

Problems and challenges in the implementation of suggested improvements to fodder management strategies in the field through local farmers' groups

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Abstract

The collaborative research project 'Strategies for improved fodder production in the dry season in the mid-hills of Nepal using participatory research techniques' is one of several projects carried out in Nepal in recent years concerned with improvements to land or natural resource management in the country. However, there has been limited measurable progress on the implementation of suggested strategic improvements in the field as a result of this work. However, without successful implementation the value of the work cannot be fully realised. Several issues are relevant to successful extension in this regard. It is important to avoid using detailed collated information on resource availability to develop prescriptions or timetables of management strategies for presentation to farmers. Suggestions should have inherent flexibility to take account of farmers' short-term priorities. Similarly, advice should build on farmers' current practices, rather than using information, whether or not collected in a participatory manner, to produce management formulas in a top-down method. Any new innovations should undergo trials before being presented to farmers. On-farm trials have more significance for farmers than station trials but often cannot be used to test more complex technological innovations. Farmers should share responsibility for designing any trials on their own land. Ideally, any extension strategies used to promote recommended changes in fodder management techniques should focus on increasing farmer choice and encouraging discussion of ideas and problems through local farmer groups.

Introduction

In recent decades, there has been a significant shift towards the farmer-centred approach in on-farm agroforestry research and management. Such research follows a bottom up process where farmers are the decision-makers and they are prepared to bear the associated risks (Galpin, M. et al., 2000).

Nepal Agroforestry Foundation (NAF) has been particularly involved in farmer centred fodder/grass research, training and extension since its establishment in 1991. Over the years it has developed a network with more than 40 community based organisations and has been providing agroforestry support to more than 200 **women's** farmer groups through the network organisations. NAF launches agroforestry programmes in areas where there is a scarcity of fodder and grasses for the farmers. Most of the trees and grasses promoted have supplied fodder in the monsoon months as well as in the dry season.

NAF, in collaboration with the Nepal's Department of forest research and survey (DFRS) and the Natural Resources Institute (NRI), UK carried out a collaborative research project entitled "Strategies for Improved Fodder production in the dry season in the mid-hills of Nepal Using Participatory Research techniques". This is one of several projects carried out in Nepal in recent years concerned with improvement to land use or natural resource management in the country. This program started in 1997 for three years in response to the scarcity of animal feed resources, particularly during the dry months, in the mid- hills of Nepal. The collaborative involvement of farmers, representatives of local community-based organisations, and researchers from national and international and government bodies is a central feature of the research project.

The paper looks at the research and extension process followed in carrying out this research work, gives an overview of NAF's research status, outlines the problems in implementation of the suggested improvements to fodder management strategies and makes recommendations for possible future continuations of similar research and extension programmes.

Rationale

The history of agroforestry research in Nepal shows that many studies conducted in the past have made a tremendous impact on the understanding of the complexities, diversities and prospects for development and management of hill farming systems (Garforth & Malla, 1997). Many studies have been carried out but the impact of these studies on farmers' livelihoods is generally not recorded. The report of a study carried out by Lama in 1992 for assessing the impact of hedgerow inter-cropping in relation to soil erosion found more than 90% of farmers were positive in the adoption of hedgerows that help to control soil erosion. Farmers interviewed agreed to expand this technology on their farmland. Many other research studies have contributed to understanding the role of trees. However the general phenomenon is that when the research is completed, the report is been prepared and submitted to the concerned donor and no further action is taken. But this process is of limited use to the farmers (Garforth & Malla, 1997).

A failure to assess the impact of research work has limited progress on the implementation of suggested strategic improvements in the field as a result of the research work. Without successful implementation the value of the work cannot be fully realised. There is a growing understanding that research should start from the farmers, who are the ultimate users of the technologies developed (Baidya, 1992).

A blueprint approach does not produce findings suitable for farmers. The research outcome of station trials does not directly fit with the farmer's needs all the time. An integrated approach with back up support and collaboration is needed for speedy and reliable uptake of new technology (Tiwari et al, 1996). Extension combined with demonstration of those technologies has a direct impact on the farmers involved in the research and on their neighbours (Campbell et al, 1990). Several issues are relevant to the successful extension of research work. Thus it is necessary to develop a farmer based research package in which timely assessment of the impact of the findings is in built and extension support is provided.

Process followed by NAF in carrying out research (NAF, 2000)

The main research strategy of NAF is to support Community based Organisations in strengthening the capacity of farmer groups to meet their basic needs. NAF works at the grass roots level - with priority given to women. NAF's mission is not simply to transfer existing technologies to farmers but to empower them to help themselves. In order to achieve this, farmers should understand the real value of new technologies which are suggested for supplementing existing practices.

Firstly, NAF did a **need analysis** in potential sites of Sindhupalchowk, Kavrepalanchowk and Dhading districts. Meetings were arranged with local partner organizations and community people in their own area. Farmers were interviewed and the area was observed. They explained that there is a scarcity of fodder during the dry months. After the concept of this research project had been outlined, local NGOs and farmers expressed their interest to cooperate if there would be a program related to the promotion of fodder trees and grasses. Then a dialogue was made together with the local NGO and community regarding the most suitable area for research and extension support. NAF and local organisations agreed to sign contracts of partnership for the research. Five villages were selected following this procedure. Ten farmers from each of the five villages were selected on the basis of wealth as defined by the farmers themselves. These farmers were interviewed on a Bi-monthly basis to collect the required information, which would help to interpret the situation.

These farmers were taken to successful agroforestry on farm demonstration sites where they observed demonstrations and interacted with farmers who have developed fodder innovations on their own farms and other members of the agroforestry group. They shared experiences and learned from each other. The main objective of such **cross visits** is to motivate farmers to plant fodder and grasses on their farmland. The visits were not confined to farmers involved in the research, other interested farmers from the same village were also taken to observe the demonstration sites. They were as equally involved as the research farmers in the agroforestry extension programme but not included in the bi-monthly survey.

Farmers returned to their villages to discuss their experiences and which aspects could be promoted in their own community. If a farmers' group did not already exist in the community in which the local partner organization was working, NAF and local organization together facilitated the **formation of one group** representing all ten farmers involved in the research programme and other interested local community members. When the group was formed they started a savings fund according to their capacity to afford. Group meetings were held every month. During this time members shared their initiatives and discussed problems they have faced and how these problems could be tackled. Monthly savings were collected during the meetings. One of the committee members kept a record of the account. She was trained in simple account keeping. Interested farmers in adjoining communities were also encouraged to attend these meetings to share their experiences.

Those interested farmers who have taken part in the exposure visit and become members of the group were given species-specific on-site **home nursery training**. A home nursery was established near to each member's home producing 2-3 species, so that a farmer could easily take care of the nursery. They integrated this activity with their daily tasks. Farmers set criteria for the selection of the species. Their priorities included those species which can grow fast, are nutritious, coppice well when managed at a low height and provide good quality fodder. Home nursery farmers produce seedlings required for both themselves and sometimes for their neighbours. Farmers planted and maintained these seedlings on their own farmland. They produced seedlings according to their personal requirements. The farmers at research sites on average produced 150 plants each. Farmers' were provided further training on planting out and management of seedlings. After six months each group selected a leader according to criteria set by themselves. These selected farmer should be interested and enthusiastic, have developed a successful demonstration, had adequate time to support the group, was willing to produce some seedlings, was willing to lead a farmer-to-farmer cross-visit to another community and had no intention of leaving the area.

The selected farmers were given 10 days **Training of Trainers (TOT)**. These farmers were later responsible for conducting home nursery training and organising exposure visits to the interested farmers at the village level. These farmer leaders were provided regular back up support. During the training they learned how to collect relevant data for basic field level research training and extension program.

Local partner NGOs were responsible for the arrangement of seeds, cuttings, poly bags and other required materials and were provided with financial incentives to perform this work. They were also responsible for participatory monitoring and evaluation of the programme. The seed was procured from Nepal Agroforestry Seed Cooperative Limited (NAFSCOL). Regular follow up visits were made by the collaborating organisations to the home nursery and plantation sites. Bi-monthly surveys provided information on the feeding patterns in each village. Farmers were involved in the establishment of experimental plots. After the survey work was completed village level workshops were organised at each site. This was followed by a workshop in Kathmandu where representatives from local NGOs involved in the research, the research group farmer leaders and farmers from NAF's other projects participated in the discussion.

NAF's status/involvement and follow up strategy in the Research and Extension work.

Prior to official registration of NAF (formerly agroforestry advisory service) as an NGO, NAF was an advisory arm of World Neighbors for providing agroforestry support to the grantee organisations of World Neighbours. At that time *Leucaena leucocephala* was promoted as a fodder tree in Majhigaon of Sindhupalchowk, one of the program sites of Baudha Bahunipati Project of the Family Planning Association of Nepal. An impact study was conducted in that area by New Era to assess the impact of the fodder development. The results showed that before the start of the program there were very few animals and fodder trees but after intervention tree and livestock numbers significantly increased (Pandit, 1990). Another study conducted in the same village indicated that managing *Leucaena* species at 120 cm. height gives the optimum fodder output and does not hamper the crop yield by shading effect. Later this technique of management was incorporated in the NAF training & extension program (Adhikari and Joshi, 1990). However, our experience over time showed that farmers usually manage the *Leucaena* species at their own breast height.

Psyllid attack on *Leucaena* species brought a negative impact to the farmers in 1989. Shortly before the problem became apparent NAF shifted its policy to focus on a wider range of local and exotic species (Baidya, 1992) mainly *Morus alba*, *Bauhinia purpurea*, *Ficus semicordata*, *Artocarpus lakoocha*, *Flemingia congesta*, *Guazuma ulmifolia* and resistant varieties of *Leucaena* (Ipil Ipil). Before the arrival of psyllid 16 different species of Ipil Ipil were tested in the project nursery at Kavre to find out their levels of resistance to the insect. We found that *L. pallida*, *L. esculenta* and *L. retusa* were highly resistant to psyllid and *L. esculenta paniculata*, *Kx3C*, *K145*, *K156 hybrid Kx1A*, *K784*, *L. shannonii* and *L. collinsii* were moderately resistant and *K584*, *K743*, *K636*, *Kx1 composite*, *Kx3mc* were not resistant to psyllid. *Leucaena* species resistant to psyllid were incorporated into the extension program. Currently NAF is promoting the resistant varieties *L. pallida* and *L. diversifolia (K156)* in its program.

A lopping trial of *Moru alba*, *Guazuma ulmifolia*, *Flemingia congesta* and *Sesbania sesban* species was carried out in farmers' fields to ascertain optimum lopping height and frequency. Farmers were involved in harvesting fodder and weighing the biomass. It was found that these species coppice well and can be managed at a low height (Adhikari, 1989). Farmers involved in the trial have shared their experiences with farmers from other areas. The research findings on lopping activities are now incorporated into NAF extension activities.

In 1990 NAF (Formerly Agroforestry Advisory Service) carried out a research study entitled "Inter cropping of velvet bean and jack bean with maize" in Kavre. After a year's trial the results showed that inter cropping of velvet bean with maize doubled the maize yield (Adhikari and Pandit, 1990). This result was later shared with the farmer group members. Some of the farmers became interested in intercropping velvet bean with maize to improve the soil fertility status and thus gain more income from their farm. However, the farmers' rotate crops on a cycle of between four and six months and the velvet bean cycle was more than a year. They had to trim the bean stems regularly to prevent them climbing maize stem and farmers did not have the labour resources to perform this work. Therefore they no longer wanted to plant it on their cropping land. After another year farmers shifted the planting of

these beans from cropland to marginal lands, which were not suitable for cropping. Farmers are now using the bean for fodder mulching and green manure. Thus we can see how farmers can adapt new techniques and technology to their own strategies and fit their own priorities.

The introduction of species after testing with farmers is cost effective in comparison with station trials. A mixture of the species listed above reduces insect and disease problems and, at the same time, helps to produce a balanced diet of fodder and grasses for livestock. Planting a mixture of legumes and non-leguminous trees and grasses on the bunds and risers of terraces is a proven technique to utilize marginal land. NAF is introducing valuable fodder species to new areas and is providing training to manage tree species at low height. A large number of mulberry plants have been promoted for the purpose of fodder production in many of NAF's action areas and now other organisations are using this resource to implement sericulture programmes.

Studies on the impact of agroforestry in Ramechhap and Dhading revealed that NAF activities were effective in increasing self sufficiency in fodder and reducing pressure on on-farm resources (Pandit, 1995; Regmi, 1998). In 1997 Reading University produced a report in association with NAF outlining priorities for the future agroforestry research strategy in the hills of Nepal (Garforth and Malla, 1997). Livestock feed shortages were highlighted in this report for further investigation.

Almost all farmer groups associated with NAF's network organisations are composed of women members and they are very effective in running nursery and plantation activities. Most of these groups have practiced stall feeding since NAF's programmes began, which helps to relieve pressure on farm labour resources and protects fodder species planted on farmland from grazing.

At Ange village in Sindhupalchowk, one of the current research sites, the women's farmer group has started to control grazing practices. The group decided not to leave their animals on the fields and to adopt a cut and carry method to feed to the animals. All members have agreed to follow this practice. To date there has been no problem of protecting plants from animals. The savings they have collected are loaned out to members of the same group for emergency needs and the member pays the loan back to the group at a nominal interest rate. The creation of local farmers groups as institutions has brought greater awareness among farmers involved in the research and highlighted to them the extent of the problem of fodder scarcity. They have had a home nursery program every year. On average the members have raised and planted 150 fodder seedlings each on their farmland. NAF's approach is to supplement the existing system so that farmers become faster learners and more independent. Farmers can pursue their own ways of creating knowledge by questioning designs and testing and identifying possible solutions for themselves.

There is now a trained NGO representative and farmer leader in each village who can continue the fodder production program on their own. The binding factor for the group is now the savings collection for which they will have to meet every month. They could loan out money for productive purposes such as livestock development and for other income generation where they are involved in saving and extension work together. Farmers have

gained basic knowledge on seed collection, harvesting, storing, raising and planting out seedlings. The program could continue when the extension agent is no longer present.

Farmers' who were initially involved in NAF's agroforestry development program in Sindhupalchowk and Kavrepalanchowk were trained in selecting seed trees, seed collection and storing methods. These farmers have established Nepal Agroforestry Seed Cooperative (NAFSCOL) on a shareholding basis. Interested farmers from NAF's action areas and other districts have become shareholders of this cooperative. The cooperative has also supplied fodder and grass seed to the farmers associated with this research program so that they also have the opportunity to join and benefit from the cooperative in the future.

Problems/Challenges in relation to the Implementation of Suggested Improvements

There are a number of problems in conducting research that have come to our attention over the years. Farmers and researchers often have conflicting agendas and likewise donors who fund research and those who fund extension programmes. Some of the issues outlined below should be considered in the formulation of future research projects.

Short term vision

Farmers are not prepared to bear potential risks from their involvement in research practices. They work and cooperate if they can discern immediate benefits from the research. There is a tendency for farmers not to become involved in projects that will only result in tangible benefits after several years. Their priorities are mainly related to day to day subsistence living. This has clear implications for the potential success of research activities. Firstly, along with any research programme there should be a parallel income generation and skill development programme, particularly when the farmers will not see immediate tangible benefits from the research, which will help to augment their income and encourage their participation in the research. Research programmes must also avoid a prescriptive approach as far as possible and should have the flexibility to take account of farmers' short-term priorities.

During the research we developed a model of 20 m. demonstration plots of fodder trees and grasses on terrace bunds (Amatya and Chhetri, 2000) with specified distances between the species to be planted. Different models were proposed for each village, in consultation with the farmers involved. External to the plot area, farmers planted species raised in their home nurseries according to their own inclination, although in some instances they replicated the design of the plot. The termination of the research project came only 18 months after establishment of the trial plots, which is too soon for any reliable conclusions to be drawn about the success of the plots in terms of fodder output. The most interesting results from this research approach will come after five years or more. Field staff could then investigate the farmers' opinions regarding the success of the plots and other planted areas and which elements from the plot design, if any, they have extracted and replicated on other parts of their farmland.

Dependency

When research projects are designed in full before being presented to farmer participants, without a bottom up approach, then farmers do not develop ownership of the research and are less likely to take interest in the results, regardless of the incentives given to them to participate. Incentives of cash or infrastructure, in particular, are counterproductive as communities become accustomed to handouts and are less inclined to form their own groups and initiatives for local development. A central aim of all research work should be to reduce this culture of dependency by encouraging community-led initiatives. In this project, communities were assisted in the formation of local groups, which now operate their own micro-credit and loan schemes and organise communal purchases of improved livestock, seed and equipment. Organisation and conduction of activities was done in consultation with these groups. Intensive discussion with farmers should follow each activity and all the stakeholders should agree on what is to be done. The researcher and extension agent need to play the role of catalyst.

Research design

Research conducted in station trials can exclude external influences and produce a very basic result, which bears little relation to the field. Without the involvement of farmers the technology developed may not be suitable for any particular area as the design of the research is based on the researchers own criteria. On farm trials with the participation of farmers is the alternative, bottom up, approach for designing research projects. Farmers' local technical knowledge should be carefully considered. Any new innovations should undergo trials with the participation of farmers before being presented to them as potential improvements to their current systems. This strategy has more significance for farmers than station trials but can sometimes not be used in the production of complex technological innovations. Farmers should share responsibility for designing any trials on their own land. Increasing farmer choice and prioritisation should be given due consideration, encouraging them to take part in the discussion.

Top down prescriptive research does not take account of farmers various seasonal priorities. Because farmers have seasonal responsibility for their farm work, any research methodology must avoid clashing with this timetable. When they are not free, then they will not be able to spare the time required for proper attention to research activities. When conducting on farm trials with farmers in remote areas researchers must consider that many of them are illiterate and their methods of recalling or retaining information is not always trustworthy for providing reliable research data. Therefore such farmers need some sort of basic education in literacy or research methodology before beginning data collection with them. Alternatively, and in the case of this project, some of the responsibility for logistics and follow-up at the local level was given to partner NGOs who assisted leader farmers and their groups in organisation of project activities, collection of data and dissemination of development work.

Long term impact

Any research strategies developed for fodder tree and grass development take time to reveal any impact. Organisations engaging in research activities must explore how best to develop a long-term research and extension vision. Extension organisations providing financial and organisational support to farmers terminate their activities after the period of time specified for the project. For example, this collaborative research program ran for only 3 years. There is currently no provision for further follow up support to build on the research. However, NAF will maintain contact with the participating farmers through local partner NGOs and through possible future development work in the same areas. It is essential that contact is maintained so that the future impact of the research and development activities can be assessed. As demonstrated in the examples presented above, the impact of research work on farmers' practices and management systems is often at odds with researchers original assumptions and expectations. Farmers may find alternative applications for new technologies developed or design strategies in response to lessons learnt from research projects.

The impact of research work on farmers themselves is the most important result of our activities but there are currently very limited channels for reporting these effects back to the organisations which initiated the work. Such participatory feedback should be a central feature of extension activities to assist in reducing the current sharp distinction between research and extension work. Although research and extension are complimentary, donor-funded projects usually concentrate on one or the other. Organisations which are truly interested in complete and comprehensive results from research work should consider allowing for future provision for extension programmes to further test the strategies and feedback to future research work. Implementing agencies and others submitting project proposals should press for these provisions. Farmers who are involved in research programmes should be encouraged to feel an intrinsic part of the process of exchange of knowledge by being canvassed for their own independent opinions.

Recommendation/Lesson learned

1. Controlled grazing, and encouraging the practice of stall-feeding should be developed & agreed by the farmers group themselves. This is a successful approach, which will have a direct impact on livestock development.
2. Research should be farmer centered and compatible with their cultural practices, values and knowledge.
3. Agencies funding research should also make provision for follow up after the program is terminated include the information gleaned from such activities in the assessment of project results and impact.
4. Farmer groups should be encouraged to discuss the varied potential applications of research work in their areas, exchange ideas and share their opinions with extension agencies as a central part of the process of research development

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