Annex One

ABSTRACT

1. **J.K.O. Ampofo, U. Hollenweger, and S.M. Massomo.** Participatory IPM development and extension: The case of bean foliage beetles in Hai, Northern Tanzania. International Centre for Tropical Agriculture (CIAT), Tanzania

During the cropping season of 1996, farmers of Masama in Hai district, northern Tanzania expressed concern about a pest that was constraining bean production in the area. Using participatory surveys, problem diagnosis and monitoring of the pest biology and ecology, farmers and extension workers found that it was the Bean Foliage Beetle (BFB). Understanding the pest biology and ecology enabled the farmers and extension workers to identify management measures. They focussed on cultural strategies, including the use of botanical pesticides, timely planting, crop rotation and post-harvest tillage. Subsequently they selected strategies that they felt were compatible with their production circumstances. At the end of the1997 season they observed that a community approach was necessary to solve the BFB problem because the pest could fly from one field to another. In1999 the extension service requested for a wider dissemination of the technologies. A stakeholders' workshop was held to select suitable technologies and dissemination pathways to reach the wider farming community in the district. The technologies and pathways selected differed from one village to another, in accordance with resources and opportunities available to them. The community at large was informed of the IPM technologies through farmer-organised field days during which all participants reviewed the dissemination process and suggested ways of improvement. The results were discussed in a second workshop during which all stakeholders

Annex Four

THE PTD FRAMEWORK

Clusters	Rationale	Elements	Expected Outcomes
Getting started	Taking a participatory approach does not mean starting PTD initiatives unprepared. Several important issues need to be addressed before intensive interaction with farmers can begin.	■ receiving a request to start collaboration, or selecting communities with which collaboration will be sought; ■ gathering and analysing existing secondary data; ■ making an inventory of existing organisations; ■ clarifying one's own agenda and possibilities for follow-up after situation analysis; ■ building a relationship with the local people and coming to a basic agreement on the form of future collaboration.	■ a clear perspective and protocols for collaboration; ■ a preliminary understanding of the socio-cultural and agro-ecological situation of the community or communities; ■ a core network of individuals and organisations that could play an important role in future PTD work.

Clusters	Rationale	Elements	Expected Outcomes
Understanding problems and opportunities	The strongest driving force of a participatory programme is the farmers' realisation that it really addresses their particular concerns. a joint understanding of these concerns must be developed. At the same time, ideas for innovation already present among the farmers may provide good opportunities for commencing PTD.	■ sharing impressions of trends and problems in local farming; ■ supporting farmers in identifying and analysing their problems and the cause-effect relationships involved; ■ clarifying whose problems have been identified; ■ discussing the context of the problems (e.g. wider agro-ecological systems, socio-political changes) and analysing driving/ restraining forces; ■ making an inventory of opportunities and potential resources, including human resources and good ideas. The PRA (Participatory Rural Appraisal) toolbox is an important source of methods and techniques for these activities.	■ shared insight into local agricultural potentials and constraints; ■ improved skills of farmers to diagnose and analyse problems; ■ increased self-confidence and a better organisational basis for systematic experimentation by farmers.

Clusters	Rationale	Elements	Expected Outcomes
Looking for things to try	Research and extension agencies are not the sole source of innovations to solve the problems or tap the opportunities identified. Also farmers and artisans in the community or elsewhere can provide interesting ideas to follow up. The various ideas are screened systematically by the farmers and PTD facilitators, and a joint agenda for experimentation is developed.	■ gathering information for detailed analysis of the identified concerns and priority problems; ■ identifying promising solutions from local experience, farmer experts and sources outside the community; ■ making a critical review of the options by establishing criteria for selecting initial activities and assessing advantages and disadvantages; ■ clarifying expected effects of the options on different subgroups within the community and the area; ■ developing an understanding of the need to experiment with the options selected; ■ agreeing on what exactly is to be found out by doing the experiment (formulating the hypothesis to be tested).	■ overview of possibly relevant technologies; ■ agreement on the most interesting option(s) to be tried out; ■ improved linkages between farmers and sources of innovations.

Clusters	Rationale	Elements	Expected Outcomes
Experiment-ation	The focus is on experiments that farmers can manage and evaluate themselves and that give results on which the farmers can base sound decisions. Through involvement in these activities, farmers improve their capacity to adapt their agricultural practices. This is achieved through skill development, group building, and strengthening exchange and supportive linkages with other communities and organisations.	■ reviewing farmers' existing experimental practices; ■ designing selected experiments; ■ defining evaluation criteria and choosing monitoring and evaluation tools; ■ training farmer-experimenters; ■ establishing and managing the experiments; ■ monitoring by the farmer-experimenters supported by PTD facilitators; ■ evaluating results, both during the course and at the end of the experiments, to decide if the option is suitable locally, to develop possible technical guidelines for applying it and/or to identify any need for further experiments; ■ reviewing the experience of collaboration and experimentation with a view to improving the PTD process.	■ insight into the functioning and value of innovations, gained through experiments planned, implemented and assessed by farmers; ■ development of technology adaptations that are relevant locally; ■ improved capacity and skills of farmers in experimentation; ■ increased understanding of PTD processes.

Clusters	Rationale	Elements	Expected Outcomes
Sharing the results: farmer-based extension	Many of the above activities involve farmers learning from other farmers - while discussing problems and opportunities, seeking good ideas and analysing results of experiments. PTD also encourages wider sharing of results among other farmers, using the networks developed during earlier PTD activities. Not only are the locally-developed technologies disseminated, but attention is also given to sharing the methodological aspects of learning through experiences of farmer organisation and experimentation.	■ studying the existing patterns and channels of farmer-to-farmer exchange and learning; ■ strengthening farmer-to-farmer exchange: visits, farmer-to-farmer training through learning-by-doing; developing manuals and audiovisuals by and for farmers; ■ training farmers as grassroots extensionists/ promoters.	■ enhanced farmer-to-farmer diffusion of ideas and technologies; ■ building up an inter-community PTD network; ■ involvement of an increasing number of communities in systematic technology development; ■ establishment of a farmer-managed system of inter-community training and communication.

Clusters	Rationale	Elements	Expected Outcomes
Sustaining the PTD process	The ultimate aim is to leave communities with a capacity to implement an effective process of change. PTD programmes are therefore concerned with organisational development and the creation of favourable conditions for ongoing experimentation and development of sustainable agro-ecological systems. The role of outside PTD facilitators gradually changes. Their attention begins to shift to other communities and areas. They gradually phase out their support at one site, in order to be able to promote PTD on a wider scale.	■ stimulating group development and linking groups with farmers' organisations; ■ providing training in fields related to management; ■ strengthening linkages between (groups of) farmers and service organisations; ■ consolidating institutional and policy support to PTD processes; ■ documenting the process and methods of experimentation and diffusion; ■ supporting evaluation of the impacts of technologies and the PTD process on the livelihood system.	■ consolidated community networks or organisations for agricultural self-management; ■ a more supportive institutional environment; ■ documented and operationalised PTD approach and resource materials; ■ relevant services and input supply.

Source: Developing technology with farmers: a trainer's guide/L. van Veldhuizen, A. Waters-Bayer, and H. de Zeeuw, ETC Netherlands B.V., 1997

Annex Three

WORKSHOP PROGRAM

MONDAY, 17 SEPTEMBER 2001

0830-1000	**OPENING RECEPTION**	
	Welcome Remarks	Scott Killough
	Workshop Overview	Julian Gonsalves
	Message	Ueli Scheuermeier, LBL
	A 'little story': A voice from the field	Ka George Pepe
	Workshop Process and Schedule	Marise B. Espineli
1000-1030	Coffee/Tea Break	
	OPENING PLENARY	
1030-1130	Introduction of participants and working committee *Participants and committee members will be ask to introduce oneself to the group.*	Marise Espineli
1130-1145	Participants' Perspectives *Card sheets will be distributed to each participant, which will be requested to write their expectation(s) from the workshop in terms of its content, output and process.*	Tom Limpo

1145-1200	Overview of Yen Center facilities *An orientation on Yen Center facilities, logistics and other basic administrative information.*	Angie Poblete-Algo
1200-1400	Lunch Break	
1400-1600	Information Market *Each participant/organisation will be assigned a "market booth" where they can put in display the case study, posters, pictures or present slides or videos. Participants will be requested to go around the "market booths" for the presentations and discussions. Simultaneous presentations and discussions will take place around the workshop venue. An overview of the process and mechanics will be presented at the beginning.*	Laurens van Veldhuizen
1600-1700	Identification of issues, themes for discussion *A brainstorming session on the issues and questions from the cases submitted and selected. A big-group discussion will follow to identify more issues and questions. An initial list of issues and questions will be posted for consideration during the group workshop activities.*	Laurens van Veldhuizen
1700-1720	Orientation on Field Visit	Tom Limpo/ Julian Gonsalves
EVENING 1900-2200	Welcome Dinner and Cultural Event	

TUESDAY, 18 SEPTEMBER 2001

0730-1430	Field visit *Participants will be divided into three groups. Each group will visit some farms in Cavite and have an informal discussion with farmers. Visit will be mainly on farms with multi-storied and agro forestry based cropping systems. There is a possibility for viewing beautiful sceneries in Tagaytay if time allows.*	Tom Limpo/ Julian Gonsalves
1430-1500	Travel back to IIRR campus	
1500-1530	Coffee/Tea Break	

WINDOW DISCUSSION

1530-1545 Process, Mechanics and Outputs
Moderator
Overview of window discussions (small group discussion) process, mechanics and expected outputs.A window discussion consists of case presentations, questions and reactions to the presentations, discussion groups and plenary sessions. We are calling these windows, because we will be looking at different aspects of institutionalising PTD, viewing the same realities from different angles or windows. There will be four windows in this workshop. Window A will focus on case experiences with multi- stakeholder platforms for institutionalising PTD. Window B will deal with institutionalising PTD in research sector, while Window C will look at institutionalising PTD in the Farmer/Community level institutions. Widow D will focus on NGO Extension/Development sectors.Each window will have case presenters, open-ended discussions and then reactors to present highlights.

WINDOW : Multi Stakeholder
Moderator
Case experiences with multi-stakeholder platforms for institutionalizing PTDTwo cases will be selected and presented in a plenary session. The selected cases are experiences with multi-stakeholder platforms for institutionalising PTD. A plenary discussion will follow after the presentations

1545-1605 **Case 1 Presentation:**
Institutionalisation of farmer participatory research in Southern Ethiopia: a joint learning experience (FARM-Africa, Ethiopia)
by: Ejigu Jonfa

1605-1615 Open Forum

1615-1635 **Case 2 Presentation:**
PTD for Sustainable Dry land Agriculture in South India: Balancing Our Way to Scale (AME, India)
by: Y.D. Naidu

1635-1645 Open Forum

1645-1800 Plenary Session

WEDNESDAY, 19 SEPTEMBER 2001

0830-0845 Introduction on the objectives and schedule for the day
Moderator

0845-1000 **WINDOW B:**
Institutionalising PTD in Research Institutions

1000-1030 Coffee/Tea Break

1030-1200 Continuation of Window B discussion.

1200-1400 Lunch Break

1400-1500 Plenary Session for Window B
Ueli Scheuermeier, Moderator
Each of the sub-groups will now present the output of their group discussion to the plenary. Open forum will follow after each sub-group presentation.

1500-1530 Coffee/Tea Break

1530-1545 Synthesis
Ursula Hollenweger
Summary of presentations and issues of Window B discussion and group workshop.

1415-1700	**WINDOW C:** Civil Society Moderator, Scott Killough *Case presentations and sub-group discussions*
EVENING1 830-2100	Cocktails/Dinner

THURSDAY, 20 SEPTEMBER 2001

0830-0845	Introduction on the objectives and schedule for the day Moderator
0845-0945	Plenary Session for Window C Scott Killough, Moderator *Each of the sub-groups will now present the output of their group discussion to the plenary. Open forum will follow after each sub-group presentation.*
0945-1015	Coffee/Tea Break
1015-1030	SynthesisModerator/Panel
1030-1200	**WINDOW D:** Institutionalising PTD in GO and NGO Extension/ Development Sectors Kennedy Igbokwe, Moderator *Case Presentations and sub-group discussions.*
1200-1400	Lunch Break
1400-1600	Continuation of Window D discussion
1600-1700	Plenary Session for Window D Kennedy Igbokwe, Moderator *Each of the sub-groups will now present the output of their group discussion to the plenary. Open forum will follow after each sub-group presentation.*
1700-1715	Synthesis Panel/Moderator *Summary of presentation and issues of Window C discussion and group workshop.*

1900-2000 Dinner

2000-2100 Video Presentations

FRIDAY, 21 SEPTEMBER 2001

0830-0845 Introduction to the objectives and schedule for the day
Moderator

0845-1200 Discussion of thematic issues in small group and gallery presentation
Ann Waters-Bayer

1230-1400 Lunch Break

1400-1500 **CLOSING PLENARY**

Reflection and follow-up planning — Laurens van Veldhuizen
Plenary discussion of workshop outputs, identified gaps, issues and questions on PTD efforts. Plenary reflection and discussion on lessons learned and identification of practical recommendations.

1500-1530 Coffee/Tea Break

1530-1600 Synthesis and wrap-up — Scott Killough
Workshop synthesis and wrap-up.

1600-1630 Evaluation — Marise Espineli
An informal evaluation of the workshop outputs and processes will be conducted by getting reactions of the participants and working committees. Each participant will be ask to write in a card his/her reflection on the workshop content, outputs and processes.

1630-1700 Closing Remarks

EVENING
1830-2200 Dinner and socials in Tagaytay

Annex Two

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critically evaluated the dissemination process and adopted recommendations for improvement and wider dissemination of the IPM. All participants appreciated the participatory mode of technology generation and dissemination, and farmers identified new problems that they would like to solve using this process. Many of the participating farmers generated enough confidence to share their experiences with others in their community. Groups of farmers would meet to use the process to analyze and develop solutions to their problems. In addition, the farmers have started a program on Radio Tanzania for the dissemination of IPM strategies. As a result, a project on IPM promotion through participatory approaches[1] has been initiated with funding support from the DFID[2] Crop Protection Program and the Africa bean research networks (ECABREN[3] and SABRN[4]) and CIAT to institutionalize the process and use it to generate and disseminate IPM strategies more widely across bean growing environments in eastern, central and southern Africa.

2. Roland Bunch and Mateo Canas. Farmer Experimenters: The Technology They Develop on Their Own. Association of Advisors for a Sustainable, Ecological and People-Centered Agriculture (COSECHA), Honduras

In the 1980's and early 1990's, a number of development organizations working in the field of agriculture trained farmers in Honduras to experiment with different technologies. Even after the end of such projects, many of these farmer experimenters (FE) continued to work on developing new technologies.

In 1999, COSECHA, a Honduran NGO, carried out countrywide study of selected FEs to identify the new technologies that had been developed. The study analyzed all the technologies developed and rated them according to the economic benefits to farmers, and how widely they could be applied. A total of 52 FEs, from ten of Honduras' 23 provinces, were interviewed. Of these, 7 were women FE's. The study reveals that the FE's have developed some 82 original

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1 *"Promotion of integrated pest management strategies of major insect pests of Phaseolus beans in hillsides systems in eastern and southern Africa".*

2 *Department for International Development (UK)*

3 *Eastern and Central Africa Bean Research Network*

4 *Southern Africa Bean Research Network*

technologies which they continue to use. 39 of these are good and can be used widely. The nature of the 39 technologies varies widely. The main ones included; 15 on pest control, 10 on soil fertility, and 8 on plant disease control.

Examples of the technologies developed include ways of very cheaply controlling aphids, the corn borer, leaf cutter ants, late blight and damping off, various foliar fertilizers, and even a way of grafting Neem onto a local tree so that it can grow up to1,200 meters wide. It is interesting to note that, though the FE training predominantly focussed on soil fertility, farmers have developed technologies that reflect the different priorities in their communities. Another observation is that all the technologies experimented used locally available inputs.

Unfortunately, these technologies have not been disseminated widely, though some of the FE's were also trained as villager extensionists. This is probably due to the fact that most of the technologies have been discovered in only the last two or three years, or that by their nature the technologies may not be easily recognized by the farmers.

The study findings indicate that farmers are capable of developing innovative and valuable agro-ecological technology. It is therefore recommended that more organizations should train rural farmers in participatory technology development and dissemination methodologies.

3. **Hoang Hui Cai, Ruedi Felber, and Vo Hung.** PTD in Community-Based Forest Land Management and as a Contribution to Building up a Farmer-led Extension System in Social Forestry: Case Study of Vietnam. Social Forestry Support Programme (SFSP), Vietnam.

Farmer-led extension is a new approach of rural development in the transitional economy of Vietnam. The national agricultural and forestry extension system was established in 1993 and since then, has rapidly developed up to commune level. However, dominated by government staff who were trained to become technocrats and after a long period of a centrally planned economy, the system has faced many challenges. One key challenge is integrating poverty reduction and sustainable natural resource management especially

in complex, diversified and risk-prone production systems of forest dweller communities.

Fortunately, PTD as well as other participatory approaches have been introduced to Vietnam mainly by international development institutions, including the Social Forestry Support Program (SFSP), which has been implemented by Helvetas. The objectives of PTD in SFSP are (1) to develop an alternative action research and extension approach based on the participation of local villagers in generating appropriate technologies for forest land management; and (2) to generate field-based learning to be inputted in the participatory curriculum development of the program.

This case study explores the PTD process in 3 provinces of the southern part of Vietnam and highlights institutional aspects for PTD to be integrated in the national extension system. Participating researchers are staff of three University faculties of forestry in Hue, DakLak and HoChiMinh City. After a basic training on PTD , they have selected forest dweller communities in upland and mangrove forest in their mandated areas and have worked closely with local extension agencies and/or development agencies.

4. **Dindo Campilan, Carlos Basilio, Lilibeth Laranang, Clarita Aguilar, Clarita Aganon and Irene Indion.** PTD for Improving Sweet Potato Livelihood in the Philippines. Users' Perspectives with Agricultural Research and Development (CIP-UPWARD), Philippines

This paper focuses on the experiences of the Users' Perspectives With Agricultural Research and Development (UPWARD) Network in PTD in a broader participatory research and development (R&D) process, and locating PTD within a livelihood system framework.

It presents a case project involved with introducing technological improvements in the sweetpotato livelihood system of Central Luzon, Philippines. It describes how PTD principles and practices have been incorporated in three key R&D phases: 1) assessment and diagnosis, 2) action research, and 3) facilitating local R&D.

Among the key results and lessons derived from this case are:

1. PTD efforts, while focusing on specific technologies and often for

particular crops, need to be conducted in the context of the broader livelihood system managed by farming households. This will enable projects to effectively link technology options to potentials for contributing to overall livelihood systems improvement.

2. PTD could be combined with other participatory research and development methodologies (e.g. field schools), in order: 1) to promote group learning and wider diffusion, b) to address technological and socioeconomic/marketing constraints simultaneously, and c) to mobilize local resources necessary to support

3. Immediate effects of PTD are mainly in terms of change in knowledge and practices by participating farmers. On the other hand, achieving concrete impact on livelihood and the general biophysical environment takes several seasons.

4. The sustainability of PTD and other participatory methodologies depends on how these are effectively integrated in the program priorities and strategies of research and extension institutions. Project efforts can best be seen as opportunities to demonstrate a viable, alternative approach to be phased over to these institutions.

5. **Mohammed Majzoub Fidiel.** The Experience of the Intermediate Technology Devleopment Group in Participatory Development of the Donkey-drawn Plough in North Darfur, Western Sudan. Intermediate Technology Development Group (ITDG) Animal Traction Project, Sudan

Sudan's North Darfur State has a population of 1.4 million people. It is a drought prone area with 9 to 12 arid months a year. The soil is mainly sandy, thus restricting water infiltration and causing runoffs. The people have therefore been vulnerable to famine and the associated problems like migration and disease. For the people to survive, there was need to increase food production using improved technologies. The farmers decided to use animal traction by developing ploughs locally.

In 1987, ITDG was invited to provide technical assistance, after realizing that the locally made plough was not adequate to meet the

needs of farmers. The State Ministry of Agriculture provided an engineer for the project to help produce a plough that would be affordable by the farmers, suitable for cultivating the specific soil types, and which could be easily reproduced by local blacksmiths. A new plough was thus developed and tested. Blacksmiths were trained in manufacturing the plough, and farmers instructed in its use. Subsequently, blacksmiths societies have been formed, village tool and seed banks established, and necessary training materials developed on how to use the plough. With the establishment of village development committees, more people are now involved.

There has been an increase in yields and incomes of households as a result of the project. People have stopped migrating from one area to another in search of food and water. The soils have also improved as a result on improved farming methods.

Institutionalization

- Farmers are capable of expressing their needs and getting answers to the needs via their VDCs and/or VEAs
- Village extension agents are performing their role in linking farmers with blacksmiths and with other agricultural services in the State
- Blacksmiths innovated new products mostly upon requests such as camel plough
- Federal Ministry of agriculture has included plough promotion in the Federal Agricultural Strategy. A unit for technology was also developed in the ministry
- Four universities are somehow incorporating technology development in their curriculum

Lessons Learned

- Careful need assessment to start with
- Farmers support was made possible through involving others such as blacksmiths
- Building on traditional structures is better than building new structures
- Development is a long process
- Building institutionalisation of PTD since the project design
- Being part of Oxfam and ITDG projects, the development and promotion of the technology was made the success possible

6. **Tim Hart and Joyene Isaacs.** Transforming the Agricultural Research Council Focus from only supporting commercial farmers to supporting black smallholder farmers by means of PTD: A case study from the deciduous fruit sector of South Africa. Agricultural Research Centre-Infruitec-Nietvoorbeij, South Africa

This case study looks at the chronology of events that have been undertaken by one institute of the South African Agricultural Reaserch Council (ARC). It details the successes and constraints that it has experienced while being part of ARC which is transforming from an organisation that did not serve black smallholder farmers to one that is attempting to provide services to these farmers by utilising PTD, participatory extension and similar approaches. The strategy is multi-pronged in that different but related activities have to be carried out at various levels in order to achieve this shift. The case study indicates how the research practices and projects moved towards participation with farmers as the structural changes at the national and institute level unfolded.

During the 1990s, a small group of personnel within the institute realised the need to change existing practices and to include smallholder farmers in their client base[1]. This was influenced by changes in the national ARC structure and also changes in the national agricultural policy from 1994 onwards. By 1995 the need to employ a coordinator to manage and drive this process was identified and a programme manager was appointed. The subsequent development of a matrix system allowed the participating team members of the division tasked with servicing the smallholder farmers to conduct these activities while still continuing their work within their divisions.

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[1] *The smallholder agricultural sector in South Africa is currently comprised of black farmers who farm relatively small areas of land, usually less than 5 hectares per farmer/farming household. These farmers are often considered to be resource-poor because the primary research and extension arms of the government previously ignored them. This resulted in their not receiving the latest agricultural technology and information. In the South African context, the term small-scale or smallholder farmer usually refers to black farmers, regardless of whether or not they are farming on a subsistence or commercial basis. The term commercial farmer usually refers to white farmers who are farming on a commercial basis irrespective of the size of their land and agricultural operation. To a large extent the distinction is a historical one on racial lines and in which the type of operation and size of land are generally related to racial classification and previous government policies. In this case study, the terms smallholder, small-scale, emerging and resource poor are used interchangeably and refer to black farmers, the majority of which are farming largely for domestic purposes while selling or exchanging surplus where appropriate.*

This ensures that the various types of agricultural research disciplines were available for the smallholder farmer programme. At the ARC Infruitec-Nietvoorbij this division has undergone a number of name changes since 1995 and is now known as the Sustainable Rural Livelihoods (SRL) Programme.

A number of the team members, some technicians, researchers and research managers were trained in Participatory Rural Appraisal tools and principles. However, there was very little practical application of these tools by team members and the others trained. Often very little support was given to team members for their activities relating to smallholder agriculture from managers and divisions where team members are permanently based. It was soon realised that the dynamics of smallholder farmers and the rural communities were more complex than that of the institute's historical client group, the white commercial farmers. A social anthropologist was appointed to assist in understanding the sociocultural and socioeconomic context in which smallholder farmers' carry out their agricultural activities. This person also supports and assists the team with the implementation and dissemination of the PTD process. The intention is to change a historical one-sided process to become one of participatory development and shared exchange of technologies, resulting in the empowerment of all involved and the effectiveness and appropriateness of subsequently developed technology.

One of the latest projects of SRL Programme at the institute ARC Infruitec-Nietvoorbij has been reformulated to actively include farmers in the processes of technology development, planning, monitoring and evaluation, and thereby encourage their participation in the project. While the project was not entirely conceived by participating farmers, it is based on solving the identified needs of farmers and it encourages them to conduct the research in conjunction with the institute's scientists and technicians. This process has resulted in the research team carrying out on-farm trials relating to weed management and includes the use and comparison of local practices and scientific knowledge.

A similar process has been developing to a greater or lesser degree within the national structure of the ARC and, at times, these parallel processes influence one another. Both the broader process and the

process at this and some other institutes have been constrained by the unwillingness of some personnel to work with the new clients and also the inability of some of those who are willing to work with this new client group to change their behaviours and attitudes and to listen to the dreams, needs, experience and knowledge of the emerging farmers. There is also sometimes an inability to adapt older approaches (training-and-visit, and lecturing) so that they are suitable for working with the new clients. While other institutes and some government departments of agriculture at the national and provincial level have received assistance from overseas agencies in the form of specialist advisors, funding and exchange programmes, the ARC Infruitec-Nietvoorbij has not and has had to evolve its strategy as information is obtained from literature, networks, interaction with smallholder farmers and other sources. Where individuals have overcome many of these constraints, much ground has been covered in moving towards PTD.

7. **Henri Hocde and David Meneses.** The Reunion of Two Worlds: Experience of the Heuter Region, North Costa Rica, in the Construction of Process of Participatory Technology Development. Regional Program for Reinforcing Agronomic Research on Basic Grains in Central America (PRIAG), Costa Rica

In Huetar North region two parallel initiatives merged to scale up the PTD process. One consisted of a team of farmers that promoted a movement for farmers' experimentation with exchanges between farmers; the other was made up of extension workers and researchers of the Ministry of Agriculture who promoted "farmers experimenters" as a new model of technological innovation.

Unlike other attempts at institutionalization that focused on the extensive incorporation of the participatory approach by various institutions supporting the agriculture, this was designed to strengthen producers' organisations. The aim was to enable these organizations to carry out and administer technological innovation, and invite more effective cooperation from support institutions as a means of helping farmers survive in a globalized economy. The paper shows the lessons learnt from this initiative without hiding the numerous limitations.

The difficulties in the institutionalisation of the process were noted. These revolve around issues between producers' organisations and professionals and the lack of resources:

Personal or cultural aspects: (a) inadequacy in the academic training of professionals and technicians working in the institutions; (b) very poor aptitude for change; (c) difficulty in establishing a stronger link between researchers and farmers

Learning and education aspects: (a) lack of training of the A/E, technicians and researchers in farming experimentation, (b) insufficient diffusion of the A/E's works.

Methodological aspects: (a) lack of tools to systematise and collect the information, (b) insufficient quality of the experiments made by the A/E.

Economic aspects: the lack of economic resources, without doubt, the major obstacle to the realization of the A/E's dream.

The producers' organisations of the CRAE ZN required a broad vision; their aim is solving the problem of all the organisations, not only some of them. But not all of the organizations have the same vision about technological development although they are willing to participate in the process. A lot of organisations in the Huetar North are still to be involved.

The case shows that institutionalization is not achieved through the strengthening of the institutions supporting agriculture. Instead the process was sustained through the consolidation of farmers' organisations involved in technological development. A group of professionals accepted this challenge, allied with them and tried to make it work.

Difficulties arose because much of the process depended on a few technicians and farmers. The producers' organisations were not strong enough to advance the process, to negotiate cooperation with other groups and to find the resources to carry out the process. The professionals were not interested enough, and their lack of commitment and training led to the low quality of the farmers' experiments.

Farmers and professionals need to look beyond their own noses. The matter is not the production "per se" of alternative techniques in agriculture. The originality and power of this movement lies in strengthening the farmers and professionals' skills to re-invent farming and research.

8. **Stefan Joss and Kachkynbaev Nadyrbek.** Participatory Technology Development in the Kyrgyz Republic with Special Reference to rural Advisory and Development Service in Jalal Abad Oblast 1999-2000. Kyrgyz Swiss Agricultural Project (KSAP) Kyrgystan

Kyrgyzstan is a small country in central Asia, bordering with China, Kazakhstan, Uzbekistan and Tadjikistan. The climate is harsh and dry with temperatures ranging from -40 to + 40 over a year in certain areas. Crops can only be grown where irrigation is possible from streams and rivers coming down from the glaciers in the Tien Shan mountains. Animal husbandry is the mainstay. In some areas extensive farming is possible, and in the south some intensive horticulture.

During Soviet times, large Kolchozes and Sovchozes dominated the economy. These were huge government farms, managed by scientists and trained technicians. The people were organized in work brigades instructed by foremen. Individuals had specific roles on the farm i.e as tractor drivers, dairy-cow feeder, herder, repairman etc. After the collapse of the Soviet system, land had to be distributed to families. For the first time in their history, the Kyrgyz are now forced to manage their own farms. This is a big challenge, as there is no farming tradition, because even prior to Soviet times the Kyrgyz were herders organized in nomadic clans.

It is in this context that the Rural Advisory Development Service was established. This is an organization run by farmer associations at the District (Rayon), Province (Oblast) and national level. The national level has a secretariat, at the Oblast a regional manager plus 5 Subject Matter Specialists provide support to their Rayons where generalist Rural Advisors work with farmers. Part-time Village Promoters help in the extension work at the village level. The Kyrgyz-Swiss Agriculture Project is assisting in setting up and running this farmer-owned extension system.

PTD is introduced in a village via a "PTD-week", where assessments are made and trials planned with groups of interested farmers. Topics are broad and include production, marketing, inputs, processing, etc. Trials are documented and assessed by both farmers and RA's, who in turn ensure proper linking with the PTD-data base at the Oblast and national levels. PTD spreads through new RA's taking part in PTD weeks.

The most positive institutionalization effect is, that PTD has become "standard procedure" in some of the Oblasts. However this way of working is systemically challenged by the old instructivist behavior and attitudes of both development professionals and farmers.

9. Ejigu Jonfa, Barry Pound, Endreas Geta, Ousman Surur and Furgassa Bedada. Institutionalization of Farmer Participatory Research in Southern Ethiopia: A Joint Learning Experience. Farmers' Research Project, FARM-Africa, Ethiopia

In Southern Ethiopia, FARM Africa has been working on farmer participatory research for sometime now. Considerable experinece has been gained in methodologies over the years. In 1999, a three year project of Institutionalization of Farmer Participatory Research (FPR) was started. It is aimed at facilitating the institutionalization of FPR approaches and tools in the organizations involved in the generation and transfer of agricultural technology in the project area.

In the project, "institutionalization" of FPR is defined as the incorporation of FPR tools and procedures in the regular activities of organizations mandated to work with farmers. It refers to the routine applications of practices that actively engage farmers in a decision-making role, in identifying and prioritizing production constraints, defining and listing potential solutions and adapting/adopting technologies that enhance agricultural production and productivity.

To achieve its objectives, the project undertakes activities that will lead to:

- The creation of clear awareness, of and applications for, the concept and philosophy of FPR at all levels
- Better knowledge and skill to plan and implement FPR

- The creation of structures that facilitate the incorporation of FPR approaches
- Make available adequate resources in terms of skilled staff, funds and logistical support
- Creation of effective linkages among relevant organizations and farmers and make available adequate incentives for adoption of FPR tools and procedures and to develop respect for farmers knowledge and skill among staff of relevant organizations

The Bureau of Agriculture, which is mandated for agricultural extension, the two agricultural research centers (Areka and Awassa), the Awassa college of Agriculture, Bureau of Planning, and Economic Development and FARM Africa were jointly involved in the development of the project proposal. These institutions are still involved in project implementation, monitoring and evaluation under the coordination of a steering committee, composed of heads of these institutions.

There is now increased awareness of the FPR institutionalization process and better linkage among these institutions as a result of joint involvement in the process. The various forms of training in FPR, which is based on practical and field based, enhanced the capacity of these institutions in FPR.

10. Agustin R. Mercado, Dennis P. Garrity and Julian Gonsalves. Participatory Technology Development and Dissemination: The Landcare Experience in the Philippines. (spell out) ICRAF/Landcare, Philippines

Sustainable land use is one of the focal issues in the debate about rural development in the Philippines uplands where about 18 million people live. This paper relates experiences of the authors in a participatory approach to develop technology and institutions for agroforestry at the ICRAF research site in Claveria, Northern Mindanao, Philippines. Contour hedgerow farming with leguminous trees has come to be viewed as an important agroforestry technology to ensure food security, alleviate poverty, and protect the environment. For several years, effort were focused on assessing the management strategies to address key technical constraints of this system. It was observed that adoption by farmers was low. The reason

for this include: high labor requirements in establishment and maintenance of the hedgerows, resource competition above and below-ground between the hedgerows and associated crops, limited value-added from the hedgerow prunings, and poor species adaptation.

Efforts, therefore, were refocused toward finding alternative systems that would address the technical and institutional issues of conservation farming. It was found that natural vegetative filter strips (NVS) provide a simple solution to the technical constraints of soil conservation on slopes. These are buffer strips that are laid out on the contour in which the natural vegetation is allowed to re-grow into a thick, protective cover. NVS also provide a foundation for farmers to evolve into complex agroforestry systems with fruit and timber trees. There is a tremendous surge of adoption of this system.

Adoption has been enhanced by the Landcare approach. Landcare is a movement of farmer-led organizations supported by local government. The organizations share knowledge about sustainable and profitable agriculture on sloping lands while conserving natural resources. As the Landcare groups began to grow, the local government units (barangay, municipal and provincial) provided unthusiastic support. This involved the contribution of funds, technical assistance and policy support to the movement. Participatory technology development and dissemination (PTDD) is institutionalized into the Landcare through the creation of farmer research committees (FRC). FRCs are tasked to generate, verify, and adapt technologies to fit the complex and diverse bio-physical and socio-economic environments of resource poor upland farmers. FRCs become the powerhouse for appropriate technologies for the communities they represent. Different modalities and pathways have been devised to achieve rapid and inexpensive diffusion of Landcare concept. Today, the Landcare movement has grown to over 300 groups in northern, central, eastern, and southern Mindanao and in the Visayan islands.

11. Evison Moyo and Jurgen Hagmann. Facilitating Competence Development to Put Learning Process Approaches into Practice in Rural Extension. Agricultural, Technical and Extension Services (AGRITEX), Ministry of Lands and Agriculture, Zimbabwe

12. Y.D. Naidu and Edith van Walsum. PTD for Sustainable Dryland Agriculture in South India: Balancing our Way to Scale. Agriculture Man Ecology (AME), India

This paper is about collaborative action between institutions and individuals in South India, seeking to develop people-centered approaches to promote sustainable dryland agriculture and livelihoods for the rural poor. Participatory Technology Development (PTD) is an important component of this approach. South India is characterised by a declining resource base, high population pressure, and a high density of institutions, which play a role in promoting sustainable land use. This creates a peculiar context for PTD as an approach: there is a favourable institutional climate, but farmers' economic capacity for experimentation is limited.

AME is an independent support organization, which has been a prime mover of sustainable and ecologically sound agriculture in South India since the mid eighties. AME developed an approach to concerted stakeholder action, with PTD as an 'entry strategy'. The initial focus is on field level guidance to farmers and NGO field staff; then subsequently lessons learned will be fed 'upwards' into the formal information systems of research institutions and Ministry of Agriculture and other stakeholders.

A PTD process begins with the identification of entry point problems, crops and institutions. We start experiments with a few groups, on single crops. Over a period of three to four years, the approach broadens and deepens, from single crops to integrated farming systems, and from single groups to farmer's federations. Village level institutions, mainly Farmers Help Groups, form the main launching pad for PTD experimentation and for scaling up of PTD-proven technologies.

Women increasingly manage agriculture in dryland areas. In 1996 about 30% of farmers involved in PTD processes were women, in 2000 65% were women. But is that the same as gender mainstreaming? No. Women still face important constraints when it comes to control over resources and institutional gender bias. On the other hand, once women are involved in PTD processes, their Self Help Groups and Federations become very powerful instruments for scaling up of sustainable and women friendly technologies.

Results and impact of PTD processes are multi-dimensional. Impact means spread of technologies and approaches, within one farm - from one crop to another, from entry point to system level, then from farmer to farmer, from village to village, within and between organisations, and so on. In 1997 we started experimentation with 270 farmers in two districts, in collaboration with 12 NGOs. In 2001 we are involved in PTD processes with 1900 farmers in 25 districts, with an estimated outreach to another 10300 extension farmers, who get exposure to the technologies tested through PTD and are encouraged to also try them. Eight NGO networks are involved, with in total about 180 member NGOs.

An impact study gave insights into the way in which PTD tested innovations spread. It was found that the spread was quicker when the crop was more profitable, the technology was simple, and when there were low crop specific risks. Social cohesiveness of the group and the village also contributes positively to the extent of spread.

13. Ashraf Naseh and Semeh Seif. Case Study on Agro-Environmental Pilot Project 1996-1998. The Coptic Evangelical Organization for Social Services (CEOSS), Egypt

The Coptic Evangelical Organization for Social Services (CEOSS) aims at building the capacities of local communities to achieve sustainable development, using participatory techniques and methodologies. In partnership with two Dutch aid organizations (NOVIB and ICCO), the Agro-Environmental Project was implemented in two villages (Sharona and Nasrya) of Minia government in Upper Egypt.

In 1996, the project conducted participatory rural appraisals with seventy-five families from both villages. Lack of a proper system of human and animal watse disposal and excessive use of chemical fertilizers, were identified as the main problems facing farmers in the villages. CEOSS staff were trained in PTD, after which they trained three farmers' and six women groups. The training was conducted through workshops, discussions and field visits. With the help of facilitators from the National Research Centers, the farmer groups concentrated on reducing chemical fertilizers by using both organic and bio fertilizers. There have been two main innovations. Women groups have developed a technology for cabbage/manure.

House holds with livestock have improved the stable design which has greatly facilitated the collection of animal manure, urine and kitchen waste. For the households without animals, plastic composting barrels have been introduced. So far, twenty-one farmer groups with one hundred and eighty six farmers and thirty-nine women groups with six hundred and fifty women benefit from the project.

In order to institutionalize PTD, CEOSS has agreed to support the translation of the PTD manual into Arabic. Additionally, the Swiss Egyptian Development Fund approved the civil society organization capacity building project implemented by CEOSS. This project will support capacity building for PTD and PRA with target organizations.

14. C. Opondo, P. Sanginga, and A Stroud. Monitoring the Outcomes of Participatory Research in Natural Resources Management: Experiences of the African Highlands Initiative (AHI), Uganda

The African Highlands Initiative (AHI) is an ecoregional program that focuses on natural resources management (NRM) research in the densely populated highlands of Eastern Africa. Since its inception in 1995, AHI has been promoting integrated participatory research as a more effective approach to the development and dissemination of NRM technologies. This is done through; 1) integrating solutions to NRM issues by adopting participatory and systems approaches; 2) strengthening partnerships enhancing collaboration and building capacity of a wide range of institutions; 3) improving research through integration of biophysical and social sciences research; and, 4) linking local policy formulation and technology development.

Sustainable use and management of NRM is essentially about people relating to each other and their environment in a positive way. Therefore, outcome monitoring can be used to characterize and assess in detail changes in behavior of researchers and farmers as they engage in community based participatory research activities. A framework for performance monitoring and evaluation was introduced in 1999. The innovation of outcome monitoring methodology is that it makes a shift from assessing only the technical outputs of research programs towards focusing on the changes in

behavior, relationships and actions of the people and organizations, noting "how" these came about (or not). These contribute and lead to desirable outcomes.

The methodology used in the research reported here followed a "participatory learning action research" approach and involved teams of scientists from eight benchmark sites in five countries in Eastern Africa. They systematically monitored the outcomes of participatory research, and its challenges, their experiences, lessons and behavioral changes that took place as they tried to apply participatory research approaches. The methodology for monitoring outcomes was used as a means to the desired changes as part of the continuing activity of research.

Preliminary results show that the desired changes in the approaches used by research teams to cope with NRM technology development has been realized in part. Researchers focus on documentation of adoption trends and economic profitability of technologies but are less engaged in documentation of the participatory research process, changes in behavior, and interactions that result from using the process. Strongly rooted commodity approaches to research and technology development and dissemination, and skepticism about participatory research remain some of the challenges; if not among the researchers themselves, then in the institutional culture in which they are based. Additionally, skills and competencies in conducting participatory research and monitoring of the outcomes are new and developing. Increasingly, partnerships and other institutional working arrangements among collaborating R&D organizations are influencing the research teams who are starting to modify their approaches to include community based research.

15. G.D. Perera and Bert Sennema. Towards Sustainable Development in Mahaweli Settlements through Farmer Participation. Mahaweli Authority, Sri Lanka

Mahaweli Authority of Sri Lanka (MASL) is a government organization, which involves in agricultural development in the country covering 125,000 families. Promoting Multifunctional Household Environments (PMHE) project which was funded by the Netherland government tried to help MASL to develop a strategy

for its sustainable development in its various geographical regions (systems). Before the PMHE came into Mahaweli systems, farmers were dissatisfied and debt ridden due to many reasons such as increased cost inputs, low yields. The agricultural extension approach (T&V) did not help the farmers to overcome agriculture-related location specific problems. PMHE in developing a strategy addressed negative aspects - lack of farmer participation, underutilization of resources, lack of appropriate skills and knowledge, dependency on MASL. In this endeavor of stimulating farmers to be better managers of their resources the principles of LEISA and PTD were extensively used. Farm planning, farmer experimentation and farmer to farmer extension were key elements that needed to find a place in the agricultural programme and extension system of MASL. This required capacity building at the local level with farm families and at the institutional level with MASL staff to gain relevant skills, effect attitudinal and behavioral changes. This was mainly done through training and backstopping.

Participatory Rural Appraisal (PRA) and participatory approach to sustainable agriculture were the initial training programme and PRA was considered pivotal for all categories of MASL staff as it focuses on developing the attitudes and skills required in facilitators. As a consequence it was able to introduce participatory approaches in the agricultural extension programme and institutional development programmes. They were included in the new agricultural policy of the MASL. One of the most important points to be mentioned with respect to institutionalization of PTD is the close collaboration and rapport that PMHE built up with the staff of the agricultural division of MASL. PMHE looked for allied beyond MASL and was actively involved in networking within Sri Lanka. One network clearly contributed to the scaling up of the PTD experience is PTD working group in Sri Lanka. It helped to share experiences of trainers and pooling of resources. The main learning points of PMHE regarding "strategy" for scaling up and institutionalizing PTD are (1) right entry point; project implementation was based on experimental learning process with cycles of planning, action, reflection and replanning. Participatory monitoring and evaluation and a strong emphasis on reporting helped to improve the process (2) documentation of successful initiatives (3) systematic training and backstopping (4) active involvement of MASL staff and (5) networking.

16. Eric Sobourin, Pablo R. Sidersky and Luciano Marcal da Silveira. Farmer Experimentation in Northeast Brazil: The Story of a Partnership Between Smallholders' Organizations and an NGO Seeking to Enhance Agricultural Innovation in the Agreste Area of Paraiba State. Assessoria e Servicios a Projetos en Agricultura Alternativa (AS-PTA), Brazil

Projeto Paraiba started in 1993. This local development programme is being carried out by a Brazilian NGO called AS-PTA in the Agreste region in Paraiba State. Projeto Paraiba works on the basis of partnerships as a way of enhancing full participation. Local farmer organizations are AS-PTAs "partners" in this initiative. Another important feature of the approach is the use of an agroecological perspective, as a tool to understand and discuss local farming systems.

Innovations development activities within Projeto Paraiba, that started with AS-PTA addressing individual interested farmers, slowly shifted towards the support of innovation processes in which farmers' experiments play a central role. Today, the main characteristics of the PTD process in this context, are the importance of farmers' inputs (including knowledge and ideas, labour, etc.) and their involvement in the process of innovation development. At the same time, farmers' organizations have become more involved in supporting the fieldwork and using accumulated experience to negotiate more and better quality support from the different social actors present on the local development scene.

The project has realized that although farmers do innovate, they do not adopt ready-made practices or technologies: they experiment to try to adapt new ideas or techniques to the specific conditions of their farms. They also contribute to the dissemination of innovations, by means of their own information channels, for example, religious meetings (prayer, saints' celebration), festivities or commercial events (weekly fair, etc.). Also, farmers develop individual and collective learning capacities. When available, scientific knowledge about biology or ecology is incorporated by farmers into their innovation processes.

Lessons learned with Projeto Paraiba suggest methodological and institutional proposals that can contribute towards a new way of providing support for the development of agriculture and farmers.

The idea is to push the notion of participatory methods a bit further or to think in terms of the participation of support institutions and technical staff in the projects, logic and knowledge of farmerss, instead of the usual opposite practice. Joint action on the basis of negotiated partnerships is the core of what is being proposed. What is, in fact, at stake is the "renewal of public action". Between the levels of individual action (the farming family) and public action (public policies, credit, infrastructure, education, etc.) the new institutional environment today includes a (growing) level of collective action. This requires progress in the organization of local development stakeholders, including family farmers. This is crucial, not only to guarantee negotiations between individual and public authorities but also to form networks and alliances capable both of stimulating individual action and of exerting pressure and provoking a better response from public services.

17. Yiching Song. Exploring the Potential for Crop Development and Biodiversity Enhancement: Fostering Synergy between the Formal and the Farmers' Seed Systems in China. Centre for Chinese Agricultural Policy (CCAP), China

The Participatory Plant Breeding (PPB) Project in SW China started in January 2000 in Southwest China. This project is a follow-up to an impact study carried out from 1994 to1998 by CIMMYT to assess the impact of CIMMYT's maize germplasm on poor farmers in Southwest China. The study addressed the processes of technology development and diffusion by both the formal and the farmers' seed systems and the impact of the introduced germplasm at different levels. One of the key findings of the impact study is the systematic separation and conflicting operation of the formal and farmers' seed systems, which resulted in poor adoption of formal bred MVs, increasing narrower genetic base for breeding and decrease of genetic biodiversity in farmers' fields. Therefore, the current project aims to identify possibilities, mechanisms and arrangements for developing more effective linkages and mutually beneficial partnerships between the two systems which will enhance crop development, in-situ/on-farm management of genetic resources, and farmer capacity building in the specific context of China.

The main perspectives guiding the research are Agricultural Knowledge Systems, and Participatory Research and Gender Analysis. The main methods used are main stakeholders identification and network mapping, comparative field trials between conventional professional breeding, farmer traditional seed selection, PPB, and participatory monitoring and evaluation.

This paper intends to present the case by first describing the research methodologies, main research activities, and the achievement so far. Then, emphasis will be given to the analysis of the social and institutional aspects of the technology development and diffusion process and the related emerging issues in the social transition period in rural China now. A discussion on the confronting challenges, future directions and institutionalization will bring a close to the paper.

18. Piroge Suvanjinda. Lessons Learned. Sustainable Agriculture Development Project (SADP), Thailand

Sustainable Agricultural Development Project (SADP) is the cooperative between the government of Thailand and the government of Denmark through the funding of DANCED within the period of August 1999-April 2002. The main objective is to strengthen the learning process of Participatory Technology Development (PTD) and the networking of small farmers in order to promote the sustainable agricultural development throughout the country of Thailand. The Ministry of Agriculture and Cooperatives assigned the Office of Agricultural Research and Development (OARD) of the Department of Agriculture to work as the coordinating agency.

In order to institutionalize PTD, the SADP set up 3 levels of committees: the Project Steering Committee at the ministry level, the Provincial Project Coordinating Committee and the District Project Working Committee. Various stakeholders from GOs, NGOs, private sectors, farmers' representatives come to be the member of each level of the project committees. Farmers themselves become the chairman and the secretary of the committees at district level. The networking of farmers, researchers, extension workers and NGOs were enhanced and facilitated by the project coordinating teams of OARD. Many training activities to motivate the learning process of PTD are fully

supported in several ways. Both formal and informal PTD training courses for researchers and extension workers as well as NGO staff were done several times a year. Traveling seminars by farmers and project staff, farmers' evaluation meeting, seminars and workshops on PTD for farmers as well as for field staff and senior staff were also recognized as the effective ways to make all stakeholders to learn about PTD.

To implement the sustainable agricultural technologies in the farmers' fields, SADP have all about 78 project sites around the country. Each project site will be allocated THB 100,000 annually for farmers' research in their own fields, THB 35,000 annually for training activities and another amount of money for activities such as the establishment of village marketing, networking activities, etc. All the money allocated will be managed by the District Working Committee. Researchers and extension workers will get involved as the facilitators for each activity whenever farmers need help.

19. Paul Tchawa, Felix Nkapemin and Jean-Marie Diop. Participatory Technology Development in Cameroon: The Route and Milestones in the Process of Its Institutionalization. National Program for Agricultural Extension and Research (PNVRA), Cameroon.

In the framework of the ISWC programme in Cameroon, an interesting innovation was identified at Upper Babanki located in the West of Bamenda in a distance of thirty kilometres. This innovation named 'Night Paddock' (fertilisation through the overnight stay of cattle in the paddock) is very relevant because of three main characteristics.

First of all it was devised by a local farmer innovator to meet a need felt by the community. That is the decrease of the soil fertility. The innovation has spread rapidly into the community without a formal extension. A survey made in the two biggest quarters of Babanki (Chuku and Tsimisuih) revealed that 86% of farmers have adopted the technology.

A second characteristic of the innovation is that two new innovations stemmed from it.

A third characteristic of the innovation is its favourable role in the management of the conflict between peasant farmers and cattle farmers. This kind of conflict seemed to be insoluble before from the side of policy makers.

Farmers requested first a collaboration to meet their needs. The Participatory Technology Development (PTD) approach used was adapted to the local context. The first results obtain show in general the efficiency of the approach in the process of joint improvement of technologies.

Three methodological ways are used for the improvement of this local technology:

- The first one corresponds to a participatory process where the three main actors (farmers, extensionists and researchers) work together with the purpose to improve and validate the technologies.
- The second is linked to the first and is conceived and led by researchers in order to validate the on-farm findings.
- The third is a spontaneous initiation from farmers' side with or without the help of the researchers.

What is noticeable in this experience is that with the facilitator role of the programme, the field actors have the leading roles and they create solid links of work and exchanges. This is the striking proof that an approach, which consists of jointly developing local technologies with farmers, can leads to sustainability.
Institutionalisation-wise, one can notice two phenomena: The first is the great interest from the side of extension workers who have additional technologies to include in their basket of technologies. The second kind of interest is the one shown by policy makers who consider this technology as an efficient tool for managing the conflicts between peasant farmers and cattle farmers.