

Chapter 2

Review of Methods Used in Case Studies

Introduction

A review of the methods used in the fifteen case studies reveals a trend in initiating and undertaking research. All the researchers began by selecting the site and carrying out preliminary observations and discussions to arrive at a better understanding of the range and breadth of issues in their area of interest. Following this process, they reviewed the literature and selected different tools from the methods available for collecting the necessary data and information. A brief introduction to each study with a review of the methods used by the investigators follows. Please refer to Annex 2 for a complete reference to the study reports.

2.1 Sustainable Management and Conservation of Medicinal Plants in the Jingpo Community, Southwest Yunnan, China

Jingpo is a large community in the eastern Himalayan region. The community is found in parts of Myanmar and China. The *Jingpo* live in small hamlets comprising of 20-30 households. This study focussed on Jinzhu village in southwest Yunnan which has a total population of 125 individuals in 21 households. Very little ethnobotanical information is available about these people. They have been marginalised in the wake of increasing commercial pressure and logging of forests on the Myanmar/China border. This report basically covers the process of preparing an inventory on the useful flora of the *Jingpo*. It was carried out by Yang Yongping of the Kunming Institute of Botany, Kunming, Yunnan, and focussed especially on the following.

- a) Identifying and preparing an inventory of all plant species used in traditional remedies
- b) Investigating folk classification systems for medicinal plants
- c) Documenting indigenous knowledge on the use and management of medicinal plants

Various ethnobotanical and taxonomic methods, such as key informant interviews using structured questionnaires, personal observation, and collection of voucher specimens of plants for correct identification were used. Ethno-taxonomic nomenclature was elicited on the following criteria.

- i) The names of plants give indications to the inherent characteristics of plants. For example, *Bum Shibyri*, the local name of *Litsea cubeba*, means that it tastes hot. *Mimosa pudica*, locally called *Myog hog*, means the 'touch me not' plant.
- ii) The names of plants reflect some physiological reaction, e.g., The local name of *Pang kair*, *Sargentodoxa cuneata*, means that one feels hungry.

- iii) The names indicate the external morphological characteristics of the plants. For example, *Zu Jurin*, the name of *Toddalia asiatica*, indicates a plant with sharp thorns on its stem.
- iv) The names indicate a close relationship with animals, e.g., *Byo Chuban* (*Cleorodendron serratum*), means that insects like this plant; *Byo Byuni myog* (*Plantago major*) indicates that frogs prefer to stay under this plant.
- v) For some medicinal plants, the local names describe curative properties, e.g., *Haqzuang mui* (*Asparagus cochinchinensis*) indicates that the plant can be used as an anti-inflammatory and to stop bleeding.

In order to assess the spatial and temporal distribution of medicinal plants, seven ecological zones were identified based on local knowledge: paddy fields; fallow land less than three years' old; and primitive forest, home gardens or around settlements, secondary forest, and cultivated fields.

2.2 Application of Indigenous Knowledge of Fodder Trees in Kalikasthan, Rasuwa District, Nepal

This study focussed on documenting farmers' management practices in relation to plantation on private land; recording important fodder trees in terms of quality, production, and associated ethnobotanical information. Additional aspects included understanding the role of livestock in the local economy and suggesting measures to improve the fodder situation in the area. Agriculture and livestock farming are inseparable in mountain areas. However, because of the growing population, land holdings are becoming fragmented and reduction in the area of pastureland is being caused by conversion of pastures for cereal cultivation. Livestock farming in the mid-hills of Nepal has been a steady source of income and a source of manure. Fodder trees provide fuelwood as well as fodder. People have traditionally followed and evolved agroforestry practices that are based on sound ecological understanding and economic judgements. The researcher, Sunil Acharya of the National Herbarium at Godavari, was guided by Dr. N.P. Manandhar in this work. Dr. N.P. Manandhar retired as the Head of the National herbarium and currently provides advisory services in the area of plant sciences.

Methods followed by the investigators included using a structured questionnaire in all the 21 households in the study area, informal discussions on various issues with local political workers and teachers, personal observations of agroforestry plots, and collecting herbarium specimens for identification. They also recorded farmers' perceptions on the quality of fodder and effect of trees on food crop production; and they also analysed the management and process of lopping and drew up a list of fodder trees with lopping and plantation periods as well as ethnobotanical information on other traditional uses of important species.

2.3 Study on Ethnobotany and Conservation of *Sinopodophyllum hexandrum*, *Diphyleia sinensis*, and *Fritillaria cirrhosa* in the Zhongdian Tibetan Autonomous County, Yunnan, China

The Government of the People's Republic of China is promoting floriculture on a large scale on the subalpine natural grasslands of Zhongdian Tibetan Autonomous County. These areas

are and have been important areas for medicinal plants and other products (almost 600 species of medicinal plants used in Tibetan medicines are found in Zongdian). Two species, viz., *Sinopodophyllum hexandrum* and *Diphyleia sinensis*, were scientifically validated a decade ago for containing anti-cancerous compounds. This led to a very high level of demand for these two species for chemical extraction. There is a dire need to supplement these plants with cultivated sources. *Fritillaria cirrhosa* is considered to be one of the best wide-spectrum medicines for respiratory diseases. Therefore, the project's purpose was to document the local classification and uses of the three species and set up demonstration plots in farmers' fields to standardise and promote their cultivation and marketing. Important questions about the economic viability of small-scale and decentralized production of medicinal plants were also addressed.

The project was undertaken by Qi Shunhua of Yunnan University under the supervision of Professor Hu Zhihao, also of that university. Local traditional health care practitioners and Tibetan doctors working in the local hospital were interviewed using a semi-structured questionnaire. Personal observation and interaction took place with farmers in the village to persuade them to undertake cultivation of the three plants. Phytochemical analysis of the collected rhizomes and seeds was carried out in the laboratory.

2.4 Investigation of the Status of Indigenous Medicinal Plants and Their Conservation in the Newar Community: A Case of Bungamati VDC, Lalitpur, Nepal

This study was concerned with the status of indigenous medicinal plants. Their status was assessed according to their availability and socioeconomic and cultural significance among the Newar ethnic group. Efforts were also made to examine and understand traditional health care practices in Bungamati. The two investigators, Meena Pokhrel and Rupa Shrestha, worked closely under the guidance of Dr. Ram Kumar Sharma, an expert in the use of participatory rural appraisal methods. Various PRA tools have been used in the study and the methodology, as summarised by the investigators, is presented on page 8.

In addition to the study, a project on cultivation of 32 species of plants found to be economically useful was initiated in a demonstration area situated within the premises of Tri Ratna Cooperative School within the Bungamati VDC.

2.5 Genetic Diversity, Distribution Pattern, Germination and Ethnobotanical Uses of *Alnus nepalensis* and *A. nitida* in Lumle and the Pokhara Region of Gandaki Zone, Nepal

Alnus nepalensis and *Alnus nitida* are multipurpose tree species that are much preferred in the mid-hill region. Some of the reasons for their popularity are:

- a) they are among the best known modulated non-legumes;
- b) the root systems grow very rapidly, root suckers freely proliferate, and they can tolerate extremes of moisture, temperature, and pH;
- c) they are shade tolerant and moderately frost resistant trees and act as excellent 'nurse trees'; and
- d) the wood dries quickly and burns easily without characteristic odour.

Methodology for Case Study 2.4

Study Concern	Verifying indicators	Study Tools
Ethnobotanical Inventory	<ul style="list-style-type: none"> • Identification of economical, cultural, and medicinal plants in Bungmati • Traditional health care system 	<ul style="list-style-type: none"> • Field observation and self judgement • Herbarium collection and identification • Resource map • Review of secondary sources • Key informant survey • Household survey
Socioeconomic Inventory of the study site	<ul style="list-style-type: none"> • Population size and settlement pattern • Language and ethnicity • Social group/classes and their interdependency • Survival strategies • Gender analysis 	<ul style="list-style-type: none"> • Review of CBS data • VDC profile • Social map • Key informant survey • Household survey
Economic Importance of Plants	<ul style="list-style-type: none"> • Direct economic value • Annual edible commodities available • Annual collection of firewood • Annual collection of construction material • Annual collection of medicinal plants • Annual collection of fodder 	<ul style="list-style-type: none"> • Household survey • Key informant survey • Case study
Sociocultural Importance of Plants	<ul style="list-style-type: none"> • Use of plants in community festivals/rituals/occasions • Seasonal farming • Belief in and perceptions on the use of indigenous plants 	<ul style="list-style-type: none"> • Key informant survey • Case study • Household survey
Inventory of Practice and Trends in the Traditional Health Care System	<ul style="list-style-type: none"> • Belief and degree of dependency of people • Identify herbal practitioners, and traditional faith healers and their status in the community • Role of herbal healers in use and conservation of plant resources 	<ul style="list-style-type: none"> • Household survey • Key informant survey • Case study

The study tried to determine the genetic variability in the two species, select the most suitable genotypes, conduct seed viability tests, and document ethnobotanical uses of *Alnus*. The study was carried out by Bharat Sah of the Central Department of Botany, Tribhuvan University, Kirtipur, and was supervised by Prof. B.N. Prasad of the same department. The method of field level data collection was a household survey with a structured questionnaire. Informal personal interviews with key informants were also carried out. To assess genetic diversity, a number of parameters was recorded (such as diameter at breast height) at the start as well as at the end of the study; seed length in millimetres, number of seeds per 100 milligrams, and study of chromosome numbers in *Alnus nepalensis*.

2.6 Community-based Case Study on Sal (*Shorea robusta*) Forest Management and Sal Seed Collection for Commercial Potential

Five community forests out of 45 community forests in Makawanpur district were selected for the study on sal forest management. The particular focus was on the historical background and relationship between indigenous and community forestry practices. The study was led by Sangeeta Rajbhandari of the Central Department of Botany, Tribhuvan University, Kirtipur in association with Virendra Kumar Karna and Nabina Dongol of the same department. Most of the information was obtained through primary data collection using the interview method with structured and unstructured questionnaires and personal observation at different sites. The questionnaire for the household respondents contained the following sections.

- a) Socioeconomic and demographic information
- b) Past and present forestry practices
- c) People's participation in community forestry management
- d) Use of sal parts
- e) Role of indigenous knowledge in forest management
- f) Relationship between indigenous and community forest management

The data thus obtained were analysed using the standard deviation chi-squared method. Preference for species was noted by ranking.

2.7 Ethnobotanical Survey of Rare Medicinal Herbs in the Buffer Zone of the Valley of Flowers' National Park, Chamoli, Garhwal, India

The Valley of Flowers' National Park is a high altitude protected area in Garhwal Himalayas. The park and its buffer zones are rich in medicinal plants and the local people in this area have considerable knowledge of ethnobotany. These people are gradually shifting from a subsistence economy to a market economy, mainly due to an increase in tourism and mountaineering activities. In addition to the adverse impacts on habitats, overextraction of medicinal plants for commercial purposes in response to increased demand has exerted tremendous pressure on the existing plant populations. In all 112 species of medicinal plants have been recorded to be in use by the local population. Of these, 23 species are rare and endangered; and they include five species enlisted in the Red Data Book of Indian Plants.

This study was carried out by C.P. Kala, Wildlife Institute of India, Dehradun, under the guidance of Dr. G.S. Rawat of the same Institute. He collected ethnobotanical information

using semi-structured and unstructured questionnaires as well as direct observations in the field. Each household was surveyed for information on the quantity of medicinal plants extracted from the wild. Verification of data was carried out by repeated interviews with more than one informant. To study the effects of various anthropogenic activities on the population of medicinal plants, 25 quadrats of 50 X 50 cm each were laid in the different sampling units. Sampling units were identified after stratifying the area in different pressure zones and identifying various landscape elements in each of the pressure zones. The entire study area was stratified into three broad pressure zones:

1. the Valley of Flowers, being a protected area, was considered to be a control site;
2. the buffer of the park, which is under severe pressure due to tourism and livestock grazing, was taken as a high pressure zone; and
3. Khiron Valley, which is grazed mostly by sheep and goats, was taken as a moderately disturbed (grazed) area.

2.8 *Ethnomedicobotanical Studies of Gurung Communities in Bichaur Village, Lamjung, Nepal*

There are many remote areas in the Himalayan region where modern medical health care is not available. Thus, the traditional healing system plays an important role in maintaining the physical and psychological well-being of the vast majority of people in such areas. It has been observed that, when the allopathic system is introduced into a village; the complementarity of the two systems in terms of integrated health care practices is not emphasised. In fact, there is a certain level of mistrust in the traditional medical system. The project focussed on the current use of herbal medicines and the problems of the *Dhami* and *Jhakri* (local healers). A local workshop was also organized to initiate two-way communication between the *Dhami-Jhakri* and allopathic health care workers and to promote and continue appropriate and discourage and discontinue inappropriate traditional health practices. Another objective of the workshop was to increase awareness about prophylactic measures such as immunisation, family planning, nutrition, and environmental hygiene. The study, led by Ila Shrestha of the Nepalese Society for Systematic Collection, also produced a detailed inventory of all the medicinal plants; herbarium plants were also collected. They conducted household surveys using a structured questionnaire, identified and interviewed key informants, and carried out meetings with interest groups.

2.9 *Ethnobotany of Fruit Plants and Its Application for Conservation and Community Development in Drosh Valley, Chitral, Pakistan*

The North West Frontier Province of Pakistan is well known for fruit cultivation. The focus of the project was to assess the traditional ways of propagation, pruning, harvesting, and protection against insects, disease pests, and grazing animals. The study was supervised by Prof. Farrukh Hussain, Chairman, Botany Department, University of Peshawar, Peshawar. After a general survey and preliminary discussions with the elders in the area, 36 villages were selected.

In each village, interviews were carried out by randomly selecting the local inhabitants and administering a structured questionnaire. The questionnaire was divided into two parts. The

first part included personal information such as name, locality, age, education, and the knowledge of the respondent regarding wild or cultivated fruit plants; likes or dislikes in terms of varieties of fruit, and the criteria for ranking the fruit/variety in the area. This part of the questionnaire also looked at the general problems of the area related to agriculture, horticulture, forestry, communication, and health and educational facilities. The second part of the questionnaire was specific about individual fruit varieties. The investigations assumed that a person had enlisted the names of fruit or their varieties in order of preference in terms of quality, prevalence, or commercial value in that area. Thus, the position in the free listing task was taken as the preferred rank. The research team interviewed a total of 728 individuals who included respondents in different age groups, educational levels, and professions such as farmers, labourers, shopkeepers, government servants, and school/college students.

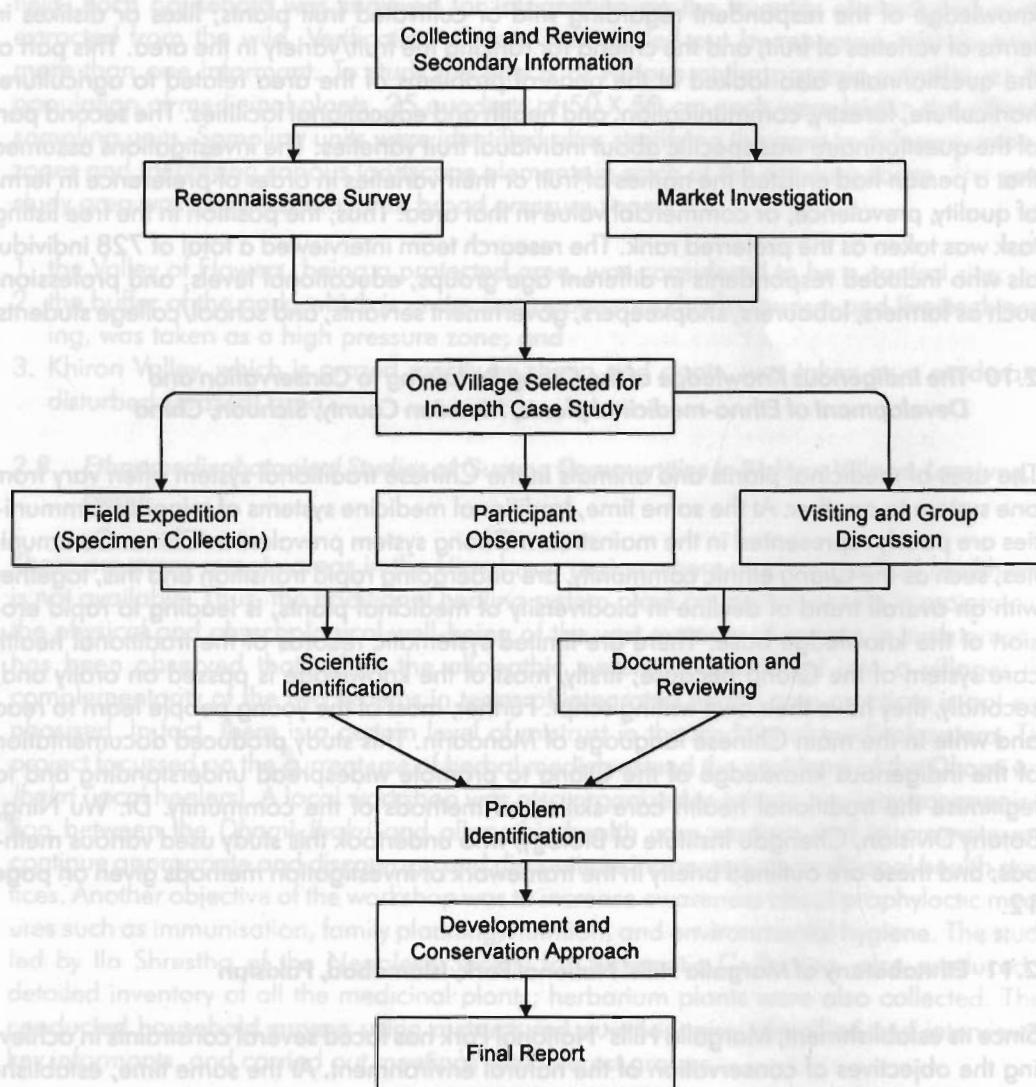
2.10 The Indigenous Knowledge of the Qiang Pertaining to Conservation and Development of Ethno-medicinal plants, Maoxian County, Sichuan, China

The uses of medicinal plants and animals in the Chinese traditional system often vary from one system to another. At the same time, traditional medicine systems of minority communities are poorly represented in the mainstream *Ghong* system prevalent in China. Communities, such as the *Qiang* ethnic community, are undergoing rapid transition and this, together with an overall trend of decline in biodiversity of medicinal plants, is leading to rapid erosion of the knowledge base. There are limited systematic records of the traditional health care system of the *Qiang* because, firstly, most of the knowledge is passed on orally and, secondly, they have their own writing script. Further, most of the young people learn to read and write in the main Chinese language of Mandarin. This study produced documentation of the indigenous knowledge of the *Qiang* to promote widespread understanding and to legitimise the traditional health care skills and methods of the community. Dr. Wu Ning, Botany Division, Chengdu Institute of Biology, who undertook this study used various methods; and these are outlined briefly in the framework of investigation methods given on page 12.

2.11 Ethnobotany of Margalla Hills' National Park, Islamabad, Pakistan

Since its establishment, Margalla Hills' National Park has faced several constraints in achieving the objectives of conservation of the natural environment. At the same time, establishment of the park has also led to limitations in terms of access and lack of control over the resources on the part of the villages inside and on the periphery of the park. This study, undertaken by Mohammad Ibrar Shinwari of Quid-e-Azam University, was part of the field work towards award of the M Phil. degree. The researcher focussed on documentation of folk uses of medicinal plants found in the park. This study was supervised by Dr. Mir Ajab Khan. It used primary data collected in the field through interviews, personal observations, and guided transect walks. Interviews were held with the local inhabitants by using a structured questionnaire. Among the selected key informants were *Hakim* (herbalists), *pansari* (medicinal plant vendors), and the park management. In order to access information from the women, two girl students were included in the team. In order to make quantitative assessments, questions regarding quantities of particular plant resource uses, rate of consumption, and availability and market value were included in the questionnaire.

Framework for Investigation Methods Used in Case 2.10



2.12 Preliminary Studies in the Ethnobotany of the Chittagong Hill Tracts, Bangladesh, and Its Linkages with Biodiversity

This study provides a list of 1,995 plant species in 63 families. All species here are arranged alphabetically and bear *Chakma*, *Marma*, and *Tripura* names (wherever possible) in addition to Latin names. Voucher specimens have been collected and preserved at the Bangladesh Forest Research Institute (BFRI). The study was jointly undertaken by Dr. M.K. Alam of BFRI and S.K. Khisa of Chittagong Hill Tracts' Development Board, Government of Bangladesh. An intensive effort was made to document as many ethnobotanical species as possible, using various techniques such as free listing, village market surveys, and homestead surveys. Additional records on folk taxonomy, perception about different uses, tree management practices, and seasonality of harvests were put together based on rapid unstructured interviews and observations.

2.13 Ethnobotanical Study of Traditional Farm Cultivation Practices Based on Alder Tree (*Alnus nepalensis*) by the Naga Tribes of Nagaland, India

In traditional Naga society the use of land influences all aspects of social life. The Naga practice two types of agricultural system. One is *jhum*/swidden cultivation in which paddy, millet, taro (*Colocasia esculenta*), yams, cotton, maize, chilli (*Capsicum annuum*), and cucumbers are grown. The second type is terraced wet rice cultivation in which terraces are cut into the hill slopes. The flooding on these terraces is carefully controlled by using bamboo and other local materials as water conduits. In these fields, old alder trees are maintained and pollarded after every four to six years. The alder tree is a nitrogen-fixing plant and yields a lot of biomass. The current study is focussed on a survey of alder-based farming systems in the state of Nagaland, identification of all the plants associated with it, and various crops used by different Naga tribes. Laboratory analysis of soil samples collected from different areas was used to evaluate indigenous knowledge aspects, particularly in relation to nitrogen availability.

2.14 Ethnobotany and Conservation of *Allium hookeri* Thwaites and *Allium wallichii* J Kunth in Tengchong County, Yunnan Province, China

These two species of *Allium* are multicultivar vegetables with local ethnic characteristics. There is an increasing demand for them, particularly as more and more people from other communities are recognising their nutritional value. This is leading to a decrease in availability. The pressure is particularly acute on *Allium wallichii* which is found in the natural state only. The current work was to collect an inventory of local cultivars of *Allium* and systematically collect indigenous knowledge about these species and conduct cultivation trials with farmers. This study was carried out by Huang Ji of the Department of Biology, Yunnan University, for a Master's dissertation. He interviewed local peasant farmers belonging to the Lisu community and local officials and agricultural extension workers. He made personal observations on the growth of *Allium* sp and collected local cultivars for laboratory analysis of amino acids and for cytology research.

2.15 Ecology and Indigenous Management of Tribal Home Gardens: A Case Study of the Marma Community in Bandarban Hill District, Chittagong, Bangladesh

Home gardens are a widespread agroforestry system. The life of the Marma people and their socioeconomic activities in the study area are centred around the hills and their resources. Home gardens feature as an important component of their landscape. This study undertook a vegetation inventory to determine species' composition and diversity and elicit knowledge from farmers about propagation, cultivation, management, and uses of home garden plants. Dr. Millat-e-Mustafa from the Institute of Forestry and Environmental Studies, University of Chittagong, undertook this research. He carried out a vegetation survey by listing the species present in the home gardens. A tree-use matrix exercise (Freudenberger 1994) was then conducted with the farmers and their families to determine the use of species. Family members were interviewed by using a semi-structured questionnaire. This guided interview addressed five broad topics as follow.

Question 1: "What planting materials do you use for your home garden?" This was to elicit farmers' knowledge about regeneration procedures with different home garden plants. The

reasons for using various types of planting material for different species were ascertained through further questions.

Question 2: "What are the sources of different planting materials?" This was to establish the relative contribution of different sources of planting materials to the home gardens.

Question 3: "Do you follow any criteria to select mother trees in collecting planting materials?" This retrieves farmers' knowledge about the introduction of improved varieties of species in their home gardens.

Question 4: "Do you carry out weeding, lopping, pruning, thinning, coppicing, and pollarding in your home garden?" Weeding and thinning determine the horizontal structure of the home gardens, whereas pruning determines how the farmers regulate sunlight in their home gardens.

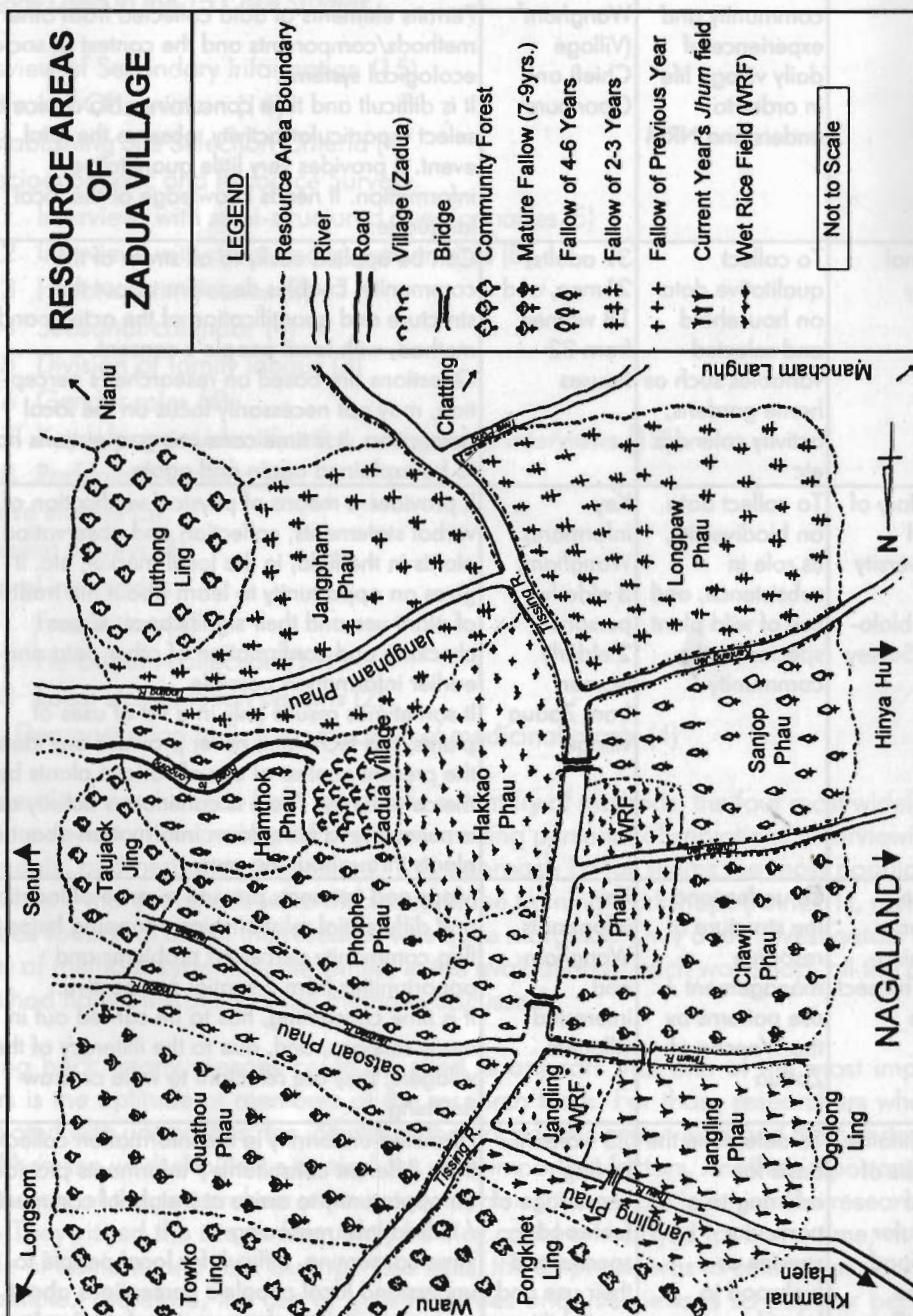
Question 5: "Do you water and manure your home garden plants?" This question was to arrive at an idea of the efforts needed to manage a home garden. If the reply was 'yes' the frequency and quantity of watering and manuring, and the name of the species to which these were applied, were determined with further questions.

ICIMOD Research Fellowship Study: *The Use of Indigenous Knowledge in Mountain Natural Resource Management: A Case Study of the Wancho Community, Tirap District, Arunachal Pradesh, India*

This study was undertaken by Dr. Archana Godbole as a part of her ICIMOD research fellowship work in 1996-97. The specific objectives of this research work were assessment of the indigenous knowledge system (IKS) used for traditional agricultural and agroecosystems, documentation of the natural resource use patterns, and assessment of the role of women and others in the Wancho Community in natural resource management. She carried out village resource mapping and a brief ethnobiological survey to assess the extent of plant use today. The summary of her methodology is provided in the table below, and one of the village resource maps prepared is given as Map 1 on page 15.

Preliminary Analysis of Methods Used

The above-mentioned studies depict a general trend in approach. Most of the researchers start with a review of secondary information and data followed by a visit to the site for informal discussions and personal observations in order to revise the research questions. These unstructured interviews are followed by administration of semi-structured or structured questionnaires, mostly at the household level. In the process, some key informants are identified for detailed discussion on particular traditional practices and aspects of indigenous knowledge. As a result, they present some of the analyses carried out of this information. This approach can be largely grouped together with Rapid Rural Appraisal methods. In addition, an important aspect of ethnobotanical studies is making inventories of useful plants, and so substantial efforts are expended by researchers in floral collection, herbarium preparation, and in identification. The studies that focussed on biochemical analysis of plant parts, such as seeds and rhizomes, collected the samples necessary for laboratory analysis. In one study, soil samples were also collected for nutrient analysis. Some researchers also attempted to draw resource maps and seasonal calendars and to make transect walks in



Summary of Methodology Used for Case Study 2.15

Method	Purpose	Sample Size	Advantages / Disadvantages
Participant Observa-tion	To gain understanding of the research community and experience of daily village life in order to understand NRM	Total village (men and women) in Wangham (Village Chief) and Gaonbura.	Provides an opportunity to understand the research community. Also provides a context in which other methods are developed and refined. Permits elements of data collected from other methods/components and the context of socio-ecological systems. It is difficult and time consuming. No choice to select a particular activity, observe the total event. It provides very little quantitative information. It needs knowledge of the local language.
Informal Survey	To collect qualitative data on household and selected variables such as home gardens, activity calendar etc	39 adults, 21 men, and 18 women from 22 houses	Can be applied easily to all strata of the community. Enables decisions about the structure and quantification of the activity and method, with local people's consent. Questions are based on researcher's perception, may not necessarily focus on the local perception. It is time consuming, questions have to be explained again and again.
Inventory of Useful Biodiversity and Ethnobiological Survey	To collect data on biodiversity, its role in subsistence, and use of wild plant species by the community	Key informants Wangham, 3 elderly persons 2 elderly women from Zadua village	It provides a means of physical verification of verbal statements, collection and observation of plants in the field, in the local market, etc. It gives an opportunity to learn about the traditions of plant use and their significance. Cross checking and confirmation of other data and earlier information possible. It sometimes results only in a list of uses of plants, this technique never provides any idea of the present context of use of various plants by the community. There is continuous activity as it is necessary to note down information about all plants throughout the year.
Village Resource Mapping and Transect Walks	To understand the structure of resource management / use patterns by the Wancho of Zadua	Key informants, Wangham and interested villagers.	Maps and transects provide a sense of location and differential relationships. Mapping helps to flag community perceived problems and opportunities from a spatial perspective. It is time consuming, has to be carried out in many sessions, and, due to the illiteracy of the villagers, they are reluctant to write or draw anything.
Quantitative Analysis of Use of Particular Fuelwood Species Using Pair Ranking Method	To determine the basis for referring to a particular species as fuelwood to learn how Wancho people perceive fuelwood species	23 women. having knowledge of fuelwood species and their use and availability	Permitted uniformity in the information collected from different consultants / informants provided an opportunity to arrive at insight of community's / individuals' reasoning Time consuming, difficult for local people to understand local people's perceptions about research activities changes, they feel simple documentation is complicated when it is called research

order to complement the information from market surveys. A summary of various methods used by all the researchers is presented below. The number against the method reflects the number of studies that have used it in some form or the other.

Methods Used in the 15 Case Studies

1. Review of Secondary Information (15)
2. Personal Observation (14)
3. Establishing Site Selection Criteria (4)
4. Socioeconomic and Resource Surveys
 - 4.1 Interviews with semi-structured questionnaires (5)
 - 4.2 Interviews with structured questionnaires (8)
 - 4.3 Historical time series (2)
 - 4.4 Seasonal calendar (4)
 - 4.5 Division of family labour (3)
 - 4.6 Gender roles (4)
 - 4.7 Key Informant identification and guided interviews (12)
 - 4.8 Preference ranking (4)
5. Case studies (5)
6. Market surveys (4)
7. Floral inventories
 - 7.1 Free listing (4)
 - 7.2 Herbarium collection (11)
 - 7.3 Local classification systems (2)
8. Demonstration trials for cultivation of medicinal plants (4)

In general, as can be seen from the above summary of methods, the four most widely-used tools are review of secondary information, making personal observations, interviewing key informants, and herbarium collection. This approach by far seems the most popular one. While many more methods were discussed in the training workshops (Annex 1), revision of methods for actual use in the research was quite marginal. Only a few investigators used a variety of methods systematically, while, in the evaluation of each workshop, all the participants had hailed the utility of the methods discussed.

Looking back, many reasons could be cited. It appears that one of the most important factors is the aptitude of members of the research team. For those researchers who were associated with universities, the interest of their academic supervisors and their understanding of how the work should be carried out were important factors. Another important factor is that most of the researchers were not residents of the places in which the research took place. They visited the site as frequently as they could and stayed for some time; at best a couple of weeks in one visit. During these visits, the emphasis was to collect data as quickly as possible. Therefore, the use of questionnaires and interviews is so popular because it allows one to accumulate a lot of information in a short time. Although due emphasis was placed in training workshops to measure and carry out in practice various methods to verify and supplement the information collected through interviews with primary data, not many researchers followed the advice.

The importance of preparing maps, walking transects, and conducting ecological surveys in the various resource areas of the local community was also highlighted during the training workshops, but these aspects were also neglected by most of the researchers. Some of the main reasons for this are that such activities are time-consuming, require good rapport with the community, and also require certain special skills such as the ability to negotiate and resolve conflicts. Above all, such exercises raise certain expectations amongst the people, and this means that follow-up after the study is needed. In most instances, researchers came from academic institutions or organizations far away from the place of research and thus had little confidence in making concrete contributions beyond the research itself.

Another important factor that has come to light is the lack of discussions with all the stakeholders. This is an essential element in order to present a more balanced and complete picture of the issues related to the thematic subject of research. In general it is true that all traditional societies are going through rapid transition in terms of their value systems, and this affects resource use patterns as well as the wisdom associated with such use. Therefore, in addressing any issue, it has become vital to carry out an assessment from as many aspects as possible, discussing it with all the major stakeholders and decision-makers. Somehow, the researchers here concentrated on the custodians of indigenous knowledge only and failed to interview other stakeholders.

These are some of the messages that can be drawn from the process and the results of these case studies and study grants. These and other factors such as size of the area covered in terms of resource use and patterns of usage and so on, are significant aspects in mountain areas. Keeping this in mind the following section has been written to outline and explain some methods for qualitative, quantitative; and spatial assessment. These methods include participatory mapping, resource dependence profiles, profile diagrams, and systematic data collection for statistical analysis.

The most important factor in carrying out applied research with a community is that the results of the study should be useful to it. Very few researchers carried out activities, such as public meetings, at the beginning of the work to inform people of the nature of work to be pursued. At the same time, only limited investigation reports were returned to the community. To reinforce the importance of sharing study results with the host community, a section on the moral paradigm of ethnobotanical research has been added for the reference of researchers working on applied ethnobotany in future.