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PARTICIPATORY RURAL APPRAISAL TECHNIQUES

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Abstract

Natural Resources Institute (NRI) in collaboration with the Department of Research and Specialist Services (DR&SS) initiated the Crop Post-Harvest Program (CPHP) in Zimbabwe during 1996. The CPHP program is funded by the Department for International Development (DFID). Preliminary fieldwork on Household Food Security was conducted in Mutoko, Chivi and Zimuto districts. Post-Harvest (storage, processing and marketing) issues were found to be a major constraint faced by small holder farmers. A

Memorandum of Understanding was signed between the Government of Zimbabwe and Natural Resources Institute through DR&SS. Subsequently, an umbrella project "Identification and development of Crop Post-Harvest research activities in Zimbabwe" was formulated. The needs assessment studies had both a commodity and geographical approach. Specific sites were selected through consultations with major Zimbabwean institutions involved in agriculture research, extension and development. The overall objectives of the PRA were to identify and prioritise researchable post-harvest constraints faced by small holder farmers. NRI and DFID achieved capacity building in PRA skills through training of local and regional scientists, who later trained others. Participatory Farm Management tools (farm accounting, resource allocation and problem analysis) were also developed during the needs assessment studies. The CPHP (Zimbabwe) with DFID jointly provided PRA technical skills to the Zambezia Crop Post Harvest Program in Mozambique. The research methodologies varied, but a common theme was that farmers participated in the research process. Following identification of priority research areas working teams of scientist conducted a matrix ranking of researchable priority areas and recommended areas for future research. In-country development of project proposals was achieved through consultations with other stakeholders and target beneficiaries. The establishment of the in-country, (CPHP) office, linkages with other research programs and, organisations, is in program portfolio. It also stresses the need to package and promote research outputs so that the target beneficiaries adopt and utilise the outputs to improve their livelihoods and contribute towards poverty alleviation

INTRODUCTION

The Crop Post-Harvest Program (CPHP), sponsored by Department for International Development (DFID) was initiated in Zimbabwe during 1996. Following the publication of a country framework document (NRI, 1995). A rapid rural appraisal on household food security was conducted, in selected districts of Zimbabwe (Donaldson *et al.*, 1996). Findings of the survey demonstrated that post-harvest constraints were priority problems faced by small holder farmers. Through consultations with Zimbabwean institutions involved with agricultural research, extension and development; 3 districts were chosen for initial focus. It was recommended that a more in-depth problem analysis be implemented, before projects formulation.

The Government of Zimbabwe then approved a Memorandum of Understanding (MoU) through the Department of Research and Specialist Services (DR&SS). Realising these constraints, the DR&SS developed a co-operative project with NRI, on "The Identification and development of Crop Post Harvest Research Activities in Zimbabwe". The collaborating institutes are Natural Resource Institute (NRI), Agricultural Technical and Extension Services (Agritex), Cranfield University, Overseas Development Institute (ODI), Non-Governmental Organisations (NGOs) such as Intermediate Technology Development Group (ITDG) and Development Technology Centre (DTC); and University of Zimbabwe.

Many agricultural research outputs have been unpopular or rejected outright by farmers because they were unsuitable under farm conditions. In many cases constraints identification and solutions generation is done outside the actual setting in which problem is found (Agritex *et al.*, 1998). Financial investments running into millions of dollars in research has generated good outputs or technology, but make minimal impact on the livelihood of rural populations. To address this dilemma it was recommended that PRA surveys be conducted.

The goal of the CPHP Zimbabwe funded by the Department for International Development (DFID) in United Kingdom is to "improve the livelihoods of poor people through sustainable enhanced production and productivity of renewable natural resource systems." The CPHP commissions research on cereals, legumes, oilseeds and horticultural crops. Focus is on these crops, because of their importance in many farming systems in Zimbabwe, providing food nutrition and income to the poorer sections of rural and urban communities. The program focuses on resource poor farmers to reduce post harvest losses, add value through processing and marketing of produce, through development of small enterprises and more effective marketing.

CAPACITY BUILDING IN PRA SKILLS

In the late 1970s, it was realized that most technologies developed by researchers were inappropriate for small holder farmers (Agritex *et al.*, 1998). In the 1990s farmers are now seen as partners in research and extension; and considered as the main key to sustainable agricultural development. In an attempt to address the non-adoption of agricultural technologies PRA skills were adopted (Mudhara, 1996). Many researchers and extension workers in Zimbabwe are aware of PRA survey techniques, but with very little practical experience (Mudhara, *et al.*, 1996). Shifting from teacher to facilitator goes beyond training in participative tools and; involve new skills, different attitude and behavior (Nabasa, *et al.* 1995).

In recent years, participatory rural appraisal (PRA) has become the new 'buzz' phrase in agricultural development. As with other information-gathering techniques, PRA is not an end in itself, but rather a set of tools which should be selected, modified and adapted to the situation (Chambers, 1994 a, b, c). Central to the successful application of these techniques is a shift towards an attitude and approach which recognise that community members and agricultural development workers must work together as partners in the wider development process." (Nabasa *et al.*, 1995).

PRA Training

The general objectives of the training courses were to; get a better understanding of PRA techniques and put the tools to practical use; acquire ability to teach PRA techniques to others and enhance communication skills. The successes of participative approaches of the CPHP in Zimbabwe have seen other organizations requesting for training in PRAs.

Training courses in PRA

(a) Training of trainers

In February 1997, NRI and ODI trained seven scientists from DR&SS and Agritex.

- (B) TWENTY SIX SCIENTIST FROM RESEARCH, EXTENSION, NGOS AND THE UNIVERSITY OF ZIMBABWE WERE TRAINED BY THE TRAINED CPHP MEMBERS IN AUGUST 1997. TWENTY SIX PEOPLE ATTENDED THESE PRACTICAL WORKSHOPS AND TWELVE HAVE HAD THE OPPORTUNITY TO PRACTISE THE TECHNIQUES DURING PRA SURVEYS CONDUCTED IN BUHERA DISTRICT (DONALDSON *ET. AL.*,¹ 1997), CHIVI (BOYD *ET. AL.*, 1997), BINGA (BOYD AND CHIGARIRO, 1997) AND MUTOKO (MARANGE *ET. AL.*, 1997) AS PART OF THE NEEDS ASSESSMENT STUDIES (PROJECT A0549).
- (c) Ten members of DR&SS senior management were trained by the CPHP upon request by the Directorate. The Farming Systems Research Unit (FSRU) of DR&SS also facilitated in the training since they have been using the participative tools since 1992 (Mudhara, *et. al.*, 1996)¹. DR&SS management later on conducted PRAs in various provinces of the country under the guidance of experienced team leaders from Crop Post-Harvest Program (CPHP). The collected information was used in formulation of "DR&SS Agriculture Research Strategic Research Plan"
- (d) Fifteen officers from the Zimbabwe Council of Churches (ZCC), a non-governmental organisation involved in community development and training programs were trained in PRA during November 1998. The target beneficiaries of these programs are mainly rural farmers.
- (e) CPHP Zimbabwe and ODI; trained sixteen scientists from the Zambezia Post Harvest Program based in Mozambique; jointly funded by DFID and World Vision International. The collaboration was created when the Zambezia CPHP management attended a stakeholder review of needs assessment research findings in January 1998. CPHP Zimbabwe and ODI further offered technical assistance in post harvest constraints needs assessment studies, conducted in the Zambezia Province.

OBJECTIVES of PRA

The overall objective of the Participatory Rural Appraisal (PRA survey) was to provide the basis for more detailed needs assessment of crop post-harvest research requirements in one of the three selected districts.

The main objectives of the PRA were as follows:

- To gain a full understanding of the area specific general farming systems to identify the major post-harvest constraints faced by small holder farmers;
- To describe grain treatment methods currently used by farmers (maize, sorghum and millets);
- To describe labour divisions by sex and age during post-harvest activities;
- To gain a better understanding of the socio-economic structure of villages and communities
- To provide field training for resource persons in PRA following a two day class-based training workshop;

¹ Farming Systems Research Unit of DR&SS has been using participatory approach to carry research in small holder farming communities.

- To provide a forum for comparing conventional PRA techniques with Participatory Farm Management (PFM) techniques; which are being developed by researchers at the University of Reading in conjunction with the CPHP².

METHODOLOGY

A series of needs assessment studies with both a farmer and commodity foci were conducted (Figure 1). A multi-institutional and inter-disciplinary team working towards a clearly defined output implemented PRA surveys. The research methodologies varied, but a common theme was that farmers from communal areas in Natural Regions III, IV and V participated in the research process². Through consultations with the major Zimbabwean institutions involved with agricultural research, extension and development, four Districts (Buhera, Chivi, Mutoko and Binga) were initially chosen as field sites. Five days were spent in each village and many farmers provided a wealth of information. The team stayed in the village throughout the PRA exercise, which enabled further informal discussions and participation in everyday tasks. The team held regular debriefing sessions in the evenings to compare notes and discuss emerging findings. Feedback meetings at the end of the PRA survey enhanced farmer/researcher relations and served as a means of verification of constraints and priorities set by farmers to avoid misconceptions.

Commodity focus studies

Participatory needs assessment surveys on horticultural and root crops, oilseeds and on-farm storage of cereals were conducted in the selected districts. Individual farmer trends to compare trends in grain storage management, consumption and differences in store performance were covered under the study on-farm storage of cereals. Problems associated with; marketing of horticultural and grain crops large, small-scale oil expellers and requirements for sorghum threshers and dehullers were examined (Mazvimavi, 1997). A list of recommendations for future research were drawn up on the basis of the needs and constraints identified.

Farmer Focus

The farmers focus was achieved through concentrating village level activities on a limited number of districts and villages. Individual village(s) were then identified as initial foci in collaboration with Agritex district staff. In 1996 it was recommended that participatory rural appraisal (PRA) surveys of the villages be conducted.

4.1 Research instruments and implementation

All CPHP projects encourage the use of Participatory Rural Appraisal (PRA) techniques, which are incorporated into the fieldwork. Background information on selected districts was available (Donaldson *et. al.*, 1996, Mvumi, 1996, and Mvumi *et. al.*, 1998 a, b, c). Key informant interviews with the relevant stakeholders were conducted. Primary data was largely collected through use of participatory research tools such as semi-structured interviews, mapping (farm and village level), transect walk; historical time-lines, seasonal calendar, matrix ranking of crops of crop post-harvest problems and wealth-ranking (Nabasa, *et. al.*, 1995; Pretty, *et. al.*, 1995)

The University of Reading (UK), in conjunction with the CPHP, developed Participatory Farm Management (PFM) methods for improved needs assessment. PFM methods help poor farmers express their needs, and so contribute to making the research truly demand-driven and poverty focused. PFM

tools are adaptive methods which are more useable than traditional farm management methods and complement traditional PRA methods (Galpin and Mvumi, 1997).

Participatory Farm Management (PFM) techniques were also used in parallel to test their comparative performance with PRA. The main PFM methods used were causal diagrams, resource allocation maps and labour budgets.

SUMMARY OF NEEDS ASSESSMENT RESULTS

A stakeholder meeting to review needs research assessment findings was held in January 1998 to develop concept notes for further research projects. A round table discussion was held at DR&SS with specialists in the respective disciplines covered during this first phase; representatives of DR&SS directorate, NRI and NR International. The meeting served to disseminate preliminary findings as well as chart out future course of action.

Needs identification studies conducted in 1997 identified improved access to cost effective de-hulling and threshing, types and suitability of existing storage structures, improved access to cost effective oil seed processing methods, lack of marketing information and access and use of synthetic and non-synthetic grain as the major constraints. Full results from the activities are reported in A0549 (Projects) CPHP reports (Donaldson *et. al.*, 1997; Marange *et. al.*, 1997; Boyd *et. al.*, 1997; Bockett *et. al.*, 1998; Chigariro, 1998; Boyd and Chigariro, 1997; Douglas *et. al.*, 1997)

Following the identification of priority research areas from needs assessment and PRA studies, working groups of Zimbabwean scientists met and conducted a matrix ranking (Figure 1). Client demand, cost of the research, gender sensitivity, rate of adoption, sustainability, potential impact and chances of success were used as a criteria to rank identified researchable constraints. Participants scored each research area (maximum score of 10) and means were subsequently calculated.

FIGURE 1: MATRIX RANKING OF RESEARCHABLE PRIORITY AREAS

Criteria Research Area	Low Risk (Chances of success)	High Potential Impact	High Client Demand	Low Cost	High Gender sensitivity	High Potential Rate of Adoption	Sustaina bility	Total Score	Rank
Pest Control (synth, non-synth, varietal)	9	9	10	5	5	8	5	51	1
Oil Expressing (Including peanut butter)	5	5	6	5	5	6	6	38	6
Drying (Horticultural, legislation)	3	3	2	8	5	7	8	36	8
Market Information (Grain / horticulture)	9 / 9	5 / 9	7 / 10	4 / 4	5 / 5	7 / 10	3 / 3	40 / 50	3 / 2
Market Access (Transport, credit)	3	8	10	6	5	3	3	38	6
Structures	4	5	2	8	5	1	8	33	9
Improved Access to Cost-effective Dehulling and Threshing.	3	7	9	5	5	4	7	40	3
Quality versus Price	8	1	3	7	5	0	2	26	10
Food Contamination (Inc. mycotoxin)	8	0	1	2	5	0	2	18	11
By-products – Livestock feeds	8	3	1	8	5	7	7	39	5

Constraint areas were subjects of round table discussions with specialists in the respective disciplines. As a result of the stakeholder meeting a total of 8 concept notes were submitted to DFID through the Program Advisory Committee (PAC) and three were approved². The CPHP will continue to develop relevant research initiatives to improve the productivity and productive potential of crop post harvest systems in developing countries

CREATING RESEARCH LINKAGES

In-country office

The CPHP is steered by an in-country coordinator. An in-country coordinator was appointed at the beginning of the program to facilitate effective communication between local and U.K based researchers. The CPHP in-country coordination office has 3 members of staff and plays an important role in initiating dialogue with Zimbabwean collaborators and stakeholders. The office also has contributed to the creation of an improved relationship between U.K and Zimbabwean collaborators and has resulted in better appreciation of in-country research priorities and constraints which has enhanced effective implementation of research programs.

The in-country office also provides a role in providing feedback on current social, political and economic developments and particular policies on strategies, which impact on agricultural sector. Such information is critical to agricultural development of demand-driven research that is consistent with national objectives.

Linkages with national stakeholders

The Crop Post-Harvest Program works in collaboration with various institutions within the country. These include government departments, private organisations and NGO's. The main collaborating institutions are DR&SS, Agritex, University of Zimbabwe, DTC, CIMMYT, ITDG, NRI, Cranfield University, and ODI. This ensures that a multi disciplinary team of scientists and advisors participate in the program. The multi institutional approach ensures that information flow is facilitated and CPHP projects are not duplicating previous or current work and, strong linkages between organisations are developed. The institutions involved form a backstop for the program in terms of human resources and facilities and this also ensures sustainability of the program's activities because of the increased sense of ownership. Strong linkages are continuously being developed with stakeholders in the post harvest sector.

Linkage with Bilateral Program

A conducive relationship with the Bilateral Program has been established with DFID through Mr. John Hansell (DFICA Senior Natural Resources Advisor) in Harare. The in-country coordinator holds regular meetings to share information on research activities, general developments in areas of DFID involvement. The CPHP Zimbabwe steering committee minutes are circulated to the local DFID office. This link with the DFID office also provides a channel for establishing linkages with other projects that are within the DFID network that may be relevant or complementary to CPHP activities especially on the developmental side of things and in terms of disseminating CPHP outputs.

Regional Linkages

Linkages have been created with Southern Africa Development Committee (SADC) Food Security Post Production Unit, based in Harare. Regional linkages prevent duplication of research efforts. SADC Food Security has a potential role in disseminating program outputs. The in-country office has established linkages with Mozambique through joint needs assessment studies; and the "Rodent Project" currently under implementation in Mozambique. Links have also been initiated with Namibia through the "Hardwoods Project"; which was aimed at modifying the existing storage structures through minimizing and making it rodent and termite proof.

Linkage with Renewable Natural Resources Knowledge Strategy (RNRKS) programs

The CPHP has established links within the RNRKS programs such as the Livestock Production Program (LPP). An administrator, office space and expenses are jointly shared with the CPH and Livestock Production Programs in Zimbabwe.

Memorandum of Understanding (MoU) with the Government of Zimbabwe

A unique feature of the program is the MoU established with the Ministry of Lands and Agriculture (MOLA); which seeks to establish the CPHP as a collaborative project with NRI and co-ordinated by DR&SS. Potential problems of CPHP focus, implementation and increase in program portfolio are minimised through existence of the MoU.

Project formulation

In-country coordination provides an advisory role to CPHP U.K based management on submitted concept notes to avoid duplication of research and ensure complementarity of formulated projects with national agricultural research planning and policies.

Program quarterly newsletter

A CPHP quarterly newsletter is a regular feature of the program; which has wide circulation among stakeholders ranging from Government institutions, farmer organization, NGOs and donor community. These newsletters also outline the various program activities increased awareness of the CPHP thus encourage further and fuller collaboration. To date eight copies have been produced. Plans are underway to produce the newsletter in vernacular for circulation among project farmers who are increasingly requesting for feedback reports.

CPHP Steering Committee

A steering committee comprising representatives of collaborating institutions has been established and it holds regular (monthly) planning meetings. These planning meetings provide a forum for information exchange pertaining to the different projects. Each organisation is kept informed on project progress through the minutes, which are circulated to all parties involved with the CPHP. These meetings are primarily to disseminate the findings of the research work to stakeholders. The minutes have proven to be very important platforms for establishing research linkages with potential collaborators and strengthening research linkages within the program.

In-country stakeholder workshops/seminars.

The CPHP holds more generic seminars and workshops where CPHP activities are highlighted and further linkages can be developed with a wider range of collaborators. The different projects within the CPHP hold stakeholder workshops at the initiation and completion of the project. For example CPHP steering committee organised a seminar on "Post-harvest Research and Household Food Security" on 15 June 1999 in Zimbabwe. The private sector, government research and extension institutions, non-governmental organisations and members of the donor community attended the seminar. Proceedings of such seminars or workshops are produced and circulated.

Constraints in uptake

Uptake pathways were identified as the weakest linkage in technology adoption and considered a major bottleneck to sustainable agricultural development. Poor communication due to use of non participative methods, poor to below optimum markets, lack of a good market infrastructure and; finally lack of monitoring, evaluating and impact assessment contribute to existence of poor uptake pathways. The CPH Program is increasing the potential rate of adoption through creating good linkages with extension, NGOs, community, church and women organisations.

Creation of Resource Centre/Database

A resource centre was established through the in-country office. A database of current projects is being created by the CPHP country office in collaboration with Agricultural Research Council (ARC)². The initial foci is on Crop Post Harvest and Livestock Production projects.

CURRENT CPHP PROJECT PORTFOLIO

Projects are currently being funded by the CPHP in Zimbabwe and these include:

Grain Storage Management using Inert Dusts and Related Substances

The project involves evaluation the efficacy of two inert dusts (Protect-It and Dryacide) in reducing insect damage in stored maize, sorghum and cow pea. The dusts are not commercially available in Zimbabwe, but if these trials are successful, the suppliers may look for outlets, and a search for natural sources of these inert dusts within the country will be carried out.

Improving viability and technical efficiency of mechanised peanut butter processing

Peanut butter production for income generation is a common and profitable activity for rural families in Zimbabwe. Processing pea nut butter is laborious and time consuming. Mechanical grinders relieved some of the grinders associated with the task (Masendeke, 1997). The project aims at providing technical, social and economic evaluation to establish whether the technology is providing the required benefits.

Rapid Screening of Maize and Sorghum for Varietal Resistance to Post-Harvest Insect Pests.

The project aims to adapt this technique in order to provide a rapid and accurate resistance screening method for both maize and sorghum. Current standard resistance screening methods are labor intensive and time consuming.

Hardwoods project

The project is addressing grain storage structure design. A modified structure, which minimises the use of hardwoods and, at the same time prevents access to the stored grain by rodents and termites, has been designed and tested. A construction manual, which is complemented by an instructional video, has been produced and is waiting field-testing.

Ethical trade Guidelines for the Horticultural Export Sector

Horticultural marketing has been liberalised for decades, but farmers still have difficulty obtaining timely, accurate information on prices. The project seeks to conduct a review of local market information systems and explore the ways in which farmers could use the information to improve their bargaining power with buyers

CONCLUSION

Agricultural research has a major role to play in developing the technology and systems to support sustainable development and the better use of natural resources. It is vital that research increasingly becomes more interactive, bringing together farmers, primary producers and research workers. Participative technology generation is of paramount importance throughout the project cycle, so that priority constraints of target beneficiaries are addressed and furthermore to give in-country stakeholders the ownership of the program. This in turn ensures full commitment to aims of the program.

Choice of appropriate in-country research partners have a significant bearing on the program's success. More attention needs to be paid to uptake pathways so that beneficiaries gain from the research. It is envisaged that Crop-Post Harvest activities in Zimbabwe will be continuum of

research projects incorporating strategic to adaptive research, and that the program complements Zimbabwe's agricultural research planning. Participative problem identification of different groups in the community and their common vision of development form the foundation of sustainable agriculture (Agritex *et. al*, 1998). The CPHP aims at deepening and broadening linkages with developmental, research, extension, NGOS and civil organisations. The program aims at producing interventions and research outputs in an accessible form to extensionist and their active involvement without compromising the scientific nature of results. The participative nature of the CPHP Zimbabwe to date offers to contribute to the improvement of the livelihoods of rural communities and is a foundation of sustainable agricultural development.

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