuizen, Ann Waters-Bayer & Henk de Zeeuw, 1997. Developing technolgy with farmers. A trainer's guide for participatory learning. ETC Netherlands. ZED Books Ltd, London and New York.

CHAPTER TWO

WIDENING THE SPACE: INSTITUTIONALIZING PTD

The focus on partnerships between farmers and outside agents/ professionals in the mid-1980s resulted in the wider acceptance of the notion of participatory technology development. This process of interaction between local people and outside facilitators was expected to result in more sustainable, ecologically sound and culturally acceptable farming systems. This process started with a joint analysis of the situation and encouraged experimentation by farmers. These activities and methods are clustered in six themes that form together the "original" PTD framework as shown in Annex 4 (ILEIA, 1988). These six original PTD principles were:

1. How to get started

Building a relationship of confidence aimed at cooperation with local networks of farmers and other actors. Making a joint analysis of the existing situation, farming systems and problems.

2. Looking for things to try

Identifying indigenous technical knowledge and relevant formal knowledge. Screening and selecting topics for further development, using criteria leading to optimal use of local resources and sustainable systems of production.

3. Design of the experiment

Planning and designing experiments, based on farmers' criteria and measuring techniques, but improved with (methodological) suggestions of outsiders.

4. Trying out

Actual implementation of the experiments and evaluation of the results.

5. Sharing results with others

Communication of results with other local and scientific networks to scrutinize and interpret them, and to encourage others to adapt and test the results for their circumstances.

6. Sustaining and consolidating the process of PTD

Creating favorable conditions for farmers' organizations, local institutions and support at policy level. Establishing physical infrastructure and educational facilities to strengthen local experimental capacity and local management of the processes of innovation.

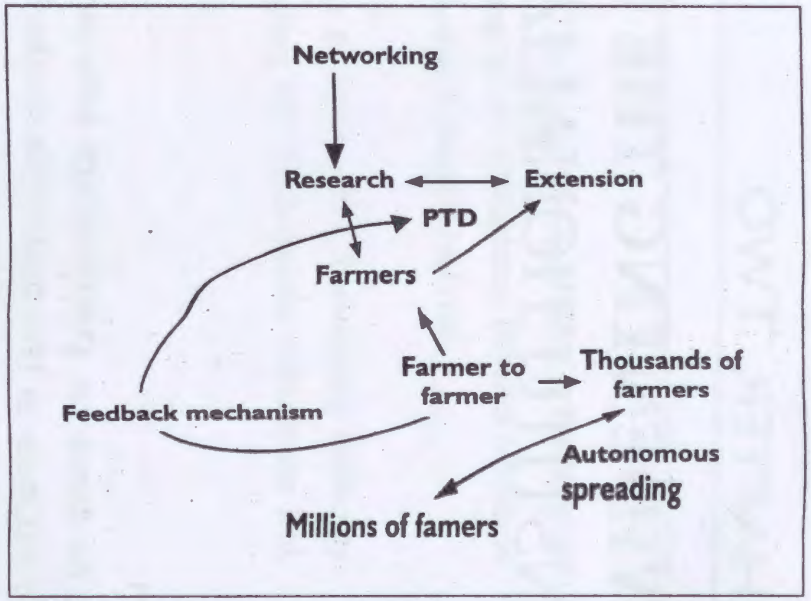
The original proponents of the process always emphasized that the sequence suggested by the above list of activities was artificial because linear, stepwise processes did not occur in practice. To be effective, PTD activities depended on collaboration among farmers, field workers, researchers and others. New patterns of interaction and cooperation evolved. PTD is more than research: it combines the generation, testing and application of new techniques with the creation of the physical and institutional infrastructure to sustain the application and further innovation of the technology (Haverkort, Kamp, Waters-Bayer, 1991).

The last element emphasizes "sustaining the PTD process." The ultimate aim is to leave communities with a capacity to continue to implement an effective process of change. PTD programs must therefore also be concerned with organizational development and the creation of favorable conditions (Veldhuizen, Waters-Bayer, and de Zeeuw, 1997). More than a decade after PTD was widely promoted, participants at the September 2001 workshop stressed that technology has to do with values and processes and that success in achieving wide impact happens not out of domination, but out of partnerships.

Falling under the rubric of PTD, innovations are marked by –

- the centrality of partnership in mutual and respectful learning among farmers, scientists and extension workers;
- the focus on strengthening local capacities to experiment;
- innovations based on farmers' requirements;
- the openness to creating an organizational culture (norms, values and behavior) that supports partnerships;
- the readiness to create links between different types of knowledge, as well as between different sources of knowledge; and,
- the expansion of PTD application beyond agriculture into marketing and other endeavors.

As a result of PTD, farmers' innovative capacities are strengthened. Empowered and supported by partners outside the community, they become more willing to experiment in areas where outcomes are unpredictable. PTD also strengthens farmers' organizations and other stakeholder groups. The diagram below shows how PTD interactions between researchers, extensionists and farmers could reach thousands of farmers through peer exchange and feedback mechanisms, resulting in the widespread dissemination of PTD principles and processes.



PTD interactions through peer exchange and feedback mechanisms

Four major challenges in institutionalizing PTD

First, is the need to spread new ways of exchanging knowledge on sustainable agriculture practices not among thousands of farmers, but to millions of rural households in every country.

Second, the wide gap between researchers and extensionists in such complex problems as animal husbandry and common property resources, or conservation, processing and marketing. Despite investments in research and large extension services, this hasn't led to effective systems for complex and diverse issues.

Third, is the need to develop structures that could marshal resources to carry out the constructivist, farmer-to-farmer exchange over wide areas and populations.

Fourth, is the need to organize a way to learn and interact with each other across all hierarchies, at all levels from experimenting groups of households to global partnerships, in a field where there are no teachers.

Source: Ueli Scheuermeier, Opening program workshop message.

After a decade of success in promoting participatory agricultural research and extension approaches, challenges still remain in efforts to institutionalize PTD within research, extension and civil society organizations.

Institutionalization

Institutionalization of PTD requires time, and often it is a continuous learning process that can start from simple experiments to complex ones that require a shift from project to program approaches. Doing PTD in groups enhances ownership and contributes to institutionalization.

Institutionalization is a process in which new ideas and practices are introduced, accepted and used by individuals and organizations so that these new ideas and practices become part of "the norm" (Sutherland, 2000). Compared to scaling-up, which refers to the dissemination of technology or ideas over a wider area and to a larger number of persons, institutionalization refers to the transformation of norms, attitudes, behaviors and organizational structures so that a new idea becomes an integral part of the organization. Workshop participants differentiated

Differentiating scaling-up and institutionalization

Scaling-up	Institutionalization
• To promote or disseminate a technology or idea horizontally or vertically, i.e., over a wider area, a larger number of beneficiaries, larger number of NGOs and other partners to achieve bigger impact.	• To sustain the links and structures developed during the PTD processes, institutionalization seeks to ensure that technology development and scaling-up continues beyond project frameworks by becoming part and parcel of the regular work of the key actors involved. The process may incorporate elements of scaling-up.
• Is made possible through self-help groups, federations, networking NGOs and district working committees.	• To change organizational culture by enhancing a set of "rules of the game" so all development institutions (government, non-government, farmer organizations, etc.) effectively collaborate. Institutionalization is achieved only when all groups of actors involved in agricultural research and development at all levels in the institutions are willing and become capable of making the joint quest.
• Scaling-up could be the result of institutionalization, but it does not necessarily lead to institutionalization.	• Institutionalization of PTD calls for gradual changes in attitude, norms, capacities and behavior (including specific tools and methodologies) that support participatory approaches in agricultural research for sustainable development. These approaches are reflected in planning, implementation, and M&E.
	• Institutionalization can be at grassroots or at higher levels.

To have a recognizable effect, the new "rules of the game" need to be adopted at strategic points within the organization.

Since institutionalization entails engagement with government agencies, farmer organizations, NGOs and the private sector, one is immediately faced with problems inherent in working with a range of actors with different missions, management systems and interpersonal dynamics. For PTD institutionalization, mutuality and transparency, which characterize cooperation in local partnerships, will need to be replicated in these wider settings. Breaking old bureaucratic cultures, changing attitudes, exploding myths about other actors and about PTD itself, and

time and other transaction costs. Actors must learn new roles or be wise enough to evolve them.

The succeeding chapters show how these and other issues are manifested and may be addressed in different settings.

Institutionalization issues

Overall institutionalization concerns

- When should institutionalization begin?
- What is institutionalized? Technologies or approaches?
- Can there be dualistic PTD-conventional approaches?
- Is there a need to create new PTD institutions? Should their creation be prevented?
- Who owns research results? Does public good override intellectual property rights?
- Can implementing guidelines be set up for institutionalization and still keep PTD dynamic?

Lobbying campaigning

- How can research institutions be influenced?
- What will show that PTD really leads to technology development and that the costs translate into better results?

Policy formulation and planning

- Who must be involved in planning institutional change?
- Can there be too much structuring of the PTD process?
- How will the lag in time frames be handled?

Institutional change/development

- With diversity in crops, environment, organizational culture, logistical capacities and other factors, is it possible to standardize procedures in institutionalization?
- If there has been no experience with wide-ranging extension work, why bother institutionalizing?

Monitoring and evaluation of institutionalisation

- What criteria for success may be used for institutionalization? How is quality control ensured when PTD is scaled-up?

External conditions

- Can PTD be a sustainable alternative to globalization and regional integration?

Strategies for institutionalizing PTD/PID

A Panel Discussion

Institutionalization of PTD requires time, and it is often a continuous process that can start from simple experiments to complex ones that require a shift from project to program approaches.

Doing PTD in groups enhances ownership and contributes to institutionalization.

Types of institutions

- Research
- GO/NGO extension and development
- Civil society sectors
- Multi-stakeholder platforms

Major challenges

- Need to spread new ways of exchanging knowledge, especially through farmer-to-farmer mechanisms
- Despite much investment in these linkages over many years, wide gaps still exist between researchers and extensionists, esp. on complex problems such as NRM, common property resources and agricultural marketing
- Need to organize ways to learn and interact with each other across hierarchies and at different levels

Important elements of institutionalization

- Organizational culture, norms and values
- Mechanisms for internal and external sharing and learning
- Partnerships, cooperation and networking
- Multi-stakeholder platforms and processes
- Attitudinal changes
- Decision-making and policy-making processes
- Reward systems
- Capacity development, competencies and training
- Level of importance given to 'empowerment' objectives

Objective of the Panel discussion

- To examine critical issues related to efforts to institutionalize PTD/PID approaches within and between research and development institutions.

Invited Panelists

- Professor Oscar Zamora
  Agronomy Department, University of the Philippines Los Banos (UPLB)
- Dr. Gil Villancio
  Institute of Agroforestry, College of Forestry and Natural Resources, UPLB
- Dr. Edwin Balbarino
  Farm and Resource Management Institute (FARMI), Leyte State University

NOTES:

Strategies for institutionalising PID (Participatory Innovation Development)/PTD [1]

A. Capacity development

1. Need to invest on farmers.
2. Danger of creating "professional farmers", i.e. farmer trainers and leaders who do not farm but rather attend meetings, conferences, etc, here and abroad.
3. Creating too much demand on good farmers - innovative farmers who eventually spend too much time hosting and talking to visitors.
4. Relying too much on too few good farmer leaders; need for 2nd and 3rd liners.
5. Anyone who decides to work on empowering farmers should be willing to give up some of his/her power.

B. Networking and partnership

1. Informal networking is, from experience, more effective as long as you know what the person stands for.
2. Formal institutions are becoming more and more open to networking and establishing partnerships with informal institutions, in search of relevance. However, many are not set up for participatory approaches.
3. Should be careful with formalising with partnership with formal institutions, e.g. universities, research institutions, etc. Most of the time, the moment formal institutions linked and partner with NGOs, it is to "deodorise their stink".

C. Strategies for institutionalising arrangements

1. Informal person to person commitment
2. Formalization i.e. MOA, MOU, LOI, etc. Usually required by formal institutions.
3. Formal agreements is best done at the local level (local organisations) rather than national organisatiosn for the following reasons:
   a. empowers local groups
   b. strengthens local groups
   c. legitimises local group especially in politically charged areas
   d. makes local groups better organised
4. Dangers of institutionalization:
   a. becoming top down
   b. danger of being misused by formal institutions
   c. heavy administrative load
   d. involvement (of many formal institutions) not because of commitment but to generate funds and uplift the name of the institution and professional recognition of staffs involved.

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[1] Notes by Oscar B. Zamora, Professor, UPLB-College of Agriculture. Panel discussion at the "International PID/PTD Training of Facilitator's Course". International Institute of Rural Reconstruction (IIRR), 14-25 June 2004

Important competencies in PID/PTD*

Marissa Espineli

Basic knowledge and skills for successful involvement in PID/PTD

- Identification of learning needs of participants
- Implementing participatory and experiential learning processes
- Articulate the following concepts: sustainability, indigenous knowledge, low-external input and sustainable agriculture, diversity, nutrients flow
- Recognize the important role of farmers in generating and communicating innovations
- Differentiate the various levels and forms of farmers' participation and identify one that will suit their particular situation
- Creatively approach technology development given their understanding of the potential and limitations of participatory approach compared to farmers' own and conventional top-down approach
- Taking real interest and makes an effort to understand the day to day struggle of farmers, showing respect for farmers' achievements in managing extremely difficult situations
- Articulate the logic behind the farming communitys'complex local livelihood systems
- Recognize the farmers' basis for daily decision making including his role and position in the community structure/s
- Sensitivity to power issues and their implications in given socio-cultural settings and handle these issues in a responsible way
- Deep respect for the farmers' cultural identity and ability to re-evaluate and reflect on one's own cultural practices and biases
- Differentiate roles and responsibilities of women and men in agriculture/natural resource management related activities and take into account the interrelationships of these roles and responsibilities in developing PID/PTD strategies
- Communicate dialogically to stimulate common action by listening with an open mind, probing and using positive body language and non-verbal communication

Getting started

- Joint analysis of trends and problems in local farming, supporting farmers of their own analysis of cause-effect relationship of issues affecting them including inventory of opportunities and potential resources.
- Joint formulation of criteria for selecting work areas
- Conduct organizational mapping that would be relevant for the PTD process in the work area

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* Consolidated from Veldhuizen, Laurens van et. al. 1997. "Developing Technology with Farmers: A Trainers' Guide for Participatory Learning". ETC Netherlands. Zed Books Ltd, London and New York.

- Facilitate a rapid appraisal of agricultural knowledge systems that involve all relevant organizations in the work area
- Build a relationship of trust and of joint commitment with possible collaborating organizations in the PTD program
- Screen and study existing information about the work area and talk to people who have experience in working in the area

Situation analysis

- Use of participatory tools for gathering information for analyzing community situation affecting farming practices
- Creatively design appropriate methods and approaches for situation analysis
- Joint analysis of the local situation, problems and opportunities
- Identifying promising solutions from local experience, farmer experts and sources outside of the community and prioritizing them
- Use of methods and tools for observing the land and the environment to monitor sustainability

Looking for things to try

- Finding opportunities for complementation of farmers' and outsiders' knowledge and their ideas in looking for concrete solutions
- Use methods for determining options for experimentation
- Facilitate group decision making on the agenda for experimentation/agricultural innovation leading to a clear understanding of what is to be tried out and why
- Formulate the idea to be tried out in a systematic and analytical way
- Stimulate direct contact between farmers and different source of information including research stations and other government services
- Elicit farmers' criteria for evaluating the results of trials/experimentation

Looking at local ways of experimentation

- Building on farmers' experimental capacities and methods
- Identify local innovators/experimenters
- Conducting experiments with farmers, agreeing on the hypothesis to be tested
- Describing different ways farmers approach to experimentation and the logic and relevance they prescribe to these experiments
- Stimulate the generation of local knowledge and reinforcing local capacities to develop sustainable farming systems
- Coordinate local creation and sharing of knowledge among farmers
- Stimulate farmers to recognize the value of their own experimentation
- Show genuine interest in the farmers' own initiatives and efforts

Strengthening farmers' experimentation

- Support farmer experimentation by learning from it, documenting it and sharing its results
- Enhance farmers' understanding of the basic principles behind locally developed or introduced technologies and underlying biological processes
- Facilitate systematic discussion and decision making among interested farmers about how to design their experiments
- Support the formulation of a clear hypothesis for the farmers' experiment
- Draw from the farmers conditions that will strongly influence the outcome of the experiment and how these conditions will be measured
- Help farmers articulate to others the basis of their conclusions
- Facilitate a learning process among different farmers that are into similar experiments
- Provide farmers an array of trial formats from which he can select simple, manageable and flexible format for his experiments
- Joint assessment of the contribution of each innovation to the larger problem and how it relates to enhancing the sustainability of the farm system as a whole

Build self help (farmer experimenter) groups for agricultural development

- Encourage farmers to collaborate in designing and organizing farm trials
- Allow self help groups to develop in their own way and in their own pace
- Facilitate group cooperation
- Facilitate group problem discussions
- Stimulate the farmer experimenter group as a platform for discussion and sharing information
- Develop the ability of the group govern themselves, manage their resources, evaluate its own functioning
- Assist in moderating meetings initially and stimulating farmer-to-farmer interaction

Recording and assessing experiments

- Articulate concepts behind participatory monitoring and evaluation and respect for farmers' criteria
- Identify farmers' practices for recording and assessment
- Assist farmers in improving their monitoring practices
- Jointly develop with the farmers a recording and assessment plan that contain the list of what to record, how and when
- Facilitate farmers' identification of its criteria in assessing the experiments
- Encourage the development of creative, flexible and farmer friendly information collection methods
- Joint analysis of information for farmers to learn from the experience
- Facilitate cost-benefit analysis of the experiment

Farmer to farmer extension and training

- Encourage farmers to share with other communities the ideas and methods of how to identify, test and adapt promising technologies to develop more sustainable agricultural practices
- Identify indigenous communication networks within the village that would be strategic in spreading out information
- Build a cadre of farmer extensionists that will teach other farmers the technologies he/she is adapting
- Using different approaches to capacity development for extensionists: cross visits, training, provision of extension materials, mentoring etc.
- Ensure the involvement of marginalized groups in community discussions
- Creatively tap local resources to support farmer extensionists
- Keeping track of the results and impact of farmer-based extension activities for discussion with people involved

Sustaining the process

- Strengthen local problem-solving capacities to continuously develop sustainable agriculture and improve their livelihoods
- Map out a clear phasing out plan with the farmer experimenters and groups
- Enhance individual capacities: self confidence and respect for their own knowledge, analytical skills, experimental skills and skills in interacting and negotiating with outside organizations
- Strengthen horizontal and vertical linkages of the group
- Develop the capacity of the group to monitor their ability to innovate and learn from the process of innovating

Roles of development professionals in PTD*

1. FACILITATORS

1.1 In analyzing present farming situation and resource base
1.2 In making an inventory of local knowledge and ideas which could provide solutions for identified problems and other local resources relevant for developing a sustainable farming system
1.3 In making farmers' criteria explicit and selecting options to try
1.4 In making farmers' informal experimental methods explicit and in systematic planning, monitoring and evaluation of new experiments
1.5 Of farmers' self-organization and self-management

2. NETWORKERS

2.1 By encouraging exchange among farmer-experimenters in the local area and beyond
2.2 By helping to develop linkages with local farmer organizations and relevant support organizations
2.3 By linking farmers with relevant sources of information
2.4 By feeding back information about farmers' experiments to formal researchers
2.5 By stimulating greater participation of farmers in programming and assessing formal research

3. EDUCATORS AND TRAINERS

3.1 By enhancing farmers' diagnostic capacities
3.2 By revitalizing indigenous knowledge, cultural identity and self-esteem in farming communities
3.3 By helping farmers increase their understanding of the principal processes at work in their agro-ecological system;
3.4 By facilitating the development of relevant organizations and communicating skills (such as problem-solving, leadership development and functional literacy) of farmer-trainers and PTD group leaders

4. CO-RESEARCHERS

4.1 By contributing ideas, potential solutions and information from formal research, whenever useful in the PTD process;
4.2 By replicating farmers' experiments under more controlled conditions;

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* Lifted from Veldhuizen, Laurens van et. al. 1997. "Developing Technology with Farmers: A Trainers' Guide for Participatory Learning". ETC Netherlands. Zed Books Ltd, London and New York.

4.3 By making additional measurements and observations to support analysis of farmers experimentation;
4.4 By documenting the entire process and the final evaluation of socio-cultural and agro-ecological impacts

5. EXTERNAL ADVISORS

5.1 By participating in the evaluation and planning of group activities at the farmers' request
5.2 By supporting leaders of farmer-experimenter groups
5.3 By assisting in networking and policy lobbying at inter-community and higher levels

Capacity Needs Assessment for PID

Marissa B. Espineli

Capacity needs assessment

The process of identifying capacity gaps and capacity development intervention to address these gaps

Capacity building vs capacity development

These are terms that are often used as synonyms, highly elastic that is both can be stretched to embrace many different things.

Capacity building

In agricultural research and development, capacity building is often equated with training activities and workshops

In NGOs and volunteer services organizations, capacity building is associated with the empowerment of individuals (Rahman, 1991)

In management schools, capacity building often means organizational development (Harrison, 1994)

In the UN and WB, capacity building typically refers to improving national institutions to improve governance and economic management (UNDP, 1998; Picciotto and Wiesner, 1998)

Implies a carefully planned and executed activities following a blueprint (building)

Capacity development

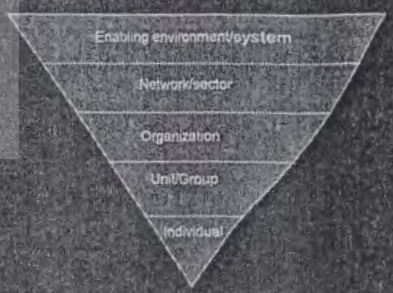
The process by which individuals, groups and organizations improve their ability to carry out their functions and achieve desired results over time (Morgan, 1997)

Refers to the approaches, strategies and methodologies used by developing country, and/or external stakeholders, to improve performance at the individual, organizational, network/sector or broader system level (Bolger, 2000)

A concept that is broader than organizational development since it includes an emphasis on the overall system, environment or context within which individuals, organizations and societies operate and interact (and not simply a single organization) . (UNDP, 1998)

Involves more experimentation and learning which implies an organic process of growth and development

WHOSE CAPACITY?



WHOSE CAPACITY?

Farmers | Project field staff | Trainers of project field staff

What competencies?

Competencies – combination of knowledge, skills and attitudes essential to the mastery of a particular field

It is the lowest level of abstraction used to define learning that is expected in any training course.

Competencies better define the course outcomes which better define course objectives

Competency based system makes it possible for learners already knowledgeable about a particular subject to make progress toward a desired level of competence

Knowledge

facts, information, theories, principles, concepts that learners can either recall, articulate, synthesize, consolidate

Skills

ability to perform a particular observable behaviour that learners can demonstrate

Attitude

state of mind informed by values that influence the positive or negative performance of a behaviour

Competencies	Farmers	Project field staff	Trainers of project field staff

WHOSE CAPACITY?

Capabilities/ Competencies	Farmers	Project field staff	Trainers of project field staff
Basic knowledge and skills for successful involvement in PID	√	√	√
Starting a PID process	√	√	√
Situation analysis		√	√
Looking at local ways at experimentation		√	√

Levels of competence

Level 1 : Performs the activity with significant supervision and guidance
Performs basic routines and predictable tasks
Little or no responsibility or autonomy

Level 2 : Supervision is only required in more complex circumstances
Some individual responsibility or autonomy

Level 3 : Performs the activity in some complex and non-routine contexts
Significant responsibility and autonomy
Can oversee the work of others

Level 4 : Performs the activity in a wide range of complex and non-routine contexts
Substantial personal autonomy
Can develop others in the activity

Level 5 : Can take a strategic view
Applies a significant range of fundamental principles and complex techniques across a wide and often unpredictable variety of contexts
Wide scope of personal autonomy

What competencies and how are they defined

How are competencies identified?

- Invite experienced PID practitioners in a meeting and ask them to list the different competencies needed for them to be able to do their responsibilities and functions
- Draw from existing literatures the various competencies attached to the roles, functions and responsibilities related to PID

What competencies?

Exercise: In groups, review the list of important competencies and roles of development professionals in PTD drawn from the book "Developing Technology with Farmers"

- Suggest revision/s to these list
- Suggest additions/deletions

In the light of yesterday's discussion on emerging concepts in PID and your current practices in your respective situation

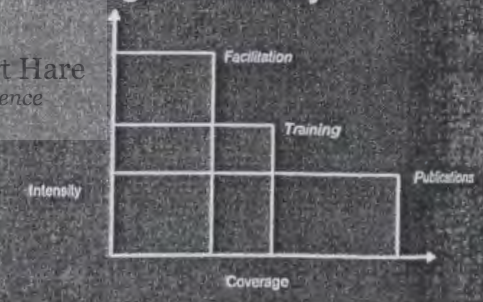
Your task:

Given your experience in capacity development for PID/PTD, what were some of the strategies you found effective

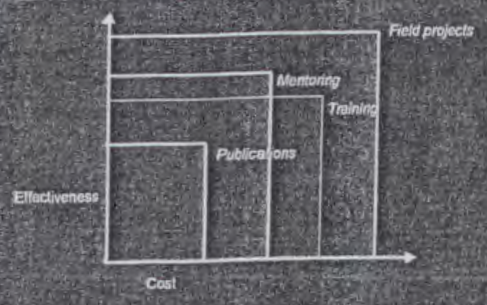
Capacity development strategies for PID

- Formal training
- Actual participation in a PID process
- Mentoring
- Cross visits
- Making available publications/IEC materials

CD Strategies: Coverage vs Intensity



CD Strategies: Effectiveness vs Cost



Your task:

Given your experience in developing capacities for PID of individuals and groups, what support activities, mechanisms, systems have made it successful?