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Participatory Soil and Water Conservation in India - Experiences from the KRIBHCO Indo-British Rainfed Farming Project

*Paul D. Smith**

ABSTRACT

Soil erosion in the hilly tribal lands of India is widely recognized by both outside observers and indigenous people as a serious problem that has decreased agricultural productivity and exacerbated poverty. Most earlier attempts to initiate soil and water conservation activities in such areas have adopted a top down approach. Even in projects with a so-called participatory approach, much of the "participation" amounted to persuading the farmers to participate in work planned entirely by project personnel, resulting in a low sense of ownership.

This paper describes attempts by the KRIBHCO Indo-British Rainfed Farming Project (KRIBP) to develop participatory approaches to natural resource management including soil and water conservation (SWC). It discusses how KRIBP found that pre-existent social groups of 15 to 25 households at falia (hamlet) level which had started project-assisted savings and credit schemes could become effective units for the implementation of farmer-led SWC activities. Participatory approaches used in-group level planning, implementation and evaluation are briefly outlined. Village level soil and water specialists (jankars) were pivotal to the success of the project and their selection, training and function are described. Finally, some suggestions are made about how the role of small groups can be improved.

INTRODUCTION

Until recently, the environmentally degraded tribal areas of western and eastern India have been somewhat neglected by government funded development projects. Those that did exist were often heavily subsidized SWC activities (often 100% of the cost of labour was paid to participants) and tended to be managed in a very top-down manner. The KRIBHCO Rainfed Indo-British Projects are bilateral development projects, which set out to develop a participatory approach to farming systems development and natural resource management in such areas (Jones et al., 1996). The projects are funded jointly by the UK Department for International Development (DFID) and the Government of India (GoI). The projects are being implemented by KRIBHCO, a national fertiliser co-operative.

KRIBP (West), on which this paper is mainly based, started in 1992 in contiguous areas of Panchmahals District (Gujarat), Banswara District (Rajasthan) and Jhabua District (Madhya Pradesh). The area was chosen partly because it was known to be an area where severe land degradation had taken place (Sankaran, 1992; Sikligar, 1993; Thakur and Thakur, 1994) and partly because an innovative project using innovative approaches had a better chance of success in an area which was relatively socially homogeneous. The general requirement of social homogeneity was met because villages in this area, although having sizeable numbers of scheduled[†] caste households and other categories, are populated mainly by members of scheduled tribes, the *Bhils* and *Bhilala* .

The KRIBP paid particular attention to the needs of the poor and of women. An important aim was to test ways in which their needs and priorities could be heard so that they could contribute more fully to locally planned and executed farming systems development and improved natural resource management.

This paper describes the role of small groups in soil and water conservation (SWC) in the context of the KRIBP, outlines ways in which SWC planning and implementation has been carried out in these groups, and, based on experiences with KRIBP, suggests ways in which the institutionalization of farmer participation in SWC in the context of the tribal areas of India, and perhaps elsewhere, could be refined.

Environment and economy

The most widely grown staple crop is maize though rice is preferred. Owing to the high levels of runoff, mainly upland rice varieties are grown in the more favorable sites (*nalahs* and non-*nalah* areas where moisture retention is greater). Pigeonpea and other grain legumes are grown as maize intercrops in the *kharif* season (June to September). In the *rabi* season, again on favorable sites, wheat and chickpea are among the main crops grown.

Traditionally, soil fertility was maintained through the application of (mostly composted) animal manure, usually to the more fertile fields near the homestead and by the growing of crops such as sun hemp as a green manure on a rotation basis. The alternative use of animal manure as a fuel for cooking reduced the quantities available for soil improvement. In recent decades, a decline in animal numbers has reduced the availability of animal manure and

*Centre for Arid Zone Studies, University of Wales, LL57 2UW, UK. p.d.smith@bangor.ac.uk.

[†]Scheduled castes and tribes in India are those, which are considered economically disadvantaged by the government and for which there is a certain number of places in jobs and educational establishments reserved.

many farmers now apply small amounts of artificial fertilizer. The use of green manure fallows has all but died out because of the smaller farms (currently, average landholding is about 1 to 2 ha), which have to be cropped permanently*. This trend has contributed to the high level of land degradation in the area, which is compounded by erodible soils, intense rain and undulating topography. Also, partly because of the population pressures and the higher urban demand for timber and fuel wood, there has been extensive deforestation, often combined with illegal felling of trees. Expansion of cultivated land onto steep hill slopes (often up to 100%) and encroachment onto Forest Department land where insecurity of tenure discourages good land husbandry have also contributed to increased degradation. Erosion rates in the area can be as high as 130 $m^3 ha^{-1} y^{-1}$ (13 mm) though the modal range is about 15 to 30 $m^3 ha^{-1} y^{-1}$ (Smith, 1999). As a result of these high levels of erosion, farmers have experienced diminishing returns to labor and other inputs.

Agricultural production alone is now normally inadequate to support most families throughout the year. Only about 15 to 20% of households are able to subsist on cultivation alone. Thus, over the last 30 or 40 years, the practice of seasonal migration to urban areas between November and March has developed. Remittances earned during this period form a critical component of villagers' livelihoods.

Increased poverty has brought about another aspect of life among the *Bhils* - high levels of indebtedness to money-lenders, who may charge as much as 150% per year in interest. Defaulters risk having their crops forfeited. Loans are taken out for social reasons such as marriages as well as for the purchase of farm inputs.

Given the changes in the farming systems, the large percentage of rainfall that runs off the land and the preference for rice as a staple, it is not surprising that during issue-focused participatory rural appraisal exercises (PRAs), farmers invariably asked for help with physical structures such as the construction of small embankments (*bunds*) around field boundaries in upland areas (to retain moisture and to delineate ownership) and *nalah "*plugs"†. However, tree planting and grazing land improvement activities were also popular and the Joint Forest Management schemes were particularly successful. These activities are reported elsewhere (Bezkorowajnyj, 1999; Smith, 1999).

The high incidence of seasonal migration and the serious indebtedness meant that careful consideration had to given to the financing of the physical SWC techniques for which farmers were asking assistance. SWC had to be done in the dry season and farmers and their families needed alternative means of support to replace the income otherwise earned on migration. However, because of the widespread incidence of heavy indebtedness it was impracticable to consider offering the large loans that would have been necessary. This, together with inter-generational equity and externality considerations, led to the decision to offer 50% subsidies on labour costs, and suggesting that farmers should contribute 50% of the (opportunity) costs as a contribution to the benefits.

Subsequently, some observers of the project argued that during later PRAs, groups began to ask mainly for what they believed was acceptable and what the project was offering (Mosse, 1996) and that the farmers valued soil conservation almost entirely for the opportunity to be paid subsidies (Shah, 1995). However, while the income from SWC subsidies was undoubtedly valued by the farmers, it was unreasonable to suppose that farmers were not also aware of the benefits of the techniques they suggested both in terms of increased production and the benefits to the environment, nor that they would have carried out such work for short term gain if long term productivity had been undermined. It is not so much the payment of subsidies that have led to project failures in the past but the lack of consultation in the technologies to be used and its field design and the lack of sufficient attention to training and the developing of an adequate sense of ownership.

Participatory planning approach‡

The role of small groups in soil and water conservation has to be seen in the context of the process and participatory approach of the whole project. An outline of the approach is shown schematically in Figure 1.

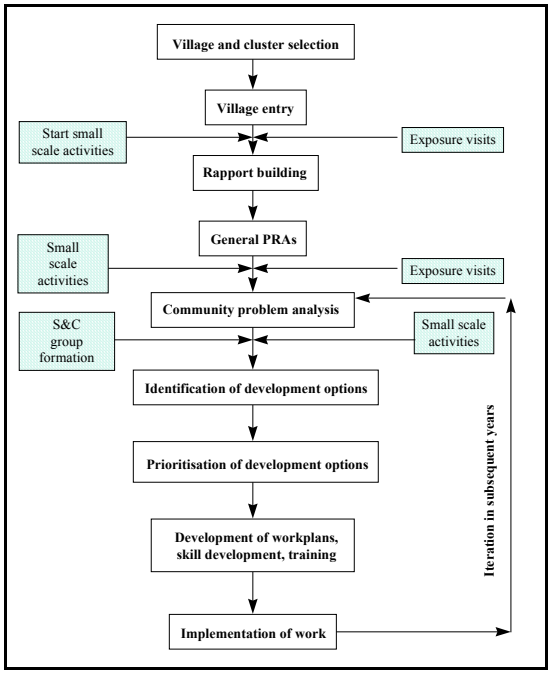

Figure 1. Schematic diagram of participatory planning processP.D. Smith. Participatory soil and water conservation in India - experiences from the KRIBHCO Indo-British Rainfed Farming Project.

*In some situations in the Eastern project, where the seasons are longer and rainfall higher, some farmers plant green manures at the beginning of the season and then plough them in about 4 weeks after planting. The shorter season in the west makes this technique less feasible.

† *Nalahs* are narrow valley areas often only 10 to 20 m across between the hillocks; plugs are the local name given to check dams in the *nalahs*, usually with the purpose of ponding water to increase infiltration so that rice (not flooded varieties) can be grown.

‡ The approach is discussed in detail in Sodhi et al., 1996.

At the beginning of the project, the poorest villages in the *talukas** within which the project had decided to work were selected in a two-stage process. Firstly, the last available census data (1981) were used to select villages, which satisfied various criteria used to select the poorest villages (Sodhi et al., 1996). Once an initial selection was made, the villages were visited to finalize the selections. This procedure for selecting new areas was not strictly followed after the first year or two of the project and subsequent clusters were often chosen as a result of lobbying from village members who had become aware of what the project was already doing in other villages. In other cases, new clusters were chosen because they were relatively near existing clusters and so were easier to visit by supervisory staff.

Once villages were selected and it had been established during initial visits that they were interested in participating in the project, a series of follow-up visits were made during which informal rapport building and general PRAs aimed at developing an understanding of the farming systems, natural resources and social structures took place. It soon became apparent to the project staff that early confidence-building interventions would be necessary if the village was to appreciate that the project meant to do more than collect information through numerous PRAs. These activities consisted of interventions that did not require complex group action, such as experimentation with new crop varieties or the purchase of small water pumps. It was not until some months later that activities requiring group cooperation such as SWC, tree planting, well construction, and small-scale irrigation schemes were undertaken.

The PRAs and rapport building were carried out by pairs (ideally one male and one female) of "Community Organizers" (COs) who were assigned to groups or "clusters" of 3 or 4 villages. The COs usually lived in nearby *taluka* towns. Although it was initially intended that the COs would concentrate their efforts on village institution building and social development, they soon began to take on other roles such as handing out payments from SWC work and organizing agricultural trials, perhaps to the detriment of their social development roles.

After the initial PRAs were completed and relationships had been consolidated, the COs facilitated the groups in community problem analysis (CPA) involving a thorough discussion of the perceived problems voiced by group members and a grouping of the problems into those which had relatively simple solutions (involving little or no input from the project such as the cleaning of a well or assistance with cattle vaccination camps) and those for which the solutions were complex (such as SWC, forest and common property resource management and indebtedness). The next phase was to produce development options and to undertake detailed Issue Focused PRAs (IF-PRAs) to gain a better understanding of wealth distribution, sources of livelihoods, women's perspectives, existing forms of community organization, cropping systems and land types, trees and their uses, SWC and livestock problems. Often, during this stage, exposure visits for villagers were arranged to other projects or existing project villages to allow farmers to see how other communities had solved their own problems.

In order to develop a village or *falia* work plan, further activities were required including the collection of information for detailed planning, awareness building, planning the management of the work, technical training, and the development of group management skills (Sodhi et al., 1996). Projects that required funding from KRIBHCO were then be submitted to the head office either village by village or as in recent years, in a consolidated form.

The role of groups in SWC

The first program of SWC started in five villages at the beginning of 1993. In many respects the program was successful, and in technical terms the performance was acceptable. However, there were, predictably, some problems: farmer groups formed to implement the work did not function well; compromises on bund alignment were worked out between individual farmers and the project field staff rather than through group discussions; farmers attempted to use bund construction for field boundary marking (for example many bunds were built up and down the slope which had limited usefulness as SWC structures) and village volunteers (*jankars*) responsible for laying out and measuring work done on bund construction felt accountable to the project rather than to the villages (Mosse et al., 1995).

In the second year (of KRIBP (West)), there was a shift towards working with smaller groups in which there was less obvious domination by influential individuals. These were found in the project area in the form of pre-existing hamlets (*falia*)† of 15 to 25 households who were related or who had other close social ties though sometimes small groups based on gender or special interests were formed (Mosse *et al.*, 1995). Most of these groups wanted to start savings and credit schemes and as it had been decided to pay farmers subsides, it made sense at the time to concentrate SWC activities on the savings and credit groups so that part of the subsidy payments could be used to build up the groups capital.

Once the savings and credit schemes were working well, households were given an initial loan from the project of Rs 500 to Rs 1,000 through the group to provide for crop inputs. Repayments were made into the group funds (partly because institutional constraints prevented loans from being repaid to the project and partly to help in priming the savings and credit scheme).

Income from SWC subsidies contributed significantly to group and individual savings. By 1998, there were 232 savings and credit groups in about 70 villages, each with an average membership of 18 households. Funds held by each group averaged Rs 650 per household**,** generated mostly from project programs. By then, SWC had been carried out on about 4,250 hectares of land in 53 villages and SWC subsidies had generated about Rs 900,000 in savings of

* States are divided into districts and districts are divided into *talukas* - there is no precise English translation.

† In West Bengal (KRIBP -East), groups are mostly based on whole villages. This may have something to do with the fact that communist parties have had a lot of influence in the area.

which 34% had been put into group funds and 66% had gone into private savings. Savings generated from SWC were about 33% of all income into the groups.

Savings are used to finance private agricultural inputs, capital items such as water pumps for irrigation, and also to meet social needs such as the financing of weddings. Group funds are used for purchasing communal assets. The savings and credit schemes thus had a great influence on the dependency of villagers on moneylenders. They also provided a useful forum for discussions about the management of natural resources and helped to build organizational and conflict resolution skills.

In addition to the existence of a well functioning savings and credit group, SWC was only initiated if soil degradation was discussed in community problem analysis. Initially, the planning and training process took up to five months though some of the preparatory stages were omitted in subsequent years.

Several group meetings were organized by the field workers at intervals throughout the rainy season. In initial meetings, the causes of erosion and different methods of soil and water conservation were discussed. In later meetings: decisions were made about the general technical approaches that should be adopted in the village; *jankars* were selected; working modalities (such as percentages of subsidies paid into group funds and private savings and the organization of the work) were worked out; and participatory mapping (soils, slopes, land use, natural resources) and issue-focused PRAs on soil management and erodibility took place.

Participatory techniques that focus on soils and natural resources have become a key part of the planning procedure. The PRA discussions encourage villagers to make a natural resource inventory, to decide how their resources could be improved, and to discuss how they should be managed and who would benefit. The discussions also cover tree planting, grazing management and water management. They work best when there are several field specialists present from different disciplines though, unfortunately, this rarely happens.

Fortunately, it is relatively easy in India to obtain copies of "revenue" maps (Fig. 2), originally drawn to designate plot boundaries for taxation purposes. Although plots have been subdivided since the maps were drawn, each farmer knows where on the map his farm is situated. It was thought to be desirable to develop reasonably accurate methods of resource assessment that group members could subsequently use without outside assistance. Thus, techniques were developed that made use the of the revenue maps as base maps for plotting village resources. Often the project arranged to have these photocopied so that different thematic maps could be drawn by the farmers. If not, tracing paper was used over the revenue map.

After drawing a general map of village resources (showing wells, trees, boreholes, and roads for example) -

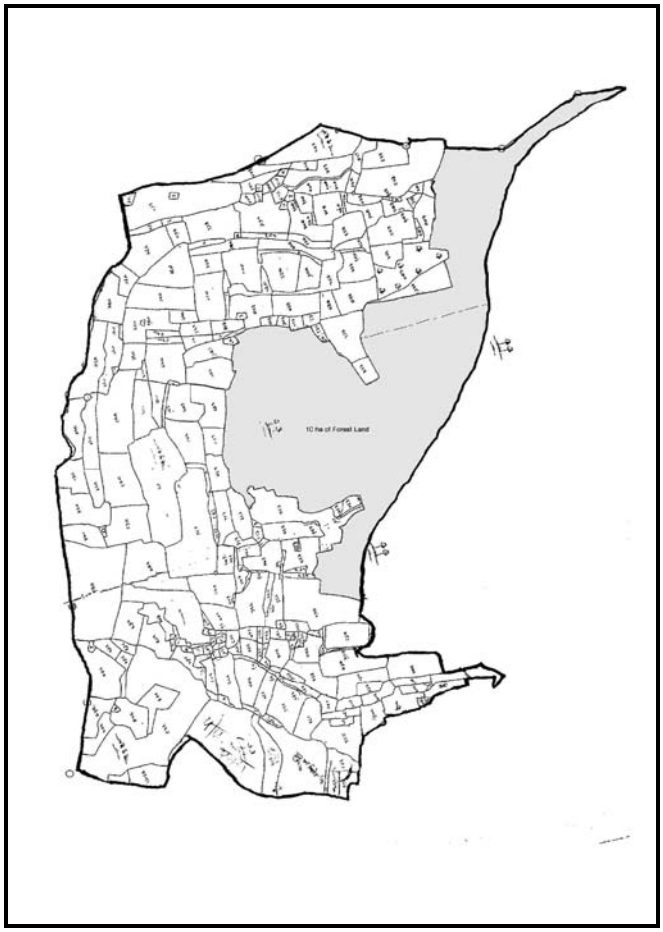

Figure 2. Example of revenue map on which participatory thematic maps were based

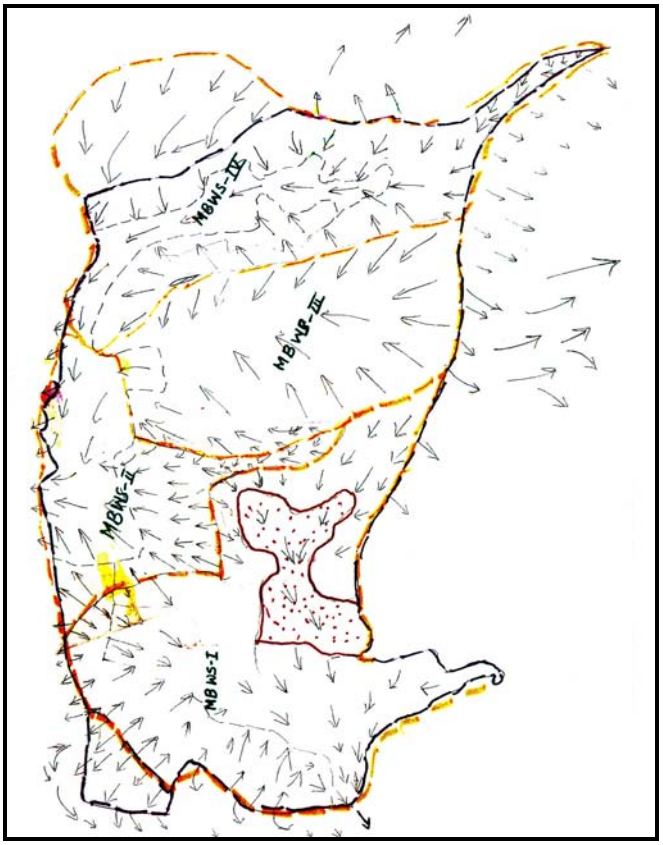

Figure 3. Example of map of field slopes and dervied micro-catchments drawn by farmers on a revenue map as a base

usually in the form of a sketch map, group members constructed maps of soil type, land use, and land type (villagers classify land into lowland, medium land and upland) and other parameters).

The mapping of soil type was particularly interesting as there were many different soil classes recognized by group members in a single village and dozens of words are used for different soil types. Once group members had agreed on a soil classification system, they discussed and documented the properties of each type in qualitative terms including color, ease of cultivation, water-holding capacity, infiltration rate, susceptibility to erosion, slope range, soil texture, soil fertility, and the main crops currently grown on the soil type in the *kharif* and *rabi* season. Another innovation was to derive micro-watershed maps by asking each farmer to mark the slope of his field on a base map with an arrow (Figure 3). The micro-watersheds thus defined were then used to develop work schedules. Although these maps have been used for certain aspects of planning soil conservation, they have not been made as much use of as they might - for example on planning the planting of different tree species.

The selection and training of local specialists (*jankars*) in SWC was essential to the project's success. Often *jankars* had little or no formal education. They were selected by the groups after the project field workers explained what kind of work they were expected to carry out. Groups were encouraged to appoint female as well as male *jankars*. It was originally intended that the *jankars* would be paid by the group members. In some cases this was done but in most, an agreed percentage of the subsidy payments was deducted at source and paid to the *jankar* directly. This practice, discussed further below, was clearly not a healthy one since it put the *jankar* in an ambiguous role with mixed loyalties. After selection, the *jankars* attended a series of four training sessions organized by the project on basic soil science, simple surveying and record keeping.

Once a general strategy had been worked out by the group in the meetings, a field survey was undertaken, initially with advice from the field engineer but eventually the *jankar* was able to provide most of the technical inputs. The field engineer or *jankar* discussed with the farmer and ideally, their neighbors, the alignment of field bunds and other physical structures. Some groups discussed field designs together before implementation to avoid potential conflict.

Groups may work independently of other groups, the work being done in family units or the whole group may work on one field at a time. Alternatively, five or six groups may organize themselves to undertake SWC work simultaneously in one village or even several neighboring villages.

In practice it is difficult to adopt a comprehensive watershed approach if projects are truly participatory. For one thing, in the project area, the Forest Department owned much of the upper catchment areas and was usually reluctant to allow farmers to undertake SWC work on encroached land or areas planted to trees in order to avoid giving the impression it was thereby relinquishing ownership. Also, some farmers or some groups did not wish to participate in SWC work. The approach adopted was sometimes termed "a partial watershed approach" in which an attempt was made to follow the general principles of working from the top of the watershed and to try to integrate physical and vegetative techniques whilst allowing for compromises. The indigenous system of field spillways to discharge surplus flow from one field to the next made this approach more technically feasible.

DISCUSSION

The following are some suggestions and observations about how the involvement of small savings and credit groups in soil and water conservation could be enhanced and how problems might be avoided. The suggestions do not imply criticism of the KRIBP project which is a process project (learning by doing) and which has already taken into consideration some of the suggestions.

Pace of group development

Some KRIBP groups had more money than they could manage efficiently too early. This had obvious dangers. If physical targets are unavoidable, it would be better to delay using SWC subsidies to build up savings in these small groups until they have the necessary managerial capabilities. However, they could still be useful for resource planning.

Experimentation with different models of financing of SWC

A number of complications were observed in the payment of subsidies. Firstly, the subsidy rate used of 50% of the state minimum wages turned out to be nearer 75% of the local market rate for labour. By the time this was evident, the payment of 50% subsidies had become virtually institutionalized. Secondly, group members were paid for the work they did rather than farmers being paid for the work done on their land. Since poorer farmers did more work, they effectively subsidized the better off farmers. The effect was not large as the range of farm sizes was relatively small. The problem has been discussed and alternative mechanisms proposed by Smith (1998).

In the initial stages of a participatory soil conservation program, there may be a need to experiment with different models of financing the interventions using either subsidies or loans or perhaps utilizing traditional mutual help schemes. One such scheme is the *halma* system in which small amounts of food and sometimes liquor are provided by the farmer in exchange for help during harvesting and similar tasks on the understanding that the farmers will help their neighbors for similar nominal payments. The implementing organization should be institutionally flexible enough to cope with such variations and not become entrenched in continuing with one way of doing things. If loans are an option, the agency should have the ability to receive repayments as well as disbursing funds. Villages where different models are tried may need to be widely dispersed to avoid conflicts arising from different financing systems. Above all, the financial controllers of the agency need to have an appreciation of social auditing as well as more formal financial management. An agency which is geared to marketing commodities in the commercial sector may not have sufficient flexibility to help groups to develop appropriately unconventional systems of accounting. Groups

need to develop an adequate ability to account for their own funds as soon as possible without risking fraud or embezzlement. This will require making adequate provision for training needs of the whole group and group officials such as treasurers.

Clarity about rules for subsidies or loans

If subsidies are paid, groups need to clearly understand on what basis (amount of work) they will be paid. If loans are offered, they will need to know what the interest rate is and what will happen if they default. If deductions are made, group members need to understand clearly what they are for.

Payment of village specialists

The system of training village "specialists" in aspects of SWC was an essential part of the KRIBP approach. In theory, they were to service the needs of the group by offering advice and skills related to SWC such as sitting of structures and deciding on grass species. Although some have undertaken "advisory" work in neighboring villages without project involvement, they soon became to be viewed as agents of the project rather then servants of the group. Their task of checking measurements for subsidy papytmerns put them into an ambiguous position and was obviously detrimental to their long term role. Although the groups decided on their method of remuneration, this was usually on the basis of a percentage of the subsidy and as this was deducted at the source and paid directly, their ambiguous role was accentuated. It would seem that if measurements have to be made for the purposes of subsidy or loan payments, it would be better if the project recruited their own staff and did not pretend that those reporting to them were servants only of the farmers.

Farmer led or project led?

If farmers are to "drive" resource conservation, the tempo of the work has be in their control, not under the control of the implementing agency. Many implementing agencies feel they have to set physical targets such as number of trees planted, kilograms of grass seed sown, or kilometres of bunds constructed. This requirement will inhibit the development of a truly participatory approach to resource conservation. Setting targets in participatory terms such as numbers of groups established, meetings held, local plans drawn up or group officials trained may be more meaningful - if only these would satisfy the donor agencies and parent organizations. They may not satisfy them if they also have their own clients such as tax payers, donors or shareholders to whom they are beholden. Education of the supporters of development projects about the participatory paradigm is as important, perhaps more so, as the training of the beneficiaries.

Integration of soil conservation into a wider natural resource management plan

Soil conservation should not be seen in isolation from the wider context of natural resource management and farming systems development. Tree planting, grazing land improvement, livestock management, land ownership issues and gender issues all need to be debated by the local groups. Although KRIBP has encouraged farmers to develop Village Work plans, these plans have rarely been adequately integrated. Nor have they included a sufficiently long time horizon. Work plans should include a "vision" of what the village or area should look like in 5 years and the vision revised annually.

Different kinds of work may need joint meetings of smaller groups

This paper has centered on the role of small groups in SWC. Given the need to integrate SWC planning within natural resource planning, particularly making plans for the management of common property resources, there will inevitably be a need to have joint meetings - perhaps at the village or even wider level - for some decisions. The obvious example in the case of the KRIBP is the Joint Forest Management committees that are set up at village level. These could also be used for other purposes such as planning for village wide grazing management.

Exit strategies

It is essential that both the implementing agency and the groups are clear at the outset about the extent of the commitments in terms of finance and time that the project is willing to give to the group. The project needs to consider the need for continuity when funding ceases and have a clear idea about how to manage the winding down process, particularly in those villages in which the project is still working in the final year of the project.

CONCLUSIONS

The first phase of the KRIBHCO Indo-British Rainfed Farming Project has demonstrated that small, hamlet-level savings and credit groups of 20 to 30 households can form the basis for institutionalizing farmer-led natural resource planning and management in tribal villages in India. The long-term nature of savings and credit groups may make them more suitable for a for natural resource management planning than task oriented groups which may more easily stop functioning once a supporting project has ceased. However, there have been some problems that have been experienced in the development of such small groups that need to be rectified if they are to be sustainable and have a significant contribution to improved farmer-led resource management.

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