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**COMMUNITY MAPPING EXERCISES:
AN EVALUATION**

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| ICIPE | International Centre for Insect Physiology and Ecology |
| NRI | Natural Resources Institute |
| PRA | Participatory Rural Appraisal |
| SSIU | Social Science Interface Unit |

COMMUNITY MAPPING EXERCISES: AN EVALUATION

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ABSTRACT

Maps and diagrams are key tools in Participatory Rural Appraisal (PRA). This paper describes a PRA activity designed to assess the value of maps and diagrams for assisting community decision-making about tsetse trap placement in the Lambwe Valley, Western Kenya. Researchers from the International Centre for Insect Physiology and Ecology (ICIPE) had already conducted a community mobilisation campaign before carrying out this PRA exercise which involved drawing up a village resource map and two transects as a basis for discussion. The response to the mapping exercise was positive; almost all homesteads were represented and, during the final meeting, those who had participated were talking about encouraging other villages to use the same techniques. The researchers also agreed that they had gained from the exercise but expressed concern about who had benefitted most, themselves or the villagers. They also doubted whether the villagers would find the time to follow up on the activity. Two other issues were also raised: firstly the problem of defining the community boundaries for natural resource management in locations with dispersed settlement and non-resident users of the resources concerned, and secondly, the ability of extension to provide the necessary institutional support in such a context. In the case discussed here, a new community management organisation has been formed with considerable support from ICIPE.

INTRODUCTION

This paper describes a community mapping exercise carried out by staff of the International Centre for Insect Physiology and Ecology (ICIPE) and residents of Nyaboro, in the Lambwe Valley of Western Kenya. The objective of the

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exercise was to assess the value of participatory mapping as a tool for decision-making about tsetse trap placement. In addition, researchers were interested in stimulating dialogue with farmers to assess their perception of the potential impact of tsetse control on future land use and soil fertility. This dialogue highlighted farmer concerns about their own health as well as that of their livestock, and possible limits of their responsibility in any control programme. The exercise raised a number of issues related to the concepts of community and community organisation, which have modified the researchers' monitoring activities.

While there is now much experience with participatory research approaches, we suggest that the case reported here is comparatively unique. It concerns a research programme focused on a technology which is dependent on the participation of individual homesteads and villages but at the same time requires great breadth of participation. As such this example dramatically highlights the challenge of moving from the rhetoric of participation to implementation.

The paper briefly reviews some key issues within farmer participatory research and provides background information on the ICIPE research programme. Details of the mapping exercise and specific issues relevant to the particular social context within which the exercise was carried out, are then given. This section ends with a discussion of researcher and community perceptions of the mapping activity itself, possible trap placement and implications of sustained tsetse control. The exercise is then evaluated by the researchers involved. The paper concludes by returning to the issue of community organisation in the context of specific technologies and a discussion of the wider relevance of this example to the debate about the institutional context of participatory research approaches.

THE ROLE OF PARTICIPATORY RESEARCH APPROACHES

Experiences with Participatory Rural Appraisal (PRA) tools and participatory research with farmers have now been recorded from throughout the world.¹ In particular, attention is given to maps and diagrams as key tools for stimulating dialogue between rural communities and outsiders, and as a means by which communities can plan and monitor their own development activities (see especially Lightfoot *et al.*, 1991; 1993).

PRA tools can be used in a more or less participatory manner. However, they are being popularised as a means of catalysing self-awareness and analysis by rural people themselves rather than as tools for extracting information for use

by outsiders. It is argued that through the use of the tools associated with PRA, indigenous knowledge systems can be strengthened so that the capacity of rural people 'to classify, evaluate and, to some extent, to predict the outcome of innovations in the local environment can complement science-based development of technology' (Farrington and Martin, 1988:29).

One element of the motivation to use participatory approaches is to increase understanding of the contribution that researchers can make to technology development for the improved welfare of rural people. This understanding relates to the subject of 'formal' (researcher) and 'informal' (rural peoples') knowledge and the link between these. Clearly, in order to move beyond rhetoric, it is essential to determine areas of knowledge of both parties involved in the research process.

As emphasised by Farrington and Martin (1988), it is in the area of plant breeding that a number of research institutions appear to have taken seriously the incorporation of farmer knowledge into their research. They have moved beyond simply involving farmers in the final evaluation of crop varieties, with farmers being integrated into early varietal selection processes (see for example Haugerud and Collinson, 1990; Sperling, 1988; Sperling *et al.*, 1994). On the other hand, it is precisely in the area of plant pests and diseases that there is already some understanding of the limits of farmer knowledge (see Richards, 1979; Andrews *et al.* 1992) and hence where the question of how rural people and researchers can come together is especially relevant.

Finally, more recent criticisms have been aimed at the poor link between problem diagnosis, conceived of as a first step in research and development planning, and actual implementation of research. It is argued by some that this partly reflects the interest generated in PRA tools themselves which are more commonly used as diagnostic than as planning tools.

ICIPE AND COMMUNITY CONTROL OF TSETSE²

The programme within which the participatory mapping activity took place is a research programme with a highly focused objective: the control of animal trypanosomiasis and human sleeping sickness within 44 of the 120 villages in the Lambwe Valley of the South Nyanza District of Western Kenya. ICIPE has been concerned with community-based management of tsetse and trypanosomes since 1970; however, the use of participatory research approaches by ICIPE is comparatively recent, dating from the establishment of a Social Science Interface Unit in 1988.

ICIPE is one of a number of institutions which have been involved in the development of mechanisms to reduce the incidence of tsetse-transmitted diseases in both livestock and humans over decades. Strategies to control the vector itself, the tsetse fly, have progressed from insecticidal sprays which have been effectively used by government and other institutions to control the fly over extensive areas, to traps and targets which depend on more intensive, local management.³ A major technological breakthrough was achieved when the odour-bated tsetse traps, and particularly the 'NGU version', were developed and tested, achieving almost total elimination of the tsetse species *Glossina pallidipes* (Brightwell *et al.*, 1987).

These traps are believed to be environmentally sound, technically efficient, socially acceptable, economically viable and sustainable. All these are now widely accepted as essential attributes of technology for resource poor communities. However, while early trials at another nearby site, Nguruman, demonstrated considerable interest in the traps by local communities, to date, none of these features have been investigated in detail. A collaborative project designed to address these was developed by ICIPE (the implementing institute) and the NRI (the donor institution) and initiated in 1992. The Kenya Ministry of Livestock Development monitors livestock productivity and disease. The ICIPE Social Science Interface Unit plays the lead role in this multidisciplinary programme.

A novel feature of this programme is its concern with a technology which demands a degree of community commitment: the control of tsetse flies by individual homesteads will not provide protection against disease precisely because tsetse colonise large territories and move up to 9 kilometres daily. Farrington and Martin (1988) noted the lack of such experiences with participatory research approaches. Like other community-based programmes, it also highlights the problem of defining boundaries for action when resources to which residents have access are also accessed, and in certain cases, controlled by, outsiders.

PROJECT ACTIVITIES

While the wider project objective is to improve the welfare of communities in the tsetse-infested areas of South Nyanza District, Kenya, the specific objectives are, amongst others: to identify options for community management of NGU traps, and to develop tools and training modules for extension personnel involved in subsequent dissemination of the trap technology (Figure 1). Studies are currently underway on the use of similar odour-baited trap systems to control

other tsetse species and it is expected that the strategy developed for the NGU trap system will also be suitable for these species.

Figure 1 Expected Project Outcome: Sustainable Community-Managed Tsetse Control



The research component of the programme focuses on the development and implementation of a monitoring plan covering livestock and crop production, environmental changes and community implementation and management skills (Figure 2). This plan is based on the conceptual framework which links tsetse trapping with expected impacts on the human and animal population and the environment (Figure 3).

Figure 2: Implementation: Planned Sequence of Activities

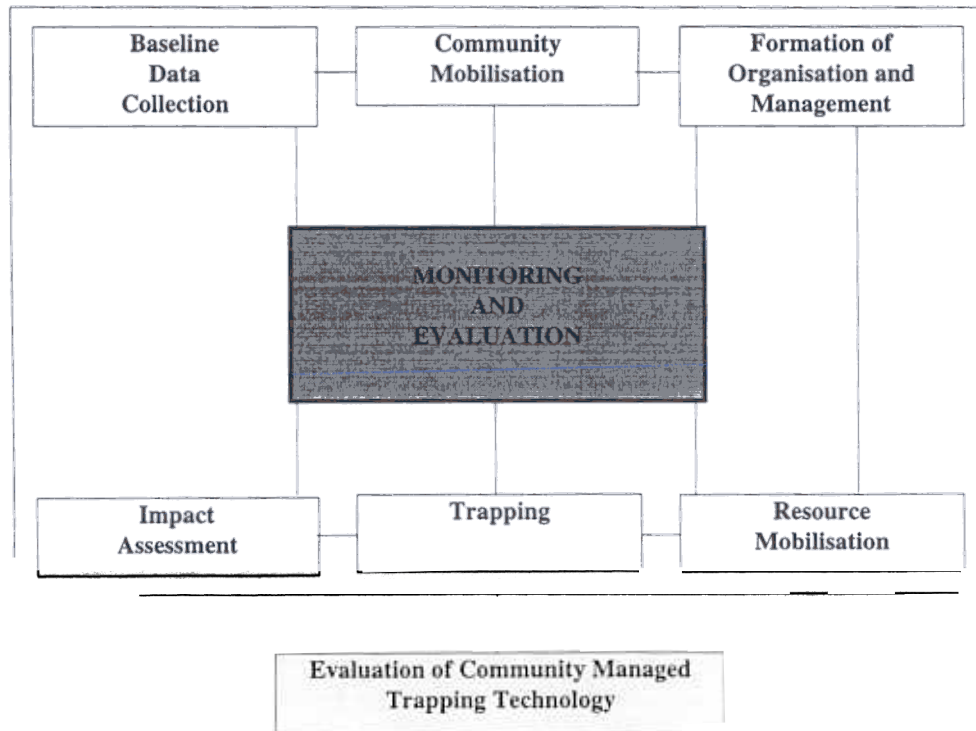
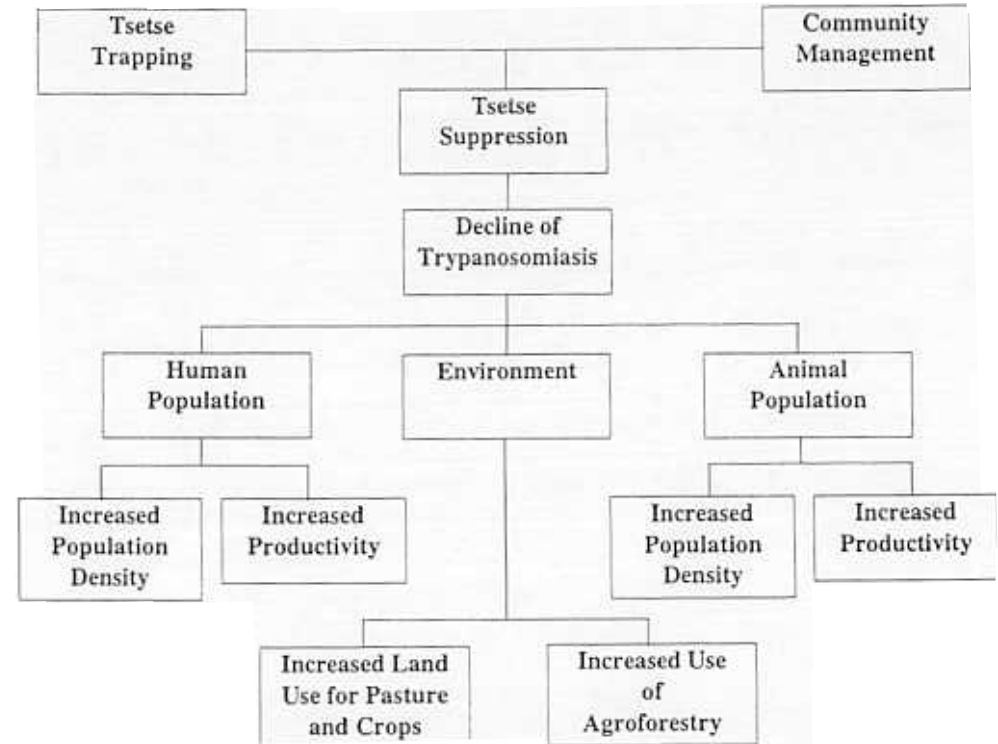


Figure 3: Conceptual Framework of Evaluation of Community-Managed Tsetse Control in Lambwe Valley



Baseline studies of each village, including the resource base, tsetse population and the current status of animal trypanosomiasis and human sleeping sickness have either been completed or are currently being undertaken by ICIPE. For this paper, the part of the project that is most relevant is the community effort to organise and mobilise resources with which to develop and implement a tsetse control strategy.

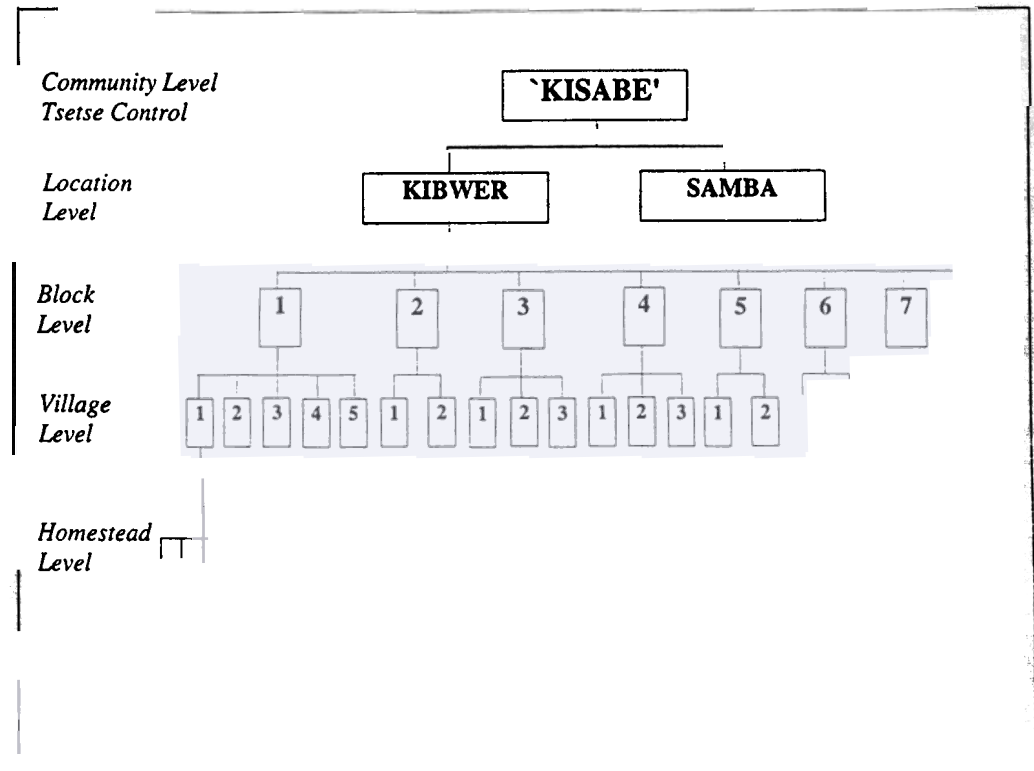
As part of its contribution towards this mobilisation, ICIPE trained a group of 40 farmers who were in turn expected to mobilise the villages involved. The farmers were trained in two separate batches and considerable attention was given by the research team to the selection of participants. In the first instance, baseline data on socio-economic differentiation within the community (the term used to refer to the 44 villages as a whole) was collected and lists of leaders of local organisations were used by five local leaders to select trainees. This was acknowledged by the team to be cumbersome and lacked any pressure for accountability: some of those trained failed to live up to community expectations and in one case, the person was removed. For the second training, the community made its own independent selection.

The selected farmers were first provided with detailed information on tsetse biology and ecology based on the assumption by researchers that this knowledge would provide the incentive to Valley residents to continue to trap flies in spite of declining numbers appearing in the traps over time. They were also given practical training in trap making and maintenance.

An attempt was made during the training to assess the farmers' own knowledge about tsetse ecology and the way in which disease is transmitted, since this knowledge is central to the trap technology (Ssenyonga *et al.*, 1992). It was found that while farmers associated the disease with flies, and held various views on how and when the fly moved into the research area, they were not always able to distinguish the tsetse from other biting flies, nor were they aware of the complex process of infection in the vector and its transfer to both human beings and livestock.

Following the completion of ICIPE's community mobilisation campaign, the trained farmers organised 30 meetings in 14 different villages to discuss the type of organisation required for the management of the programme. The community agreed to form a new organisation (rather than to add this activity to an existing organisation) and proceeded to detail its structure, procedures for regulating its affairs and a time-table for the various activities. The organisation, named 'Kisabe', is based on the two sublocations within which the 44 villages are located (Figure 4).⁴ A new unit based on a 'block' of 2-5 villages grouped according to their population size and spatial arrangement was made responsible for the actual implementation of tsetse control activities. Altogether there are 15 blocks. Each block has a committee made up of 9-12 members, several of whom are 'trap managers', and is represented at the higher levels of the organisation. One representative from each block also participates in monitoring exercises.

Figure 4: Organisation Structure for Trapping Technology, Lambwe Valley



To date, Kisabe's meetings have not taken place in individual villages. Rather it is the trained farmers who are expected to generate a discussion at this level. Research team members attend Kisabe meetings by invitation only and they primarily use these opportunities to monitor the organisation, recording attendance and issues arising. So far key issues have included the possibility of individual community members placing traps on their own land and whether the organisation should become involved in activities other than tsetse trapping. The researchers only intervene in the discussions if they are asked to provide some information or if they sense that some issues have not been considered.

The next logical step for Kisabe was to implement trapping, requiring the preparation of a detailed plan for trap placement and management and the collection of funds to cover group registration, trap making and management. Having arrived at this point, the researchers were not clear as to how the community would move from planning to plan implementation. Community mapping appeared to provide one possible solution. The team already had access to aerial photos and maps covering the whole target area, and data on the concentration of fly populations. These data pointed to a trap placement plan focused heavily on the central thicket, the main breeding ground for the tsetse flies.⁵ This information was given to the farmers involved in the training although no actual directives were given as to where the traps should be placed.

MAPPING: ISSUES AND PROCESS

The success of the technology is contingent on an understanding of the spatial arrangement of peoples' activities and the distribution and movement of the tsetse flies. Maps were therefore especially appealing to the researchers, who wished to assess the potential of community mapping in relation to their own programme needs.

The community mapping exercise included two activities, a village resource map and a transect. The first consideration for the research team was to determine the appropriate level for the mapping exercise: community, location, block or village (Figure 4). While the time allocated to this assessment was limited and only one site could be used, the researchers needed to be able to place the results within the wider perspective of the Valley as a whole in order to determine appropriate sites for replication.

Unlike the majority of the cases of community mapping reported in the literature, the settlement pattern of the Valley is characterised by dispersed homesteads but with each village having clearly delimited areas for cropping. Livestock grazing, however, is more widespread taking place within fallow fields generally during the dry season and within the thicket in the Valley bottom throughout the year.

Since community mapping relies on local knowledge and individual villages have clearly delimited areas for cropping, it was decided to carry out the exercise at the village level. This decision was taken in spite of the fact that the 'block' was the unit specifically formed for the trapping exercises. One village, Nyaboro, within one of the Kisabe blocks, was selected. Nyaboro is divided into two parts, one of which is close to the central thicket and the exercise was limited to this area where tsetse challenge was thought to be particularly high.

Within the village itself, since it consists of dispersed settlements, it was necessary to determine where to meet. There was no natural meeting point for this particular activity: as noted above, to date, 'Kisabe' meetings have not taken place in individual villages, and no-one knew precisely what was going to happen. When the research team arrived, therefore, representatives from a number of 'blocks' had organised themselves for formal discussions (another common context within which 'insider' and 'outsider' exchanges take place) at a schoolroom. The next step, therefore, was to move to a location which the researchers felt would facilitate a different dialogue and to limit the discussion to people from the section of Nyaboro identified as appropriate for the initial exercise. A homestead of one village elder was selected and 35 people, representing 16 of the 20 homesteads located in the identified area, attended the meeting.

Once the exercise had been explained, and an appropriate spot for mapping within the homestead identified,⁶ one of the villagers took the initiative and outlined the boundary of village land which was accepted by everyone. A second person identified their homestead, cropped land and neighbours on either side. Once this was completed, others readily placed themselves on the map and after considerable discussion, modifications of the location of streams etc. were agreed upon and a map acceptable to the majority prepared. This 'resource map' was drawn, as is generally the practice, using local materials such as stones, ash, sticks and dried cow dung.

Following the mapping, participants were asked to identify transect lines passing through all areas which they considered to be important for the village. Agreement was reached on two lines and four people were selected by the participants to accompany the researchers. These included two people who had been involved in the earlier training and who were members of 'Kisabe', one woman (a teacher) and one older male farmer. Up to this point the process, from the time of the researchers' arrival in the village, had taken three hours.

Prior to arrival in the village, the researchers had determined key variables they thought were relevant to the discussion of trap placement and the impact of tsetse control on land use. Since the Valley was generally known to the participating researchers and technicians (the programme has already completed one year of baseline work), they identified the following checklist: land use, soils, vegetation, crops, water source/availability, tsetse, wildlife/pests. At the same time, they were prepared to incorporate new items that might emerge during the mapping process and agreement was reached that although the group already included four people from the village, throughout the transect, detailed

location-specific information would be discussed with any individuals met *en route*.

The transect was started that day and completed the following day. The distance covered was approximately two kilometres, including detours which had to be made around the central thicket. The whole transect took approximately five hours to complete. The researchers then returned to the station to discuss what they had seen, how the participating farmers had interpreted the information for them and how the final meeting with the total village group was to be organised.

The researchers acknowledged that they had three specific objectives to achieve at the final meeting:

to cross-check and clarify the information and analysis made


to engage in a dialogue such that the questions of the relationship between increased settlement and thicket clearing, and crop and livestock production could be addressed (the conceptual framework on which the project is based is presented in Figure 3);

to initiate a detailed discussion amongst the farmers themselves about trap placement without appearing to support particular decisions.

The researchers considered this latter objective to be especially important since farmers' reasons for choice of locations in which to place traps were likely to determine what they were eventually prepared to do. For this third objective, the researchers copied the villagers' own map onto paper. The villagers were first asked to make their own choice of sites for trap placement and to give reasons for their choices. The trained villagers were then asked to comment on and/or add to these proposals. The role of the team entomologist was to make observations on these decisions and possibly to suggest some other sites. It was agreed that the point of this discussion was not to arrive at a consensus about trap placement, but rather to initiate a discussion which would hopefully continue at different levels, including the village, the wider Valley community, and 'Kisabe.'

The outcome of the final meeting is presented below in the form of a series of statements relating tsetse control and land use. This is followed by a presentation of the researchers' own discussions relating to what new information and/or insight they acquired from the exchanges.

THE DIALOGUE: LAND USE AND TSETSE TRAP PLACEMENT

 *Farmers are aware of soil fertility differences and categorise soils on this basis*

During the transect, three distinct soil types had been identified which conformed to information already available to the researchers. During the discussion, a fourth, 'buru'buru' was identified which had not been covered by the transect. In addition, farmers noted that soil washed down from the upper hills increased the fertility of the 'anwang' where it settled forming 'buru.' There was general agreement that the soils had different fertility characteristics. The researchers pointed out that they had not observed any clear difference in cropping pattern between these different areas although they acknowledged that this might not be true throughout the year. The farmers pointed out that they did differentiate between soil types and utilised the most fertile soils for the food crops while reserving lower fertility areas for cash crops including sunflower, groundnut, cassava and green gram (the researchers are aware, however, that not everyone has access to each soil type).

While the researchers had based their understanding of soil types primarily on differences in fertility, the farmers actually categorised soils according to whether or not they could easily be ploughed. The researchers were aware that animal traction was important in the Valley and this was emphasised throughout the discussion: all major tasks are carried out using oxen, including ploughing, covering the seeds and weeding. The farmers pointed out that the growth in the use of draught animal power was accompanied by the loss of certain crops: 'simsim' (sesame) and finger millet were specifically mentioned.

During the transect exercise, the researchers spent considerable time identifying vegetation types, including weeds, and trying to link these with changing fertility status. The farmers on the other hand assessed the problem of fertility by referring to the need for land preparation: in the past, the 'thicket' had simply to be cleared and burned prior to planting whereas now it required tillage, and specifically ploughing. One man observed that tractor ploughing leads to rapid reduction in soil fertility: draught animal power is better. Nevertheless, in general, the farmers were less concerned than the researchers about soil fertility (the researchers concluded that this was because the Valley soils are much better than those in other areas with which they are familiar). There was also some suggestion on the part of the researchers that the impact of soil fertility on yield was being masked by increases in farm size due to the use of animal traction.

□ *Sustained control of tsetse by Valley residents will lead to an increase in area cropped and more intensive cropping and grazing*

For the researchers, the question about soil fertility is almost entirely related to the changing use of the central thicket and hilltops which are presently the main grazing areas during the cropping season: while all land in the Valley has been 'allocated', land within the central thicket is largely unoccupied in the sense of being cropped at present. For the researchers the question was: Is soil fertility at risk if tsetse is controlled and the thicket subsequently removed?

As might have been expected, the issue for the farmers was less the loss of soil fertility for cropping and more the loss of grazing area and possibly therefore of animals for traction. One man joked: "We might all revert to using hand-tools if we can no longer keep cattle!" Possibly more to the point, it was noted that most of the land in the thicket was owned by people who were not presently resident in the Valley. Farmers also pointed out that bush pigs (a protected species) are a major problem in the thicket which makes cultivation there especially risky.

In terms of value as grazing, fallow land and the thicket are considered to be the same. One farmer speculated that with the loss of specific grazing areas, crops would need to be protected from grazing animals which would spend much more time closer to the cropped area: some suggested that they might have to fence their land and paddock the animals. They pointed out that a first response to a loss of grazing land would be a reduction in the number of animals and the first animals to be affected would be those 'farmed in' (i.e. those belonging to non-Valley residents who use the Valley as a grazing area. A number of Valley residents keep some of their animals elsewhere and presumably would suffer some retaliation).

□ *The thicket is the breeding ground for tsetse*

In relation to tsetse, there was only one point on which farmers and researchers did not seem to agree: the tsetse species in the Valley. The farmers are convinced that there is more than one species, but the entomologist argued that the flies to which the farmers referred are other biting flies.

□ *Trap placement*

Only one person, a man, proposed placing a trap inside the central thicket. His justification was that the tsetse live there and if trapped, could be stopped from moving closer to the homesteads. The majority chose to place traps on the edge of the thicket, either in alignment with their homes or along the path which the animals take when they go to and return from grazing. These paths are used by the people themselves when collecting wood for construction, cooking and charcoal production. The objective of the trapping in each of these cases was to prevent the tsetse (and other flies) from entering the area where people live (rather than trapping the maximum number of flies or trapping flies in known breeding areas). One person suggested placing a trap at the dam site where all animals collect. Other locations were also suggested: near the road (to protect travellers); adjacent to the homesteads/fence; between two homesteads to protect both; where someone had been bitten and in a maize field. As the villagers pointed out, the tsetse fly is a resident of the village.

The farmers who had attended the ICIPE training sessions did not offer a critique of these proposals. Rather they made a particularly important observation, that there is a seasonal difference in tsetse distribution. During the cool season the flies are widely dispersed and trap placement near and within homesteads would be appropriate whereas in the wet season, flies tend to be more confined to the Valley bottom thicket.

The ICIPE entomologist made few additions to the farmers' proposals. He suggested strengthening protection around the dam by adding one more trap and raised the possibility of placing some traps inside the thicket. He then commented on the apparent lack of interest in this latter strategy by the villagers themselves. In response, one farmer argued that since they were going to pay for the traps themselves, they would not be able to cover all options and the people on the other side of the Valley were really responsible for the thicket area. One of the trained farmers interjected: "The tsetse know no boundaries." Others pointed out that since ICIPE had carried out the mapping exercise at the level of their village, they had been thinking only at this level, but of course, they recognised the need to work with other villages. On the other hand, they also pointed out that both ICIPE and the government have been controlling tsetse within the thicket (including the National Park) and they had presumed that this work would continue.

RESEARCHER DISCUSSIONS

Subsequently the researchers aimed to integrate the information from the mapping, the transect and the dialogue with what they had already been thinking.

The interest of the researchers continued to focus on the personalisation of the trap arrangement since this was viewed as a clear indication of what Valley residents would be willing to implement. The researchers were certainly not surprised by the farmers' choice but they had not fully appreciated their apparent unconcern with the risk of animal trypanosomiasis: the villagers' key concern during the whole discussion of trap placement had been the protection of people rather than of animals. Since people, in general, are only passing through and not living and working with the flies in the thicket, the thicket would not logically be seen as the site of greatest risk. As the villagers had pointed out, both during the transect and the discussions, a major problem pest for cropping within the thicket and even in adjacent areas, is wild pigs (rather than tsetse).

The entomologist pointed out that ICIPE presently treats infected cattle identified during their routine monitoring activities. In addition, during discussions and the transect, farmers had indicated that they purchase trypanocide drugs privately. Possibly both these factors explain the apparent unconcern. Nevertheless, the question of human sleeping sickness appeared to be a much more important issue than animal trypanosomiasis in determining control strategies than the researchers had appreciated. A further factor which might influence a homestead-focused trap placement strategy is the multi-purpose nature of the trap: it attracts both tsetse and other biting flies. This was pointed out during the farmer training and farmers actually remarked on the range of flies caught during their visits to the traps. More than one farmer had talked of this advantage when justifying the placement of traps near the homestead. Trap placement at the boundary of the thicket had also been associated with the idea that any flies which had been attracted to the cattle would be left behind as the cattle exited the thicket.

The researchers also returned to the issue of land use by people residing outside the Valley. They admitted that this was a difficult question to resolve, especially since they are aware that situations where there are potential 'free-riders' are usually defined as clear areas for government intervention. Clearly, if tsetse are controlled in the thicket and the actual land owners crop the land, this will lead to the loss of an important grazing area for present residents. Under these circumstances, an appropriate strategy for present residents might be one of minimal fly control.

The second discussion concentrated on the researchers' own activities and how these might need to be changed. They had concentrated their baseline data collection and subsequent monitoring activities on fly breeding locations within the central thicket, and areas and people in close proximity. The discussions convinced them that they also needed to look at the impact of tsetse control on upper settlements, to pay greater attention to tsetse elsewhere and possibly, to monitor general fly populations within homesteads where animals are housed during much of the time. With regard to their plans to monitor soil fertility changes, the dialogue had emphasised the point that soil loss studies are only one side of the equation: losses from the hillsides are gains to fields lower down the Valley and both to be incorporated in the monitoring. Finally, the significance of draught animal power in the farm systems had been emphasised to the extent that this had to become a special concern in the livestock monitoring.

EVALUATION OF THE MAPPING EXERCISES

The team sociologist asked the key question from the point of view of the philosophy of farmer participatory research: "Have we gained more than the farmers?" The whole ethos of farmer participatory research is to move away from the extractive research mode associated with more conventional research tools such as the questionnaire. The sociologist expressed the view that the transect resembled more conventional research approaches with the researchers asking questions and later, completing the analysis. Within PRA, the final meeting with participants is emphasised as an important tool for allowing 'their' analysis to determine future events. However, while we as researchers worked into the night to discuss and organise the material we had been given by our partners during the day, the villagers did not have the same opportunity to reflect and exchange ideas before our arrival.⁷ Thus, despite the intention that rural people should be in charge of the participatory research process, the researchers, for whom the participatory activity is their work, have a clear advantage. Some writers argue that this is inevitable (Zadek, 1993) and to the extent that the techniques remain in the hands of outsiders, there may be little one can say to dispute this. We as researchers were interested in handing over the mapping technique and the participants themselves had expressed enthusiasm about the activity before we left, proposing to discuss what they had done with other villages and to encourage them to do the same. However, we reminded ourselves of the time and effort which had gone into the process and expressed doubt as to whether it would happen. We concluded that at least the mapping activity should end with a report to the participants of the details of our own discussion.

A second set of questions raised during the researcher evaluation related to the issues of who needed to be involved in the tsetse control exercise as a whole and what level of organisation was required. We have already noted that it was agreed to involve people living away from the central thicket. Our mapping activity had centred on only half of the village of Nyaboro with a total of 54 homesteads, almost all of which had participated in the mapping and subsequent discussions. However, we now asked ourselves how important it might be to include non-residents since they might have most to gain from successful tsetse control.

The whole question of differential gains from technology is central to much of the literature on participatory research. Gubbels (1993) quoting Moulton (1977) emphasizes that economic inequalities mitigate against communal investments in technology and self-help efforts. Others, including Gubbels, point out that practitioners may assume that organisations are being created afresh when in fact new forms of organisation more often involve a recombination of existing roles, social relationships and statuses (see Mosse, 1992). Gubbels (1993) suggests that the way round this is to create many different posts. Certainly, in the case of Kisabe, there are many positions at each of the levels: each block is headed by a committee of 9-12 members.

Related to these questions of ownership and participation is the amount of time which such activities take up. The sociologist remarked on the number of meetings which have already taken place in connection with the programme. Against this was the opportunity it had given the research team to construct a space for such a dialogue to take place. This mapping exercise was only the second interdisciplinary activity which had involved all the researchers and farmers, the first being the farmer training exercise. Nevertheless, everyone agreed that it was difficult to be sure that the views of rural people emerge clearly from such a dialogue.

The researchers agreed that they themselves had certainly benefitted from the exercise. The whole process had helped them to think through the implications of the trapping. As discussed above, a number of issues were brought into perspective. The main additional advantage for the researchers, widely reported in the PRA literature, was the sharing of what was previously disciplinary information, amongst other disciplines.⁸ Overall, a more holistic appreciation of the programme was gained by everyone.

INSTITUTIONS AND PARTICIPATION

It was argued at the beginning of this paper that this experience had a contribution to make to our understanding of the circumstances under which farmer participatory research can be successfully used. As is evident from this case study, ICIPE's programme is dealing with issues which go much further than simple on-farm trials, a subject with which much of the participatory literature is concerned (Okali, Sumberg and Farrington, 1994). This is true in spite of the fact that ICIPE is a research institution and not a development agency. It demonstrates, therefore, that these issues are relevant and can be addressed directly by a research institution. This point is particularly important to make given the recent attention being paid to the role of non-governmental development organisations in applied research (Farrington *et al.*, 1993; Wellard and Copestake, 1993; Bebbington *et al.*, 1993). It is implicit in some of this writing that formal research institutions are not in a position to implement participatory research.

With respect to this discussion of institutional contexts for participatory research, it is also interesting to note that ICIPE initiated participatory research without the creation of a separate on-farm or rural development unit. Rather, various existing departments, including the Social Science Interface Unit, come together as required to implement particular programmes.

This programme highlights a number of other points relevant to the debate about the role of community organisation within development. It suggests that few clear guidelines can be given about precisely who should participate in programmes and what level of organisation is required. Community mapping exercises imply a certain level or type of community resource management which may or may not correspond to the type of technology concerned and the interests of the stakeholders. Under these circumstances, it may be relevant to ask whether community management is feasible. Others have raised similar questions with respect to the 'Amenagement des Terroirs'⁹ approach (Painter, Sumberg and Price, 1994) which is biased towards patterns of resource use that are typical of more sedentary agrarian communities rather than more mobile patterns of resource use typical of pastoral communities and production systems. Woodhouse (1991) on the other hand hypothesises that community or group activity may be an essential element of effective management of soil and water conservation, windbreak planting and some forms of irrigation, and the problem of who participates must therefore be resolved. He references a number of "successful, and apparently stable", 'users' associations' that manage shared resources.

It is possible that the extension modules to be prepared by the ICIPE programme for use elsewhere will be simply 'working models' and 'process steps.' Whether these will be sufficient for extension of the technology remains to be seen. While the participatory literature is based on an appreciation of the skills of client populations, much of the literature questions the capacity of existing organisations to engage in self-help activities.¹⁰ The main question appears to be: How far do farmers need assistance in institutional management? Bebbington *et al.* (1993), referring to Latin America, suggest that local organisations need skills in institutional development which would seem to be beyond the present capacity of most extension organisations whose central concern is technology and the delivery of messages. Certainly, in relation to the specific technology under consideration here, management skills would seem to be very important and in this instance, a decision was made to encourage the community to establish a new institution and to provide considerable management support. Whether this will be a necessary step for all communities initiating such a programme of trapping remains to be seen.

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ENDNOTES

Some of the earlier experiences with Participatory Rural appraisal are reported in KKU (1987) and Chambers, Pacey and Thrupp (1989). More recent material is included in the Proceedings of the 12th Annual Farming Systems Symposium, 12-18 September 1992 held in Michigan, USA and Scoones and Thompson (1994). Okali, Sumberg and Farrington (1994) provide a review of participatory research experiences.

- 2 Much of the detail provided in this section is taken from the 1992/3 Annual Report of the programme and the Quarterly Report covering the period, April to June, 1993.
- 3 See Allsopp (1991) for a review of the various technologies developed for addressing problems of tsetse control.
- 4 The title 'Kisabe' given to the organisation is an acronym based on the names of the two sublocations, Kibwer and Samba. The two sublocations are each headed by an assistant chief who report directly to a chief heading a larger number of sublocations.
- 5 The central thicket includes the Ruma National Park to which farmers do not have access and a large area outside the Park where they can produce crops and graze animals.
- 6 Homesteads in this area are surrounded by crop fields and the cattle 'boma'. Neither are suitable for mapping exercises because the soil is comparatively soft and broken. The final site used in this instance was a small hard earth area between three houses/huts in the homestead.

'They' refers to all the participants. This is not meant to imply that some of the participants did not meet together and discuss what had happened.
- 8 The social scientists for instance did not normally visit trap sites, crop fields and grazing areas, especially the thicket.
- 9 The terms 'Amenagement des Terroirs' or the 'approche d'amenagement/gestion des terroirs villageois' describe an emerging and increasingly popular approach to promoting more effective local-level management of natural resources by peasant smallholders and pastoralists in Sahelian West Africa.
10. This point is discussed in detail in Okali, Sumberg and Farrington (1994)