NATURAL RESOURCES SYSTEMS PROGRAMME

PROJECT REPORT[1]

DFID Project Number

R7830 and R7839

Report Title

A new model for Participatory Technology Development

Annex Bviii of the Final Technical Report of projects R7830 and R7839.

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Contents

1. Introduction

This report is based on the experience of two parallel NRSP projects, R7830 and R7839. The first project (R7830) is managed by the ICAR Research Complex for the Eastern Region (IRCER). The second, R7839, is managed by Rothemsted Research (RR). Cirrus Management Services Pvt. Ltd. (CIRRUS) is an Indian company specialised in rural livelihoods and governance, working with Rothemsted Research.

This research was implemented in the states of Bihar and Eastern Uttar Pradesh in the districts of Patna in Bihar and Maharajganj in Eastern Uttar Pradesh. Project sites the Right Parallel Channel V in the Sone Canal system, Bihar and Chapia Distributary of Gandak Canal system in Maharajganj District in UP (coded RPC-V & M-UP respectively) were selected as areas where i) poverty is endemic, ii) where there was not extensive previous experience of working with SHGs and iii) opportunities were identified for improvements in agricultural production.

The projects sought to demonstrate to key stakeholders and policy actors, ways in which rural services can be made accessible and relevant to the needs of poor, socially disadvantaged women and men within rural communities. The project tests an institutional approach, which can enhance social capital at a community level and build financial and human capital of individuals that stimulates expression of demand for agricultural services by the target group, including greater equity in knowledge exchange and pro-active participation in technology assessment and adaptation (PTD). The purpose of this report is to describe the model developed by this project for PTD.

The starting point for this research was in fact an assessment of the challenges facing PTD in the specific context of development. This assessment is reported elsewhere in this annex (Annex B i). A key observation was that PTD research as assumes a scientist, or their agent, as a participant.

The cost implications of involving researchers directly in PTD represent a significant constraint to scaling up. As an example we estimate the costs associated with the initial Participatory Rural Appraisal (PRA) activity as is typically used at the beginning of a PTD exercise. PRA is an approach to the analysis of local problems and the formulation of tentative solutions with local stakeholders. It makes use of a wide range of visualisation methods for group-based analysis to deal with spatial and temporal aspects of social and environmental problems[1].

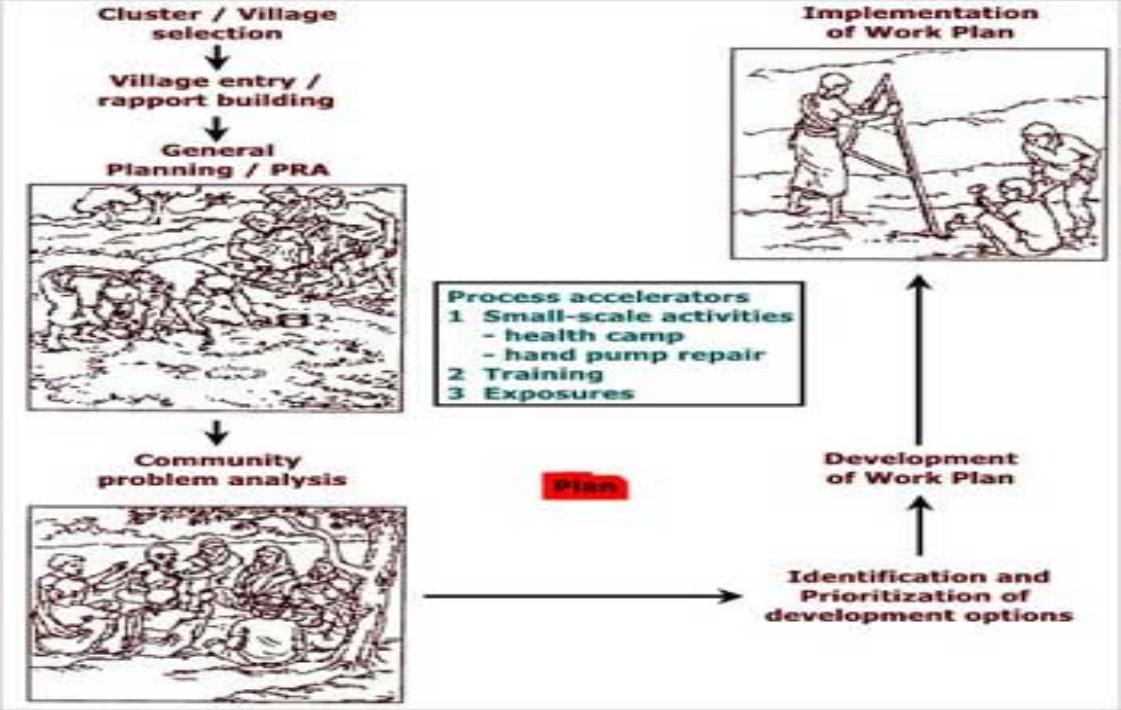
The example used is based on the process used by a development project in India in which the CIRRUS field team leader (Sunil Chaudhary) was previously employed[2]. (Figure 1). It can be seen that the Participatory Rural Appraisal (PRA) represents an important step in the PTD process.

We estimate below the cost of a PRA (in the local context of this project). We assume that the PRA requires a multidisciplinary a team off six persons. The salary cost of these for one day is Rs 500 (£6.3) (assuming local professionals, including daily allowance and professional fee). A PRA is often conducted for more than one day. Assuming the exercise requires a total of 3 days (i.e. 18 person days) then the costs will be in excess of

[1] http://portals.wdi.wur.nl/ppme/?Participatory_Rural_Appraisal_(PRA) (verified Nov 30th 2005)
[2] The figure has been taken from the website http/www.gvtindia.org of wirfp of pages approach.

Rs 12,000 (£150) assuming car hire as Rs 1000 per day. This figure can be contrasted against a figure of Rs 2-3000 to support the development of an SHG through the whole life of project support using the dialect approach (Annex B i).

Figure-1: Schematic representation of the PRA process



This implications of scaling up such an approach are staggering. Take for example the district of eastern U.P where project is in operation. There are one thousand two hundred seven villages in the district[3]. To undertake a PRA in each village would 21,726 person days. This same district has 13 extension officers.

This example situates the challenge we face in developing a new PTD model in the context of 'the numbers game' of development and extension. We make no apologies for presenting this context. If a PTD approach is to be viable at a development scale it has to operate at such a scale. Clearly neither multidisciplinary research teams nor extension development officers can realistically implement a PRA as part of supporting PTD at a development scale.

Further using a PRA to enable initial problem identification in PTD projects is particularly susceptible to being influenced by the interests of those external agents and powerful members of the community. In Annex B i we describe the dialectic approach as a way to support community development. In this Annex we describe empowerment as "*enhancing an individual's or group's capacity to make choices and transform those choices into desired actions and outcomes*".

[3] Sankhiykiy Patrika 1999 of Government of U.P

Thus, the challenge, in developing a scalable model for PTD, is to find a way to stimulate and support experimentation that does not presume direct scientist participation and which has extremely low resource requirements. In developing the model we tested

1. The use of ***Geographic Targeting*** with minimal ground truthing to position a PTD project with no PRA to prioritise interventions
2. Whether method for community development that seeks to facilitate livelihood outcomes in a non-deterministic way (in this case the ***dialectic approach*** developed by the project) would lead to PTD outcomes when supported by an effective communication strategy to raise awareness of opportunities for adoption and adaptation of new agricultural technologies.

It should be realised that the development of the PTD model was an iterative process, the model was developed after much negotiation within the project team. Whilst the challenges of implementing PTD at a development scale were clearly understood at the outset by some members of the project team, however, others were firmly rooted in the resource intensive paradigm embodied by the PRA approach, Farmers Field School[4] and the Institute Village Linkage Programme (IVLP) and were much more comfortable with an approach focused on the promotion or dissemination of specific technologies.

The testing of the PTD method thus has two dimensions activities and negotiations which at any point allowed the project to move forward and the development and testing of the model. The purpose of this report is to describe the PTD model developed by the project and to examine our findings with respect to its testing.

[4] http://www.farmerfieldschool.net/ (verified 30th Nov 2005) for information on farmers field schools, which draw on guided experiental learning methods for adult learning.
http://www.icar.org.in/natp/Programmodes.htm (verifeied 30th Nov 2005) for information on IVLP. By using these as examples we do not imply any criticism of the approaches. Indeed we invariably draw upon many aspects of the methods.
[12] Taken from the slide Dr. SS Singh. Gaunt JL. Project trip report R7839 & R7830, 13-20th Oct 2003: Annex 4

2. Methods for targeting and identification of demand

Targeting

As was described in the introduction research our hypothesis was that geographic targeting with minimum, or no, ground truthing was appropriate for a PTD approach that will leverage a community develop method such as the dialectic approach.

Initially within the project there was a significant divergence of expectation amongst the project team as to the process whereby priorities would be identified. By way of a compromise two parallel approaches were followed. A snowball survey approach using key informants and a rank based quotient analysis was undertaken by IRCER (see Annex B ii in this volume for details) and compared with issues that were being raised in discussions within SHGs. In this second approach the method did not represent a formal survey. Box 1 below contrasts the constraints identified by the two methods at project site 1 as reported by IRCER in Annex B i.

Box 1. Comparison of constraints identified through snowball survey and group discussion

2.2.10 Final compilation of constraints of farmers of all the groups (9)

A total of 106 constraints were identified from 8 stakeholders and they were ranked according to their severity. Finally, 9 common key constraints were identified which limit the improvement of stakeholders' livelihood.

1 Lack of capital
2 Lack of transportation & storage facility
3 Lack of plant protection measures
4 Lack of timely agricultural credit facility
5 Lack of basic need of health and education.
6 Lack of quality farm inputs and latest training regarding modern agricultural practices
7 Lack of dissemination of agricultural technology
8 Lack of training regarding keeping of live stocks on commercial basis
9 Lack of agro-industries and allied activities

2.2.11 CMS also identified a few agricultural production related issues of the project area based on the discussion with different SHGs. These are

- Need for crop choices and options for diversification particularly for small areas of non-irrigated land.
- Issues of water availability in non-irrigated land.
- Availability of credit beyond that available through rotational saving and credit.
- Issues of water logging that encompass both secondary water logging (ponding) and primary water logging (drainage).
- Availability, and quality of seed (rice, wheat and vegetable).

It is interesting to note that coincidently the issues identified by CMS directly or indirectly related to the constraints identified by ICAR-RCER.

Based on the findings above the project team felt that there was some agreement between the demands identified using these two methods. This finding gave the team some confidence that information collected through the SHG process could be used to identify demand.

The CIRRUS team further developed their approach to identify demand. As described in Annex B i savings and credit, using funds mobilised within groups are critical to the dialectic approach. The purpose of loans taken by group members is not restricted by the project. It is suggested that the areas of expenditure reflect both the need and interest of group members. The amount and purpose for which a loan is used is recorded using the microfinance database established by the project. This database offers the prospect to analyse the demand, as expressed by use of financial resources.

Analysis of loan profiles underpins facilitated group exercises that examine the purpose and use of loans and to explore further how this is related to needs and opportunities. The CIRRUS team used this feedback from the database analysis and group discussions to begin to identify sources of information for groups to encourage experimentation. To support this approach broad communication principles were established as follows as described below (section 3).

In moving to the project site at Maharajganj (M-UP) it was agreed that project activities would begin with social development activities and demand identification (see Annex B i and Annex A: section 6) for more details. This agreement reflected a significant change in the position of the team members.

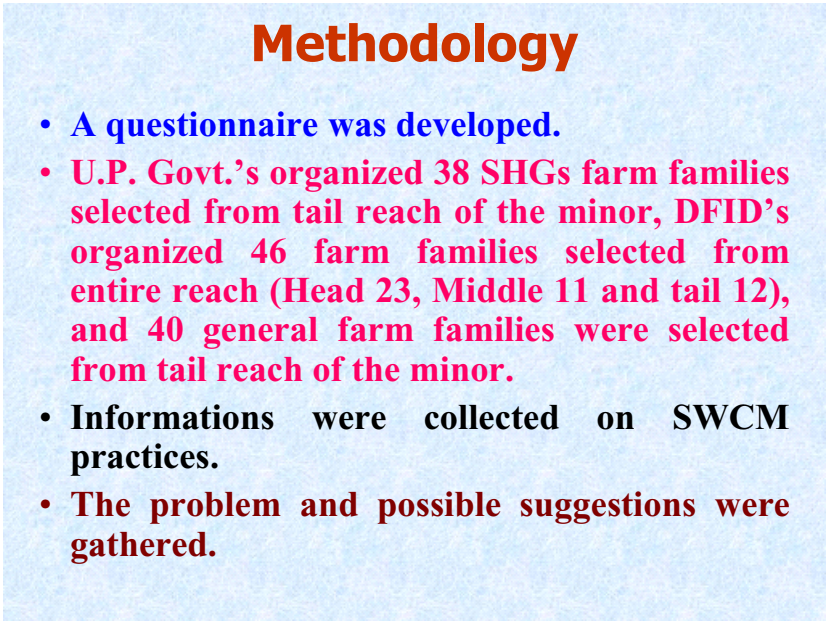
However, there was still a desire amongst the scientific Scientists made a scoping visit which was backed up by a survey. This was undertaken approximately one year after the dialectic approach was initiated. However interestingly the survey was not formally written up, but was presented at a project workshop[12]. Rather than representing a failure to write up a piece of work, this new approach by the team can be seen as representative of i) the change in thinking and approach of team members and ii) an example of a communication approach that was compatible with the PTD approach envisaged. In this case the presentation was used to engage other team members who had not (and may never) visit the project area in discussion of strategies for PTD at M-UP.

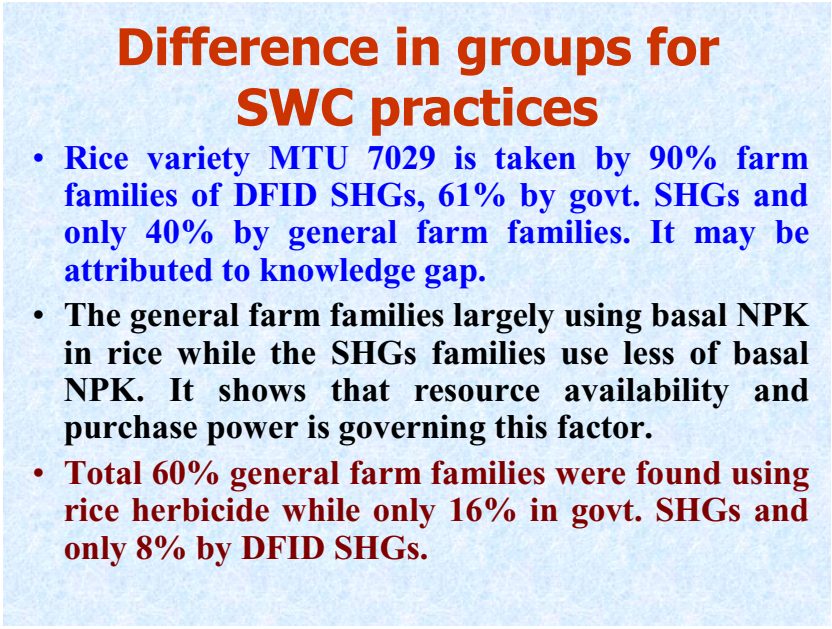
From the slide below (Figure 2) it can be seen that as well as trying to obtain an overall picture of the area, the team were trying to see whether the SHGs were atypical in some way. The results of this survey were important to the project team as they reinforced the confidence in the PTD process.

It is clear, that the project has moved significantly from seeing a PRA and extensive survey as the natural entry point for a PTD and has explored alternative approaches for demand identification that have the potential to reduce resource requirements.

Our conclusion having followed the process described above is that geographic targeting using socio-economic, environmental and agricultural production data is sufficient to situate a development project that anticipates PTD outcomes. However, we did not fully test the model proposed.

Figure 2. Slides reporting on the survey undertaken at M-UP





3. Strategy for communication

Our hypothesis is that all people constantly experiment, or at least explore new livelihood strategies, within the scope of the risk that they are able to accommodate.

As described above key tactical decision was taken by the project. Rather than engage with group members, beyond what was achieved through the dialectic approach we conceptualises and agreed to test the following process with five stages[15] (box 2) to raise awareness within communities of ideas in the research domain and to stimulate the process of experimentation. This innovation was initially proposed by the CIRRUS project team leader. At this stage a concern from his perspective (as interpreted by this author) was to maintain space for the dialectic approach to further develop. Beyond this the strategy offered two advantages:

- It ensured that the presence of scientists did not unduly influence the process.
- It represented a way to significantly reduce transaction costs associated with the support of PTD

Box -2 Stages conceptualised for broadcasting ideas

Stage 1: Identifications of technologies and information that may suit needs identified through SHG and other mechanisms.

Stage 2: Broadcast of information to groups, possibly with some targeting

Stage 3: Analyse response from groups and others EG crops of interest further refinement of demand

Stage 4: Consider response and develop appropriate materials

Stage 5: 1st meeting with no commitments by any party to further meetings

As in the case of testing demand above, the project took a number of confidence building steps and operated to some extent in parallel.

The CIRRUS field team took a responsive approach facilitating links and seeking information in response to demand that was identified from analysis of the SHG database and feedback from follow up discussions with groups.

The IRCER team chose to demonstrate their three best bet technologies, i) earlier rice transplanting, ii) deep summer ploughing and zero-tillage (Annexes B iv, ix & x) respectively using the model established under the NATP project (Annex B x). The innovation history (Box 3) taken from this Annex indicates the considerable effort was made by the leader of R7839, to convince the team to see these as demonstration / communication exercises, it also reveals how the relationship and strategy developed over the course of the project.

[15] Visit Report from 28th April-3rd may 2002 of Dr. John Gaunt IACR Rothemsted

Box 3. Innovation history for zero-tillage research within R7830 & 7839

Who was involved and what happened	Date	Why was it significant
1. Strong interest in promotion of zero tillage driven by Indian Govt directly and through NATP	Prior to project	Project was keen to get in on the action and had experience of implementing the IVLP model for technology promotion supported by NATP projects
2. Project leader of R7839 sought to position project as testing new approaches rather than implementing / validating experiences from other projects. Realisation that researcher intensive approaches would not be scalable		Did not accept approach being proposed by ICAR RCER, it had seemed OK in project discussions but had assumed that final implementation would be jointly formulated
3. During joint R7839/7830 project inception phase ICAR RCER staff (SS Singh and AR Khan) agree to adopt an approach of demonstration for DSP and O-Till rather than the previously planned researcher led technology trial in farmers fields. This was negotiated with John Gaunt after extensive discussion in the conference hall and meetings in staff offices agreed by Dr SR Singh 4. It was agreed that technology based groups would not be formed by the project. Rather if groups came forward we would work with them. Agreements were made between CIRRUS (MS Ashok) and ICAR RCER (US Gautham) backed by exchange of letters	2001	Marked a significant change of emphasis from that anticipated by ICAR staff and enabled project to test strategies for promotion of the technology. The agreement on group formation was respected in the area of ZT Was the start of a productive working relationship
5. UK visit by project team enabled a common understanding of the term 'participatory' to be established		The team were able to have a more critical and informed discussion of their ideas in the context of their understanding
6. Mid term review focused thinking of team on the need to take the views of those other than the farmers in whose field a technology is demonstrated		Team continued to seek new ways forward
7. Response of the Stakeholders regarding Zero Tillage in wheat	2002	Benefits, constraints and potential was assessed from the end use of the technology for further strategy
8. Awareness of CIRRUS activities grew within ICAR RCER team, particularly SS Singh (in the context of this work).		The potential for involvement of SHGs and awareness of alternative strategies for taking the views of farmers and others emerged. The network of contacts is beginning to change – we are talking to more people in new ways.
9. ICAR RCER team accepted that an extensive diagnostic and technology prioritisation phase is not required prior to technology promotion. First the results of the Snowball survey were compared with data from the SHG database (later SS Singh undertakes a survey in Maharajganj)		
10. Visit by John Best helped team to formulate their concepts for promotion of uptake		
11. IRCER Promote f the value of a non-subsidised (technology promotion based) approach to stimulate PTD. ICAR RCER and CIRRUS are now developing ideas together and jointly analysing experiences		Projects R7830 & R7839 test non-incentivised model for technology promotion at Maharajganj. Test supports testing of zero tillage by existing groups within the community – contrast in methods is presented as a poster at the Delhi workshop. The network has extended further we have different groups taking on roles as service providers etc.
12. IRCER staff member (and project team member) joins CIMMYT on secondment from ICAR		CIMMYT hire former CIRRUS staff (now CPSL) to contribute to PTD activities in Bihar CIMMYT move strongly to adopt an approach that involves PTD of technologies by groups who have interest in testing technology

Having established the demonstrations described above the team developed three themes for broadcasting what were still IRCERs ideas. They were crops, water related issues and livestock issues. However significantly, in the absence of the team leader of R7839, both

CIRRUS and IRCER staff began to work together and attended a number of meeting of SHG and volunteers.

First time it was a discussion where different choices of crops suiting in the environment were given to the group members. Group members were asking question on their constrains in adopting the process. But group members became ready to listen the choices of a team of scientists. This was an important milestone for the project.

Having bought into to the potential value of such interactions the project team and subsequently worked with an externally hired consultant (John Best, Reading university). The communication plans as formulated are captured in the various technology related annexes and are also captured in a project report[16]

Leaflets were initially developed and distributed among the group members (See R7830 Final Technical Report for a full listing of the leaflets produced).

Annex B x provides an elaboration of the experience of those scientists involved in the promotion of zero-tillage, includes a qualitative economic assessment, by IRCER scientists contrasting the project PTD model against what was regarded by them as the traditional (ICAR) model for PTD and the NATP – RWC model (reproduced below).

3.2.3. Qualitative economics of communication methodologies compared

Parameters	Traditional	NATP-RWC	Project (IRCER -Cirrus)
Input support	Inputs at all sites	Input at permanent site only	Only knowledge
Staff	Full time	Part time	Least time
Technology cost	Full support	Partial	No incentives
Participation level	Individual	Individual	SHGs/Interest groups
Capacity accumulation	Post-demonstration	Pre/post-demonstration	During demonstration
Level of communication	Staff to farmers	Staff/contact farmers to farmers	SHGs/interest groups to farmers

This analysis clearly shows that the strategy for communication is regarded as requiring fewer resources both in terms of provision of input support and incentives as well as recognising that the key provision support being provided relates to information that was implemented through the involvement in the PTD process

Instead of using a subsidized in field demonstration of zero-tillage at M-UP[17], volunteers and scientists developed a message or question to be used to solicit interest in discussions. The question 'can you sow a wheat crop without ploughing?' was used by CIRRUS staff to initiate discussion on zero-tillage. This generated keen interest in the technology. In June 2003 scientist visited the area to introduce equipment for zero tillage. Field demonstration was now an event where the equipment was on show -

[16] **Best, J.R. 2002.** Report by John Best on visit to Patna, December 6-13th 2002, Rothamsted Research
[17] Transporting equipment to M-UP was funded by the project, but no further subsidy was involved.

enabling farmers and others to see it being used, to view a video on a laptop computer and discuss the equipment. Subsequently some SHG members from M-UP visited Bihar to see ZT in operation at the RPC-V project site. This then led to a number of PTD outcomes around zero-tillage in M-UP.

CIRRUS continued to use information gathered from the micro-finance records to stimulate discussion and analysis as described above. The experience of the communication strategy has by and large been successful. Difficulties were faced with technologies promoted for land and water management as reported in detail Annex B iii: sections 2.3 & 2.4.

This analysis is complex; some of the ideas being communicated required the development of new relationships within the community. Thus it is not clear whether the lack of interest reflected a rejection of the technology, or that the ideas were broadcast too early, or to the wrong audience.

Again it is not possible to provide a rigorous and controlled analysis of the experience. The agreement to test the "broadcasting of ideas" was a key event in terms of the development both of the PTD model and in negotiating between the various partners in the project (see Annex A: section 1 for an analysis of the institutional context of the project).

It is clear from this analysis and a review the annexes related to technology promotion that there is a shift in thinking and acceptance that it is possible to use communication strategies that dramatically reduce the use of scientists time in stimulating PTD. Annex B i: Table 5 provides a summary analysis of PTD outcomes. From this it can be seen that PTD outcomes arise that are influenced both be the ideas broadcast and that emerge as a result of responses by the facilitators of the dialectic approach.

The following section briefly examines some examples drawn from the analysis by Annex Bi

4. What did participatory technology development look like?

Individual PTD examples are described in project R7839 project reports in addition to the technology focused annexes in this volume. Given the non-deterministic approach taken by the project the experimentation could be regarded as somewhat low key, often with simple technology adoption and adaptation. One such example is given below describing how the technology adaptation and adoption emerged in the area of seed quality.

Technology Adoption and adaptation

As was predicted during the pre-inception targeting, and from demand identification using analysis of the loan profiles, demand for quality rice seed was concerned.

The project initially broadcast the benefits of quality seed through it's early rice transplanting demonstration (Annex B iv). The IRCER team also suggested starting certified seed production, the idea was broadcasted in the group meeting. But this did not generate the attraction from the group members.

Two separate PTD experiences unfolded. In areas where there was interest in early transplanting the raising of community seedbeds and sale of seedlings emerged as a strategy to optimise use of water. This example is described more full in Annex B ii.

In a separate situation, farmers began experimenting with different sources of seed. One of the CIRRUS project team members (Mr Rakesh Kumar) who was responsible for identifying new information sources in response to needs coming from the group recognised that there was a willingness to purchase "quality' seed. He sourced three types of seeds of paddy. One seed was from agricultural University, second from local sources and third was hybrid of a Banglore based company.

Despite the cost implications and need to replace seed seasonally, which were fully understood, the farmers chose to purchase the hybrid seed. The experiment included small paired comparison plots in a number of locations and observations throughout the period from seedling establishment to harvesting. The experiences were not without some concern, excessive early growth prior to transplanting lead to concerns as did the levels of growth and tallness of the plants. This led to losses due to lodging in 4 of the 14 locations.

What has changed is more important? In the view of the field team the important lesson was that despite the fact that the variety was not a total success, there were no complaints.

A similar experience arose when chick rearing was identified as a potentially profitable opportunity. Nearly 50 percent of the chicklets died. Still there were no complaints from the group members. In one of the meeting project staff told that we are not going to take any poultry activity in future. Group members told that they would continue with the experimentation as the growth of chicklets was faster then the indigenous varieties and that even with only fifty percent survival the venture was profitable.

Further analysis and comparison of experiences in different meetings revealed that the rate of survival was greater where there was facility of electricity. The persons who knew about the technology of rearing the chicklets earned more than who did not.

Together these examples illustrate the importance of risk and the willingness of individuals and groups to invest and to accept levels of loss and failure as part of the learning process. The approach taken by the project appears to foster a high level of ownership.

These examples whilst seeming relatively minor examples were important in a number of ways. Firstly this experience contrasts with previous experiences within the team whereby failures such as this had led to complaints. Indeed there was an initial reluctance amongst some quarters of the community to test technologies being promoted by the project due to past failures. See Annex B vi on multiple water use and the discussion on hybrid livestock as examples.

Development of new institutional arrangements

The CIRRUS project team were continually aware of the costs of supporting the SHG. As groups started to show interest in testing seeds for various vegetable and homestead the project was unable to meet demand to supply seeds (at cost). The project encouraged volunteers to assess the opportunity and encouraged representatives of wholesale outlets to become involved. Some of the project volunteers positioned themselves to provide this service as part of SLPS.

Initially the wholesalers expressed little interest. However when group members purchased seed of more than Rs 50000 the wholesellers of two company and representative of seed company started attending some of the meeting.

At this point new relationships and arrangements began to emerge, when a representative of a seed company attending a group meeting the volunteers asked what would be the guarantee of these seed. The representative of the seed company indicated that whilst a guarantee could not be given to each individual as it will difficult for them to deal with individual. But if there is some thing wrong with all the people of areas purchasing seed then company will compensate for the loss.

There were also instances where the distributor was not willing to supply certain materials until they were confident of the quality of the product. In fact subsequent comparisons of the 'guaranteed' product with others in the market showed considerable differences in product (colour, viscosity etc.).

This represents an important example. By encouraging the development of relationships in the way described above, communities were able to improve their social capital and position, and to negotiate arrangements that would not have been possible otherwise. Also we see this as an example where by the approach is becoming embedded within the local institutions and institutional arrangements (in fact as would be predicted by the dialectic approach). The challenges of institutionalisation of PTD have been recognised by others. See for example the proceedings of a workshop on the Challenges for Institutional Integration of PTD[18].

Indeed an interesting examples that can be used to indicate the level of empowerment is that now a much more critcal evaluation of technologies is possible. Two examples follow

[18] http://www.iirr.org/PTD/PTD%20mainpage.htm

It is also important to note that the relationship with the scientists as external agents had changed. As a consequence of the approach adopted scientists on occasion became invited 'consultants to join discussions. The two contrasting photographs from within the same project indicate the change in the nature of the relationships.

Also the critique of ideas became more robust. One of the recommendations made during the phase of broadcasting ideas related to recommended that hybrid livestock would give more income than that of local variety. Participants of the meeting engaged the scientist 'consultants' in a critical discussion. Questions and discussions included topics such as: What is the capital is required for purchase of the hybrid? What information is available? What is the amount of risk involved? Given the market price of local variety ox is more than the price of a ox of hybrid how did this affect the viability of the technology.

Similarly the standard recommendation to groups was of the benefits of purchasing a new tubewell pump. Despite the financial rationale, many groups opted for a secondhand pump, accepting the risk of future costs as a trade off for a lower initial investment.

The fact that such discussions arose and that decisions were taken that were against 'recommendations' indicate the level of empowerment of individuals, who previously were not even seen as clients by IRCER.

A final example relates to the access by poor to land. As trajectories emerged amongst the poor and landless and their confidence grew individuals negotiated to take land on lease arrangements. This offered a beneficial arrangement for land owners, for whom the often marginal land required more intensive management than they were able to afford and encouraged a higher level of investment in production for both profit and subsistence need. Thus again we see that experimentation is taking on in the context of new arrangements to access resources, not simply testing a new technology. The two cannot be separated.

By the end of project in some instances land had actually been purchased.

6. Findings

The approach described has been judged by the team as successful. At the beginning of the project the various actors viewed each other, and their respective disciplines, with scepticism.

Development projects (and development focused NGOs) were regarded as being weak in delivering technologies and correspondingly there was a view that scientists were failing to deliver technologies that were needed.

There has been a considerable advancement of thinking within the team that has lead to a change in the positions of the individuals and organisations involved.

The PTD model presented represents an important innovation, by completely separating the approach used to enable expression of demand (PRA) replacing it with simple geographic targeting and a cost effective non-deterministic method for community development.

The PTD model focuses on information and awareness-raising strategy to encourage experimentation and the development of appropriate arrangements to respond to demand as it emerges and evolves seeing this as part of an ongoing process of innovation. This includes supporting the development, through the self mobilisation process, of new entrepreneurs as well as the strengthening of linkages with existing players, and new institutional arrangements such means that many services traditionally provided by research or development projects are met by these actors.

This PTD model provides important feedback to researchers on where demand for their technologies lies and helps to identify new areas of demand. What remains unexplored at this stage is how information gathered from such a PTD method can be used by researchers to frame "tomorrow's research questions" and opportunities to make fundamental advances to existing technology.