
# Kuturaya: participatory research, innovation and extension

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***Correct citation:***

Jürgen Hagmann, Edward Chuma and Kudakwashe Murwira (1997) *"Kuturaya: participatory research, innovation and extension*", in Laurens van Veldhuizen, Ann Waters-Bayer, Ricardo Ramírez, Debra A. Johnson and John Thompson (eds.) Farmers' research in practice – Lessons from the field, Intermediate Technology Publications, ISBN 1 85339 392 4

# 11. *Kuturaya:* participatory research, innovation and extension

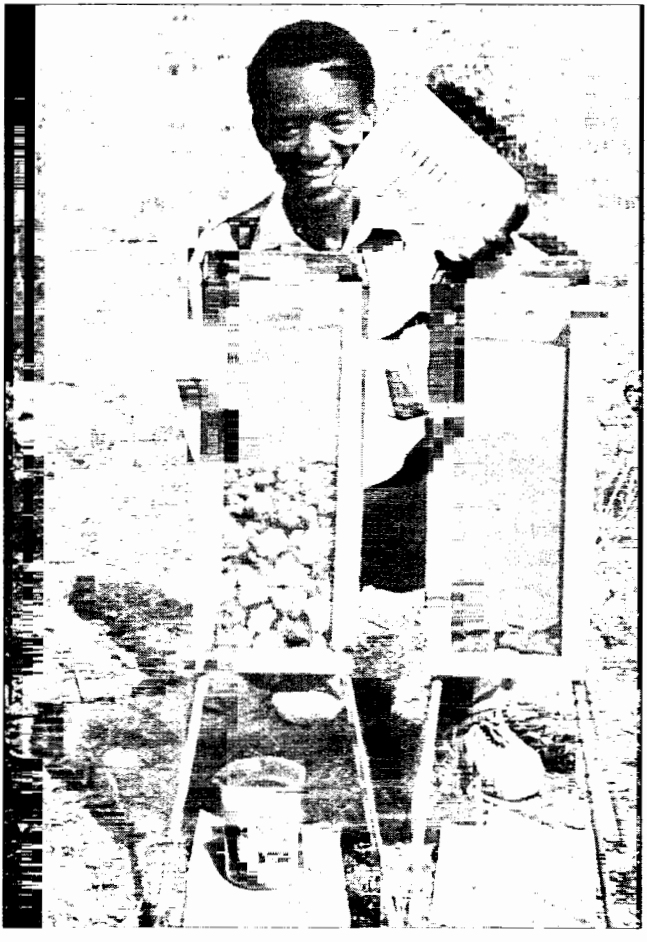

photo: Jürgen Hagmann

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Out of a need to reduce the severity of soil erosion on smallholder farms in the Communal Areas of Zimbabwe, the agricultural extension service AGRITEX initiated, in 1988, a research project on conservation tillage supported by the German Agency for Technical Cooperation (GTZ). Research was carried out on two research stations until 1990, and afterwards an on-farm trial programme was added. The original goal was to test and develop conservation tillage in order to formulate a technical package that the extension service could promote among farmers. As work progressed, however, the project went through an iterative learning process which led to a dramatic change in emphasis away from the traditional transfer-of-technology model, towards farmer-centred research and extension, an approach which became symbolized by the word *kuturaya*. When Shona farmers were asked to provide a word for research, this was the word they came up with. *Kuturaya* gradually took on a broader meaning. It became synonymous for 'spirit of *kuturaya*' or experimentation, and 'school of *kuturaya*', which stood for learning and improving through experimentation. It grew to symbolize a specific approach.

The objective of this chapter is to describe this approach and how it developed in the conservation tillage project, working in close cooperation with the Chivi Food Security Project. The latter is supported by the UK-based NGO Intermediate Technology Development Group (ITDG) and is aimed at increasing food security among peasant farmers. The development of the *kuturaya* approach was a slow process, but a learning one that led AGRITEX to reorient its efforts from a top-down approach towards a flexible stance of farmer-led participatory research and extension.

The chapter opens with a general discussion of the approaches and framework used in the conservation tillage and food security projects. It then gives some of the background to extension in Zimbabwe, and describes and analyses the different phases of the projects. Finally, it summarizes the preliminary findings, which it is hoped can offer some lessons for others wishing to develop and support farmer-centred research and extension.

## Reviving knowledge and confidence through experimentation

The *kuturaya* approach is geared to the sustainable management of natural resources and food security in smallholder farming, in this case, in areas of Zimbabwe. It aims to develop and spread sustainable farming practices and enable rural communities to handle their problems in a self-reliant way. The philosophical and developmental framework is based on participatory technology development (PTD) techniques (Waters-Bayer 1989, Haverkort et al., 1991) and the wider ideas of Training for Transformation (TFT). This training programme was developed in Kenya in 1974 and adapted to Zimbabwean conditions by Hope and Timmel (1984). It originates in the work of the Brazilian pedagogue Paolo Freire (1973) and builds on conscientization through participatory education, where learning is based on the experiences of the living world of the social actor. Teaching consists of dialogue via problem posing, facilitating a process to help groups discover for themselves the root causes and solutions to their problems, rather than imposing external solutions and realities. The TFT programme developed some concrete methods and tools for implementing Freire's approach. It

stresses the importance of participation and cooperation in organizational development in order to build institutions that enable people to become self-reliant and aims to strengthen people's confidence with messages such as "nobody knows everything, and everybody knows something" (Hope and Timmel 1984).

Freire's key principles form a philosophical framework relevant for any individual and applicable in almost all situations in life. The link between TFT and farmer experimentation, in our case, was created through the principle that problems can be solved only through the testing of ideas and the developing of innovations, not through ready-made recipes.

The process is not linked exclusively to agricultural research and extension but is part of a broader, open-ended development process where research and extension are support agencies and, ideally, participate in people's programmes and not vice versa. Strict adherence to soil and water conservation, for example, would automatically have excluded a considerable number of villagers who did not view it as a priority. If non-agricultural problems are prioritized, then the respective support agency has to be willing to provide the know-how to help people find their own solutions. This might mean that conservation activities can be introduced only in the second or third year, after the other problems have been tackled. This requires flexibility in programming on the part of the implementing agencies. It likewise requires considerable investment in awareness-raising in order to help farmers understand the impact of land degradation on agriculture and the relative importance of soil and water conservation.

Our conceptual model for participatory research and innovation included techniques to encourage farmers to experiment with ideas and methods arising both from their own and others' experience. The aim is to stimulate farmers' re-evaluation and appreciation of traditional knowledge, its combination with new techniques, and a synthesis of the two. This should also develop their ability to choose the best among several options, and to develop and adapt solutions appropriate to the conditions and circumstances in which they find themselves. Problems identified during the experimentation process form the basis for a research agenda and resulting on-farm trials, in which emphasis is then placed on quantitative data to support the earlier findings. If the technical processes and results are not fully understood, farmers' ideas can be taken to the research station for further research under controlled conditions. Figure 11.1 is a diagrammatic way of representing the *kuturaya* model. The central column of the figure can be considered the main process of learning and development through experimentation. Further details on how to implement this model are given in Hagmann, Murwira and Chuma (1996).

A crucial task in stimulating *kuturaya* is to find effective ways of spreading farmer innovations. One way of doing this is through field-days where farmer-to-farmer extension can take place, and through workshops which strengthen in various ways the self-organizing capacities of individuals, their rural communities and institutions. Extension has a crucial role to play in helping to create an environment where people feel free to talk and share their skills and experiences with all members of the community. Once this level of communication flow is reached, a vigorous dynamic in farmer-to-farmer extension can result. The *kuturaya* concept as described in Figure 11.1 is a result of an action-learning process over three years. More details about this process are given in the following sections.

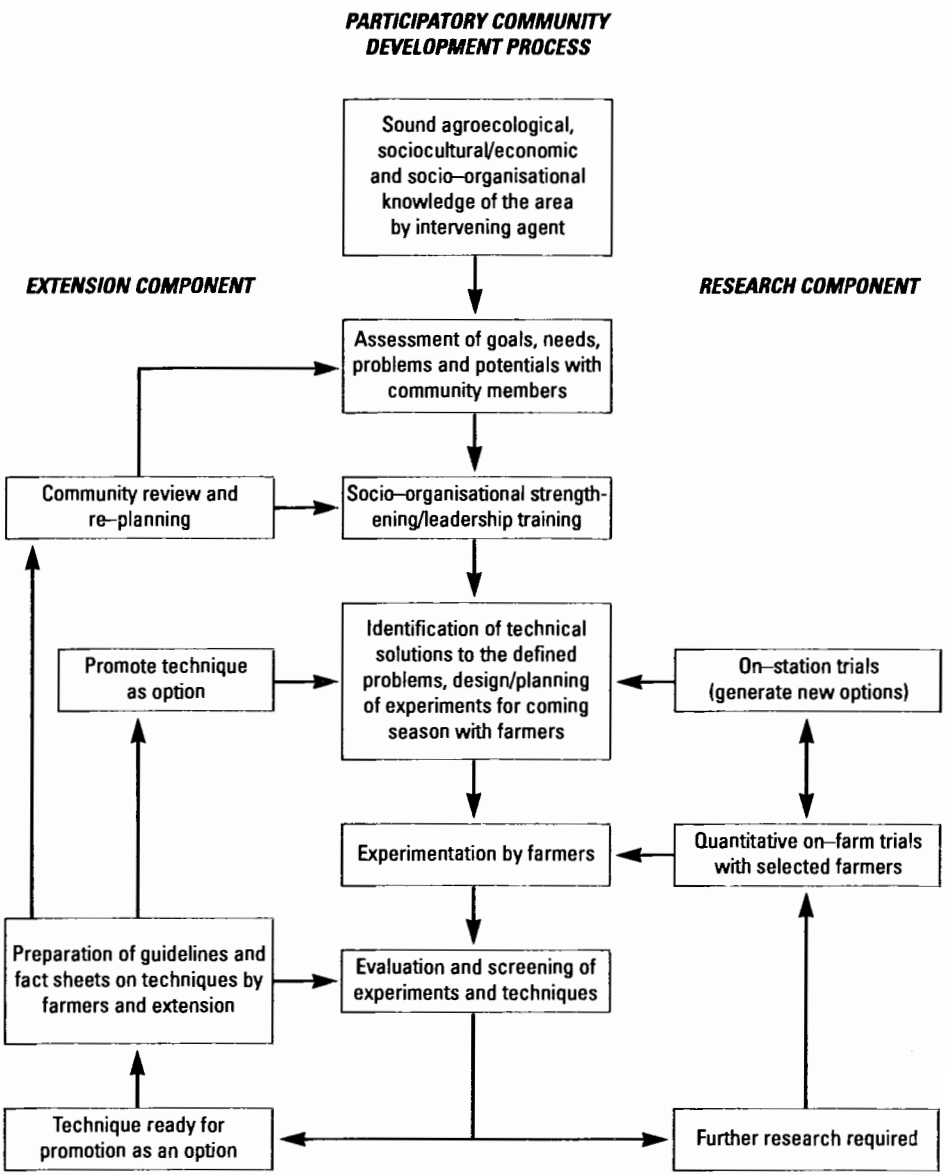


**Figure 11.1. Conceptual model for participatory research, innovation and extension**

## Indigenous knowledge, research and extension

Zimbabwe has a long record of intervention in smallholder production which stretches well into its colonial past. Agricultural extension was started in the 1930s by an American missionary (E. Alvord) whose goal was to replace "premature African agriculture which wastes and destroys" (Alvord 1926) with a "civilized" Western technology-based cash economy. This entailed the introduction of plough-based agriculture ('the gospel of the plough') with maize as the main crop, together with monocropping and the clearing and levelling of fields. This practice has been pursued assiduously over the past three or four decades (Madondo 1995) and has largely replaced traditional agriculture (Rukuni 1990). It proved so successful that the indigenous farming system was modified to such an extent that annual ploughing is nowadays regarded as the traditional system, but it has contributed substantially to unsustainable farming practices and soil erosion, which, in turn, had to be fought by imposing and enforcing mechanical conservation works.

During this period a great deal of indigenous technical knowledge was lost and its state can now be classified as poor. The superiority of the Western model of agricultural production and its accompanying technology has been internalized by Zimbabwe's peasant farmers, who have consequently become reliant on the government extension service to guide their production strategies.

Indigenous agricultural knowledge tends to be considered backward and inferior by all players. Formal research and technology development is viewed by government agents and farmers alike as the exclusive domain of research institutions, which generally follow the conventional model of technology generation and transfer. Experimentation and technology development by farmers themselves, where it does occur, is ridiculed as being primitive or as, at best, an amusing diversion. As a result the one-directional flow of agricultural information from researcher through extension to the farmers remains prevalent. Extension packages are formulated by researchers and are based mainly on formal trials conducted on national research stations. They are promoted through extension workers as rigid, blanket recommendations. As they do not take into account the variability of sites, soils, farmers' skills or resources, they fail in many situations; as a result, adoption rates are disappointingly low. Adaptation of packages is not encouraged. The government's Master Farmer Programme, for example, insists that recommendations are followed 'properly'. This discourages farmers from experimenting, and Master Farmers, with their certificates awarded after the programme, more so than most.

If farmers are to be encouraged to innovate and develop, new approaches must gain institutional support. Many of the extensionists working with the Conservation Tillage and Food Security Projects became convinced of the benefits of a change in orientation. An opportunity to begin a more general process of institutional change began in 1994, when AGRITEX made several key policy decisions which led to new perspectives in the extension services and much greater emphasis on promoting and supporting farmer participation in research and extension (Makhado 1994).

## The Conservation Tillage Project: evolution and learning

An iterative process of implementation, evaluation and replanning took place over the various phases of the Conservation Tillage Project from its inception in 1990/91, when trials were initiated in one area of Masvingo Province, to its final phase beginning 1994/95. The description of the phases is deliberate in its detail allowing us to obtain an insightful and honest picture of the successes and failures, development and change brought about over this period.

### Phase 1 (1991-1992): adaptive on-farm trials

***The procedure.*** At the start of the on-farm research programme in 1991, extension workers from four different Communal Lands in Masvingo Province were requested to select clusters of 8 to 10 farmers (according to mixed gender and class, preferably with access to animal draught power) from each area who would like to collaborate with researchers and carry out trials on conservation tillage. Various farmers were chosen, men and women, but the majority were members of the Master Farmer Clubs, government-supported groups of progressive farmers.

These farmers were invited to the research station and asked about their main problems, the most significant of which turned out to be the lack of water. The farmers were then exposed to different soil and water conservation techniques (mainly conservation tillage) that would protect the moisture in the soil. After discussions they decided to test a technique called no-till tied ridging (Elwell and Norton 1988). This was the technique the researchers had in mind, but did not admit to until after the farmers had made their choice. Procedures for using the technique were explained, and the farmers were told that they should manage the trials themselves, and modify and improve the technique. A simple paired design was the major tool in the experiment, allowing a continuous qualitative assessment of the innovative ideas in comparison to the conventional technique, side by side in one field. This would help the farmers to understand the factors which contributed to the differences, which in turn would enable them to improve on these factors in future (learning by experimenting). They agreed eagerly, until they heard that fertilizers and seeds would not be provided. Previous experience with trials executed by research and fertilizer companies had led them to expect this. Nevertheless, after lunch at the research station and further discussion, the farmers decided to join the programme, not yet really convinced that there would be no fertilizer.

***The process and the lessons learnt.*** The first surprise came when we visited farmers to discuss their choice of field for running the trials. One originally enthusiastic farmer could not be found. During a second visit, neighbours told us that he was hiding because his wives refused to do the work on his behalf, as he had demanded, and he was unable to carry out the trials himself. Another husband was out, and his wife knew nothing about either the visit to the research station or the trials. With most of the other farmers things worked out well, but the women were not enthusiastic about the joint venture. So the first lesson learnt was

that extension workers should ask the farmers to bring along their wives. Communication in the household appeared to be weak and the family as a productive unit would have to be addressed. The involvement of women was crucial to success.

Although farmers had been told that they should feel free to modify and experiment with tied ridges, they had changed hardly anything. In some cases they were waiting for us to tell them how to begin. Whenever farmers were asked what they thought about the technique, they praised it, even when it was obvious that the crops were doing worse under it. Some extension workers had been telling farmers surreptitiously that they must follow, to the letter, the recommendations given. Through the intensive (weekly) dialogue, over time trust was built up and some openness developed, although many women still appeared uninterested. This revealed that farmer participation is not a method but a process which develops slowly. Top–down communication had become a very strong culture which could not be reversed simply by asking farmers their opinions and trying to involve them in our programme. Farmers have to gain confidence in their own experimental capacities before they feel free to experiment.

Tied ridging proved to be a good entry point for overcoming these handicaps. During the first year of the programme, we were able to collect much formal and informal data which enabled us to understand more of the farming system, the farmers' rural livelihoods with their potentials and constraints, and the extension system. This led us to develop tools to increase farmer participation in the following season and to make the process far more farmer–led. The paired design worked well for collecting quantitative research data, and the detailed monitoring and intensive interaction with farmers provided a good base for analysing the effects of the improved technique.

## Phase 2 (1992-1994): farmer participatory research

***Training for Transformation as framework for introducing kuturaya.*** Workshops with farmers, researchers and extension workers were organized before the start of the next growing season. The goals were to catalyse participation and the spirit of experimentation, and to gain a greater understanding of farmers' problems and priorities. Viewing participation as a process, it was decided that what was needed was a way of stimulating the farmers' confidence in their own capacities and encouraging a change in the existing hierarchical roles of researchers, farmers and extension workers. Training for Transformation (TFT) as described in the introduction was the approach chosen. The workshop was one of the tools of this approach which was used to particularly good effect.

***Workshops to catalyse participation and experimentation.*** A number of three–day workshops with farmers (husbands and wives), extension workers and researchers were organized at a local training centre, and moderated by a local community facilitator trained in TFT. A maximum of 40 participants were invited to attend. Project staff designed an agenda and agreed with the facilitator on the implementation of the programme. The facilitator encouraged the process of group dynamics and, except for a few technical sessions, ran the workshops. All participants took part as equals.

## *Farmers' research in practice: Lessons from the field*

The workshops were held during September 1992, at the end of the worst drought for a century. In some areas farmers had lost all their animals and were demoralized. Farmers were invited to a training centre for the three-day period so they would be free to concentrate on the issues at hand. The programme consisted of the following four steps:

*Step 1:* *A warm-up to catalyse participation.* After the objectives and the expectations of the workshops had been clarified, participants were familiarized with key elements of TFT: communication, perception, feedback/criticism and transformation. The objective was to break down social barriers in communication, increase confidence and self-awareness, encourage openness and indicate the role individuals should play in personal and community development;

*Step 2:* *Farmers' goals, problem analysis and solutions.* A combination of different methods was utilized to obtain a deeper insight into farmers' perceptions and understanding of their sociocultural environment and of the farming system: definition of a common goal or vision (adapted from Savory 1991), problem analysis and elaboration of solutions (both elements of the objectives-oriented project planning methodology, GTZ 1987) and problem ranking (adapted from Crouch 1991). Participants went into small work groups for discussions and presented their visualized results in a plenary session;

*Step 3:* *Clarification and evaluation of the concept of research and experimentation.* The objective of this phase was to create a link between the problems and potential solutions identified in the previous phase and the need for experimentation to find concrete answers to overcome some of the problems. Examples of farmers' own earlier experiments were discussed as practical examples of how local solutions can be developed instead of waiting for external input. The trial programme was introduced into this context, and the research concept and the roles of farmers, researchers and extension workers in adaptive research were clarified. Basic principles of small-scale experimentation were explained, activities of the previous season were evaluated and a research agenda for the following season was agreed;

*Step 4:* *Closure of workshop with participants' evaluation and field demonstrations.* Field demonstrations were carried out to stimulate farmers' ideas and link the theoretical discussions with practical issues.

The methodology used in the workshops consisted of group discussions, role plays, codes (for example, pictures which symbolize real-life situations and are used to deduce important points in discussions), poems, exercises on perception, proverbs and songs, all of which could be adapted to different situations. Some components were utilized in joint evaluation tours and informal discussions. A more detailed description of the methodology is given in Hagmann (1993).

***Lessons from the workshops: the social crisis and implications for innovation.*** The workshops were most instructive in what they revealed of socio-organizational and cultural problems. It was particularly surprising that farmers perceived social problems as more severe and more constraining than technical ones. The elaborated problem tree on non-technical problems, as prepared in one of the workshops (Figure 11.2), illustrates this well. In a ranking exercise, the problem of highest priority was the lack of cooperation among people. The major underlying cause of the social problems was identified as sociocultural change, which has split rural society into those who want to follow a 'modern' life, mostly the younger people, and those who accuse this group of not sticking to traditional norms and values, mostly the older members of the community. According to the farmers, this generational conflict, and increasing individualism and monetarization of society, has created an atmosphere of mistrust, jealousy and discouragement, and has weakened traditional leadership structures (Nyagumbo 1995).

New leadership structures capable of integrating the various social streams and buffering conflicts have not developed strongly and are easily undermined by the individualized and hierarchical communication structures. A solution to this leadership and cooperation crisis would require community members to identify a common vision and a shared philosophy.

In terms of innovations, the tense social atmosphere was given as a reason for the prevailing fear of new things. Despite farmers' recognition of a need for innovation to cope with social and ecological change, the fear of being laughed at in the case of a failed experiment or innovation is stronger. Given this negative attitude, people prefer to prove that things do not work rather than try to make them succeed. A general apathy and reluctance to experiment is the result.

Another constraint to the development of innovations and knowledge transfer is the weak communication structure within local institutions. Such comments as "people with ideas should talk to the chairman" or "leaders should respect the members" or "we should have rights in the groups" indicated the existence of an authoritarian approach which created frustration and was said to result in lack of will and commitment. People do not feel represented by their leaders. A permanent power struggle between traditional and modern political elites aggravates the situation. Such an atmosphere does not encourage a joint learning process, nor does it help to solve the crisis of communally-managed lands. It was apparent that socio-organizational issues had to be addressed in any attempt at technological development and that social innovation had to be an integral part of the process.

The workshops were successful in encouraging farmers to talk about their real problems and attitudes without fear of being criticized. Their analyses placed us in a better position to understand some of the events of the first year, for example, when a rather successful farmer had his trial field 'accidentally' grazed by a neighbour's cow, although he guarded the field almost day and night. We began to appreciate the constraints of extension based on a few Master Farmers. Most of these certified farmers (the exemplars and 'carriers of farming knowledge') did not want others to adopt the innovations they used, as they feared that this would result in lost prestige.

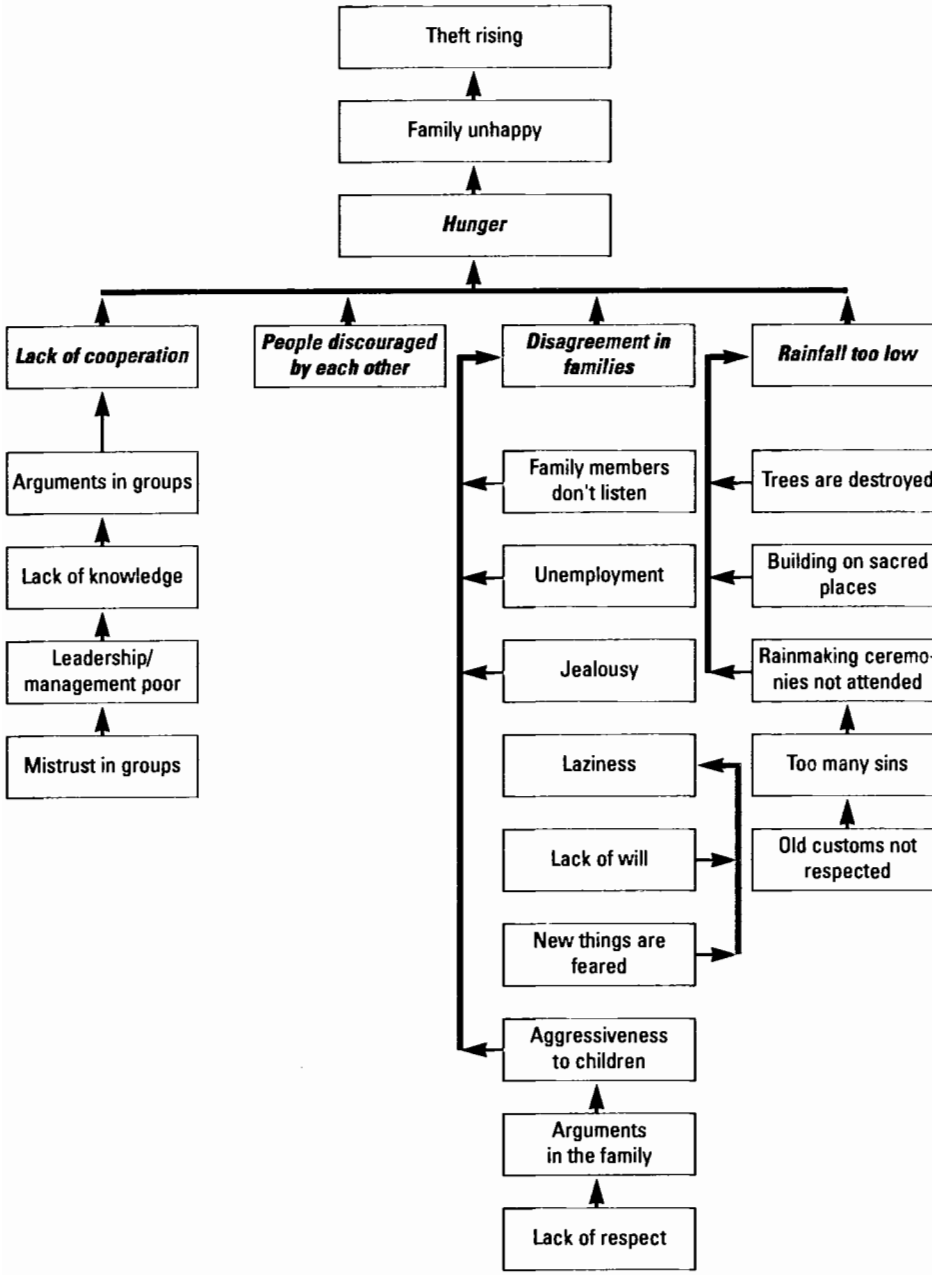


**Figure 11.2. Problem tree (non-technical problems only) as put by farmers from Zaka/Chivi Communal Lands**

***Continuation of trials and expansion towards innovation in 1992/1993.*** The trial programme (testing tied ridges) continued after the workshops, but the focus moved to include other farmer-initiated experiments which addressed many farming problems not related to the initial programme. Farmers were actively encouraged to experiment with techniques and ideas from whatever source. Mid-season evaluation tours were organized jointly with farmers, where all the participating farmers went to see the experiments in the fields, and the owners explained what they had done and found out. The in-field discussions were open and lively, and the farmers' level of understanding of processes showed that ***kuturaya*** (learning by experimenting) was proving highly successful.

Details of the techniques used in their experimentation are presented in Table 11.1 (Hagmann 1996; Hagmann and Murwira 1996; Chuma and Hagmann 1995). Farmers also gained an obvious pride and their confidence rose due to the presentation and valuation of their knowledge. This manifested itself later in field-days initiated and organized by farmers in almost all communities. At one such day, more than 220 people were invited, and research and extension workers were guests, a role which was hard to accept for some of them. In some cases we heard about such field-days only afterwards, when farmers proudly reported them to us. It seemed that the experimenting farmers had managed to inspire their communities and had overcome some of the social constraints described during the workshops.

***Extension as research focus 1993/94.*** Before the onset of the 1993/94 season, another workshop was held where the activities of the previous season were evaluated and feedback given on the quantitative research results. Forthcoming research activities were planned, and a field visit to the research station was organized where farmers could comment on the on-station research. We realized that to spread such positive developments we had to focus more on extension, while continuing with the technology research process as it developed.

An analysis of the teaching, learning and knowledge of the different social actors was undertaken. The role of agricultural extension had to be focused predominantly on facilitation of the process, especially in the initial years, until farmer-leaders were trained and experienced enough to take over that role themselves. Facilitation involves introducing the methodology for the process, enabling communication and information flow, and providing technical back-up and options. As the project got underway, extension staff began more to guide and support the process without making unilateral decisions or dominating farmers. Documentation of farmer knowledge and experiences, as well as production of guidelines and fact sheets with and, most importantly, for farmers, was started.

A field-day programme was developed for the research station, which served as an inspiration for farmers and visiting extension workers. More than 20 technical options in soil and water conservation and animal-draught power (many of them farmers' ideas brought to the research station for further testing and demonstration) were shown to farmers, who were encouraged to try, adapt and improve them. Visual learning tools and simulation models were developed to help in understanding the ecological processes which make techniques succeed or fail. These aids played a major role in creating awareness for conservation and for ***kuturaya***. For example, different treatments (e.g. mulch, tied ridges and conventional ploughing) are simulated as demonstrations in small trays (0.5 m x 0.3 m) that are moistened

with a watering can and have an outlet to collect surface run-off in glass jars. This has a spectacular effect on farmers' awareness for soil erosion under ploughing. An example of linking the effect of soil erosion through the reduction of soil depth to drought is demonstrated by using two glass boxes with one soil column of 15 cm and another of 30 cm depth. After pouring the same amount of water in each, farmers can observe how the shallow soil loses most water to deep drainage, while the deeper soil is able to make the water available to plants. Farmers manage extremely well to link these processes to their environmental reality. Farmers' interest in environmental issues indicated that extension should generally be refocused from a purely yield-based orientation to one with a broader emphasis.

**Table 11.1. Experimentation on techniques by farmers: ideas, source and state of development by mid-1995**

| *Innovation/Experiment* | *Source of idea* | *State of devt* |
|---|---|---|
| *Implements:* | | |
| • animal-drawn disc ridger | ConTill Project | on the market |
| • donkey-drawn toolbar (multiple purpose) | farmers | on the market |
| • ripper tine mounted on plough beam | ConTill Project | on the market |
| • planting device mounted on plough beam | farmers | on the market |
| • animal-drawn weed roller | ConTill Project | under testing |
| *Soil and water conservation techniques:* | | |
| • tied ridges/furrows | ConTill/Chiredzi* | promotable |
| • basin tillage (widely spaced ridges/semi-circular bunds) | ConTill/Chiredzi/farmer | promotable |
| • vetiver applications | ConTill/CARD | test & promote |
| • methods for rill reclamation | farmers/ConTill | promotable |
| • the modified fanja-juu | ConTill/farmers | promotable |
| • infiltration pits | farmers | promotable |
| • stone bunds | farmers | under testing |
| • subsurface irrigation for gardens | Chiredzi | promotable |
| • inverted bottles for irrigation in gardens | farmers | promotable |
| • plastic sheet to prevent rapid drainage (gardens) | farmers | test & promote |
| • mulching in gardens | farmers | promotable |
| • mulching in fields | ConTill Project | test & promote |
| *Other organic and biological soil management methods:* | | |
| • innovative planting techniques | farmers | promotable |
| • various planting dates (various crops) | farmers | under testing |
| • various methods of making compost | ConTill/farmers | test & promote |
| • spreading of termitaria as fertilizer | farmers | test & promote |
| • various manure and fertilizer applications | farmers | under testing |
| • green manure and *Crotalaria* sp. | farmers | under testing |
| • planting and use of hedgerows | ConTill/ CARD | under testing |
| • a relay-cropping system | farmers | test & promote |
| • various intercropping combinations | farmers | under testing |
| • natural pesticides | farmers | test & promote |
| • raising of indigenous trees | farmers | under testing |
| • chicken manure as top dressing | farmers | under testing |

* Chiredzi Research Station

These field days were meant to be a starting-point to initiate farmer experimentation, but they became so popular that several farmer groups who had heard about them organized their own visits to the station, covering all transport and food costs themselves. By 1995, the Zimbabwe Farmers Union made a request to take more than 1000 farmers to the station. The effective link between on-farm experimentation and the research station had transformed the latter into an options think-tank for the duration of the research programme.

## Lessons learnt

### About participation

When asked to assess the new approach and compare it with previous extension activities, farmers mentioned equal partnership as one of its strongest points. Workshops enabled farmers and researchers partly to overcome social constraints. TFT in particular helped stimulate communication and initiate role changes, self-reliant development and participation. The relationship between the researchers and farmers developed into a form of partnership in which feedback and criticism were voiced openly and without fear.

Following the workshops, experimenting farmers showed their strengthened commitment by digging tied ridges, even by hoe; some worked in groups. A major reason for this dedication was that women had begun to identify with the trials. In the formal assessment of the impact, they expressed satisfaction at having been included in the process. Their initial suspicion and scepticism gave way to enthusiasm and interest following the workshops and in some cases women have become the driving force behind the success of *kuturaya*. During the weekly visits to the farms, they appeared to feel competent and were active in discussions, even in the presence of their husbands.

The approach had an impact on community activities and on the awareness of the need to cooperate. Asked about the activities they had undertaken as a result of the first workshops, out of 27 farmers who were interviewed eight months later, 8 said that they had initiated a club (garden, bakery, broiler, building) with other members of the community; 25 farmers had discussed the workshop with other members in the community; and in 10 cases other members had asked to join the trial programme. This growing interest became evident during the weekly visits to the farms, when we were approached regularly by people who wanted to join the programme. Table 11.2 summarizes the farmers' assessment of the differences between the old and new approaches and can be taken as an indication of the impact of the latter.

Competitions were introduced among all the farmers in a community for the best ideas (not only for soil and water conservation) and among neighbouring communities for the highest number of farmers participating in trials. These stimulated the process of experimentation and the revival of farmer knowledge. Competitions between individuals brought with them a high risk of victimization for the innovators. This was lessened, however, if these were combined with contests between communities, since success then linked directly with experimentation. In this situation, experimenting farmers were respected and appreciated even in the event of losing the contest. For organising and judging the competitions, farmers were

encouraged to form or elect a committee comprised of individuals whose leadership qualities they defined in the first workshop. These activities encouraged farmers to exchange ideas with members of their communities and to motivate them. Within the groups, cooperation improved greatly, as was shown in one group when an uncooperative member, who had not worked in the fields of the others even though they had worked in her field, felt ashamed and rejoined the group. The impact on the communities indicates that TFT has considerable potential for community development.

**Table 11.2. Differences between the old and new approaches according to farmers (results of evaluation workshops with farmers)**

*Old approach:*

- Forceful methods were used
- Only a few people could benefit (e.g. literate)
- Intercropping was forbidden
- Failed to address soil and water conservation (SWC) convincingly
- We were told to do things without questioning
- Usefulness of conservation works was never explained
- No dialogue between farmers and extensionists
- Little cooperation among farmers
- Extension agents treated our fields as theirs

*New/participatory approach:*

- Everyone benefits as all are now free to attend meetings
- There is dialogue
- Process is well explained (teaching by example)
- Farmers are the drivers now
- Intercropping is encouraged to boost yields
- Farmers are being treated as partners and equals
- No discrimination against poor or rich, educated or uneducated
- We are given a choice of options
- They pay attention to us and take time to find solutions to our problems
- We are being encouraged to try out new things

*The most important aspects of the new approach:*

- It helps farmers to work cooperatively
- Farmers now practise SWC with the knowledge of why they should do it
- Learning from others through exchange visits/learning through sharing
- It helps farmers to develop the ability to encourage each other in farm activities
- Encouragement to practise SWC through various options
- It is capable of mobilizing large numbers of people with satisfaction
- The approach brings about desirable SWC techniques through participation
- Farmers are free to ask for advice
- Yields have increased through SWC techniques
- The dedication of modern extension agents/researchers
- It has brought development into the area
- It is very effective in the conservation of trees, soil and water

To conclude, the methods which were applied in the TFT workshops to encourage farmer participation were highly effective and had a marked effect on the implementation of the trials. Participation was generated, however, not only through the workshops, but through the farmers' full involvement in the choice of technology and in the planning and evaluation of the trials, and through the frequent visits of the researchers to the farms where a stimulating exchange of ideas took place.

During the first three years, it was realized that participation is not a method but a gradual process, which has to be learned and developed slowly by all the stakeholders (researchers, farmers and extension workers). A relationship based on mutual trust is the starting point of all of these efforts.

The success of a participatory approach depends largely on the personalities of the researchers and extension workers and their personal attitudes towards farmers and to participating with them. Researchers and extensionists need an ability to empathize, a commitment to share a part of farmers' lives and a willingness to accept farmers as equals. In a society where small-scale farming is considered the very last resort for people who cannot find a better job, this is a real constraint for a researcher who enjoys high social standing. Building confidence and revaluing indigenous knowledge are crucial elements in strengthening participation for all involved.

## About experimentation and research

Similar to the experiences relating to participation, learning about farmer experimentation also proved to be a gradual process. Several factors were crucial as catalysts. One was clarifying the difference between trials and demonstrations. In contrast to well-established demonstrations (where farmers are requested to follow precise recommendations), adaptive trials require the farmers' own experimentation, and can imply failure as well as success. These were new concepts to both farmers and extension staff. Master Farmers in particular tend to be less innovative, as they depend too much on the extension worker's recommendations. Before initiating their own experiments, farmers needed

- to gain self-confidence
- a high level of participation to overcome social/hierarchical constraints
- initial stimulation of ideas
- basic knowledge of methods of small-scale experimentation (same treatment for new and traditional technique, e.g. planting date, fertilization etc.) to obtain reasonable comparisons between the two.

Once the fear of new things had decreased, all participating farmers started their own trials independently of the project, and presented them proudly during joint evaluation tours. In one area, a total of 36 self-initiated trials on 16 farms were counted at the end of the 1992/93 season. Several innovations (e.g. on the use of implements, planting methods, relay cropping etc.) were generated. The number of farmer-initiated trials increased steadily, once farmers had gained confidence and become more familiar with the approach. In the third season each of the farmers had at least 3, some even up to 12 different trials in their fields,

derived mainly from their own knowledge. The fear of new things has been replaced by an experimenting spirit. A major factor in the spread of farmer experimentation was the exchange of ideas among farmers during the workshops and joint evaluations. Farmers' own experiments are reviving the indigenous knowledge system as they become confident enough to talk about traditional knowledge and share it with fellow farmers and extensionists without fear of being classified as backward. The generally competitive spirit among farmers has supported this process, as everybody tries to be innovative. The way farmers presented their findings proved that the new spirit has raised their morale and strengthened their identity as farmers, which has in turn helped reduce the apathy and resignation often observed amongst them.

It was possible, by means of frequent interaction and observations to match the adaptive research component to quantitative research. The paired-treatment design with only one variable proved appropriate, and enabled farmers to compare the performance of new techniques and researchers to obtain quantitative data. The quality of that data improved with the strengthening of the farmers' experimental capacities. Variability in soil and fertility was so high that reasonable results were obtainable only when closely-spaced, paired check-plots were used by the researchers. Where farmers have fully understand the basics of small-scale experimentation and where there are sufficient observations during critical times (e.g. planting, harvesting) by researchers, check-plots can provide data which will satisfy scientific standards. Data quality in trials managed and implemented by farmers, without frequent contact with researchers, proved to be more questionable. The same is true of farmers' records, which were of good quality (for researchers) only if the researcher showed strong interest and requested them on a weekly basis.

The informal collection of socio-economic data and the analysis of problems by the farmers were indispensable complements to formal surveys. Intensive long-term observations of experimenting farmers (case studies) and the farmers' analyses of problems provided the basis for understanding rural dynamics and decision-making patterns influential in the adoption or rejection of technologies.

## About extension and the institutional context

Although it seemed at first that farmer-to-farmer extension as begun in the self-initiated field-days would animate other farmers to adopt and adapt the locally developed innovations, the results were not what we expected. Farmers appeared to think that there was an exclusive club, which they had to join, or that the new techniques were for Master Farmers only. We concluded that there is no alternative but to involve the whole community right from the start and to give attention to institution-building through more active leadership training, an approach that had already been started by the ITDG Food Security Project (Murwira 1991).

In the agricultural extension service the participatory approach was favoured and supported by most officers. However, field staff (older extension workers and extension supervisors in particular) were more sceptical, as they tended to follow a rigid, top-down approach. Situations arose where the project team members were busy encouraging farmer experimentation, while the extension supervisor was busy ordering farmers to experiment only with the

approval of the extension worker. In other cases, during evaluation tours, it became obvious that the farmers' practical knowledge exceeded the (mostly theoretical) knowledge of some extension workers. Such incidents made some extension workers insecure and they interpreted this active farmer participation as a loss of respect and power. For better-trained staff it was easier to admit to not knowing everything, as their background provided them with greater respect and authority.

The clash of the two approaches created reservations on the part of extension workers, as they could see that *kuturaya* required a change in authoritarian structures. Where field staff felt unable or unwilling to hand over some of their power to farmers, it was difficult to integrate them fully into the process. This dilemma was later specifically addressed through organizational support to AGRITEX.

Another general handicap for farmer initiatives are the aid policies of certain external support agencies. Extensive discussions and observations revealed that farmers tended to hand over responsibility for their lives to other authorities. Whenever serious problems arose, government or donors were expected to help. These expectations were often met through direct subsidies in the form of free external agricultural inputs such as seeds and fertilizers, food-for-work and other gifts. The ability of local people consequently to maintain or revitalize their self-reliant community structures was undermined. A telling example is food aid. On several occasions farmers reported that, in the past, traditional headmen (local chiefs) had more land than their people, but were obliged to lend food to those kraal members who were unable to produce enough for themselves. Since the appearance of food relief, however, headmen and even entire communities no longer feel the need to maintain these traditional distribution and production systems. The social safety nets have disappeared. One farmer expressed this predicament succinctly: "Now Mugabe [the president] is our chief". Grosser and Moyo (1993: 22) even found an attitude where ***not*** sustaining local livelihoods was the goal of some people. Local leaders deduced that "the earlier the kraal area [village] is made desert, the better; government will then be obliged to resettle us on better and bigger holdings".

Participation in self-reliant development and associated experimentation is difficult when the experimenting farmers receive free hand-outs from other organizations. This happened several times where farmers were offered a 'better deal', and we almost lost through donor competition. Such disturbances always required discussions to convince farmers of the necessity of self-reliance. Some farmers were proud of not getting donations from us; they once explained to others that they only got 'brain donations'. Other farmers still did not believe, after three years, that they would not obtain donations from us in the future. An old man was once so disappointed that he stated seriously: "If only I could have my own donor, things would work out well for me."

## Promotion of farmer experimentation

The following conditions are required if successful farmer experimentation is to be promoted:

- An input to make the social environment more conducive is often necessary. This requires a philosophy, strategies and tools to improve communication with and between farmers,

and which contribute to strengthening local institutions and capacities without imposing Western models and values. A focus on technology alone is too limited to achieve successful innovation development and spread.

- Intervention should be geared towards community activities in order to avoid victimization of experimenting individuals and increase acceptance of the process. A high level of participation (in terms of numbers of people involved and quality) is necessary to overcome social/hierarchical constraints.
- Activities should address the households in communities as key units of decision-making, but make special efforts to address intra-household relations (especially gender relations) related to access and control of resources.
- Support of the institutional environment (extension and research) must be gained through active involvement. All players must be fully involved right from the start and be willing to 'let it happen'.
- A gradual approach, with an entry point (e.g. adaptive trials, visits of innovative farmers to research stations, workshops), is needed to build trust between researchers, extensionists and farmers.
- Initial stimulation of ideas for experimentation is required and farmers' self-confidence in their abilities to experiment has to be built up.
- Basic knowledge of methods of small-scale experimentation (same technical treatment for new and traditional technique) must be understood by farmers in order to obtain good comparisons between techniques.

At the end of Phase 2 we agreed that we had to refocus our activities and build the insights, lessons and conclusions from the first two phases into a more integrated approach, where research/innovation development and extension based on farmer experimentation are embedded within a participatory process. The testing of this new approach (described at the beginning of this chapter) began in 1994/95 with the launch of Phase 3. The main elements were to be: two-way communication, farmer experimentation and strengthening the self-organizational capacities of rural communities.

The close collaboration with ITDG's Food Security Project contributed to this shift in focus. ITDG had been following a very similar approach focused on extension of soil and water conservation techniques since 1991. Through our close collaboration we were able to have considerable impact on the extension department, but a fully-fledged concept which the extension service can follow had not developed before the start of Phase 3. Then, we combined the best elements of both approaches in order to devise one concept which still allows for flexibility and diversity (see Fig. 11.1). To do this, ITDG drew on its extensive experience with local institution-building, while we used our knowledge of technology development and research. The synthesized approach is not meant to be a blueprint for any given situation. It needs to be modified and adapted to each local context, but the impact to date is encouraging. As demonstrated in Table 11.1, the number of experiments that farmers are undertaking is impressive, as is the spread of various soil and water conservation technologies (see Table 11.3). Strides have also been taken in strengthening cooperation and communication among farmers and between farmers and the research and extension institutions.

**Table 11.3. Adoption of SWC techniques in Chivi (Ward 21) in 1992/93, 93/94 and 94/95**

| *Technique* | *adopted as options by number of farmers* | | |
|---|---|---|---|
| | *92/93* | *93/94* | *94/95* |
| *Cropped fields* | | | |
| Tied ridges/furrows | 28 | >100 | >500 |
| Infiltration pits | 20 | 289 | >800 |
| Fanja–juu | 0 | 4 | n.d |
| Mulching | 2 | 3 | n.d |
| Intercropping | ≈50 | >450 | n.d |
| Spreading of termitaria | 78 | >128 | n.d |
| Tillage implements | 0 | 96 | n.d |
| *Gardens* | | | |
| Sub–surface irrigation | ≈50 | 68 | n.d |
| Plastics/inverted bottles | 1 | >200 | n.d |
| Compost | 4 | 14 * | n.d |
| Mulching | 85 | >300 | n.d |

* groups out of a total of 37

## Conclusion and outlook

From the perspective of conventional agricultural research and extension, the task of developing improved tillage techniques appeared straightforward. Our close interaction with farmers, however, has shown us that the conventional way of doing things is inadequate and can act as a constraint to experimentation. New ways of developing and spreading innovations had to be found, which led us far from our initial technical objectives.

The *kuturaya* model for participatory innovation development and extension has shown great potential. It increases self–confidence and the farmers' ability to develop, test and modify both external and indigenous technologies. The pilot activities have demonstrated to the formal research and extension services that it is possible to increase the number, variety and quality of farmers' innovations and accelerate significantly the spread of the farmer–developed and –tested techniques.

The scope for institutionalizing this approach now appears favourable in Masvingo Province. Before it can be scaled up and incorporated into the organizational culture of the Department of Agriculture, however, much work needs to be done to change the attitudes of the stakeholders. This will require more intensive training and follow–up exercises, as attitudinal change is a long–term process.

In our case, through close cooperation and networking between our two projects, one governmental and research–oriented and one nongovernmental and extension–oriented, we managed to have a real impact on the AGRITEX extension department. To introduce a bottom–up approach in a highly bureaucratic system is a complex process and raises as many

challenges as it offers solutions. It highlights, in particular, key policy and planning issues which need support and commitment from the top.

At present, the concept of *kuturaya* is geared towards innovation, development and extension on individual arable lands. To achieve the sustainable management of common property resources, however, the concept will need to be integrated into a wider concept for community–resource or watershed management. This presents another challenge for the future.

## Acknowledgements

We would like to thank Mr O. Gundani, Mr M. Diza and Mrs M. Tamirepi for their valuable and dedicated fieldwork. Without their good interaction with farmers our work would have been impossible. We would also like to thank the participating farmers for their hospitality and the inspiration they provided.

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