Name of Institute: **Institute of Environmental Studies**

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Zimbabwe.

Project Title: **Evaluating the Impact of Farmer Participatory Research and extension in Natural Resource Management in Zimbabwe.**

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Collaborating Institutions:

Department of Agricultural Technical and Extension Services (AGRITEX).
Department of Research and Specialist Services (DRSS).

1. Introduction and Background

Research on natural resource management in the Zimbabwean smallholder farming sector has been ongoing for almost five decades by various actors and agencies. It was however in the last ten years when the design of research approaches underwent substantial changes, mainly from the on-station researcher designed and controlled research to on-farm research and towards farmer participatory research. Soil and water conservation and conservation tillage were prominent research areas in natural resource management where participatory research and extension initiatives have been tried by different institutions. Through these initiatives, various technologies for use as options by smallholder farmers were developed. While various approaches with different levels of participation were applied and activities documented, the impact of different approaches has never been thoroughly assessed, analyzed and compared. Even in ongoing activities of various actors and agencies, the impact assessment and evaluation components are not fully developed and rigorously tested. These shortcomings led to the development of this case that is based on two studies namely, a retrospective study in which the issues and impacts of selected cases were analyzed and the development of improved participatory research and gender analysis methods.

Two salient factors that influence crop production in most communal or smallholder areas of Zimbabwe are rainfall and soil fertility. Zimbabwe is divided into Natural Regions (NR) based on natural rainfall. The cases studied are in agro-ecological regions NR III and IV. Rainfall in these regions varies from 450 mm to 700 mm per annum and is characterized by infrequent heavy downpours with long periods of drought in between. The inherently infertile soils of these areas in tandem with vagaries of sporadic and erratic rainfall distribution culminate in low agricultural potential domains. Four of the cases (The Intermediate Technology Group (ITDG), The Institute of Environmental Studies formerly AGRITEX/GTZ (IES), The Farming Systems Research Unit (FSRU) and AGRITEX) are in the semi arid Masvingo Province in the Southern part of the country. This province is predominantly home to the Shona speaking Karanga people. Generally, the province is one of the most populous in the country with a population density now exceeding 60 persons per square kilometre. The average farm size for the three cases in Masvingo is 2.4 ha per household. The *dejure* female-headed households have consistently the smallest farm sizes. In these areas, an average of one person per household is in gainful formal employment. Annul household incomes are mostly from agriculture and off farm non-agricultural activities.

The other two cases (the Cotton Research Institute (CRI) and Institute of Agricultural Engineering (IAE)) are in Mashonaland West province in the North -Western part of the country. Mashanaland West province is dominated by large scale commercial farmers. Smallholder farmers are a mixture of the Shangwe, Korekore and Karanga people. The Karanga people migrated from Masvingo province in search of areas with better soil and adequate rainfall for crop production. They are generally inclined to crop production while the Korekore and the Shangwe favour hunting and gathering. Conflicts always arise in these areas where the Karanga are accused of cutting down trees with uncompromising efforts to convert forests into arable areas which clashes with the Shangwe's hunting acumen. The average land holding in smallholder areas is 3.7 ha with the *dejure* female-headed households owning small areas. The majority of

farmers work full time on the land and produce food crops and cash crops that include cotton and to tobacco.

In all six cases, institutions dominant in local areas are the traditional ones that encompass the village heads, the headmen and the chiefs. The government also has its structures comprising the village development committee (Vidco), Ward development committee (Wardco) and the councilors who fall directly under the Rural District Councils (RDC). Other institutions and organizations active in these communal areas are the government research and extension agents and non-governmental organizations. Institutional surveys in the case study areas manifest different levels of institutions' importance and closeness to smallholder farmers.

2. Objectives and Methodology

The objectives of this case were:

1. To analyze impacts of different participatory research approaches and allocate them to core factors for success and failure.

2. To improve the capacity of the Institute of Environmental Studies and in its partners in monitoring and evaluating impact through development of new methods.

It was planned to achieve these objectives though:

a) Documentation and analysis of participatory research and extension cases
b) Assessment of the perception of the stakeholders through a question survey and informal and informal interviews.
c) Synthesis of lessons learned and implications for the future
d) Development and testing of improved participatory monitoring and evaluation/impact assessment methods

The first three stages were completed with some modifications and final stage is still in progress.

3. Research Process

Time line and important activities carried out as a plan to achieve the objectives are tabulated in Table 1.

Table 1.

Point in time	Activity	Outcome and Comment
February 1999	Start up workshop on evaluating the impact of farmer participatory research and extension in natural resource management.	Went on very well and a Workshop report was produced.
May 1999	Guidelines for analysis of cases	Went on well and a report was produced.
June 1999	Criteria for selection of cases	Case implementers identified. A number of those who implemented cases had moved and some were too busy.
November 1999 – March 2000	Documentation of cases and analysis of cases by implementers	Submission of cases. Initial draft were generally very poor..
April 2000	Review of cases	Comments on drafts. A lot editorial input was required
May 2000	Final documentation of cases	Reports
June 2000	Draft questionnaire & PRA checklist	Questionnaires and checklist
February – March 2001	Administration of questionnaire and PRA	Row data collected, 50 households per case. The exercise was postponed three times due unfavourable political and economic situation. The exercise was delayed by more than a year.
July -September 2001	Questionnaire & PRA analysis	Draft documents of surveys
October	Synthesis	Synthesis report. Synthesis workshop was cancelled.
September 2001	Development of improved monitoring methods.	Success factors identified and operational frameworks developed. Task is still in progress.

4. Impact assessment methodology

The assessment of the impact of different approaches used was based on the impact assessment plan developed at the beginning of the project. The plan clearly identified the different stakeholder levels. These included male and female farmers, researchers, extensionists and local institutions. The impact areas from which indicators were selected included behaviourial (like decision making) and technological ones (like the application of appropriate technologies by farmers). Impact areas were improved farmer skills and development of positive attitudes, availability of technologies for dissemination, effective application of appropriate technologies in natural resource management and effective social organization for innovation. At the researchers and extension agents level, the impact areas were enhanced capacity to apply participatory research process and enhanced participatory extension approaches.

Appropriate measurable indicators for each impact area were chosen. The information was obtained from the case writers and from the field survey. For example under improved farmer skills and development of positive attitudes, indicators focused at experimentation and development of technologies by farmers on their own initiative. Questions asked to generate the required information centered on whether farmers experimented on their own initiative, number of innovations farmers developed and number of experiments initiated by farmers.

Another area of indicators involved assessing the ability of farmers to choose appropriate technologies and apply them situation specifically. Information needed was on the variety of options used by farmers. Questions asked sought to establish who chose appropriate technologies for dissemination, which technologies were applied situation specifically and how farmers used a variety of options available to them. The number and types of modification made by farmers on provided technological options indicated the ability of farmers to adapt technologies to their needs and situations. Specific questions asked included adaptation of any technologies to suit farmers' needs and how and the number and types of technologies modified.

Other indicators assessed active demand for services by farmers, active participation and articulation of farmers in meetings and workshops and improved status of farming. Relevant questions asked were sought to understand how many and what type of services were demanded by farmers, whether numbers of farmers increases or decreased in their groups, level of contribution by female farmers and comments on articulation of farmers in meetings. Changes in perception and attitudes concerning farming were probed.

The impact area on availability of technologies for dissemination reviewed the number and type of technical options suggested by research and extension, resources required for adoption of technologies. It also investigated resources available to different stakeholders and availability of extension material for different levels of users. Specific questions asked centered on the number and types of technological options offered or suggested by research and extension, the range of options for different stakeholders, and the type of extension material available.

In the domain of effective application of appropriate technologies in natural resource management, questions focused on the effectiveness of technologies in solving identified problems taking cognizance of the previous and present problems, timely application and management of technologies. Above all the effect of technologies on crop yields, how returns compared with and without technologies and how the technologies affected the farmers' income were investigated. The state of the environment with and without technologies was also compared.

The impact area on effective social organization for innovation was assessed through a number of indicators. Questions focused on formation of new groups, number of groups, their activities and composition and changes in the number of groups with time. In addition, questions sought to ascertain how groups solved conflicts, the mechanisms in place for conflict resolution and how they negotiated interests. Probing was done to obtain information on effectiveness and accountability of the leadership and how members perceived their leaders. Questions also sought to find out the presence of rules for living together, how they were set and implemented.

Information and feedback flow was investigated by asking for comments on the process, problems leaders encountered when reporting back, type of information passed to the farmers. Farmers were asked if their leaders withheld some type of information from them, whether they were consulted before making decisions and the procedure for consultations.

Local institutions were assessed through probing the farmers about the mandates of the local institutions, whether they were transparent or not and the farmers' general perceptions of the roles and responsibilities of institutions.

The degree of commitment and stakeholder contribution of own resources could be established by specific questions to farmers that asked for the form of contribution, funds raised and for which type of functions. Again, questions sought to know whether there was transparent and acceptable use of group funds, rules overlooked in use of group funds and general perception of group members.

Concerning enhanced capacity to apply participatory research process and participatory extension approaches, farmers were probed with such questions as: What farmer knowledge was recognized and integrated into research, how was the research design done, and how were research questions and agenda formulated? More questions directed to researchers tried to find out the influence of farmers' experimentation had on the research design and process, types of farmer experiments and designs considered and the criteria for monitoring and evaluation.

Finally, farmers were asked of any attitude changes and better communication skills of the researchers and extension agents before and after the intervention. The extent to which participatory methods were applied, the number of extension staff that applied participatory methods and the role farmers play in the production and design of extension material were investigated. Extension agents were asked to provide information on the quality of extension manuals and guidelines produced before and after the intervention, the farmers' indigenous knowledge recognized and whether it was documented or not.

5. Results and Impacts

Household characteristics

An initial analysis of the questionear survey reveal the household characteristics of the case study sites and these are presented in Table 2. There was no significant difference in the age of household heads and household sizes across the five cases. However, the gender composition of the sample households was generally 70 % male-headed households and 30 % female-headed households with the AGRITEX and OTT cases being on extremes. There was no significant difference in the number of family members gainfully employed and effective labour per household across cases.

Table 2. Comparison of household characteristics across cases.

CRITERIA FOR ASSESSMENT	AGRITEX	IES	FSRU	CRI	OTT (IAE)	ITDG
Age of household head (yrs)	50.7	51.3	52.7	49.0	48.3	47.3
Gender composition of hh heads (% ♂, %♀)	58, 42	60.4	70, 30	70, 30	88, 12	70, 30
Hh size	7.3	7.5	7.9	7.1	6.9	7.9
Members gainfully employed	1.4	1.3	1.5	1.4	1.6	1.3
Members providing effective labour	3.5	3.3	3.1	3.2	3.4	3.4
Land holdings (ha)	2.3	2.5	2.1	4.3	3.6	2.5
Number of cattle per household	4.6	5.2	5.2	4.2	6.3	6.1
Bags of fertilizer bought per season	5.5	5.5	6.1	6.6	7.5	2.5

The land holdings for the CRI and OTT cases that were both in Mashonaland West province were relatively larger than for cases in Masvingo province. This confirms earlier statements pointing Masvingo as one of the most populous provinces in the country. Generally, inorganic fertilizers are purchased by all farmers but those in the ITDG case purchase the least number of bags per household. These farmers are however, among those owning the highest numbers of cattle per household. Farmers in ITDG case rely heavily on cattle and other livestock manure. The CRI and OTT cases are generally cotton producing smallholder areas and this might account for

higher fertilizer purchases. These differences in household characteristics are not likely to have influenced the impact of the different research approaches.

Comparison of research approaches used for different cases

In a start up workshop, seven cases were tentatively identified and approved by participants. These cases focused on research/ extension in on-farm natural resource management. Documentation was possible for five of the cases done by the project staff involved in the implementation of the projects. The completed cases were for the Farming Systems Research Unit (FSRU), the Cotton Research Institute (CRI), the Institute of Environmental Studies (IES), the Department of Agricultural Technical and Extension Services (AGRITEX) and that for the Institute of Agricultural Engineering (IAE). Key components of the adopted approaches that influenced the success or failure of the projects were identified basing on the participatory extension approach cycle (Table 3) and these are summarized in table 2 below.

Site selection for the projects was done at different levels such as provincial, district or station depending on the regulations of different departments. In most cases the provinces or departments at headquarters selected districts and these in turn selected wards where research would be conducted. Site selection was done at district level by AGRITEX and FSRU while CRI and IAE selected from the station. AGRITEX, IES and FRSU entered the communities they had been working in previously while CRI and IAE researchers took advantage of extension agents who introduced them to the community. CRI and IAE had been conducting conventional research on station and had to go to the smallholder farmers for uptake of technologies developed. FSRU worked in Chivi for a long time and at the onset of participatory research process farmer selection was relatively easy as farmers organized themselves into voluntary research groups to address specific problems they themselves identified. The groups were mixtures of livestock owners, non-owners, master farmers, non-master farmers, women, men and traditional leaders. The CRI with help from the extension workers selected 12 pilot farmers according to resource endowment broadly grouped into well, adequately and poorly resourced farmers. The IES linked with a group of farmers that were initially selected through the local extension service. Meanwhile, AGRITEX sought the help of community leaders to mobilize people and ultimately selected 30 farmers for a training for transformation course. AGRITEX was able to that because it had been traditionally the bridge between farmers and researchers. The IAE targeted 80 smallholder sites throughout the country with at least two farmers per district. IAE worked closely with AGRITEX extension staff who selected the farmers according to their own criteria.

Farmer training is an important aspect whenever introducing a new approach. Only AGRITEX and CRI trained pilot farmers for them to be equipped with new skills and better understanding as preparation for impending change in approach. CRI and IES took farmers for tours to experiment stations for orientation (Table 3). The four cases except the IAE had to be in rapport with farmers by engaging in dialogue at numerous meetings. That paved way for ensuing research activities. Situation analysis was only plausible in cases where the project mentors did not have rigid predetermined objectives. The AGRITEX, IES and FRSU had objectives that viewed farmers as equal partners or co-researchers and accommodated their views unlike the other two cases. Consequently, AGRITEX, IES and FRSU could identify and prioritize

problems together with farmers whereas the CRI and IAE could not do that exercise. It could therefore, be concluded that CRI and IAE researchers could not easily descend from their pedestal of conventional research. CRI only encouraged farmers to try out some technological options that were developed at the research stations.

The implementation stage in all cases involved farmers with facilitation from either researchers or extension staff. The supply of inputs and sometimes implements by researchers created a dependence syndrome. In the IES and AGRITEX cases, farmers had to utilize their own resources. In the IAE case, extension staff had the sole responsibility of implementing while farmers only provided land and drought power. It is felt that regular monitoring and evaluation of project activities or technologies is fundamental to the success of that project. However, monitoring was done once or twice a season which is inadequate. Monitoring and evaluation of project activities were similar in the AGRITEX, IES and FSRU cases whereas in CRI researchers were more interested in measuring predetermined parameters and farmers did their own assessment of technologies. The IAE researchers only collected data gathered by the extension staff on their behalf at the end of the season.

The process review by AGRITEX, IES and FSRU was similar while the CRI researchers only assessed farmers' preference for certain technologies but had little room to maneuver. No review was done in the IAE case. It becomes clear that the research by CRI and IAE was not farmer led though attempts were made to incorporate farmers as much as possible in the CRI case. All cases except the IAE played a part in disseminating the technologies to other farmers by means of field days, farmer to farmer exchange visits and at social functions.

Table 3 Comparison of approaches used for different cases.

CRITERIA FOR QUALITY ASSESSMENT	AGRITEX – Gutu	IES (former Agritex/GTZ)	FSRU	CRI	OTT (IAE)
SITE SELECTION	Site selected by extension staff district level.	Research continued at a site that was initially proposed by extension at provincial level.	Site selected by researchers at district level.	Site selected by researchers at the station	Communal areas in NR II, III, IV & V targeted randomly with 80 sites through out the country.
ENTRY INTO COMMUNITY	Extension agent been in the area for five years. Announced reorientation of approach	Researcher been in the area for five years. Announced the need to inclusive.	Researchers been working in the area before.	Researchers introduced by extension staff in a meeting.	Researchers met with extension staff.
FARMER SELECTION	Local leadership helped mobilise people in communities	All farmers encouraged to participate.	With researcher guidance, farmers organised themselves into voluntary research groups - generally along kinship lines.	12 farmers selected by researchers based on previous experiences.	Agritex was responsible for selecting farmers using their own criteria. No social mobilisation.
FARMER TRAINING	Training for transformation (TFT) for 30 selected farmers.	Frmers working with the Agritex/GTZ project exposed to Training for transformation.	No formal training of farmers	12 farmers taken on tour of exp. sites within Sanyati CA. Farmer training on basic skills.	No formal training of selected farmers but only Agritex field staff.
AWARENESS RAISING OF "NEW" APPROACH	Workshops with extension worker and Feedback meetings.	Workshops with extension worker and Feedback meetings.	Meetings of researcher & farmers introducing participatory research	A workshop by researchers, ext. agents & farmers to discuss all technologies noted during the tour.	No exposure visits, no formal/informal discussions with farmers concerning the trials.

SITUATION ANALYSIS	Situation analysis using PRA tools. Extension agent as facilitator	Information from predecessor project and further situation analysis using PRA tools. Reseacher as facilitator	Situation analysis by both farmers and researchers using PRA tools	No situation analysis.	No situation analysis
PROBLEM IDENTIFICATION & PRIORITISATION	Problems identified & prioritised at meetings in groups by gender, using problem trees.	Problems identified & prioritised at meetings in different social groups.	Joint meetings of farmers' research groups & researchers to define research agenda.	Farmers encouraged to try at least one technology offered.	Research agenda directly from researchers.
IMPLEMENTATION	Farmers implemented trial using own resources. Extension agent as a facilitator.	Farmers implemented trial using own resources. Researcher as a facilitator.	Farmers implemented trials with some resources provided by researchers	Farmer implemented & managed trials with support from researchers	Extension staff implemented
MONITORING AND EVALUATION	Mid-season and end of season evaluations (mostly visual assessment) and discussions.	Mid-season and end of season evaluations (mostly visual assessment) and discussions.	Trial evaluation (mid-season and after harvest). Scoring using agreed attributes,	Visual assessment of technologies by farmers. Researchers measured plant height and crop yield.	Research officer visited trials at the end of season to check and collect all required information gathered by extension staff.
PROCESS REVIEW	Review of previous season and discussions refinements before new calendar.	Review of previous season and discussions refinements before new calendar	Review of previous trials and decisions to refine or discard some of the technologies.	At end of season, only researchers assessed individual farmers' preference for certain tillage treatments and implements.	No review was done during the 5 yr project period. Number of sites varied per seasons due to motivation of Agritex staff & their ability to get trials on the ground.
DISSEMINATION	Field days, visits to research stations & other farmers	Field days, visits to research stations & other farmers. Farmer-farmer cross visits	Farmer-farmer cross visits and field days.	Farmer- farmer dialogue, field days & at social functions.	No dissemination done due to changes in research staff.

Comparison of impact between the cases

From the case documentation by implementers, pertinent information to the impact assessment plan was extracted. Major highlights are presented in Table 4.

From the documented cases except the IAE, it can be deduced that farmers' skills and development of positive attitudes occurred. The methods adopted influenced the farmers' involvement in the research and technology development. AGRITEX and IES followed an approach that managed to unravel some of the indigenous technologies developed by farmers. Most smallholder farmers are used to the top down approach and they are passive recipients of technologies. They keep secret of their technologies or do not openly try to develop technologies on their own for fear of reprimand from respective authorities. Technologies extended to farmers by researchers were tested on station. It was purposeful for researchers and extension agents to provide a basket of technological options. In all cases except IAE farmers chose relevant technologies basing upon their resource endowment and the importance of a particular technology.

There is little documentation of adaptation of technologies by case writers. This could be because farmers were either not free to make changes to some knew technologies they were still testing or the project mentors did not allow changes to technologies during the project life. Technologies that were adapted were mainly to suit farmers' limitations of labour or implements. Only IES, AGRITEX and CRI encouraged farmers to modify technologies to their liking.

The extent of empowerment of farmers partly dictates their capacity for active demand for services. The AGRITEX, IES and CRI cases show significant farmer confidence in demanding services in tandem with their type of projects. Again, demand for services hint on the development of positive attitudes and type of relationship between the project mentors and the farmers.

Participation and articulation of farmers depends on the type of community, and mutual trust between the project implementers and farmers. AGRITEX and IES cases indicates that farmers' confidence improved gradually. This was due to more training, continued meetings, workshops and assurance that farmers did it for their own development. The FSRU does not say out whether farmers' participation improved despite its appeals for democracy and empowerment of marginalized groups.

Technologies that were extended to farmers were tried and tested before and their effectiveness was high if orchestrated meticulously. In all cases except the IAE, technologies were deemed effective in solving identified problems. However, crop yields t in localized areas either improved or did not change at all. Depending on the extent to which farmers applied technologies, some realized increased income, as in the CRI case, but other did not.

Project mentors could not ensure social organization alone. This possibly called for collective effort from other organizations working in respective areas. Group dynamics in some cases was detrimental to the progress of projects. In all cases that had participatory components, ether group memberships or number of groups fluctuated. Internal conflicts and power struggles were explicitly mentioned in the

CRI and FSRU cases as major causes of splitting of groups and declining membership. This questions the ability of such groups to handle local conflicts. Though group constitutions were mentioned, there is probably laxity in observance of group rules and regulations. More effort in forms of training by the facilitators is called for and involvement of local leadership as done in the AGRITEX case.

Farmer participation is generally non existent in the IAE case. As discussed earlier, the approach was predominantly conventional research. Attempts were made by CRI to accommodate farmers but the project was predominantly researcher driven. Consequently, no farmer knowledge or experimentation was integrated into research design and process. The FSRU and IES incorporated farmers into the process research through experimentation involving indigenous knowledge and also introducing more technologies that alleviated farmers' problems.

Comparison of perceptions on impact between implementers and farmers

A comparison of perceptions of the case implementers and farmers can be drawn from Table 4 and Table 5. Farmers' perceptions in Table 5 are from the questionnaire surveys and informal interviews conducted in respective case study areas.

Generally, there were disparate levels of improvement of farmer skills and development of positive attitudes within and across cases. In all cases except the IES case, farmers pointed out that nobody had developed any technologies out of their own initiative. This is in contrast with AGRITEX and CRI cases that documented technologies developed by farmers alone. Farmers noted that any type of technology said to be developed by farmers was mainly through the guidance and facilitation from the research or extension workers.

All case implementers extended a number of technologies to farmers (Table 5). However, relevance of technologies differed with gender and wealth status of individual farmers. For example in the AGRITEX case, most women ranked the following technologies in order of importance and applicability: Winter ploughing in vlei areas> compost making> ridges> crop rotation> livestock management. Meanwhile, men ranked technologies differently where compost making> ridges > countors/orchards> Variety selection/intercropping. Some of the technologies claimed to be promising such as use of vetiver, infiltration pits and Fanya juu were among the lest adopted. This could be because of limited availability of vetiver, limited labour, implements and time to construct the water conservation structures. In addition moisture conservation might not be as critical as other factors such soil fertility and livestock management.

The FSRU case documentation of technologies was similar to those adopted by farmers. Only preference of technologies differed with gender and as expected with farmers type. Technologies ranked the best by women were in manure application> compost preparation> plant populations> OPVs and varietal trials. Men ranked OPVs> manure application> ridges> fodder trees. These technologies were favoured because they had potential to save money and improve crop yields.

Adaptation of technologies by farmers in all cases except IAE was not as common as indicated by case writers. No more than an average of 3 % of farmers per case

adapted technologies to suit their needs. A common trend was that most farmers adopted technologies as they were extended to them. Moreover some technologies were new to the farmers and hence they needed to try them several times before any modifications were made. A few technologies modified in the AGRITEX, FSRU and CRI cases were basically due to limitations in implements or inadequate amounts of required inputs or raw materials. For example, in the FSRU case compost could be mixed with cattle manure or termitaria soil. In addition, inorganic manure could be applied per planting station in order to maximize application of the resource.

Services demanded were mainly to deal with the problems identified. A common feature across cases was that farmers appealed for assistance in the form of crop inputs, money and livestock to government and non-governmental organization. This indicated that farmers were not yet self-dependant and still sought outsiders' help. Only in CRI and did the majority of farmers sought assistance in the form of knowledge and skills. The efforts of the project implementers were recognized in all cases except IAE as more farmers actively participated in the research. The project mentors all played a facilitatory role to ensure active participation of all members including women and youth. Consequently almost all farmers confirmed that they applied the technologies on a yearly basis and this uplifted the status of their farming. In addition, all farmers asserted that most of the technologies extended to them were effective in solving identified problems and had a positive effect on the environment.

In all cases except the IAE, farmers appreciated that wherever technologies were applied there were improvements in crop yields. In the AGRITEX case, implementers did not value changes in yields as they concluded that there were no difference. However, farmers appreciated difference in yields even in small areas though such differences did not implies increase in income.

Social organization as indicated by formation and dynamics of groups need strengthening in all cases. Generally, cases implementers did not know the exact number of groups formed by farmers. Some groups were formed by other organizations working in the same local area and others were by farmers on their own. In all these cases, farmers could not clearly tell which groups used participatory approaches to research and extension. Maintaining a single group as in the case of CRI where 50 % of farmers belonged to the same group was instrumental to internal wrangles. In the AGRITEX case, it is not clear whether 10 focus groups mentioned by case writers exist in the area given the average group membership of 39. Moreover, the majority of farmers belong to only one or two groups yet only 48 households were involved in the research.

Conflict resolution is an indispensable attribute of vibrant groups. Comparison of perceptions of case writers and farmers showed that the project mentors always played a leading role, much more than facilitation, in conflict resolution. Response of farmers in the FSRU and CRI cases indicate no structures at all put to handle conflicts. Presence of group constitutions mainly crafted by project mentors as in the FSRU and CRI make observance or enforcement difficult. Probably this aspect was out of scope of objectives of respective projects.

Farmers perceived that their knowledge was integrated into research in the FSRU and IES cases and the extent of farmer experimentation was clearly pronounced in these

cases. However, experimenting farmers were guided or closely monitored by researchers. Probably other cases did not have this phase as part of their objectives.

Generally, there were few discrepancies between the implementers' documentation of cases and the findings from the survey and PRA for all cases as shown in Tables 4 and 5.

Table 4 Comparison of impacts across the cases.

Impact areas	Areas of indicators	AGRITEX	FSRU	IES	CRI	OTT (IAE)
Improved farmer skills and development of positive attitudes	**Experimentation & development of technologies by farmers on their own initiatives**	Six types of innovations mainly of indigenous know how	No new technologies developed by farmers alone	More the ten famers' own experiments in the first year.	One farmer developed a duck foot winged ridger for weeding & ridging in a single pass	No new technologies developed by farmers alone
	Ability of farmers to choose appropriate technologies	Use of Fanya juu, vetiver, compost making, ridges, paddocking, establishment of woodlots, graded contours	Use of suitable OPVs, Compost making, leaf litter, anthill soils, bio resource flow management including fodder trees	Use of Fanya juu, vetiver, compost making, ridges, paddocking, establishment of woodlots, graded contours. Use of suitable OPVs, Compost making, leaf litter, anthill soils.	Use of pot holes on anthills, tied ridges, dead level contours, infiltration pits & catchment orchard technology	Tied ridges & ripping
	Ability of farmers to adapt technologies to their needs	Improvised ripper tine, ridges made by plough instead of a ridger	Fertility resource allocation to different niches, cropping patterns.	Different types of mulch tried. Ridges of different height.	Crop establishment in shallow furrows & ridged after establishment, no cross tied to mid season ridges, composting in infiltration pits	No room for technologies to be adapted.
	Active demand for services by farmers	Farm budgeting, record keeping, leadership courses, master farmer training.	Partnership between farmers and researchers who identified local specific problems together and prioritised researchable sustainable options	Training in trial management.	Fruit tree seedlings, information on raising seedlings, knowledge of pegging contours	Farmers had no platform to air their views

	Active participation & articulation of farmers in meetings & workshops	Varied due to different levels of understanding, response affected by inferiority or superiority complex. Gradual improvement overtime	FRSU's closer linkage with farmers mediated and appealed for group democracy & empowerment of marginalized groups eg. Women, youths.	Gradual improvement with time. TFT trained farmers taking the lead.	Initially, men dominated but modification of having women in leadership positions brought a balance & both sexes participated freely.	No platform for farmers.
	Improved status of farming	Improved over time as income generating projects were initiated, farming considered a business where farmers can look for attractive markets for their produce.	Research approach empowered farmers. Farmers accepted active responsibility for their own self development.	Farmers accepted responsibility for their own development.	Technologies introduced were mainly for improvement of homesteads and cultivable lands, income more than doubled	No improvement could be noticed
Effective application of appropriate technologies in NRM	**Technologies effective in solving identified problems**	Yes. Vetiver controlled soil erosion, fanya juu enhanced soil & water conservation, intercropping maximised land use & controlled soil erosion	Yes. Various organic inputs improved soil fertility, fodder trees improved livestock feed, intercropping increased crop output, OPVs saved money	Yes, various soil and water conservation methods.	Yes. Infiltration pits, potholes, ridges, dead level counters, catchment orchard technologies & water tanks all solved problem of water shortage	No assessment was done
	Increased crop yields	No significant difference	Yes, especially soil fertility technologies	Varied between farmers.	Yes, soil moisture constraints were mitigated	No, were only demonstrations
	Increased income	No. Extent applied was to small to influence income	No, done on small scale	Varied between farmers.	Yes, cash from sale of fruits and higher crop yields	No
	Improved conservation & positive effect on environment	Yes, soil erosion controlled	Some technologies reduced soil erosion eg. Fodder trees	Yes, soil erosion controlled and water conservation.	Reduced soil erosion by controlling run-off	Was not taken up by farmers

More effective social organisation	**Formation and dynamics of groups**	One big group to 10 focus groups with fluctuating membership due to individual differences	15 groups that increased to 50 over time but with fluctuating membership. Groups split due to internal conflict & wrong perceptions.	One big group with leadership elected annually.	Big 12 was maintained, households that copied technologies from the pilot farmers increased to 300.	No groups
	Size and effectiveness of groups and representation	From 7 to 56 members bigger groups represented all people but not effective	Ranged from 7 to 9.9 members, represented all type of people	Improved with time.	12 members, well, medium & poorly resourced	No groups
	Ability to solve conflicts & negotiate interests	Consultation with concerned stakeholders, mediated by various leadership eg. Local religious, political leaders, round table conferences	FSRU mediated, with use of group constitutions	Consultation with concerned stakeholders, mediated by various leadership eg. Local religious, political leaders, round table conferences	No structures to handle conflicts. Committee tried negotiating interests but had limitations.	No groups
	Farmer share their experience freely	Yes through field days & exchange visits	Yes at seminars, field days and exchange visits	Yes through field days & exchange visits	Yes at field days & farmer to farmer sharing	Farmers did not fully understand what was happening
	Effective and accountable representation and leadership	Yes but some were pompous	Yes, bound by constitution	Yes, bound by constitution and annual elections.	Yes, always voted into office	No groups
	Ability to set up rules for living together & implement them	Presence of group constitutions mainly by extension worker	Presence of group constitutions agreed to by members	Presence of group constitutions agreed to by members but sometimes conflicts with ridgid traditional rules.	Presence of group constitution	No groups

	Information and feedback flow	Good, no information was withheld from members	Information free-flow amongst groups & within FSRU	Good, no information was withheld from members	No comment	No groups
	Local institutions have clear mandates and are transparent	Their mission focused on rural development, were supportive	No comment	Their mission focused on rural development, were supportive	Power struggles between traditional leadership in group and political leadership led to split of group	No groups
	Degree of commitment and stakeholder contribution of own resources	Funds raised for workshops and field days	Funding sought by FSRU for transport, field days & workshops	Funds raised for workshops and field days	Farmers raised own funds by donating 50 Kg seed cotton per households. This was sold	No groups
	Use of group money transparent & acceptable	Funds correctly used but few cases where no feedback on use of funds & no invoices/receipts for items bought	Budget statements always made and all expenses accounted for to donors	Funds correctly used. Group always sought support of the research in financial management.	Always an area of contention, allegations that funds were embezzled or not used to some members' liking	No groups
Enhanced capacity to apply participatory research process	**Recognition and integration of farmers knowledge into research**	Farmer knowledge of traditional pesticides integrated in research, dialogue between farmers and researchers contributed to formulation of research questions	Researcher managed trials complement farmers' own research action by enlarging the range of technological options	A competition to encourage the recognition of indigenous knowledge introduced.	Farmers were free to alter/modify technologies extended to them by researchers	Not done
	Degree of farmer experimentation in the research design and process	Innovations done in planting techniques, manure & inorganic fertilizer application, mulching in fields, and use of pesticides. Researchers changed approach to that favoured by farmers	OPV trial selection, simple nutrient input trials and application. Trials designed & managed by farmers with facilitation from researchers. Monitoring and evaluation criteria developed jointly	Innovations done in planting techniques, manure & inorganic fertilizer application, mulching in fields, and use of pesticides. Researchers changed approach to that favoured farmers.	Farmers were only implementers of technologies from researchers while researchers facilitated	Farmers were not accommodated

	Conducive attitudes, behaviour & communication skills	Mainly dealt with extension agent	Farmers respected & treated as co-researchers	Farmer treated as co-researchers.	Good, especially offer of incentives for all farmers who participated	Process was a whole top down approach
Enhanced capacity for participatory extension approaches	**Extent of application of participatory extension methods (Researchers)**	Applied to a very limited extent due to limited financial & material resources though all extension staff were trained in these approaches	Mainly researchers using this approach in Chivi South & Central	Approached used in the whole ward and tried in South Africa.	Project funded by researchers and had predetermined time of pulling out.	Not applicable
	Conducive attitudes, behaviour & communication skills (extension agents)	Positive in some areas but idea of farmers being equal partners with them is loathed	Only researchers involved	Positive when initially supported by researchers.	Only researchers involved, extension workers were invited	Not applicable
	Involvement of farmers in production & design of extension materials	No extension manual was produced	No comment	Farmers commented on extension material developed by researchers.	No extension manuals	Not applicable
	Ability to recognise farmers' indigenous knowledge	A lot of indigenous knowledge was documented but a few technologies in pest control were disseminated	Documentation of indigenous knowledge from which formed basis for some of the trials	A lot of indigenous knowledge was documented and a competition was introduced.	Was out of scope of project	Not applicable

Table 5 Farmer perceptions on impact across cases

Impact areas	Areas of indicators	AGRITEX	FSRU		CRI	OTT (IAE)
Improved farmer skills and development of positive attitudes	**Experimentation & development of technologies by farmers on their own initiatives**	Not done by farmers on their own initiative	Farmers did not experiment on their own initiative	Farmers carried out own experiments.	No farmer developed any technology on their own initiative	No new technologies
	Ability of farmers to choose appropriate technologies	Technologies ranked differently by gender, commonest were compost, ridges, winter ploughing & orchards	Chosen technologies differed by gender, commonest were OPVs, ridges, compost preparation & manure application	Ranking of technologies varied between social groups.	Technologies chosen differed by gender, most common were infiltration pits, fertilizer & manure application, crop rotation, livestock management	Farmers passively implemented technologies from researchers
	Ability of farmers to adapt technologies to their needs	Ridges made by ploughs due to lack of ridgers, planting different crops on ridges (<5 % farmers)	A minority (< 6%) of farmers adapted compost making & manure application	Farmers modified some technologies that include mulching and size of ridges.	Changing spacing & depth of holes for planting trees in orchard technology, pesticide application (< 2% of farmers)	No room for adaptation
	Active demand for services by farmers	Only in seeking solutions to problems they identified	Only 40 % of farmers active in seeking solutions and make demands for services	Some demands for training in management of experiments.	As 90 % of farmers are involved in seeking solutions, they demand services from research & extension that help solve their problems	The was no dialogue
	Active participation & articulation of farmers in meetings & workshops	Improved over time with efforts of extension worker	Improved over time through active involvement of research workers	Improved overtime.	Women in leadership positions, participation of all members encouraged	Trials targeted at individual farmers

	Improved status of farming	Improve over time as 96 % of farmers apply technologies every year	All farmers use technologies on yearly basis and others continue to join the group	Some improvement.	All farmers acknowledges improvements due to technologies	No improvement
Effective application of appropriate technologies in NRM	**Technologies effective in solving identified problems**	Almost all farmers (96%) concurred that technologies were effective.	Yes, reduction in soil erosion & improved soil fertility & moisture status in fields confirmed by farmers	More than 90% of the farmers agreed that technologies were effective.	Yes, technologies alleviated soil & water problems as claimed by all farmers	No assessment
	Increased crop yields	Yes but on small areas	Yes, where technologies were applied	Varied	Yes , where technologies were applied	Technologies not taken up by farmers
	Increased income	Not directly linked	Yes, but in the long term	Varied	Yes, technologies applied in large field areas by all farmers	No
	Improved conservation & positive effect on environment	All farmers agreed to improvements only where technologies were applied	Ridges, fodder trees & vetiver reduced soil erosion	Soil and water conservation improved.	Reduced soil erosion & improved water relations	Technologies had potential but were not adequately promoted
More effective social organisation	**Formation and dynamics of groups**	About 95 % belong to at least a group, with half belonging to one group & 40 % to two.	All farmers belong to at least one group with 22 % belonging to 3 or 4 groups	Research group growing and trying to include everybody.	About 50 % belong to a single group while 30 % belong to two groups	No groups
	Size and effectiveness of groups and representation	Highly variable, average size of 39 with standard deviation of 30. Big groups not effective	Average group size is 15 with standard deviation of 13. Some groups too small to be effective	Size increased from 8 during the AGRITEX/CONTILL time to more than 100 in two years.	Variable group sizes, after split of Big 12, average of 20 with standard deviation of 11	No groups
	Ability to solve conflicts & negotiate interests	Half the farmers are in capable groups, other half from incapable groups or those not sure	Some 73 % of farmers do not have the capacity	More than 50 % of farmers involved in solving own problems.	Majority (76 %) from groups have not developed any structure to handle conflicts	No groups

	Farmer share their experience freely	Yes, through group meetings and exchange visits	Yes, at field days & meetings	Yes, at field days & meetings	Yes, at field days & rare exchange visits	Researchers tried educate farmers at field days
	Effective and accountable representation and leadership	Group leadership improved over years & 98 % are content with leadership	Yes, selection of leadership including women through elections. All satisfied with leadership	Yes, group leadership selected every year with representation of all social groups. Inclusivity facilitated by researchers.	Yes, these are elected annually and have to be effective to maintain their positions	No groups
	Ability to set up rules for living together & implement them	Group constitution mainly crafted by extension worker	Group constitutions facilitated by FSRU	Group constitution.	Group constitution but sometimes hard to implement	No groups
	Information and feedback flow	Ninety percent indicate improvement over years	92 % of farmers indicate improvement over years	Some improvements.	Improved over the years	No groups
	Local institutions have clear mandates and are transparent	Assessment of institutions varied by gender, a few local institutions have clear mandates	Assessment differed with gender but some local institutions far away from farmers	Only the research group clear on its mandate. Still conflict with traditional leadership.	Local institutions are far apart from farmers	No groups
	Degree of commitment and stakeholder contribution of own resources	77 % of farmers are from groups that make financial contributions for use at field days	Financial contribution for use at field days by 86 % of farmers from different groups	The group has a bank account with a balance of more than $100000 from contributions.	60 % of farmers from different groups make financial contributions	No groups
	Use of group money transparent & acceptable	All farmers satisfied with use of group money & no problems arose in use of funds	No complaints concerning use of money	No complaints concerning use of money	Satisfied with handling of funds, point to group constitution in cases of misuse	No groups

Enhanced capacity to apply participatory research process	**Recognition and integration of farmers knowledge into research**	Farmers not aware of this development	Use of OPVs, termitaria soil & intercropping	This is the main focus of the new approach.	No farmer knowledge integrated	Not applicable
	Degree of farmer experimentation in the research design and process	Sixty percent of farmers work with extension agents more at seeking solutions than problem identification	Experimentation only done with guidance from FSRU.	The project is about our own experimentation (Kuturaya – trying out).	Farmers who experimented were closely monitored by researchers, only implemented technologies from researchers	Was a top down approach
	Conducive attitudes, behaviour & communication skills	Dealt with extension agents	Farmers cherish approach & facilitation of FRSU	Farmers like the commitment by researchers.	Approach & attitude of researchers satisfactory	Farmers were instructed on what to do
Enhanced capacity for participatory extension approaches	**Extent of application of participatory extension methods (Researchers)**	Only three villages involved	Applied in wide geographical area but with clusters of few farmers in different villages	The whole ward (6 villages) and visitors from other places.	Participatory methods not fully developed as technologies were applied on individual basis	Not applicable
	Conducive attitudes, behaviour & communication skills (extension agents)	All farmers highly rate the extension worker's behaviour & attitude	Researches are mainly involved, extension agents are invited.	Researches are mainly involved, extension supported.	Extension workers gradually got involved & were supportive	Not applicable
	Involvement of farmers in production & design of extension materials	Farmers not aware of this	Most farmers not aware of this development	Most farmers not aware.	Farmers not aware of this development	Not applicable

	Ability to recognise farmers' indigenous knowledge	Farmers appreciated extension agent's support for their local solutions mainly of indigenous knowledge	FSRU documented farmers' indigenous knowledge, includes treatment of sodic soil using river sand, treatment of animal wounds	Farmers appreciated researchers' support for their local solutions mainly of indigenous knowledge	Majority of farmers indicate that their indigenous knowledge was not recognised	Not applicable

Operationalisation of the key elements participatory research and extension of the approach

Based on the analysis of the impact of the above cases key success factors were identified and detailed steps proposed. Impact indicators are developed by answering the question; "what would farmers do differently or what would farmers have learnt after this step and process indicators were developed by answering the question, "what do we want to achieve at this step". The operational framework is also useful in guiding the implementation of the process. Key components of the operational framework would be:

- Description of the step with reference to the whole process,
- Objectives of the step(process indicators)
- What farmers would have learnt (impact indicators)
- Description of operationalisation process (the sub-steps).

An example an operational framework for participatory farmer experimentation is shown in Table 6.

MAJOR PHASES	WHAT DO YOU WANT TO ACHIEVE	WHAT ARE THE KEY QUESTIONS	HOW CAN WE GO ABOUT (STEPS)	WHICH METHOD	WITH WHOM / WHO TAKES THE LEAD?
How to inspire farmers with technical, social, economic options	Improvement of local capacity to diagnose a problem and identify options for improvement Enhancement of farmers creativity, imagination and curiosity about alternative solutions to their problems Create awareness of different ways of solving problems, including their own ways Identification of who is doing what, what is the level of local knowledge Exchange of ideas and technologies between researchers and farmers Improved linkages between farmers and sources of innovations	What do they want to achieve? What are their local practices and what have they tried before (local knowledge) and with what success? What options are available and suitable for the different social groups (age, gender, wealth/resources...)? Who are the local innovators? Who should go for a study tour and how should they report back? Who should organise for transport and other logistics What resources are required for implementing the different options?	Identify local knowledge and practices Community to identify alternative options and sources of innovations Community to select people to go for study tour and set up criteria of what they should report back Community to organise to organise logistics (transport, accommodation, food...) Bring innovations into village or farmers to these sources of innovation and demonstrate them Community to organise report-back workshop for other community members to benefit from the study tour Introduce competition for best ideas	Informal interviews and observations (individual and groups), brainstorming Community workshop Literature review Techniques to tap local knowledge: case histories, diagramming, preference ranking, critical incidents, Study / look & learn tours to innovative farmers, research stations... Farmers days at research stations Demonstrations of options Report back workshops of those who went to study tours Competitions for the best ideas between individuals and between communities	Umbrella body takes the lead, involving the whole community, researchers and PEA teams facilitate and provide also options according to their knowledge

YOUR NOTES:

MAJOR PHASES	WHAT DO YOU WANT TO ACHIEVE	WHAT ARE THE KEY QUESTIONS	HOW CAN WE GO ABOUT (STEPS)	WHICH METHOD	WITH WHOM / WHO TAKES THE LEAD?
How to select relevant experiments	Simple and affordable experiments that address farmers identified problems and involve the majority of farmers A critical review of options by establishing criteria for selecting initial activities and assessing advantages and disadvantages Clarifying expected effects on different social groups within the community An understanding by the community of the need to experiment with the options selected	What criteria can be used to select options matching farmers problems (e.g. practicability, resources, time conflicts with other activities?) How to avoid that these options just benefit a few people in the community? How can we modify these options to suit the needs of different social groups?	Refer to priority problems identified and analysed and link them to the available options Develop selection criteria with community Select the options matching best the problems and the capacities Draw up a 'research' hypotheses	Transect walk with community Community workshop Root cause analysis to the specific problem (but why?) Problem ranking Solution/option ranking	Umbrella body takes the lead, involving the whole community, researchers and PEA teams facilitate and provide also inputs according to their knowledge

YOUR NOTES:

MAJOR PHASES	WHAT DO YOU WANT TO ACHIEVE	WHAT ARE THE KEY QUESTIONS	HOW CAN WE GO ABOUT (STEPS)	WHICH METHOD	WITH WHOM / WHO TAKES THE LEAD?
How to select farmers working closely with researchers	Community mandating a limited number of farmers who work with the researchers without discouraging other farmers from experimenting on their own Identification of farmers who are accepted by the community and from whom others want to learn Identification of farmers who are representative of the majority in their conditions (bio-physical and socio-economic conditions) Identification of farmers who are reliable, willing and able to carry out the experiments until the end	Who selects according to which criteria (inclusiveness)? How to link the experimentation process of all farmers with those of the 'chosen few' How to reconcile researchers and community needs? Whose experiments are they? On whose field does the experiment have to be so that others follow and take it as an example?	Explain the difference between the general experimentation process and the trials in which researchers are involved Develop criteria by researchers and farmers for selection Agree on final selection criteria and select farmers Develop criteria for judging the competitions for best ideas, nominate a judging committee (umbrella bodies) Researchers visit selected farmers and if necessary re-visit selection criteria	Group discussions Nomination and voting Field visits to farmers fields Competitions for the best ideas between individuals and between communities	Umbrella body takes the lead, involving the whole community, researchers and PEA teams facilitate and provide also inputs according to their knowledge and needs

YOUR NOTES:

MAJOR PHASES	WHAT DO YOU WANT TO ACHIEVE	WHAT ARE THE KEY QUESTIONS	HOW CAN WE GO ABOUT (STEPS)	WHICH METHOD	WITH WHOM / WHO TAKES THE LEAD?
How to develop appropriate experimental designs with farmers	Experimental designs that farmers can manage and evaluate themselves and give results on which the farmers and researchers can base sound decisions Simple design that allow to compare technologies easily and answers researchers and farmers questions and satisfies statistical data requirements, considering natural variability Improvement of farmers capabilities and skills to experiment	How have farmers experimented so far on their own? Who decides on the design? Who evaluates the results? What are the criteria for evaluation of the results? Who manages the day to day running and collects data What data need to be collected, for whom? Who is to benefit What resources are available What is the time frame of experiment?	Review farmers' existing experimental practice Designing evaluation criteria and choosing monitoring and evaluation tools Design selected experiments on specific topics and solutions (treatment and levels, design parameters...) Define the roles (who does what?) Define resource allocation issues Training farmer experimenters in data collection	Design workshop	Experimenting farmers and umbrella body, researchers and PEA team facilitate

YOUR NOTES:

MAJOR PHASES	WHAT DO YOU WANT TO ACHIEVE	WHAT ARE THE KEY QUESTIONS	HOW CAN WE GO ABOUT (STEPS)	WHICH METHOD	WITH WHOM / WHO TAKES THE LEAD?
How to implement, monitor and evaluate the experiments	Obtain conclusive quality data and comparison according to farmers and researchers needs and requirements Insights into the processes which make the technology work or fail	Who are monitors and implementers? Timely planning e.g. where to get inputs and how? How to reconcile farmers and researchers monitoring? How to balance qualitative and quantitative data? Who is to give feedback to farmers on the research analysis	Establish and manage the experiments Monitoring by farmer experimenters supported by researchers and PEA team Evaluating results 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	Regular field visits Group discussions Mid-season evaluation Competitions for the best ideas between individuals and between communities	Farmers take the lead, supported by researchers and PEA team

YOUR NOTES:

MAJOR PHASES	WHAT DO YOU WANT TO ACHIEVE	WHAT ARE THE KEY QUESTIONS	HOW CAN WE GO ABOUT (STEPS)	WHICH METHOD	WITH WHOM / WHO TAKES THE LEAD?
How to share the results of the experi-mentation process with others (farmer-based extension)	Enhancement of farmer to farmer diffusion and adoption of ideas and technologies Involvement of an increasing number of communities in a systematic technology development Establishment of a farmer managed system of training and communication between communities Self-motivation of whole community through sharing of self-learning processes through trying out	Who should be beneficiaries of the innovations? What are the most effective channels of farmer to farmer exchange? How can these results be shared with other communities (e.g. through media, materials drawn by farmers for farmers etc.) How to ensure that all social groups are equally sharing the results and ideas (inclusivity)	Identify existing channels of farmer to farmer exchange and learning Organise judging of competitions: Organise mid-season evaluation Organise process review at end of season Draw up manuals and other materials together with farmers to be disseminated in other communities	Visits Mid season evaluation Group discussions Rankings Use of local media	Umbrella body, farmers PEA members and researchers

YOUR NOTES:

MAJOR PHASES	WHAT DO YOU WANT TO ACHIEVE	WHAT ARE THE KEY QUESTIONS	HOW CAN WE GO ABOUT (STEPS)	WHICH METHOD	WITH WHOM / WHO TAKES THE LEAD?
How to sustain the process and spirit of experimenta-tion	Continuity of spirit of experimentation Creation of favourable conditions for on-going experimentation and agricultural development Self-propelled group/ community learning through trying out which enhances problem solving capacity and capacity to innovate Reduced role of external facilitators to implement such processes Self-propelled expansion of the PEA process and the technologies Continued collaboration between farmers and researchers	How can we improve the organisational structures and roles for agricultural self-development? How can we ensure that new ideas and options can be accessed? How can we mobilise resources to implement bigger projects and economic benefits? How can we maintain a positive dynamics / the motivation of people?	Develop skills for facilitation of PEA process within community organisations: who should be trained, who selects, how to report back... Develop conflict resolution, self-evaluation and other skills of local organisations necessary to cope with change in future Documentation of process and methods of experimentation and diffusion Strengthen linkages between farmers and other service providers	Leadership training courses Village and group discussions Self-evaluation	Umbrella bodies with community members supported by PEA members

YOUR NOTES:

6. Lessons learnt and preliminary conclusions (still to be worked on).

Participatory technology development and extension is relatively new philosophy that plays a major role in community empowerment and development. It is designed to involve interdisciplinary, multi-sectorial approach to development that brings together a range of organizations in the formulation of development projects. Participation is understood differently by different people. Different levels of participation were used by the different cases analysed. The different levels of participation could only be identified by asking projects to describe what they did and the details of how they did it. The impact of the different the different cases could be explained by the identified of core success factors.

Other key lessons are:

- Operationalization of design criteria – developed with implementers

  operational frameworks and competence development

- Development of a flexible farmer participatory research process which is based on impact orientation in which adaptive approach improvement is an integral part.