

# ADDRESSING SUSTAINABLE LIVELIHOODS IN RURAL SIKKIM

Experiences with  
Participatory Technology  
Development  
in Ginger Cultivation

INDO-SWISS PROJECT SIKKIM



inter  
cooperation

Natural Resource Management  
Rural Economy  
Local Governance and Civil Society





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Indo-Swiss Project Sikkim



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## Abbreviations and Acronyms

ARD	Adaptive Research Demonstration
CBO	Community Based Organisation
FAO	Food and Agriculture Organisation of the United Nations
FFS	Farmer Field School
FPR	Farmer Participatory Research
GoI	Government of India
GoS	Government of Sikkim
GTZ	Deutsche Gesellschaft fuer Technische Zusammenarbeit
HCCDD	Horticulture and Cash Crop Development Department
IC	Intercooperation
ICAR	Indian Council of Agricultural Research
ISPS	Indo–Swiss Project Sikkim
ISPWDK	Indo–Swiss Participatory Watershed Development Project Karnataka
NGO	Non Governmental Organisation
PTD	Participatory Technology Development
SDC	Swiss Agency for Development and Cooperation
T & V	Training and Visit
ToT	Transfer of Technology



This publication, prepared by Matthias Boss, Kameshwar Rao, Dilip Chinnakonda and Nawraj Gurung, is the result of a combined effort. It is based mainly on surveys, meetings with different stakeholders, case studies and review of relevant literature.

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It is a pleasure to present this document in the 'Intercooperation India' series of publications. This document is part of our effort towards consolidating and sharing experiences from Intercooperation's work in the development sector in India. Documentation has always been an important part of our work, but now, with the current phase of several projects coming to an end, it is important for us to reflect on our experiences, analyse, introspect and share our findings with a larger group, aspects that could be useful in the onerous task of poverty reduction in India.

This document deals with a small intervention in the state of Sikkim where the Swiss Agency for Development and Cooperation was the first international donor agency to be invited in 1993, with Intercooperation as its project management partner. The Participatory Technology Development (PTD) process symbolizes several of Intercooperation's own values - empowerment, mutual trust, respect for diversity (in opinions, knowledge, practices, cultures), ethical practices and being people-centred.

Through an intervention that started on a small scale in five villages, quickly spreading to 17 and contributing to a change in the mindset of all collaborators, the Indo-Swiss Project Sikkim (ISPS) has been able to demonstrate that a group-based approach that empowers farmers, can also be very helpful for government extension workers and the state economy.

Ginger is one of the two important cash crops in Sikkim, cardamom being the other. However, frequent pest attacks, resistance to pesticides and non-scientific application of pest control methods, led to frequent and extensive crop losses. The horticulture extension system was inadequate to meet the information needs of farmers with one extension worker for every thousand farmers. A group-based approach where farmers are encouraged to experiment, share their learning with extension workers as well as research institutions, changes the direction of information flow from top down to more horizontal exchanges wherein technical institutions start responding to the information demands placed on them by the farmers.

PTD promotes the spirit of scientific experimentation among farmers, encourages collective learning and empowers some risk-taking through the formation of self-help groups. The extension staff finds it easier to reach several farmers and also gains from their experiential learning. This is in contrast to traditional systems where results from experimentation in research stations are transmitted to farmers in the fields. In PTD, both the experimentation and the technology transfer occur in real-life field conditions that are much more complex.

This kind of an approach is enriching for all parties involved and leads to real progress.

I hope you find this document useful and it makes a small contribution to the on-going quest for greater effectiveness and efficiency in development work.

**Rupa Mukerji**  
Delegate – Intercooperation India  
October 2005



This publication describes the process and the experience of introducing the concept of Participatory Technology Development (PTD) for ginger cultivation in the small eastern Indian Himalayan state of Sikkim. It highlights the strengths and the weaknesses of this process in a state accustomed to top-down extension methods and decision-making, and outlines some lessons to make the project replicable.

Ginger is one of the main cash crops for small-holder farmers in Sikkim. In recent years, however, pests and diseases have forced yields to drop, posing a serious economic problem to farmers dependant on the crop. The bilateral Indo-Swiss Project Sikkim, managed by Intercooperation, supported the introduction of the PTD concept for ginger cultivation in Sikkim to tackle this crisis.

The project had had six years of experience of working with the Horticulture and Cash Crop Development Department in ginger pest management prior to introducing the new concept. During these six years the Department had gained insight on issues related to ginger pest management and some experiences on participatory extension concepts. However, it was still predominantly following the top-down extension approach of Transfer of Technology (ToT).

The PTD programme, introduced in 2002 / 2003 on a pilot basis in five villages and extended later to a total of 17 villages, is based on an intense collaboration among farmers, Department officers and scientists. However, in a departure from the previous module, this programme offered a central role to ginger farmers in developing technologies appropriate to their specific situation. Even adopting this extension concept for a pilot project signifies a paradigm shift for the Department in serving the farmers.


The pivot of the programme was a management structure that involved regular meetings of the concerned stakeholders at ginger farmer Self Help Groups (SHGs), district and state levels. At the introductory stage, it followed a number of steps. These included, for instance, selecting the geographical area, organising the PTD ginger farmers into SHGs, designing trials, evaluating the experiments and up-scaling the programme.

The results, after less than three years of implementing the PTD programme, are encouraging. Cultivation practices in ginger have improved significantly resulting in an increase in yield. The technical know-how and social skills the farmers have gained, have made them capable of making informed choices on issues of cultivation practices and input procurement as well as of seeing the benefits of working in groups to improve individual livelihood. Perceptions of scientists and Department officers regarding the capacity of farmers to conduct research have changed considerably. The PTD programme has indirectly also addressed issues related to decentralisation and fighting discrimination.

Positive factors for introducing the PTD programme in Sikkim have been the prepared environment, the relevance of the crop chosen and the positive collaboration between all involved stakeholders.

On the flip side, the programme depended too much on scientific support from outside the state. Moreover, the capacity of NGOs managing social aspects of the programme like organising SHGs was over-estimated and insufficient consideration was given to its ability to sustain itself.

However, overall, the experience of introducing the PTD concept in ginger cultivation in Sikkim offers a number of lessons. These include, among others, the importance of a multi-stakeholder approach involving farmers, scientists and Department officers to tackle problems faced by farmers. The collaboration of these stakeholders not only helps address issues of ginger pest management but can also lead to changes in attitude and perception of all involved.



Further, the benefits of using a group approach in agricultural extension programmes have become apparent. This programme drove home the point that participatory extension methods are more suitable for small-holder farming communities with diverse problems rather than the erstwhile top-down approach.

The PTD programme has also shown that if farmers are empowered with knowledge and skills, they can take control of their own problems, which results in a shift of power from extension agencies to farmers.

Perhaps the most crucial lesson learnt is that a well-set management structure is crucial for the introduction of a PTD programme and its sustenance.

In the early 1990s, the Government of Sikkim requested the Swiss Government to support the state in natural resource management. Based on this request, the Swiss Agency for Development and Cooperation (SDC) entered into a collaboration with the Government of Sikkim through the Indo-Swiss Project Sikkim (ISPS) in 1993. The mandate to support this project was given to the Switzerland-based development foundation, Intercooperation (IC). The project aims at improving the livelihood of small and marginal farming households in rural Sikkim through efficient and sustainable use of natural resources and promoting the forces of self-governance through empowerment.

Ginger is one of the most important horticulture products in the state (Lama M.P., 2001:52). For small holding farmers in Sikkim, ginger is the most important cash crop. In recent years, pests and diseases have spread, reducing yield and affecting the economy of small farmers severely.

The project, therefore, aims among other things (see box 1), to strengthen the small and marginal farmers' capacities to improve productivity of ginger through control of pests and diseases.

Research Demonstration (ARD)<sup>1</sup>.

Based on the earlier experiences, a new extension and research approach called Participatory Technology Development (PTD) was introduced in 2002. This approach involves a range of stakeholders to address the low productivity of ginger in Sikkim.

The objective of this publication is to present the PTD procedures employed in ISPS as an instrument for projects involved in agricultural extension and research by:

- ❖ describing the experiences made
- ❖ evaluating these experiences and
- ❖ drawing conclusions.

The conclusions drawn here are pertinent to a particular situation. Nevertheless, they are relevant to any other agricultural extension and research development project in similar circumstances.

The first part of this publication describes the background of the project and the conditions in which it operates (chapter 2). In chapter 3, an overview is given regarding participatory extension and research methodologies in development projects. In chapter 4, the prevailing research and extension approach in Sikkim is described. In the second part, the PTD

### Overall Goal of the Indo Swiss Project, Sikkim

The project aims at improving the livelihood of small and marginal farming households in rural Sikkim through efficient and sustainable use of natural resources and promoting self-governance through empowerment. The project has the following components:

- Human, institutional and organisational development
- Animal husbandry and dairying
- Horticulture
- Local governance and Panchayati Raj

Source: Indo-Swiss Project Sikkim, 2001a

During the initial stages of the project, a research programme was set up to identify ginger diseases and to develop technologies to tackle them. Some of the technologies developed by scientists during this period were transferred with some success to farmers by means of Adaptive

process and the experiences gained from it in Sikkim are elaborated (chapter 5 and 6). In the last part of this publication, the experiences are analysed (chapter 7) and lessons, which were drawn from the experiences, are described (chapter 8).

<sup>1</sup> The Adaptive Research Demonstration approach was developed by ISPS. It involves a participatory process through which research results and local knowledge are combined and taken as a basis for conducting experiments. Farmers choose options from available research results and from indigenous knowledge and carry out experiments in their fields (ISPS, 2001b:1).

## 2.1 The environment

Surrounded by Nepal in the west, Tibet in the north and Bhutan in the east, Sikkim forms part of the Eastern Himalayas. Due to the mountainous location, only 16 per cent of a total surface area of 7,096 square kilometres is under cultivation. Even there, the natural conditions for agricultural production are difficult due to the steep terrain and high precipitation. Nevertheless, 75 per cent of Sikkim's mixed ethnic population (540,493 according to the 2001 census) depends on subsistence-oriented agriculture on small holdings. On the steep slopes, a multitude of staple crops - mainly cereals - and cash crops - mainly cardamom, ginger and orange - are cultivated. Most rural households keep cattle and poultry and many families rear a few goats or pigs. Crop husbandry, animal husbandry and silviculture, are closely linked. An increasing cropping intensity and a trend to concentrate more on cash crops, are some indicators that the farming system is in a period of transition towards a more commercialised production (Schmidt P., 1995:14).

Poverty is widespread, especially in the rural areas. Sikkim has the fourth-highest incidence of poverty in the country with 57 per cent of rural families below the poverty line (Lama M.P., 2001:15). Keeping in view the weak fiscal base of the state, the Government of India provides Sikkim with

heavy financial assistance.

The Government of Sikkim is active in all sectors of economic development. In its publication, "Sikkim, The People's Vision" it suggests promoting horticultural produce like ginger to improve the livelihood of the people (Lahiri A.K. et al., 2001:15-19). Ginger is, indeed, one of the most important cash crops in Sikkim, particularly for small holding farmers.

However, in recent years, as mentioned above, pests such as white grub and diseases like bacterial wilt, soft rot and dry rot have spread in the state, reducing yields.

Pests and diseases are often the reason small holder farmers are wary of expanding the area of cultivation. In some cases, the problem is so severe, that some, often marginal farmers, stop cultivating ginger<sup>2</sup> since they cannot afford losses. This obviously affects the economy of poor farmers severely.

The Horticulture and Cash Crop Development Department (HCCDD) has the mandate to improve the cultivation of cash crops in the state. Apart from providing input material such as seeds and fertilisers, the Department is also involved in providing extension services and disseminating research results to the farmers. Supporting farmers in ginger cultivation is, hence, an important part of the Department's work.

### Major Diseases and Pests Affecting Ginger in Sikkim

	<i>Scientific name</i>	<i>Nepali name</i>
White Grub	<i>Holotrichia Spp.</i>	<i>Khumlay Kira</i>
Bacterial Wilt	<i>Ralstonia Solanacearum</i>	<i>Dhuday/Oileenay Rog</i>
Soft Rot	<i>Pythium Spp.</i>	<i>Pahaylay Rog</i>
Dry Rot	<i>Pratylenchus Coffeae</i>	<i>Sukha/Daagi Rog</i>

<sup>2</sup> Despite the incidence of pests and diseases, the overall production of ginger has increased in the state. This is due to medium and large growers expanding their area of cultivation and in some places, small farmers starting to grow ginger again after they had given it up for some time.

## 2.2 The project

Based on the request of the Government of Sikkim, the bilateral Indo–Swiss Project Sikkim started with a project pre-phase in October 1993. The 30-month pre-phase generated a sound data base for the project, which was shared among the partners, and helped to jointly identify possible interventions for the main phases of the project (Schmidt P., 1995:5). One outcome of the pre-phase was the insight that, a substantial contribution to the livelihood of small farming households could be made by addressing cultivation practices in ginger. Hence, the Department of Horticulture (now called Horticulture and Cash Crop Development Department) was made a partner for the project implementation phases.

During the first phase of the project (1996-1999), the focus was on establishing

research capacities in the area of ginger diseases and building extension capacities within the Department of Horticulture.

In the second phase (1999-2002) while the focus on basic research continued, there was a move away from the traditional extension methodology<sup>3</sup> to a more participatory approach called Adaptive Research Demonstration (see explanation above). Although this approach had all the necessary elements of involving the farmers in technology development and adoption, it was lacking a systematic approach. Hence, the project looked for a more established extension method, which could take the process further. The method was found in Participatory Technology Development (PTD). Beginning with the third project phase (2002 – 2006), this method was adopted and has been applied in selected villages in the state.

<sup>3</sup> The traditional extension methodology referred to here is Transfer of Technology. It is explained further on in the document.

Extension is a key aspect in the agriculture sector. It operates within a broader knowledge system that includes research and agricultural education. The aim of agricultural extension is to transfer ideas and technologies to farmers. Extension generally implies a one-way transfer of knowledge from the outsider to the insider. However, in participatory approaches, extension is defined as a two-way communication of knowledge (Rivera W.M. 2001:7).

The prevailing extension system in India, including Sikkim, is mostly based on a one-way and top-down Transfer of Technology

(ToT) approach. The system is roughly based on the Training and Visit<sup>4</sup> concept, which was introduced in India in 1979 and has been adopted in some form by most states.

This approach has shown quick production increases in homogeneous conditions in cotton, rice and wheat in India. However, when the approach was introduced in rain-fed environments like Sikkim, where farmers cultivate crops under a great variety of conditions, it failed. This is mainly because it is not wise to offer standardised technological solutions to a heterogeneous group of farmers who suffer

from a diverse range of problems. Its top-down uniform approach also leaves little possibility for participation and initiative, both for farmers and village extension workers, leading to disinterested farmers and de-motivated extension workers. It is mainly because of these reasons that the World Bank abandoned the Training and Visit approach, after promoting it until the mid-1990s (GTZ).

Instead of top-down delivery of scientific knowledge, a participatory approach to clarify farmers' questions and to involve them in the whole extension and research process has been found more effective. Hence,

participatory agricultural extension methods are now seen as more appropriate to improve cultivation practices of farmers. This is true in particular for small holding farmers.

Participatory agricultural extension consists of a basket of approaches to extension that involve "outsider" facilitators working closely with local communities. The farmers take on more active, participatory roles than in conventional extension. Many of the approaches described in the following sections and elsewhere in this publication, are parts of this approach; they can be selected, mixed and adapted as necessary



*Sharing among scientists, Department officers and farmers at Senti*

<sup>4</sup> The Training and Visit (T&V) system is an extension management system that was developed for the World Bank by Daniel Benor (Benor and Harrison, 1977) and was promoted by the Bank between 1975 and 1995. It was aimed at upgrading the technical content of field extension activities. The idea was to increase the efficacy of agricultural extension services through comprehensively structured training, delivery and administrative systems. In the approach, "proven agricultural practices," usually from international and national research centres, are translated into packages of practice recommendations. These are then passed down the extension organisation's hierarchy, right down to the village-level extension workers. The latter then pass the recommendations to contact farmers, who diffuse them to other farmers (Hanyani-Mlambo B.T. 2002:4)



to suit a particular situation.

Participatory extension is best used with smallholder farming communities. They are encouraged to identify their agricultural problems, prioritise them and seek solutions. Participatory extension aims to strengthen the community's ability to carry out these activities with limited assistance.

Some of the established participatory extension and research approaches are described below.

### **Farmer Field School**

The Farmer Field School (FFS) approach was developed by the Food and Agriculture Organisation of the United Nations (FAO).

It is a form of adult education that evolved from the concept that farmers learn optimally from field observation and experimentation, and was first introduced in Indonesia in 1989. In regular sessions from planting till harvest, groups of farmers observe and discuss the dynamics of the crop's ecosystem. Simple experimentation helps farmers further improve their understanding of functional relationships. In this cyclical learning process, farmers develop the expertise that enables them to make their own crop management decisions (van den Berg H. 2004:4). Elements of the FFS concept were applied in the Adaptive Research Development approach and are also currently part of the Participatory Technology Development concept in Sikkim, as well as other programmes in India managed by Intercooperation, like ISPWDK.

### **Farmer Participatory Research**

Farmer Participatory Research (FPR) has been developed by scientists and

researchers. It involves encouraging farmers to engage in experiments in their own fields so that they can learn, adopt and spread new technologies to other farmers. Scientists act as facilitators and work closely with farmers from initial design of the research project to data gathering, analysis, final conclusions, and follow-up actions. The main advantage of this approach is that farmers "learn by doing" and decision rules are modified on the basis of direct experience. In this approach, it is still the scientists who control the research process. FPR is very closely related to Participatory Technology Development, and hence, most elements of it can also be found in the approach presently applied with selected ginger farmers in Sikkim.

### **Participatory Technology Development**

Participatory Technology Development, or PTD, was developed by field practitioners. It is an approach that gives a central role to farmers in developing agricultural technologies that are appropriate to their particular situation. It is a practical process: farmers, as "insiders", bring their knowledge and practical abilities to test technologies, and interact with researchers and extension workers - the "outsiders".

In this way, farmers and the outside facilitators are able to identify, develop, test and apply new technologies and practices. PTD seeks to reinforce the existing knowledge, creativity and experimental capacity of farmers, and to help them keep control over the process of generating innovations (IIRR 1998:24).

#### 4.1 Introduction

It is important to understand the present extension practices and its agent in the state, in order to appreciate the environment into which the new concept of Participatory Technology Development has been introduced.

The Horticulture and Cash Crop Development Department has the mandate to improve horticulture and cash crops in the state. It is the only extension agency for horticulture crops in Sikkim. As mentioned, it mainly applies a Transfer of Technology (ToT) concept, following an adapted Training & Visit approach in providing extension services. At the field level, the Department performs its extension functions through the district horticulture offices located in each of the four districts. The Horticulture Inspector and the Field Man supported by the Horticulture Officer, are grassroot technicians. They are in direct contact with the farmers and are responsible for the implementation of most activities.

The present role of the Department in extension was analysed<sup>5</sup> through interviews with farmers, Department officers, field visits and review of documents.

#### 4.2 Prime focus of the Department: Input supply

The Department has the responsibility to supply quality inputs to selected farmers in the state. These inputs include seeds, fertilisers and pesticides. The Department's vast network of Horticulture Inspectors and Field Men at the village level, distribute inputs like seeds, fertilisers and pesticides to a large number of farmers.

The input supply does not always take into account the individual needs of the

farmers. At times, farmers are supplied with seeds of crops they do not intend to grow, and with fertilisers for which they have no use. Furthermore, it is noted that especially in the case of ginger, the quality of seeds supplied<sup>6</sup> are not always disease-free, which can cause a lot of problems to the farmers. Finally, the increase in demand for input supply has resulted in the Department facing problems in delivering the same to the selected farmers on time.

Although a lot of small holding farmers profit from the input supplied by the Department, this system runs the risk of making and keeping farmers dependent on the Department.

#### 4.3 Selection of farmers

Traditionally, political leaders such as Members of the Legislative Assembly (MLA), and officers of the Department selected farmers who were to be supplied with inputs from the Department.

However, these days, with the decentralisation process and the greater role assigned to the local governments, the Gram Panchayats play a more prominent role in selecting beneficiaries.



*Village meeting (Gram Sabha) in process.  
In such meetings among other things  
beneficiaries are selected*

<sup>5</sup> The methodology used for obtaining the data included a one-day workshop with 15 farmers from the East and South District and one with the Joint Directors and Deputy Directors from the East District, HCCDD. After field visits to villages in the east and south District, an interview with the Secretary of the Department helped verify data and gain insight into policy matters.

<sup>6</sup> The Department has set up a ginger seed monitoring programme with the support of the Indo-Swiss Project Sikkim. The programme aims at improving the quality of the seeds and ensuring disease-free seed distribution to farmers.

#### 4.4 Technical services, demonstration and research linkages

The interaction between the Department's field officers and farmers is limited. This can be seen from the fact that a lot of farmers do not know the Department officers assigned to their village, let alone their role and the services that they are meant to deliver. Hence, farmers in many cases do not know what to expect from the Department except for inputs like seeds.

The Department organises regular exposure visits for farmers to learn about cultivation practices. Furthermore, new varieties are demonstrated in farmers' fields. The Department prefers mostly roadside plots for such demonstrations because of easy access.

Research support from research institutions to the Department and to farmers may be considered as weak. One reason for this is the absence of state research institutions, which are present in most other states in the form of agricultural universities. The only agricultural research institution in the state is the Indian Centre of Agricultural Research (ICAR) station in Gangtok, which does not have strong linkages with the Department.

There are also no strong affiliations with other national research institutes in the country, and wherever there are, the role of the Department is confined to conducting on-farm trials to screen suitable crop varieties for the local climatic environment. Hence, it is evident that the research – extension linkage is weak in the state.

#### 4.5 Training programmes

The Department follows the human resource development policy of the central

government. According to this policy, all concerned Department officers and farmers have to receive training before a new scheme or a new technology is introduced. The Department officers are sent to relevant research centres like the Citrus Research Station and the Spices Research Institute. They are expected to train farmers after they have undergone training.

This policy and the concept of multi-level cascading training are in place. However, the translation of the lessons learnt into practice at the level of Department officers and farmers, seems to happen only to a limited extent<sup>7</sup>.

#### 4.6 Information dissemination

Information outlining about improved cultivation practices are produced by the head office of the Department. The field officers disseminate this information to farmers. However, farmers indicate that the information received is often of little value to them. This could be the case because, to a large extent, neither field officers nor farmers are involved in producing the information material.

#### 4.7 Systems and procedures

There is a monitoring wing in the Department, to monitor programme implementation. Furthermore, monthly review meetings are conducted at district and state level to oversee programme implementation.

In the Department, programme planning is done at the head office without involving field officers let alone farmers. Earlier, some attempts were made to follow the state government's directives in bottom-up planning but this has not met with much success.

<sup>7</sup> Initial success of the training programmes is evident. However, since it is a one-way approach of training, sustaining the initial success becomes difficult once new problems and issues arise. This is because of insufficient forward and backward linkages.

### 5.1 Introduction

The Horticulture and Cash Crop Development Department has recognised some of its limitations regarding extension and research. This is one of the reasons why it is collaborating with the Indo–Swiss Project Sikkim to find ways of improving its service delivery system.

The mandate of the Indo–Swiss Project Sikkim is to improve the livelihood of small

all regions. In east Sikkim, which receives a lot of rainfall, diseases like bacterial wilt and soft rot are rampant. Dry rot is more common in south Sikkim. Pests like white grub sporadically occur in some ginger-growing areas of all the four districts.

The diverse problems farmers are facing indicate that a uniform extension approach cannot do justice to the different issues farmers are struggling with.

#### Identification of Problems by Farmers

Prior to the PTD programme intervention, farmers could not distinguish between bacterial wilt and soft rot. They referred to both diseases as yellowing. They were also unable to give any specific information like when the symptoms appear and how fast they spread to other plants. Hence the farmers only recognised the disease at the point of 'mau' extraction (extraction of mother rhizomes), when it is often too late for significant interventions.

and marginal farmers. Hence, collaboration with the Department has always focused on improving ginger cultivation practices for small holders. After establishing research capacities and building traditional extension competencies, the project realised the need to involve farmers more in the whole process of extension and research. After the initial experience with participatory methods, the Department agreed to introduce the Participatory Technology Development approach on a pilot basis. It was expected that the experience gained from the pilot project would form the basis to decide whether to continue and mainstream the approach, or to abandon it.

The project engaged the Bangalore-based organisation, ETC India, to give conceptual support in introducing the PTD process in Sikkim. ETC India is well experienced in applying PTD processes in different states of India, in a variety of crops. It was agreed that initially, the project would adopt the PTD concept of ETC India with its proposed structures and steps to be followed.

### 5.2 Problems facing farmers regarding ginger cultivation

The problems ginger farmers face, vary from one area to the other, although poor yield, due to degraded soil fertility, is common to

### 5.3 The purpose of introducing the PTD process in Sikkim

The main reason for introducing the PTD process in Sikkim was to find an effective extension tool to capitalise on the research collaboration between the Department and the project. PTD, as a participatory extension and research method, seemed to be appropriate for improving ginger cultivation of small holding farmers with diverse problems in Sikkim.

### 5.4 Preparations for introducing PTD

Orientation and sensitisation activities were undertaken to prepare the Department officers and ginger-growing farmers for the introduction of PTD in Sikkim.

In August 2002, three months before the PTD process was introduced, an exposure and learning visit to PTD programmes in south India was organised for a group of Department officers. The officers were familiarised with the underlying purpose of PTD, the process involved and the role of Department officers. The idea was that these officers, after their return to Sikkim, would become advocates for the idea of PTD and would create awareness for it in the Department.

Upon the return of the Department officers

to Sikkim, a four-day workshop was organised to present the concept of PTD to a wider audience and to prepare the ground for introducing it in the field. Department officers from state, district and field levels were present. Ginger-growing farmers who were formerly involved in the ARD programme and CBOs were also invited to participate.

In February 2003, another PTD orientation workshop involving the Department, consultants, scientists, farmers and NGOs, was organised. The purpose of this workshop was to come to a common agreement on how the PTD process was going to be introduced and to draw up an action plan for the first two months (up to the time of planting the ginger) of the PTD programme.

### 5.5 Structure chosen for the PTD process

#### **Actors involved:**

##### *Ginger Farmer Self Help Groups*

The main actors in the PTD process are the Ginger Farmer Self Help Groups. They consist of 15 to 20 men and women from the same hamlet. The constitution of the groups usually reflects the composition of communities residing in the specific locality. The groups are, hence, never formed along the lines of specific castes, nor do they tend to be captured by elite of the village.

The groups' role is to conduct experiments jointly. This means that at least four farmers are meant to work together on the

same or similar experiment at a time. Farmers share experiences and ideas, take joint decisions on activities like input procurement, savings, interest and loans to be given to members. Furthermore, they jointly identify problems and select options for their experiments (see further down) and coordinate the interactions with the Department and researchers. Apart from these activities, the groups engage in joint marketing.

The groups get a one-time grant of Rs 1,000 per member as a revolving fund to purchase seeds and other inputs for individual trials, and Rs 3,000 per group to procure hardware needed to conduct experiments. Apart from that, each group is supported with approximately Rs 650 to conduct its meetings and for team building activities.

##### *Social Organiser*

The farmer groups are supported by a Social Organiser whose role is to facilitate the group building process, and to provide linkages between the farmers and the Department. In this capacity, he/she also supports the groups in organising their meetings/training programmes, bringing issues to the notice of the Department and the scientists, procuring inputs, collecting and compiling experiment data as well as maintaining accounts and records. The Social Organiser is usually a representative of a local NGO/CBO, a person appointed by the Gram Panchayat or a selected active farmer.

The Social Organiser is paid Rs 1,500 per month for these services rendered to the group.

##### *NGOs/CBOs, Gram Panchayats*

The involved NGOs/CBOs and Gram Panchayats are meant as an intermediate between the Department and the farmer groups. Depending on whether an NGO/CBO or the Gram Panchayat is chosen as an intermediate, they provide the farmer groups with the Social Organiser and transfer funds to the farmer groups. They also issue and submit utilisation



*Farmers Self Help Group in the process of selecting options for experimentation at Senti*

certificates on behalf of the farmer groups to the Department to obtain further funds.

The Department also pays them Rs 500 per month to cover administrative costs.

#### *Technical Support by Horticulture Inspectors*

The Horticulture Inspector's role is to give technical support to farmer groups through regular training and by providing information on input procurement. Apart from that, the Inspector is an important link between the farmers and the Department and the scientists.

#### *Department Headquarters' overall management of the PTD programme*

The Department headquarters at the district and state levels are responsible for the whole programme. This involves policy decisions, and management of the programme, including monitoring and evaluation.

#### *ISPS Support Office conceptual monitoring and coordination*

The ISPS Support Office provides overall coordination and governance support to the Department and the farmer groups in activity planning, programme implementation, monitoring and evaluation. The Support Office is also responsible for identifying resource agencies and persons and building up the capacity of Departmental officials.

#### *ETC: overall PTD conceptual backstopping*

ETC is responsible for concept development, providing backstopping to the programme in planning, implementation, monitoring and evaluation.

#### *Scientists*

The scientists' role is to design possible options to tackle the problems farmers are facing, to support in analysing the results of the experiments and to share the latest information regarding ginger research. There are a number of international, national and local scientists who regularly support the programme.

#### *Management set-up*

##### *PTD SHG meeting*

The farmers meet fortnightly as a group to share their experiences and observations and to plan future activities. These meetings are chaired by the president of the SHG. Apart from the farmers, the Social Organiser and the Horticulture Inspector participate in these meetings.

##### *District Level Management Committee meeting*

A monthly review of the PTD programme is conducted at the district headquarters of the Department. At this meeting, progress is reviewed and future actions are planned. The meeting is chaired by the district head of the Department. Sub-divisional heads of the Department, Social Organisers, Horticulture Inspectors and a representative of the ISPS Support Office also attend this meeting.

##### *State Level Management Committee meeting*

A quarterly management meeting is held at the state headquarters of the Department. At this meeting, overall progress of the programme is discussed and policy decisions are taken. The project coordinator of the Department chairs the meeting, which is also attended by the district heads of the Department and respective deputy directors of the areas in which the PTD programme is implemented. A representative of the ISPS Support Office is also present during this meeting.

##### *Annual Multi-Stakeholder Ginger Platform*

At this four-day meeting, scientists, state and district Department heads and other respective Department officers related to the programme, Social Organisers and active farmers meet to share their experiences of the past year in conducting experiments, and plan for the next crop cycle.

At this meeting, the scientists share information on the latest basic research in ginger, and comment on farmers' results and experiences. They also make suggestions on possible future options for experiments.

## 5.6 Steps followed in the PTD process

- |   |  |
|---|--|
| 1. Selection of geographical area                     | 10. Choosing the experiment                                      |
| 2. Selection of NGOs/CBOs, including Social Organiser | 11. Training PTD farmers   |
| 3. Selection of villages                              | 12. Organising inputs  |
| 4. Introduction of PTD to farmers                     | 13. Designing experiments  |
| 5. Identifying farmer volunteers                      | 14. Putting experiments in place                                 |
| 6. Role clarity: who does what                        | 15. Monitoring experiments                                       |
| 7. Organising the PTD ginger farmers into SHGs        | 16. Data processing and analysis                                 |
| 8. Problem analysis                                   | 17. Evaluation, updating basket of options and experiment design |
| 9. Composition of basket of options                   | 18. Process up-scaling and technology dissemination              |

### 1. Selection of geographical area (September 2002)

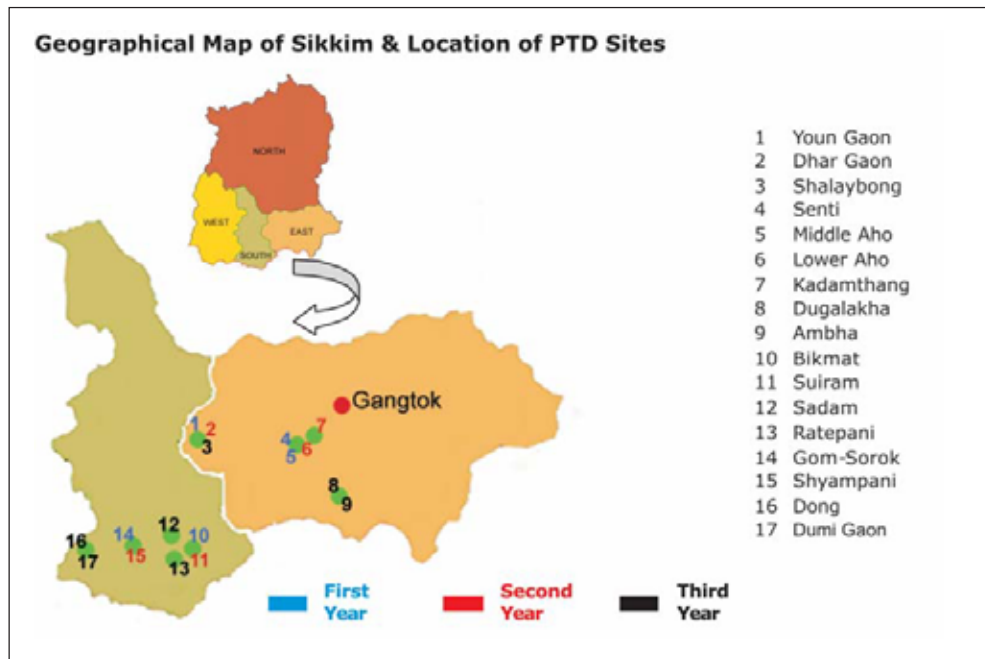
The major criteria applied in selecting the geographical area for introducing the PTD process was the presence of a large number of small holding ginger farmers facing problems caused by pests and diseases damaging their crop.

No thorough study was done regarding this, but from the experiences gained earlier, an area known for its problems with bacterial

wilt and soft rot was selected in east Sikkim, while another known for its problems with soft rot and dry rot was chosen in south Sikkim.

### 2. Selection of NGOs/CBOs including Social Organiser (September 2002)

In Sikkim, there are only a handful of NGOs having an outreach beyond one or two villages. Of these, there are none working in the area of agricultural extension. Hence, when it came to selecting NGOs, the



project had to choose from village NGOs operating as CBOs in their vicinity.

Previously, the project had worked with two village NGOs (one in East Sikkim, one in South Sikkim) in its ARD programme. On account of this experience, these two NGOs were selected to be involved in the PTD process.

The idea was that the Social Organiser would be deputed by the selected NGO. However, this only happened in two places where the two selected NGOs had their base. In the other places, farmers chose the Social Organiser from the village community.

### 3. *Selection of villages (September 2002)*

The criteria applied in selecting the villages were that the (1) area should be home to a large number of the target population i.e., small holding ginger growers faced with pests and crop disease, (2) project should have preferably done some work in this area before, (3) farmers of this place should be interested and (4) NGOs/CBOs ought to be present in that area, though not necessarily in the village.

Out of five selected villages, three were chosen because of the previous experience in those villages with the ARD programme. One village was selected because of the Department's interest in that village and the fifth was selected based on requests from local farmers.

### 4. *Introduction of PTD to farmers (November 2002)*

A series of meetings was conducted in the selected villages to inform the farmers about the planned PTD programme. The aim was to offer farmers sufficient information to decide whether they wanted to participate in the programme or not. The response of the farmers was diverse. In resource-rich villages, initially, a lot of farmers participated in the meetings. However, their interest level decreased once farmers understood that the PTD programme does not involve any subsidies. In resource-poor villages, it was difficult to mobilise

people to attend the initial meetings.

### 5. *Identification of farmer volunteers (November 2002)*

Once the farmers in the selected five villages had sufficient understanding of the PTD programme, they were given the task to decide among themselves, who would participate. The selection criteria given to them was a) personal interest b) experience in ginger cultivation c) current problems with pests/diseases.

The facilitator emphasised the role of women, who contribute approximately 50 per cent in ginger cultivation, and encouraged them to participate in the programme.

### 6. *Role clarity: who does what (September 2002 onwards)*

As mentioned above, many different actors (farmers, NGOs, Department officers etc.) are involved in the PTD process. It was, therefore, crucial from the outset to clarify their roles. This started with a workshop with all actors just before the programme was introduced in the field. However, during the process of implementation, further clarifications about the responsibilities, rights and other details were needed.

### 7. *Organising the PTD ginger farmers into PTD SHGs (November 2002 onwards)*

The PTD principle requires farmers to work as a group during the entire process. Selected farmers were invited to form Self Help Groups for conducting PTD. The principles of SHGs and the steps to establish them, were explained. Subsequently, the groups were formed. Thereafter, there was a need for continuous capacity building in group functioning and development.

Since the groups consisted of people from various communities, different economic standing and gender, the process of bringing people together and achieving mutual respect among the participants needed special attention.



#### 8. Problem analysis (November 2002)

To analyse the different problems farmers are facing in ginger cultivation, a two-day exercise was conducted with each of the PTD SHGs. The utilisation of participatory tools like the problem tree and problem ranking helped to identify the different problems faced by ginger farmers.

The farmers participated actively. However, a lot of the analyses had to be done with the external support of the Department since the farmers at that time lacked the knowledge about different diseases.



*Problem analysis by ranking at Youn Gaon*

#### 9. Composition of basket of options to solve existing problems (January/February 2003)

Most of the problems regarding ginger cultivation in Sikkim were known to the project even before the specific problem analysis took place in the selected villages. Based on this knowledge, solutions for the problems were sought from farmers, the Department and scientists. A lot of the possible solutions had been developed earlier by the project, and were made a part of the basket of options. Farmers and scientists also contributed with other possible solutions to the basket of options. The basket of options finally comprised different possible solutions to each problem analysed. Furthermore, these possible solutions could be divided into proven solutions (mostly by scientists) and unproven solutions (mostly by farmers).

#### 10. Choosing the option to conduct experiments (March/April 2003)

The choice to try and experiment with a

certain option was completely the farmers' decision.

The basket of options was explained thoroughly to the farmers. Based on their problems, they selected suitable options. The criterion was that at least four farmers should experiment with the same option to be able to validate the findings.

#### 11. Training the PTD farmers (February 2003 onwards)

Training is an integral part of the PTD process. Formal and informal training happens along the whole process. However, before the process started, a rough training schedule related to the major activities was drawn up.

This included:

- ❖ Introduction and overview of the PTD process
- ❖ Group organisation (including bookkeeping)
- ❖ Experiment design
- ❖ Technology options
- ❖ Disease identification and management
- ❖ Data collection and analysis
- ❖ Experiment sample harvest

#### 12. Organising inputs (March/April 2003)

The farmer groups were encouraged to organise their own inputs. Information concerning where and what inputs were available, was provided. The idea behind this was that the farmers should not depend on the Department to provide inputs.

The farmer groups finally bought inputs that were not available from the Department, from markets outside Sikkim. Farmers who did not have their own seeds were encouraged to purchase the same from departmentally monitored sources to ensure that only good quality seeds would be used for the experiments.

#### 13. Designing experiments (March/April 2003)

In PTD the farmers themselves design the experiments they want to try out. Through

discussions and inputs the farmers were able to design their experiments. In these discussions, the issues talked about included:

- ❖ Factors influencing yield (variety, soil type, date of planting, quantity and timing of input application etc.).
- ❖ Potential influence that experimental and control plots can have on each other.
- ❖ The minimum size of plots.
- ❖ What farmers wanted to find out, and how they want to do it.
- ❖ Data to be collected.

In this process, it was made clear to the farmers that in the whole exercise, the yield from the experimental plot does not necessarily have to be higher than that of the control plot. This was necessary because farmers have the tendency to wish to please the facilitators (Department, scientists etc.) and might say that the plot with higher yield was the experimental plot.

#### *14. Putting the experiments in place (March/April 2003)*

The chosen options and the pre-requisites of the trial and experiment plot were discussed once more in the group. This was followed by the whole group laying out the first experiment in one of the farmers' fields.

The farmer groups were also encouraged to do the same in the fields of the other farmers. This happened in most places, although not all the farmers were present at all places.

#### *15. Monitoring the experiments (June 2003 onwards)*

Each farmer in the group kept a record of the experiments in a notebook. Those farmers who were not capable of keeping records, were helped initially by the Social Organiser. Later, those who were illiterate, asked family members (e.g. their children) to document the necessary information in the notebook.

The parameters that would have to be monitored were decided upon when the experiments were designed. This included, broadly, the following areas:

- ❖ Activities undertaken (cultural practices)
- ❖ Inputs applied (quantity, quality, costs)
- ❖ Observations (pests and diseases, crop performance)
- ❖ Output (price received for main crop and by-product)

During the whole crop cycle, the farmers shared records that they were keeping fortnightly with the group.



*Experimenting with sample harvest methodology at Gom-Sorok.*

#### *16. Data collection, processing and analysis (April 2003 onwards)*

The data collected by the farmers and recorded in their notebook, was submitted once a month to the district office of the Department. The Department then had to enter the data into a computer.

The farmers and Social Organisers processed data at their level and drew adequate conclusions. At departmental level, processing and analysis of data had to be facilitated by the consultant, who then shared the information with the Department.

#### *17. Evaluation, updating basket of options and experiment design (December 2003)*

Evaluation is crucial in the PTD process. Not only were the tested technologies evaluated, but also the experimental set-

up, the data collected and the whole PTD process.

Evaluation was done at three levels:

1. PTD farmer group level
2. Representatives of all farmer groups at district level
3. Department, scientists, NGOs, consultants and farmers at state level

Based on this evaluation, the basket of options was updated<sup>8</sup> and suggestions were made for improving the experiment design.

All this formed the basis for starting a new cycle of the PTD process.

#### *18. Process up-scaling and technology dissemination (January 2004)*

After the first PTD process cycle, five more PTD farmer SHGs were chosen to participate in the programme in 2004. In 2005, seven more groups were added so that today, the programme supports 17 PTD farmer SHGs with participants from approximately 245

households. More importance was given to include women. The participation of women rose considerably in the second and third years, with three groups consisting entirely of women. Apart from that, out of seven new Social Organisers in 2005, three were women. As described in a later section, the PTD process has had a clear influence on gender relations in the villages covered by the programme.

Regarding technology dissemination, a technical manual in English and in Nepali, the local language, has been developed, and there are plans to distribute it to all the officers of the Department, and all the libraries of the Gram Panchayats. Apart from this, training of master/lead farmers to support the dissemination process is planned. Nevertheless, spontaneous dissemination of tested technologies is taking place on a small scale, mainly within the village of PTD farmers and to adjoining villages.

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<sup>8</sup> The Government of Sikkim announced in 2003, that the whole state should be declared organic. Hence, new organic options had to be introduced.

### 6.1 Ginger cultivation

The improvement in ginger cultivation practices is a significant and apparent result. PTD farmers have been the most visible beneficiaries, while farmers from the same or adjoining villages, who have learnt from the PTD farmers, have recorded improved practices. The PTD process has also instigated a sense of competitiveness to claim the best crop in the village.

Some messages like the importance of healthy seeds, raised beds, spacing, and hot water treatment have spread way beyond the PTD farmers' villages and have led to improved overall practices of ginger cultivation in certain geographical areas.

While the PTD farmers have not always experienced better yield in the experimental plots, overall, yield has increased. This is due to generally better practices and more attention given to ginger cultivation.

Finally, the PTD programme has also led to area expansion and resumption of ginger cultivation in villages with PTD farmer groups.

Through the programme, the farmers also gained a lot of technical know-how, for instance in identifying disease symptoms and seed treatment. All this has made them capable of making informed choices on what cultivation practice they want to follow.

The farmers have not only gained confidence to become involved and conduct research, but they have also been recognised by the scientists and the Department as capable and important partners in finding solutions to problems related to ginger cultivation. In this regard, the farmers have also become a source of information for other farmers within and outside the village.

In many places, it was further noticed that farmers have gained such sound technical knowledge as a result of PTD that the Department officers find it a challenge to keep up with the farmers' know-how.

Previous to the introduction of the PTD programme, farmers had no habit of sharing in-depth information about each other's cultivation practices, input

#### Improving the Economic Situation

Harka Bahadur Subba of Makha, south Sikkim, used to reap six times the ginger he sowed, prior to joining the PTD programme. He had also accumulated debts of Rs 6,000. H.B. Subba joined the PTD SHG in his village, and regularly attended the meetings, although he did not speak much. For his experiment, he chose nutrient management in the first year. He also adopted the practice of raised beds and sufficient seed spacing.

At the end of the first cycle, H.B. Subba could boast of getting the best yield of all the PTD farmers of Makha. From the 40 kg seeds he had sown in the experimental plot, he got a yield of 465 kg and from the 40 kg seeds in the control plot, he got a yield of 378 kg, which reflects a planting : harvesting ratio of 1:11.5 and 1:9.5 respectively. This resulted in a total net profit of Rs 11,200 with which he was able to pay off his debts. He still had enough money to improve his house.

### 6.2 Empowerment of Farmers

Even prior to taking part in the PTD programme, farmers were used to trying different things to improve ginger cultivation. However, what was new in the PTD process, was to introduce a mechanism to compare and find out whether the things they try out, work or not. This systematic testing and comparing has caught the attention of the farmers.

procurement and marketing channels. As a result of the PTD programme, farmers have learnt to appreciate the value of sharing information, learn from and assist each other. Similarly, they have gained the conviction that for certain activities such as input procurement, design, as well as application of treatments and communication with the Department, is more beneficial when they function as a group.

The farmers' level of understanding and confidence has also led to them being more inquisitive and critical about the inputs that are promoted by the Department. One example of this is that they have become experts in choosing/procuring healthy rhizomes and rejecting any seed, even if supplied to them free of charge, if it is disease infested.

officers and the farmers. This has led to the officers building a good rapport with the farmers, and has increased their understanding of the ground realities. In turn, this has led to the officers accepting the capacities as well as the know-how of the farmers. The officers have also learnt that they are not only to instil knowledge in the farmers but also to learn from them.

### Developing a Research Mentality

Bacterial wilt is a big problem in a place called Middle Aho. The scientists recommended careful uprooting of the infected plants and drenching the area with copper oxychloride as one option to control the disease. Another recommended option was to drench the plants with 1 per cent cow urine once every week.

P.B. Rai, PTD farmer from Middle Aho, saw that in the process of rouging, however carefully it is done, there are chances that the infected soil may spill and infect other parts of the plot. Furthermore, the holes where the plants are removed from, attract rodents. As a result, bacteria is likely to spread further. He decided not to rouge and continued to drench the infected plants with a cow urine solution. In the process, he tried out concentrated cow urine. While normally, the disease spreads quickly to the whole plot if rouging is not done, in the case of P.B. Rai, the spread of the bacterial wilt could be stopped. Three more farmers in the group tried out his technique. They were all able to stop the spread of the disease.

P.B. Rai went even further and took a healthy part of the bacterial wilt infected rhizomes and planted them in another plot to see whether it will develop symptoms of bacterial wilt. Proving his faith in the treatment correct, it was observed that they did not.

### 6.3 Effectiveness of Extension Services

The PTD programme has, in many ways, challenged the prevailing approach to extension services of the Department. Foremost of all the participatory processes, which are based on equality, I have questioned the Department's top down approach in its Transfer of Technology programmes. For the Department officers involved in the programme, it has been demanding to adapt to this new approach of working with farmers in ginger cultivation while following the prevailing approach of the Department in other crops. However, most of the Department officers have appreciated the programme and have learnt a lot regarding extension methodologies and technical issues in ginger cultivation.

The PTD programme involves frequent interaction between the Department

The interaction with scientists has given the Department scientific insight into tackling problems related to ginger cultivation and increasing its quality and productivity. Apart from that, it has also highlighted the importance of research and the fact that farmers can contribute to this research and may even decide on its agenda.

The concept of PTD has gained widespread acceptance within the Department, as officers have seen its impact on ginger cultivation and on the farmers' empowerment in general. In particular, the group approach linked with backstopping by scientists and experts, is highly appreciated. Based on these positive experiences, the Department is planning to upscale the PTD process to other geographical areas as well as to other horticulture crops like cardamom, floriculture and vegetables.

### Scope for PTD in other Crops

“As the Department could observe in the last two years, the PTD programme in ginger cultivation has shown positive results in many respects. This is why the government has decided to extend the PTD approach to other crops such as orange and cardamom cultivation.”

*G. K. Gurung, Principal Director cum Secretary HCCDD, GoS*

### 6.4 Influence on Research

In the PTD programme, practical problems faced by farmers have been at the core of any discussion among farmers, Department officers and scientists. This has had an impact on the research agenda of the scientists because they are meant to propose possible solutions to the farmers' problems.

The scientists were initially sceptical of the farmers' capacity to conduct research. This has changed to a considerable extent and they have started appreciating the farmers as partners in the quest to find solutions to problems in ginger cultivation. However, scientists still have a predisposition to try to control the design of the experiments.

and Department officers and also from the fact that they have had the confidence to take part in exposure visits.

All this is also a result of the male members starting to recognise the role of women in ginger cultivation and their capacity in contributing to the groups. The recognition of women members of PTD groups has not been limited to their capacity in ginger cultivation. Their overall status in the household and the community has improved through the process.

The impact of the PTD programme on women's access and control over resources has not been studied although it is assumed that there has been some impact. It would be interesting to conduct some

### The View of a Scientist

“In the past, we tried to involve farmers, but it was difficult to organise them. We also had problems in getting support from the Department in the whole issue of research in ginger disease management.

I am impressed with what has been achieved through the PTD process. The farmers are able to organise themselves, to identify diseases and take appropriate action on their own. The collaboration with the Department has also improved drastically. However, there are still areas that need improvement, especially the issue of local basic scientific research to backstop the PTD process.”

*Dr. Grahame VH Jackson, scientist and consultant to ISPS*

### 6.5 Gender

Farmers and Department officers have learnt through the PTD programme the important role women play in the whole process of ginger cultivation. This has led to the inclusion of women into PTD farmer groups and an increase in participation of women in meetings, trainings and exposure visits. In the course of their involvement in the groups, their meetings and training, women have gained self-esteem. This has become evident from their increased contributions in the gathering, their ability to question statements of male members

studies to assess the changes in this important area.

### 6.6 Decentralisation

A lot of the technical know-how on disease/pest control and soil fertility, and a considerable portion of inputs like healthy seeds and fertilisers used to be concentrated in the Department. When it came to systematic research, this used to be the sole domain of scientists. In the PTD process this has changed. Technical know-how has been transferred from centralised agencies to the farmer groups,

who have themselves become a respected source of know-how generation. The farmer groups have also been equipped to procure and organise the necessary inputs. The farmers have learnt to conduct systematic research, which includes planning, monitoring and evaluation. All this is an indication that decentralisation<sup>9</sup> has taken place through the PTD programme.

The political decentralisation process has also been affirmed through the PTD programme. This has happened with the involvement of the village government (Gram Panchayat) in the third year of the PTD programme to mobilise the people for the initial meetings and linking the farmer groups to the local government.

## 6.7 Equality and Discrimination

All the PTD farmer groups consist of people from different castes, tribes and economic background. Since the PTD process promotes equality, the participants, irrespective of caste, have the same rights and the same opportunities as part of the PTD farmer group.

Not only has the PTD programme promoted equality between the different castes/tribes and economic standing but also between the farmers and the Department officers.

Moreover, the selection criteria for choosing the villages for introducing the PTD programme have helped to break the usual bias towards the progressive and accessible villages.

<sup>9</sup> Decentralisation in this context is understood as an extensive and comprehensive process not being limited to decentralisation of political power through institutions of local self-governance.

## 7.1 Strengths

### *Prepared environment for introducing the PTD concept*

Prior to introducing the PTD concept, the project had already been involved in research and development in ginger management for a few years. Thanks to this, a considerable amount of basic research in ginger pests, diseases and their management had been conducted. The PTD programme could build on these findings, which helped the programme to a great extent in its implementation because farmers could experiment with locally proven technologies, which guaranteed a certain degree of success.

At the time of introducing the PTD programme, the project already had several years of experience in using participatory methods in working with farmers. This experience was gained through the Adaptive Research Demonstration programme, which was implemented by the Department. Hence, the Department did not have to be first convinced of the importance of applying participatory methods in tackling issues regarding ginger cultivation.

Prior to introducing the PTD programme, the project had already realised the limitations of the Adaptive Research Demonstration programme. As a result, it was looking for a more structured and established approach.

All these points are expressions of the favourable and receptive environment found by the project when introducing the PTD programme in Sikkim.



*Preparing the terraced fields for ginger planting at Kadamthang*

### *Relevance of the crop chosen*

Since the project was mandated to work on ginger cultivation, it was given that the PTD programme would concentrate on this crop. This choice proved to be a factor of success for the programme since a lot of small holding farmers depend economically on this crop. Moreover, most farmers were faced with problems related to diseases, pests and general decrease in yields in this important cash crop. Hence, the importance and the urgency to tackle the existing problems were important factors for the appreciation of the PTD programme.

A further strength was that the farmers who were included in the PTD groups were indeed small holding farmers who depended for their livelihood on the ginger crop. This contributed to their active participation and genuine interest in the programme.

### *Involvement of stakeholders from the beginning*

All relevant stakeholders were involved right from the beginning of the planning and implementation process of the PTD programme. This contributed to a balance in knowledge about the process among the groups involved. It also helped to build mutual respect for each other and the different roles the stakeholders play in the programme. Finally, it was also the basis for generating an attitude of learning for all involved because there was no single group that dominated over the others.

### *Collaboration*

The project's long and positive collaboration with the Department was one of the major strengths that contributed to the successful introduction of the PTD programme. Apart from that, the involved PTD facilitation agency (ETC India) played a crucial role throughout the programme planning, design and implementation process. It also helped to structure the approach and draw from experiences with PTD in other parts of the country.

The close collaboration of the project support office with the Department and the



PTD facilitation agency was the key to being able to respond quickly to problems arising in the programme implementation and to intervene where necessary.

Finally, the programme has enjoyed appreciation and support from senior bureaucrats and policy makers, which has made implementation easier.

#### *Structure of Horticulture and Cash Crop Development Department*

The PTD programme has benefited from the presence of Horticulture Inspectors close to every village where the PTD programme was introduced. These Department officers have played an important part in implementing the programme, giving regular technical support to the farmers and guiding them throughout the PTD process.

#### *Creation of ownership*

The participatory approach in the whole planning and implementation phase of the programme has contributed to creating a sense of ownership with the farmers and the Department. This identification with the programme served as a boost to the whole process.

## **7.2 Weaknesses**

#### *Dependence on scientific support from outside the state*

Although ginger is one of the most important cash crops in the state, there are neither research institutions nor local scientists involved in basic research on this crop<sup>10</sup>. That is why the PTD programme has had to depend entirely on scientific support from other states and abroad. At times, this has hampered quick response to problems that required inputs from scientists. Furthermore, the non-availability of local scientists poses a question to the scientific support of the programme after the logistical and financial support of ISPS ceases.

#### *Overestimation of NGO capacities*

The PTD concept as developed by the facilitation agency ETC India, gives NGOs an important role to play in the PTD process. Prior to introducing the PTD concept in Sikkim, there was little knowledge about the existing NGOs in the state and their capacities. This was because the project had never worked with NGOs before. As a result, the capacities of local NGOs regarding social organisation skills, administration and bookkeeping were grossly overestimated. The consequence of this was that the NGOs could not fulfil the roles assigned to them and in some cases, were more of an obstacle than a help to the PTD programme. A lot of the tasks regarding social organisation finally had to be taken over by the project support office and the PTD facilitation agency.



*P.B. Rai, farmer of Middle Aho, sharing his perception on an alternative host of bacterial wilt*

#### *Lack of continuity with Department officers*

The government practice of frequently transferring its staff to new positions was a drawback to the programme. Many officers who were trained and made familiar with the whole PTD concept initially, were transferred in the course of time. Officers inexperienced with the PTD concept replaced them and much time had to be spent to familiarise them with the ideology

<sup>10</sup> The ICAR previously did some basic research on ginger. However, for the last few years, due to the lack of scientists in this field, they were not in a position to conduct pathological and entomological research.

and the procedures of PTD. As a result of these frequent transfers, it has not been possible to establish a permanent PTD facilitation group within the Department, the members of which could also serve as experts for the implementation of PTD in other crops as resource persons.

*Sustainability issues of the programme insufficiently considered*

On different levels, issues related to the sustainability of the programme were neglected for a long time.

Regarding the PTD farmer groups, the system of supporting them regularly with money to hold their meetings, raises the question of what will happen to their meetings once this monetary incentive is withdrawn.

While it was necessary to get intensive support from the PTD facilitation agency at the beginning of the programme, this assistance should have gradually decreased, and eventually ceased. However, for various reasons, the project has depended for too long on the facilitation agency and for a long time has not fully been able to internalise the conceptual questions.

With the involvement of national and international scientists as well as Indian and expatriate experts from the PTD facilitation agency, the PTD programme has proved to be expensive<sup>11</sup>. So far, all the expenses for the programme have been borne by the project. The question of how the programme will be taken further once the financial assistance of the project ends, is still one that needs to be addressed.

<sup>11</sup> No cost/benefit analysis has been done. Expenses not only in regard to the number of farmers directly involved in the programme but also in regard to the available budget in the Department for extension services, have been high.

## 8.1 Multi Stakeholder Approach

A multi stakeholder approach is crucial to the PTD process. Through the linkages between farmers, scientists, the Department and other support organisations, many issues can be addressed in a manner that would otherwise not be possible. Linking the different stakeholders, especially in the annual multi-stakeholders' platform meetings, gives the unique opportunity for mutual exchange and learning, which aims to break through existing hierarchies and preconceptions. Just as farmers learn from the scientists and the Department officers, so do the scientists learn from the farmers, for instance about their indigenous farming knowledge and the insights they have gained from their experiments. The Department officers also gain from the interaction with the farmers and the scientists. It helps them to learn about farming practices, field realities, scientific findings and also about the effectiveness of Department policies. Furthermore, the knowledge shared by the farmers and scientists helps them in formulating more appropriate extension messages.

The multi stakeholders' platform meeting plays a vital role in backstopping the PTD process because it is based on the equality of all stakeholders.

## 8.2 Group Approach

Each horticulture extension worker in Sikkim has to cater to the needs of approximately 1,000 farmers. In such a



Farmers experimenting with hot water seed treatment at Bikmat

situation, regular face-to-face interactions between the farmers and the extension worker become very difficult unless the farmers are organised in groups. In a group approach, the extension worker only needs to contact the group leader, who in the case of the PTD Farmer SHG is the president, and can get work done with the farmers more efficiently and effectively.

A group approach also facilitates better and faster learning of the participating farmers. Frequent interactions within the group enable the farmers to reflect on their own cultivation practices and other issues, and to learn from the experiences and know-how of other farmers in the group. In that process, technology dissemination from farmer to farmer can easily and automatically take place.

Working with groups can also contribute to more equitable distribution of subsidised or free inputs from the Department if, instead of the Department identifying those eligible, this responsibility is given to the group members themselves.

Finally, the group approach also provides the framework for sufficient cohesion between the farmers for them to engage in saving and credit activities. This, in turn, can provide the farmers with timely credit for their farm operations.

## 8.3 Extension Services

Participatory extension methods are more suitable for small-holder farming communities with diverse problems regarding crop cultivation, than top down approaches like the ToT concept followed by the Horticulture and Cash Crops Development Department in Sikkim. Even if the advantages of a participatory approach like PTD are recognised, it is not easy for an agency, which has been following a top town ToT approach for years, to make such a shift in their extension services and adopt and internalise participatory approaches for their extension services.

The PTD experience in Sikkim has shown that demonstration programmes on a specific crop and in a limited geographical

area are an effective means of exposing an agency to a new approach, and convince it of its value and the benefit of adopting it on a wider scale.

Finally, extension depends on research. Scientific study is not only needed to develop new extension messages but also to verify and systematise findings of farmer researchers. In the absence of research agencies or agricultural universities in Sikkim, the need for networking with scientists from outside the state is crucial.

#### **8.4 Empowerment of Farmers – Shift in Power**

The PTD programme has shown that if farmers are empowered with knowledge and skills, they are able to take control of their own problems. Empowerment of the farmers also helps that information on new technologies and approaches can spread and get adapted easier in the rural areas.

An agency, like in the case of Sikkim, the Horticulture and Cash Crop Development Department, which has always been the provider of free or subsidised inputs and services, is in a very powerful position vis-à-vis the farmers. If the farmers are not satisfied with the goods and services provided, there is little that they can do as individuals because they are at the receiving end. However, when farmers are empowered and organised, they become strong enough to demand good services and inputs from the responsible department. As a result, a shift in power away from the Department to the farmers takes place.

The new power constellation is beneficial for the Department as well as the farmers because it is based on equity. It enables the Department and the farmers to become partners in the development process, which is essential for sustainable rural development.

#### **8.5 Attitudinal Change**

A collaborative process like PTD where farmers, Department officers and scientists work together over a period of time, helps

change attitudes and perceptions. Officers begin to understand the realities of the farmers and appreciate their capacities and know-how. They, moreover, learn to accept their role as facilitators to bring about changes in the livelihood of farmers and start to work together. Similarly, scientists learn to acknowledge the farmers' technical knowledge, the value of them conducting systematic experiments and the contributions they can make to research. Finally, the farmers' attitude, not only towards the Department officers and the scientists changes but more importantly, there is a change in their attitude towards their own work as farmers, as they are esteemed by the officers and scientists.



*Learning and sharing regarding sample harvest in a trial plot at Suiram*

#### **8.6 Institutional collaborations**

Be it in natural resource management in general or in tackling problems in ginger cultivation through a PTD process in particular, the effect is best if different institutions and agencies work together. Different know-how, usually not possessed by any single organisation, is required. Procedural knowledge on the PTD process, scientific knowledge on diseases, treatments and experimental design and practical knowledge of the agricultural practices and systems are all important to make a PTD programme successful. The collaboration of different organisations in the process not only helps to make a PTD programme successful, but also encourages learning across different disciplines and regions.

## 8.7 Management structure

A well-set management structure is important to introduce and sustain a PTD programme. Regular review meetings at different levels (field, district, state) ensure close and intensive monitoring of the PTD process and are prerequisites for taking timely and appropriate actions to support the process. The representation of

farmers in meetings at different levels, ensures that their issues and concerns are truly reflected and contributes to bringing about transparency in the whole process.

It is important, wherever possible, not to set up new review meetings just for a PTD programme but to incorporate them into the Department's ongoing procedures of reviewing their activities.

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Intercooperation is a leading Swiss non-profit organisation engaged in development and international cooperation. We are registered as a foundation and are governed by 21 organisations representing the development community, civil society and the private sector. Intercooperation is a resource and knowledge organisation, combining a professional approach with social commitment.

Intercooperation supports partner organisations in more than twenty developing and transition countries on mandates from the Swiss government and other donors. In South Asia, Intercooperation is present in India, Pakistan, Bangladesh and Nepal.

Intercooperation has been working in India since 1982, as a project management and implementation partner of the Swiss Agency for Development and Cooperation, SDC. Our early experience focused on the livestock and dairy sector, providing technical expertise through a series of bilateral projects with state governments in Kerala, Rajasthan, Andhra Pradesh, Orissa and Sikkim. Intercooperation now works with governments, technical and research organisations, NGOs and Community Based Organisations (CBOs) on initiatives in natural resource management for sustainable livelihoods. Our working domains in India comprise:

- ❖ Livestock and livelihoods – particularly small ruminants in semi-arid India
- ❖ Participatory watershed development with a focus on equity
- ❖ Participatory agricultural extension
- ❖ Farming systems approach to sustainable agriculture
- ❖ Human and institutional development
- ❖ Policy formulation and development of decision support systems
- ❖ Decentralisation and local governance.

In all our work we seek to support gender balanced, equitable development, focusing on the empowerment of the poor and marginalised.

## ISPS PROGRAMME SERIES

*In Sikkim, ginger is a major cash crop for small-holder farmers. Over the years, disease and pests have pushed the yield down, creating a serious problem for the farmers.*

*The bilateral Indo-Swiss Project Sikkim, managed by Intercooperation, supported the introduction of the Participatory Technology Development (PTD) concept for ginger cultivation in Sikkim to tackle this crisis. Prior to this, the Horticulture and Cash Crop Development Department was predominantly following the top-down extension approach of Transfer of Technology (ToT).*

*This publication describes the process and the experience of introducing the concept of Participatory Technology Development. It highlights the strengths and the weaknesses of this process, introduced in 2002/2003 on a pilot basis in five villages, and later extended to a total of 17 villages, and outlines some lessons to make the project replicable. Perhaps most importantly, it chronicles the successful teamwork that developed among farmers and their Self Help Groups, Department officers and scientists in developing technologies appropriate to their specific problems. Even adopting this extension concept for a pilot project signifies a paradigm shift for the Department.*

*This report notes the lessons learnt and the shortcomings yet to be overcome.*

