BG-SRDP

# 2 Participatory Tools and Technologies in the Service of Community-based Natural Resource Management

## Introduction

Community involvement has been a leading theme in natural resource management (NRM) in the Himalayas since the early 1990s. The sustainable management of forests has been an area of especially intense support by researchers and development initiatives alike. Much of the attention in NRM development in the region has been geared towards securing the institutional sustainability of community-based natural resource management (CBNRM), setting up appropriate legislative frameworks, shaping the organisational landscape, and building the managerial capacities of civil society bodies in charge of forest management. This intense preoccupation with the political, social, and legal aspects of CBNRM has sometimes led to the neglect of the technical aspects of forest management.

GTZ has made the issue a key area of its involvement in the region. The three GTZ supported projects have devoted much of their efforts to devising and introducing a plethora of technological innovations. These pioneering initiatives have contributed to enhancing rural livelihoods and rural economies at the local level, as well as identifying policy and institutional factors that can pave the way for a shift from mere subsistence to more commercial use of forest products.

In this section, selective packages from each project/country are described briefly, taking into account the framework conditions (project setting) under which they have been developed. Some of the technologies presented here have already had an impact beyond the local level. Other approaches have yet to reach the 'scaling up' phase.

Readers are invited to scrutinise the approaches presented, to test them, to evaluate them critically, and to contribute to their further refinement.

## Advanced Technologies Offered by the GTZ Projects

### BG-SRDP in Bhutan

#### *Forest resources potential assessment*

The forest resources potential assessment (FRPA) is a combined policy and planning tool. Its dual aims are:

- to identify and assess the present potential of forest resources in Bhutan for sustainable commercial and rural timber use with special consideration of technical and economical feasibility; and

- to evaluate whether the forests of Bhutan can supply the country's wood demand in a sustainable manner.

The FRPA focuses on the present wood production capacity; it does not identify and assess the overall potential of the forest resources for forest management in the long run. As such, the results of the FRPA may not be very reliable in terms of absolute figures. Nevertheless, it provides sufficient information on the overall situation of the country's wood production potential and its relationship to overall wood demand, and makes such information available digitally, which is a major requirement for decision making related to forest policy. The assessment is based on a pre-defined land use classification, which specifies forest cover by forest type and density class. The assessment comprises five planning steps:

1. GIS analysis
2. Ground truthing
3. Calculation of production potential
4. Estimate of wood demand
5. Final analysis

The assessment covers the technical, legal, and economic potential of forest resources. It provides the basis for producing a wide selection of maps depending on the specific planning needs.

### *Forest function mapping*

Forest function mapping defines the ecological, environmental, and social functions of all forests within a particular area and, as such, allows the balancing of diverging interests of commercial logging, local forest use, and nature conservation. The mapping is based on existing information, such as land use data and other GIS (geographic information system) based information, base aerial photos, and topographic maps. For further micro-planning this information needs to be checked.

Forest functions and sub-functions need to be defined (based on legal framework conditions) as, for example, protected areas (nature, wildlife, biodiversity, watershed, and others), religious areas, areas used for social functions, and local use areas. Each area has its own management restrictions on commercial and local use, which can overlap. This mapping exercise yields a map indicating the important functions and is used by planners to make rough calculations for things like commercial production areas.

### *Forest management planning system*

The forest management planning system developed in Bhutan has the objective of managing the rural allocation of timber in a sustainable way. The system is simple and practical enough to be implemented with minimal equipment and human resources. As such, it can be implemented immediately with existing human and technical resources after some training.

The key aspects of the management planning system include:

- simple and practical;
- can be adjusted to the capacity and technical knowledge of the field staff and therefore requires low training inputs;
- minimal time required for management planning;
- only information that is actually required at the implementation level is collected; and
- the approach is participatory (from rural supply to participatory forest management).

The approach used in the forest management planning system can be summarised in four parts:

1. **Compartmentalisation –** Identification of village intervention zones, protection zones, and manageable units
2. **Forest resources assessment –** Assessment of the resource condition, current use(s) of the resource, and its production potential
3. **Forest management planning –** Assessment of supply and demand, checking sustainability, and decisions on management options
4. **Forest management plan –** Compartment register, forest management map, and monitoring sheets

### *Community forestry manual*

A community forestry planning manual has been prepared in Bhutan for use by forest rangers. A Microsoft Excel-based program is available for data analysis and templates have been designed for the forest management plan. In collaboration with the Social Forestry Division, the Wang Watershed Management Project of the European Union, and the Participatory Forest Management Project (Helvetas/Swiss Development Cooperation), BG-SRDP has contributed significantly to Bhutan's community forestry manual with the four parts on

- Initiating Community Forestry,
- Community Forest Management Planning,
- Silvicultural Options for Community Forestry, and
- Record Keeping and Institutional Strengthening for Community Forestry Management Groups.

This manual guides extension agents step-by-step through the processes needed to establish community forestry.

### *Forest management unit planning*

In collaboration with the Forest Resources Development Division and the Wang Watershed Management Project, BG-SRDP has significantly contributed to the Forest Management Planning Code of Bhutan. The project took the lead in forest function mapping (see above) and also in conducting a socioeconomic study and environmental impact assessment for the forest management unit.

## IGCEDP in India

### *The community forest package*

IGCEDP has proactively contributed to the shaping of state forest sector reform in Himachal Pradesh, India through introducing and testing new innovations and ideas. The key lessons from IGCEDP's involvement in the promotion of community forestry in Changar are as follows:

- Only if there is general consensus in a village can community forest areas be declared.
- The selection of areas and plant species for afforestation must to be done according to the site characteristics. It is equally important to involve local users in the design of plantations after assessing the demands and requirements of the community.
- Village forest communities need to be fully registered as village forest development societies (VFDSs) under the Indian Societies Act, 1860; a Memorandum of Agreement with the Forest Department is required.
- Institutional sustainability is high if usufruct related benefit-sharing mechanisms, rules, and regulations are designed by the community itself.
- A VFDS has first to demonstrate its willingness to protect and manage the forest. Only then can it sign a Memorandum of Agreement with the local Forest Department, according to the Himachal Pradesh Participatory Forest Management Guidelines 2001.

### *Community forest technical management*

The IGCEDP does not see community forestry as a one-off activity. Rather, it incorporates community forestry into the overall watershed management approach based on delivering goods and services to the local watershed community. Technical packages are set out in each community forest management plan (as a component of the holistic watershed plan) with a few attached documents (e.g., a plantation journal containing elaborate details of interventions based on participatory monitoring and treatment/use applied to plantations) and future tasks.

Technical management packages are prepared and provided for the following tasks:

- Establishment of a village forest development society
- Identification of potential community forest areas and selection of species, jointly with on-site users, which are categorised according to the pedo-ecological status of the area (e.g., soil type, and vegetation/degradation status)
- Identification of livelihood-based activities linked to forestry; and selection of the package of species and areas accordingly (group formation and training is a separate task)
- Participation (in kind or cash) of the VFDS in plantation work and management
- Technical treatment beginning in year three, including pruning and tending of natural regeneration
- Training of local communities and Forest Department staff in all aspects of forest management

The details governing the implementation of technical management packages are clarified in the Memorandum of Agreement between the Forest Department and the VFDS. This document also provides details of technical backstopping and other facilitative tasks that are part of forest management packages.

### *Village forest development societies*

Through its involvement in establishing village forest development societies, IGCEDP has learnt that the formation of a group and the training of its members are two separate tasks.

It was also learned that the identification of areas for reforestation and the selection of species have to be done jointly with users on-site. Species have to be chosen according to the soil type and the extent of degradation.

Other important lessons include the following:

- The VFDS must make substantial contributions to plantation work and the management of sites. Depending on the capacity of the specific society, these contributions can be made in cash or in kind.
- Technical treatment such as pruning and tending of natural regeneration must be done by the VFDS starting in year three after establishment.
- Local communities and Forest Department staff need to be trained in all aspects of forest management.
- A Memorandum of Agreement has to be negotiated between the Forest Department and each VFDS and must detail the technical backstopping and other facilitative tasks to be performed by each side.
- To ensure effective impact monitoring, sample sites need to be established in plantations and the staff and local communities (VFDSs) must undergo participatory monitoring training. Annual monitoring should cover the growth of trees, biodiversity (e.g., number of new species) grass production, recharging of water in spring heads, and water flow and silt load of rivers and the damage they cause. To compile data, updates can be taken from the plantation journals. Monitoring has to be endorsed in meetings with the users concerned.

### *Evolving the concept of participatory integrated watershed management adapted to mountain scenarios*

Mobilisers and local technical innovators play a decisive role when it comes to the evolution of the concept of participatory integrated watershed management as adapted to Himachal Pradesh's mountain scenario.

Working on sustainable natural resource management with grass roots people, panchayats (as units of local governance), and development agencies, can effect improvements in community forest management, farming, and water resource development and management, as well as eco-income generation based on the improvement of local livelihoods.

Harmonisation of the panchayat micro-plan with all other watershed development related components has, for the first time, brought natural resource management under the decentralised planning done by panchayats. Forestry and natural resource-based livelihoods form an integral part of such plans. Moreover, it was established that holistic plans can be developed through participatory approaches, and replicated and scaled up by other implementing agencies.

## ChFDP in Nepal

### *Participatory forest inventory*

Participatory forest inventories are carried out in community forests by members of forest user groups in order to assess the quantity and quality of their forest resources. Such assessments are an essential step in forest management plan preparation and/or revision. The methodology for the inventory has been developed applying both forest sciences and local knowledge. It also includes the participatory use of a global positioning system (GPS) for boundary surveys.

The application of GPS has helped to increase the transparency of forest management planning and implementation. The volume, dimensions, and species of both timber and non-timber forest products (NTFP) are assessed jointly with the villagers. The inventory includes regeneration and biodiversity status. The project's experience in the application of participatory forest inventories (together with other forestry projects) is being shared with experts at the Department of Forest; this contributed to the revision of the inventory guidelines in April 2004.

Participatory forest inventories help local communities and facilitators to prepare a sustainable management plan. This plan includes protection, tending, and a utilisation scheme for the forest. In a strict statistical sense, the approach and the estimates it yields are not fully sound. But it is a simple, quick, and participatory procedure with results that are sufficiently accurate for the rough-and-tumble of forest management in the Churia hills.

### *Community forest management demonstration programme:*

The ChFDP initiated the Community Forest Management Demonstration Programme (CFMDP) in 2002 to address typical second-generation issues of community forestry: sustainable livelihoods, good resource governance, and active local participation in forest management in community forests. Designed as a participatory action research programme, CFMDP aims to develop and promote forest management practices that are socially just, economically sustainable, and ecologically sound. A total of 11 representative CFUGs in the project area were selected for this scheme for intensive post-handover support.

Special attention is given, not only to active forest management, but also to group management for institutional development. There are several benefits:

- The active participation of users helps preserve the forest and increases its production rate.

- Permanent sampling plots are established for a dynamic inventory, which helps to determine the forest growth rate.
- By improving group management, users receive the optimum benefit from forest products.
- Forest users and the staff of other stakeholders (such as district forest offices and NGOs) increase their practical experience in forest management.

While the approach is intensive and time consuming, it has increased the sense of ownership by the local people in forest management.

### *Individual plot distribution in community forestry*

Under this wholly new approach to the management of common resources, relatively open forest land is distributed as individual plots to comparatively poor members of the community.

Both common and individual resource management principles are applied. For example, in the case of tree resources, ownership and decision-making power remains with the whole group. However, in the case of non-timber forest products, such as grass, fodder, bamboo, medicinal plants, fruit trees, and sabe grass, plot owners can decide as per their individual interests or needs. The former supports community bonding, whereas the latter serves the freedom of individuals in forest management and thus increases motivation.

The scheme is designed to benefit the poorer members of forest user groups who have less access to natural resources (forests) to support their livelihoods. However, attention is needed to monitor possible imbalances between individual and common resource management regimes. The scheme has proven highly effective for poverty reduction by producing more grass, fodder, and other forest products, thus improving animal husbandry. The scheme has also brought neglected, often barren, land back into an active protection and management, thus securing its preservation as forest land.

### *Participatory assessment of biodiversity monitoring*

The contribution to biodiversity conservation in Nepal has often been praised. But how much does community forestry really contribute to biodiversity protection? Local users can now directly monitor the nexus between forest conservation and management, and biodiversity in their forests.

Using participatory assessment of biodiversity monitoring, selected and specially trained local forest users are monitoring indicator bird species to assess their community forest's health, and thus evaluate the biodiversity of the forest. This bird watching makes the concept of biodiversity tangible, a concept that otherwise often remains little understood by local users.

Forest users apply this methodology on their own. The accuracy and reliability of information produced is remarkable, as users visit their forests frequently and detect even small changes. Participatory biodiversity monitoring is also very cost effective because it builds on the participation of local users to collect the information required to

assess the status of biodiversity. For the analysis of information, however, an experienced person is required.

ChFDP has carried out this programme in collaboration with local users, the Central Committee of the Federation of Community Forest Users, Nepal (FECOFUN), Bird Conservation of Nepal (BCN), and the Livelihoods and Forestry Programme of the UK Department for International Development.

### *Conservation ponds*

This technology consists of collecting and storing surface run-off water from upstream in an artificial pond for a variety of uses. For the system to work, a gentle slope is required. A dam is raised at the converging point (lower part) of a catchment area with a concrete structure as an overflow, which also serves as a regulatory outlet.

Conservation ponds have a number of benefits: they reduce soil erosion by controlling surface run-off and floods (hence the term 'conservation pond'), they store water for irrigation, provide ponds for rearing fish, and constitute a source of drinking water for wildlife.

A major constraint is that the ponds can only be established in specific geographical settings. Furthermore, continuous maintenance is required to prevent silt from filling the ponds.

### *Distant user group approach*

The distant user group approach is a specific form of community forestry that has been applied in the ChFDP project area to address the imbalance in the distribution of (forest) resources.

Generally, user groups living in the vicinity of forests have the easiest access to forest use, and are thus at an advantage. Under the distant user group approach, people living up to 10-12 kilometres away from the forest edge form user groups to take management responsibility for the inner Churia forest.

Distant users clearly benefit from this. To further expand the approach, more users (those living even further away from the forest) need to be brought on board. For this, appropriate mechanisms have to be devised to secure a fair balance between inputs and the benefits received by far distant users from the forests.

This approach can be applied in all parts of the Terai, the Terai/Churia interface, and even in higher altitude forests where forest is not evenly distributed over the area.

### *Integrated natural resource management approach*

The integrated planning process of natural resource stakeholders applied by ChFDP since 2000 covers geographical areas that stretch well beyond the forest lands and their immediate vicinities. As such, the approach goes beyond the traditional approach

of foresters who see themselves as confined to those stretches of land registered as 'forest'. Integrated natural resource management (INRM) takes a wider perspective.

This framework for planning brings together upstream and downstream dwellers and helps them to devise a joint agreement for the use of forest resources based on the individual inputs and benefits provided by each of the stakeholders. The agreements are laid down in land use plans covering the totality of the watershed. Forest management is only one element of these plans, but it serves as a focal point for problem analysis and the resulting joint planning. This approach has been applied in the four model watershed areas of Rampur Toksila, Sarre Valley, Hadiya, and the Khando river catchment.

With INRM, local users have learned to clearly spell out their claims and expectations regarding the benefits of natural resources. The intensive work with stakeholders has not only helped to reduce conflicts between groups of regional stakeholders, but has often led to the resolution of inner group conflicts too.

## A Glance at Some Unresolved Issues

Despite the successes, there are still some unresolved issues.

### Bhutan

Initially, many activities carried out by the BG-SRDP project and its partners were heavily subsidised. These activities now need to be scaled up. In doing so, the following issues will require specific attention.

- The integration of community forestry and the management of rural wood supply areas
- The management, processing, and marketing of NTFPs
- The role of women in decision-making bodies at the rural level

### India

Community forestry has proven instrumental in improving conservation and even livelihood options at the village level. But slow policy reforms and programme development, and control barriers in the Forest Department, are hindrances. The linkage of natural resource based plans to the overall panchayat micro-plans promises a faster reform process when it comes to decentralised resource governance.

Similarly, the problems of fire, grazing, and wildlife will have to be settled to ensure that the best use is made of the potential of community forestry. In the long run the Forest Department must promote the enabling regulatory framework for co-management; otherwise, it might discourage the enthusiasm of local users for economic activity.

### Nepal

The district level coordination of forest-related planning and implementation is a touchstone of the sustainability of the participatory management of natural resources and its successful technical implementation.

Of no lesser importance are the financial mechanisms that have to be in place to fund forest management planning and to secure economic sustainability by balancing regional differences in perceptions, needs, and commitments. The difference is particularly in physical wealth and forest resource availability. The north has rainfed farming, poor economic status, and low food security, but more access to forest; and the south has good quality land, food security, relatively higher income, but negligible access to forest land.

By integrating forest management and its planning into the formal systems of regional development planning, the effectiveness of technological solutions can be increased considerably.

## Policy Implications and Recommendations

All the above policy impacts through good tools and technologies could only be achieved through intensive field experience and ground work. The implications and recommendations are summarised here.

1. **Beyond the research intervention divide** – Rather than conforming to conventional development aid projects of either a 'research' or 'interventionist' nature, both approaches should be combined in research-action programmes. Successful systems for technological innovations are those that have scope for adaptation in response to changing social, economic, and political circumstances.
2. **Technological packages are not durable in themselves; but the ability to learn and improve is there to last** – Continuous change in institutions and in natural and economic environments is a reality. Continuous learning is, therefore, a necessity and provides a more durable output than technological fixes. Inbuilt information and knowledge management systems with appropriate (i.e., widely accessible) forums for dissemination have been found to be a vital base for the scaling up and extension of communal forest management.
3. **Developing inter-agency and inter-sectoral linkages** – Linkages between the forestry sector (including community forestry, joint forest management, and sustainable forest management) and enterprise development agencies are still poor. Consequently, skills necessary for managing commercial forest-based enterprises are not yet well developed. Capacity building is an ongoing task that needs intensive institutional backup. Furthermore, a stronger integration is required between the forestry sector and other sectors to promote forest-based enterprises.
4. **Formalising and promoting partnerships** – Viable cooperation between governments, community forest user groups, and the private sector has yet to be formalised and built up through public-private partnerships.

All of these approaches need to be made inclusive so that resource poor people and women can proactively join in, and benefit from, such ventures.