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RECENT EXPERIENCES WITH PARTICIPATORY TECHNOLOGY DEVELOPMENT IN AFRICA: PRACTITIONERS' REVIEW

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Participatory technology development (PTD) has recently been widely advocated and supported by donors. However much of the discussion of PTD has been at the level of rhetoric, at times venturing into academic debate. Three dimensions of participation explored here are: farmer participation, participation by other stakeholders, and participation within a multidisciplinary team. Strategies and practical tips for improved project design and implementation are suggested, and future challenges identified.

Policy conclusions

- Funding agencies supporting PTD projects should provide adequate resources for project design, including a stakeholder analysis.
- Funding for PTD project design should be sufficient for an exploration of mechanisms and options for partnerships in implementation.
- Recruitment of team leaders and staff to PTD projects should take greater account of past experience and leadership and management skills.
- Steps are needed to reduce the mechanistic use of "participatory tools", such as PRA, RRA, on-farm trials and farmer groups.
- Support is needed for documenting how technology generation projects have formulated and shared different types of information.
- Project design should pay more attention to exit strategies and provide for the development of opportunities for scaling up successful activities.
- More formal training and short-term projects are needed - but not sufficient - for institutionalising PTD within national agricultural research systems.

From the late 1980s into the 1990s the UK Department for International Development (DFID) funded a significant number of PTD-type projects in Africa. PTD is used here as an umbrella term to describe an approach or activity which combines technology development with participatory methods. It does not imply any new or distinctive type

of approach to conducting agricultural research. The DFID-funded PTD projects were implemented both through National Agricultural Research and Extension Organisations (NAR\EOs) and non-governmental organisations (NGOs). Interaction among these projects was limited. A review process was therefore started, aiming to add practical tips on project design and implementation to existing manuals and reference materials and to separate rhetoric from the reality of participatory agricultural research (Okali et al 1994).

The review took place from October 1996 to April 1997, aiming at candid discussion of experiences, including disappointments and failures. Practitioners were asked to write a case study detailing experiences of participation which should not only present their own perspective, but include comments from other team members. Project representatives and resource persons then met at a forum to present their case studies, share experiences and further discuss ideas for improving project design and practice. The diverse backgrounds of the practitioners meant that much time during the forum was spent debating fundamental issues and terminology. Details of the nine projects reviewed are given in Table 1. The review was structured around three thematic areas of participation considered crucial to effective PTD:

- farmer participation
- participation by other stakeholders, and
- participation within a multidisciplinary team.

Table 1. Details of projects reviewed

Project Title	Institutional Location	Country
Kavango Farming Systems Research and Extension Team	NARO	Namibia (North-East)
Intermediate Technology Development Group's (ITDG's) Food Security Programme in Zimbabwe	NGO	Zimbabwe (Central)
Adaptive Research Planning Team (ARPT) and CARE Zambia's Livingstone Food Security Project	NARO and NGO compared	Zambia (Central and Southern)
DFID/DRT Cashew Research Project	NARO - Research and Training Commission	Tanzania (Southern)

Zanzibar Cash Crops Farming Systems Project	Ministry of Agriculture - HQ	Tanzania (Zanzibar)
KARI/DFID National Agricultural Research Project, Phase II	NARO - KARI	Kenya (Western)
Dryland Applied Research and Extension Project	NARO - KARI	Kenya (Eastern)
ActionAid/NRI Farmers Participatory Research Unit	NGO	Uganda (Central)
Larger Grain Borer Control Project	Ministry of Agriculture-Extension	Ghana (Eastern)

Participation by Farmers

General issues

Sequence and structure or general principles? At the start of this section there was considerable debate between participants regarding the format of the writing and discussion guidelines provided. One academically inclined group felt comfortable with the “use your own best judgement at all times” approach. Others (mainly practitioners) required more specific suggestions and ideas, but not a rule book, on how to approach a particular activity or problem. This tension was not completely resolved during the forum.

Product-based or knowledge-based approaches? If PTD projects present themselves to farmers as the providers of new and superior products and provide free inputs, farmers will see agricultural research from this perspective, making it difficult to dialogue and conduct research with them on “knowledge-based intervention”, such as IPM.

Best entry point options: Some projects (CARE in Zambia, LGB in Ghana), which focus on a specific problem, quickly enter dialogue and test technology without a long prior process of describing and understanding the farming systems. One drawback of this approach is that it requires some prior understanding of the problem and its setting if problems which are a priority for farmers are to be identified. Another is that it is difficult to link this specific approach with longer-term, more holistic research addressing livelihood generation.

Problem with inflexible RRA/PRA: In the Zanzibar project opportunities of working through market traders were missed since the PRAs centred mainly on agricultural production activities. This illustrates the limitations introduced by using these tools mechanistically.

Cost-effectiveness of farmer participation: Some participants argued that farmer participation in needs assessment and in working out solutions from first principles

was not always necessary. Where a problem is new, it may be more cost-effective to bring in and test solutions from outside.

Farmer participation and equity

Many saw difficulty in ensuring that participating farmers were representative of a pre-agreed target group. It was particularly difficult to identify representatives of the poorest farmers, and working with the poorest was costly in terms of researcher time and the amount of baseline data collection and monitoring required.

Targeting and zonation

All of the projects represented had some experience with targeting such groups as the poorest households or households with a specific problem such as a pest. Other targets were broadly homogenous groups of farmers/farm households for whom the same research effort was likely to be relevant. New biophysical and socio-economic information allows the target groups to be redefined and their farming systems re-characterised as new information comes to light.

However, two questions remain: whether categories such as “the poorest” can realistically be targeted, given their difficulty in participating regularly; also whether targeting can cope with the dynamism and variability of farming practices within a three-year project. If time pressures allow good dialogue with only a selection of interested farmers, this may be inadequate for dealing with issues relating to equity and the wider applicability of research results. However, a number of targeting strategies can be identified to minimise these problems (Box 1).

Box 1. Suggested targeting strategies during project design and implementation

- A preparatory phase in the project design can include targeting through literature review, institutional analysis and PRA with a targeting/systems overview component.
- Establish working relations with collaborators quickly and involve relevant stakeholders at the beginning of the process of targeting and zonation. Raise awareness with collaborators and reach clear agreement on criteria and objectives.
- Use existing information, where appropriate, instead of expensive baseline surveys to reduce costs and time.
- In longer-term (i.e. more than three-year) projects adopt a phased approach. Conduct a “quick and dirty” zonation at the start of the project. Allow scope for subsequent revision.
- To focus on a specific problem or opportunity will reduce costs and greatly increase the relevance of targeting/zonation.

Farmer selection

While, in principle, a purposive approach to selecting farmers goes against the ethos of participation and is, in the words of one case study, “a contradiction in terms”, in reality all practitioners know that putting selection solely in the hands of community

representatives could be disastrous. Local elites or interest groups may monopolise the process and biases are likely to arise along with the exclusion of some - usually the weaker members of the community.

Among the projects represented, the most common technique is to ask for volunteers. Other more purposive and research-directed strategies, such as random sampling are difficult and/or inappropriate. However, the project may suggest or even insist on the inclusion of some categories such as women, female-headed households, or households without oxen.

The forum concluded that there is no single way forward but there are useful strategies to guide targeting, monitor the representativeness of participants and reduce bias (Box 2).

Box 2. Recommended Targeting and Selection Strategies

- Make a clear effort to understand the local socio-cultural, economic and political situation (this could include a short study of the influence of farmers' experience of past projects on the current project).
- Careful management of the projects' image presented to farmers and all other relevant actors (e.g. traders, extension staff and other researchers) so that they clearly understand the programme.
- Reduce material incentives for participation to a minimum, so that the desire for new knowledge becomes the main motivator.
- Use specific means to increase the participation of women, including family participation, women's groups, and agreeing appropriate times and location for meetings.
- To reduce duplication of effort, mixed signals from the same institution and confusion about who is who, co-ordinate with other current institutional involvement.
- When initiating farmer selection think about sustainability and look ahead to an exit strategy which will minimise the "dependency syndrome".

Research agenda setting

Discussion on agenda setting in the forum emphasised general influences and principles, rather than specific methods.

Influences: The agendas which farmers bring forward are heavily influenced by their previous experience and expectations. This causes them to pressure for product-based interventions, a tendency often encouraged by research projects aiming to deliver new products with a measurable and visible impact. Overall, farmers may be more concerned with solving immediate problems (the need for food and cash) rather than longer-term ones (deforestation and soil erosion). Furthermore, certain types of knowledge, for example future market prospects for a particular commodity, are often not accessible to farmers and this may influence agendas. On the other hand, researchers are not always effective in accessing farmers' knowledge, and during encounters with outsiders farmers may place a low value on their own knowledge relative to that of outsiders. Additionally funders expect research results within the

project period and this may restrict the type of research which can be initiated.

Principles: For effective participation in agenda setting:

- Stakeholder analysis should be part of the agenda-setting process.
- In gathering information to inform agenda setting, efforts should be made to access different sources and perspectives, including historical information.
- Delays from the research side should be avoided as this can damage a project's credibility.

Methods: Ways of involving farmers in setting research agendas covered in the case studies included: diagnostic surveys, PRAs, community and farmer group meetings, farmer workshops to screen research options, case study monitoring of individual households, discussion of proposed experiments with individual farmers, and advocacy on behalf of farmers at research planning meetings.

Experimentation

It was also noted in the forum that farmer-led experimentation is not always appropriate, particularly where new problems arise, about which farmers have limited experience. The way that researchers experiment is conditioned by the reward system of formal research institutions that value publishable scientific outputs higher than farmer-relevant outputs. How to reconcile important differences between farmers' and researchers' goals, to choose appropriate experimental methods and evaluation criteria and to recognise, assess and build upon farmers' own experimentation emerged as major questions.

Strategies proposed to bring researchers and farmers closer together during experimental activities are given in Box 3.

Box 3. Strategies for Collaborative Experimentation

Implement training to challenge entrenched attitudes and perspectives among farmers, researchers and front line field staff.

Utilise farmers' criteria and priorities to decide on research agenda, focus and methodology. Use matrix ranking methods to promote understanding of farmers' criteria, knowledge and practice.

Conduct joint evaluations of trials by researchers and farmers, and of on-station trials by different farmer groups.

Create more opportunities for dialogue by organising farmer visits to experimenting farmers, stressing that researcher visits to farmers should **not** be brief, holding farmer open days and technology markets and forming farmer clusters, farmer research groups and farmer expert panels.

Emphasise missed opportunities as a way of encouraging researchers to be more proactive in studying farming systems and sharing new knowledge with farmers.

Build upon farmers' own experimentation by canvassing for long-term support from donors to the development of mechanisms for learning about and analysing farmers' experimentation.

Working with farmer groups is a widespread diagnostic and experimentation strategy, for which numerous tips were identified (Box 4).

Box 4. Tips for Farmer Research Groups (FRGs)

Starting groups

- a. Select villages/communities representative of the zone.
- b. Evaluate existing groups and select ones with potential.
- c. Conduct awareness raising through PRA, public relations activities, technology marketing, participatory planning.
- d. Define the image of outsiders through clear presentations.
- e. Provide guidelines for FRGs' composition/establishment (e.g. secret ballot for electing group leaders).
- f. Use effective groups to establish new ones in other areas.

Managing the working relationship

- a. "Train for transformation" to empower groups and researchers.
- b. Conduct regular reviews of research priorities/results.
- c. Monitor the representativeness of group members.
- d. Support village information systems - linking farmer groups.
- e. Stimulate farmer to farmer in-season visits - through a local competition if acceptable.
- f. Link new researchers with existing FRGs to promote experience-based learning.
- g. In addition to discussing new products with farmers, discuss processes (biological and ecological), ideas of experimentation.
- h. Support conflict resolution by careful listening and discussion of conflicts arising within the group.
- i. Work with a limited number of groups; encourage farmers to make group size self-regulating through their own mechanisms.
- j. Invite FRG representatives for workshops and ensure FRGs a role in research planning.

Formulation and sharing of technical information

Four different types of information were identified as:

- basic product information - e.g. preparation of a chemical
- (adaptive) usage information (ways in which a product can be used)
- conceptual process information (e.g. understanding the nature and life-cycle of powdery mildew)
- supply/market information. Each type of information may require a different level of input from farmers and other target audiences, depending on the particular technology in question.

Moving from formulating the information into sharing it should be a process of widening networks with a crossover of actors involved. To make new information easy to apply, it is important to understand local practices and knowledge, and convert quantities to local units of measurement.

Farmers can be involved in the generation and dissemination of information through farmer study tours, farmer extension groups, farmer research networking, use of traders and farmer-trader linkages and farmer to farmer extension.

Participation by other Stakeholders

Farmers are not the only important partners in PTD programmes. The case studies clearly showed that PTD teams do not operate effectively without good links with other stakeholders, such as NGOs, and government departments. These enable access to knowledge, ideas and new technologies and bring additional resources into the programme. They can also establish uptake pathways for technology developed and establish PTD activities, including farmer research groups, on a more sustainable basis. Stakeholder analysis can help a team to develop a strategy for linkages over time.

Differing perspectives in three areas make NGO-GO linkages particularly difficult to manage: first, philosophy, geographical scale and procedures differ; second, effective mechanisms for monitoring linkages are generally lacking; third, competition (for resources and recognition), territoriality, inequalities and negative stereotyping are common obstacles.

Further hindrances to effective NGO-GO linkages include: restrictive information policies of NGOs and also some GOs, including fear of information piracy; low awareness of how best to allocate resources between a range of potential linkages; ineffective NGO coordination mechanisms; and differences in financial policies (e.g. allowances) which affect willingness to engage in joint activities.

Strategies for linkage

While the perspectives on linkages differed somewhat between NGO- and GO-located projects, the strategies proposed for improving linkages were broadly similar. Stakeholder analysis to develop a linkage strategy for a particular PTD project and to define M & E procedures, neutral facilitation at stakeholder meetings held on neutral grounds (or rotating venues) and a stakeholder analysis covering issues of philosophy, image, power and current linkage mechanisms are all helpful. Formalisation to give linkage activities legitimacy was considered necessary, such as through a memorandum of understanding. Regular task-based coordination meetings, joint planning and budgeting and where possible joint implementation of activities were suggested as ways of strengthening links.

Better linkages through improved project design

Implementation of the above linkage strategies implies better designed PTD projects. Project design needs to detail the “whys”, “whos” and “hows” for linkages or, as a minimum, address these questions through a stakeholder analysis in the inception phase. In addition, linkage issues should be addressed in project reviews.

Project staffing needs to be flexible, with recruitment/relocation of staff having a positive linkage record and the inclusion of linkage responsibilities in staff terms of reference. Budgets need to include provision for training (in PTD and linkages), linkage management and provision of other resources such as telecommunication facilities (radio, TV, email), meeting places, seminars and workshops. Specified linkages need to be monitored against clear indicators, and in long-term projects, objectives for linkages should be periodically reviewed.

Participation within a Team

Multi-disciplinary teams are usually written into PTD project documents. But little if any guidance is provided about how teams can best be formed and managed. The forum addressed this topic from two angles: management within the team and the management of process-type PTD projects.

Problems with the former included those of managing people who have different levels of experience and backgrounds; balancing recognition of personal effort with development of a team spirit; and increasing the commitment of team members. Team leaders may have no management training and experience difficulty delegating, resolving conflicts and encouraging inter-disciplinarity and are rarely given additional remuneration.

Training needs to be given to leaders in participatory planning, budgeting, conflict management and facilitation. Regular (weekly or fortnightly) team meetings are a must and the team should develop and share schedules and outputs. Priority setting should be done as a team activity. There should be regular resource allocation meetings and full transparency of financial expenditure. Incentives for team members are not all financial and should include working environment, career development, extra responsibilities and if possible training. Project design should allow for the sharing of responsibilities across the team.

Difficulties in process projects include the management of choices among activities and the means of implementing them. Relations are established at the community level which have to be managed as farmers' expectations are raised and differences arise in the messages given by team members. At times activities are planned for which there is no specialist on the team, staff may have the wrong skills and be too pressured to do a good job. Effective management requires an adequate understanding of conceptual links between different issues, activities and the project objectives. Strategies for managing the process and ideas for implementation are presented in Box 5.

Box 5. Strategies for managing PTD process projects

Programme Focus: Areas of focus, both topical and geographical should be agreed early but reviewed periodically. Teams should be wary of trying to do everything and avoid rushing into new activities. There should be scope for programme growth so that new partners, new staff and consultancy inputs can be added.

Staffing and leadership: If the right staff are not available, it may be better to delay an activity but there needs to be an explicit process of training and integrating new team members.

Training/capacity building: Training needs will change as the project progresses, so that ongoing provision has to be made.

Planning, monitoring and review: Participatory annual planning exercises should be informed by stakeholder review processes. Developing a reflexive learning style should be aimed for with participatory fora and "double loop" learning.

Reporting: An integrated information system needs to be designed from the start, catering for all stakeholders.

Logframes: In the preparatory or inception phase a process type of logical framework is desirable to ensure output flexibility. Only goal and purpose would remain constant.
Sustainability: A continuity strategy, with appropriate training, needs to be designed with partners well before the end of a project.

Future Challenges for PTD

Forum participants noted the following challenges:

Cost-effective scaling up: Most PTD projects have been resource intensive but limited in geographical scope. How can successful approaches and activities be scaled up with much less resource intensive inputs?

Institutionalising PTD: In spite of some success, PTD often remains marginal in NAROs and IARCs. How can PTD be further legitimised and institutional attitudes made more receptive?

Simplifying PTD: How can the prevailing PTD jargon and rhetoric be demystified and the approach simplified?

Farmer empowerment: PTD is generally orchestrated by professionals. How can low income farmers be empowered to influence the formal research process?

Managing change: Farming systems are in a constant state of change. How can PTD teams be best equipped to identify and respond to emerging research opportunities which require new technical expertise?

Training for PTD: Implementation of PTD requires skills, perspectives and orientation often not included in the academic training of agricultural research scientists, including communication, community development, qualitative research, farming/livelihood systems analysis, gender analysis, design and management of on-farm trials, and participatory monitoring and evaluation. How can we equip mature research scientists with these skills so that they can have confidence in them and begin to apply them in ways which are not mechanistic?

Logframe design and cost-effectiveness: For PTD what are the most appropriate indicators and how can costs and benefits be calculated?

References

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