



The University of Reading

International and Rural Development Department

PhD Thesis

**Forest Policy and Income Opportunities from
NTFP Commercialisation in Bhutan**

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Declaration

I confirm that this is my own work and the use of all materials from other sources has been properly and fully acknowledged.

.....

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May 2005

DEDICATION

TO THE KING, COUNTRY AND PEOPLE OF BHUTAN

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Abbreviations

ADB	Asian Development Bank
BTF	Bhutan Trust Fund for Environmental Conservation
CBNRM	Community-Based Natural Resources Management
CoRRB	Council for Renewable Natural Resources Research of Bhutan
CSO	Central Statistical Organisation
DoF	Department of Forests
DFO	Divisional Forest Officer
DYT	Dzongkhag Yargye Tshogchung
FAO	Food and Agriculture Organisation of the United Nations
FCB	Food Corporation of Bhutan
FY	Fiscal Year
FYP	Five Year Plan
GDP	Gross Domestic Product
gm	gram
GNH	Gross National Happiness
GYT	Geog Yargye Tshogchung
ha	Hectare
Helvetas	Swiss Association for Technical Assistance
ICIMOD	International Centre for Integrated Mountain Development
IDRC	International Development and Research of Canada
IRDD	International and Rural Development Department, University of Reading
ISDP	Integrated Sustainable Development Project
IYM	International Year of Mountains
JDNP	Jigme Dorji National Park
kg	Kilogram
LUPP	Land Use Planning Project
m. asl	Meters above sea level
MoA	Ministry of Agriculture
NA	National Assembly
NGO	Non-Governmental Organisation
NTFP	Non-Timber Forest Products
Nu.	Ngultrum
PC	Planning Commission
PIS	Pre-Investment Survey
RGOB	Royal Government of Bhutan
RNR	Renewable Natural Resources
RVA	Rapid Vulnerability Assessment
SDC	Swiss Development Cooperation
UN	United Nations
UNCED	United Nations Conference on Environment and Development
WB	World Bank

Glossary of Bhutanese Terms

Ap	Father; Mister; Form of address to an elderly man
Bangchung/ Palang	Bamboo products
BDFC	Bhutan Development Finance Corporation
Chimi	Member of National Assembly
Chiwog	A cluster of villages
Dasho	A title conferred by His Majesty the King; Red Scarf Official
Druk	Traditional name for Bhutan
Drukpa	Inhabitants of Druk
Dungkhag	Sub-district
Dzong	Monastery fortress serving as monastic school and civil administration
Dzongda	District Administrator
Dzongkhag	
Yargye	
Tshogchung	Block Development Committee
Dzongkhag	District
FCB	Food Corporation of Bhutan
Geog	Lowest administrative unit
Geog	
Yargye	
Tshogchung	District Development Committee
Gup	Geog administrator
Gyaljong	
Tshogdue	National Assembly
Lochoed	Annual Household Ritual
Lyonpo	Minister
Ngultrum	Bhutanese currency (US \$ = Nu. 43 as of May 2005)
Sokshing	Forest stand for collection of leaf-litter
Thrimpon	Judge
Tseri	Slash and burn farming system

Abstract

The forests in Bhutan, as in much of the developing world, are state owned. Forests are seen today as central to sustainable development, but the forest bureaucracy, by mandate and institutional culture, is control-oriented, and not predisposed to promote rural people's income opportunities from the forests. The overall aim of this research study is broadly to assess the policy context for NTFP commercialisation in Bhutan. The documentary analysis shows that the forests in Bhutan are a source of conflicts of interest between the state and peasantry. Export of NTFPs can take place only under the express approval of the government. A permit application can take as little time as one day or as long as 128 days to process. There is an apparent move towards incorporating NTFP in forest policy but this represents rhetoric rather than action. The three case studies from different regions and altitudes show that there is no uniform forest policy on NTFPs. The first case study *Cordyceps sinensis*, a high altitude high value medicinal plant, was a restricted species as of 2003. The policy restriction and the high value of the product resulted in revenue loss, and was a source of 'park-people' conflict. There is however no such policy restriction for *Tricholoma matsutake*, a high value mushroom in the temperate region. The government instead is fully supportive of the mushroom industry. The regular income from the mushroom has brought economic prosperity to the local community, and much-needed foreign exchange to the country. The third case concerning *Piper pedicellatum*, a low altitude medicinal plant, which has a very low cash value compared to *Cordyceps* and *Tricholoma*, but is still a major source of cash for the people in remote rural poor districts. The future of NTFP commercialisation in Bhutan looks promising, particularly after the lifting of the ban on *Cordyceps* collection in 2004. This opens up a brave new world for forest policy development for NTFPs in the country.

Key Words: *Bhutan, state forestry, forest policy, NTFP commercialisation, rural income, case study.*

CHAPTER 1: INTRODUCTION

In much of the developing world today, the forests are mostly state owned and managed. State forestry has traditionally concerned itself with timber production to generate revenue for the state, and in the last few decades wildlife conservation. The traditional uses of forests by the people for fuelwood, grazing and non-timber forest products (NTFP) are considered as causing damage to the timber stock. State forestry institutions have been thus designed to protect forests from the people, thus discriminating against any activity that has to do with people (Guha 1983; Guha 1991; Shepherd 1992a; Banuri and Marglin 1993; Kuechli 1997). However, despite the state protection of forests, there is a massive loss of forests going on in the tropical world (FAO 2001). One of the popular explanations put forward for the tropical deforestation has been overpopulation and widespread poverty. According to Colchester (1993), tropical deforestation is an expression of social injustice arising from skewed forest ownership. Foresters by mandate, institutional culture and professional training find it difficult to involve and work with people (Shepherd 1992a). However, forests once only left to foresters are now part of larger decentralisation, governance and local livelihood issues with calls for a policy shift from a tree-centred to a people-centred approach (FAO 1978; Shepherd 1985; Westoby 1987; UNCED 1992; Shepherd 1992a; Hopley 1996). In the last decade, the debate on NTFPs has been receiving a lot of international interest for its potential to combine forest conservation with the economic well being of the millions of poor people dependent on forests.

1.1 NTFP: An Issue of Policy Neglect in Developing Countries and Bhutan

An international expert consultation meeting on NTFPs held in 1995 noted that despite the fact that some 80% of the population in developing countries depend on NTFPs for subsistence and cash income, this only got a passing mention in forest sector policies of many countries. In order to realise the potential of NTFPs in forest conservation and poverty alleviation, the experts called upon the governments in the developing countries

to develop an articulated policy on NTFPs (FAO 1995). Ten years after the recommendation, I have not yet been able to locate a government in the tropical countries that has developed a consolidated forest policy for NTFPs.

Since then significant published research studies have directed international attention to the issues of policy towards NTFP (Wollenberg and Ingles 1998; Neumann and Hirsch 2000; Kusters and Belcher 2004). More recently in 2003, the XII World Forestry Congress held in Quebec, Canada asked world governments, amongst others, to develop and implement policies and legislation to provide secure access and benefits to the people whose livelihoods are dependent on NTFPs (WFC 2003)¹. But, in the developing countries, the state ownership of forests, institutional bias towards timber, wildlife conservation and control orientation of the forest bureaucracy continue to constrain the development of NTFPs (FAO 1995; Larsen, Olsen et al. 2000). In a study on NTFP policy in Nepal, Larsen, Olsen et al. (2000) note that forest rules and regulations in the field are inconsistent with the declared forest policy statements of meeting the basic needs of the common people and poverty alleviation. The forest rules are product (species) oriented and revenue focussed. The conservation consideration is more pronounced than improved utilisation, resulting in bans on collection, and mandatory requirement of permits for collection and movement of goods. The bans and permits act to the detriment of collectors by lowering their profit margins, while providing the means for the forestry personnel in the field to maintain patron-client relationship by way of control and rent extraction from the people. Olsen and Helles (1997) report seven forest checkpoints in the five-hour drive from Gorkha bazaar to Kathmandu where the collectors risk taking their products to the market. The interpretation of forest rules is at the discretion of forest field personnel, and the higher-level officers accept this wide latitude of power in the field as vital to conserving the NTFP resource.

¹ I participated actively in the electronic discussion on NTFP prior to the World Forestry Congress, and am included as one of the authors for the background paper on Institutional and Policy Development (see Belcher, Boaz et al. (2003)).

It is a similar story in India. According to Saxena (2003), about 100 million people in India depend upon NTFP resources but forest policies are far from being friendly to poor people. The policies instead make the lives of poor people harder by a multitude of forest controls and restrictions; for example, forcing people to sell their forest products to the government corporations or the private companies that have obtained the licensing rights for the NTFPs (e.g. tendu leaves and hill brooms). Criticisms include accusations that the government corporations pay the people late and have high operational costs due to corruption and inefficiency, and that the private companies pay the people low prices for the products. In 2000, government prosecuted a tribal women's cooperative for selling brooms to other than the official channels.

There is so far no research on forest policy analysis relating to NTFP in Bhutan. However, personal observation indicates a similar forest policy climate of control and secondary treatment of NTFP in Bhutan. The state forestry concept was grafted from India to Bhutan when India helped Bhutan build its forest bureaucracy in the early 1960s (Namgyel 2001; Tsering 2002). The country nationalised its forest in 1969. The mandate for the new Department of Forest was law enforcement, territorial claim, and timber production to generate revenue to the state. As will be discussed later in Chapter 5, NTFP was never the forest priority and people were not allowed to sell directly the few products that had market demand, but they had to sell to the local forest office which bulked and auctioned to the bidders or to private contractors. There are still today no consolidated policy and rules on NTFP. They are rather embedded in the strict forest rules that have been designed with timber in mind. The NTFP harvest, movement and marketing are therefore constrained by control-oriented rules. Environmental conservation takes centre stage in the forest decision-making. The forest policy makers are yet to appreciate that the development of a favourable policy environment for NTFP collection, sale and distribution could raise the cash income level of the rural population and add to forest conservation.

Larsen, Olsen et al. (2000) note that the current policy neglect of NTFPs in developing countries is due to the lack of research information particularly policy

analysis. They say that policy analysis is crucial to trigger the debate and discussion on current practices, and to bring about changes in perception. The key to change in forest policy is the change in perception of forest policy makers by drawing their attention to the plight of NTFP collectors. It is my expectation that this research study by its description, exploration and explanation of NTFP issues will contribute to deepen understanding of the NTFP policy context, content, process and impacts in Bhutan and hence influence policy development and implementation.

1.2 Research Aim, Objectives, Questions and Propositions

This section first discusses the research aim, objectives, and questions. Following on, a set of propositions is put forward to link the research questions to a theoretical issue, and to guide the research enquiry. Yin (2003) says that only when some propositions are stated can the research enquiry be expected to move in the right direction. The research enquiry is set under the category of policy, economics and environment. This has been done because as Perez (1995) and Arnold (2004) argue, many NTFP research studies are undertaken in isolation from the broader socio-political and ecological links, thus preventing the policy makers from gaining a global view of the NTFP issue for policy and management actions.

1.2.1 Research Aim

The overall aim of this research study is to broadly assess the policy context for NTFP commercialisation in the mountain peasant economy of Bhutan. The main research emphasis is on policy and NTFP commercialisation. Policy is defined here as “what governments do, why they do it, and what difference it makes” (Dye 1992, in Tsering 2002:10). They are manifested in laws, rules, guidelines and programmes. The government is the principal agent with the choice to act or not to act on a problem (Tsering 2002). NTFP commercialisation is defined as an NTFP with an economic value and in trade with the potential to increase income and employment opportunities of the rural people (Belcher and Schreckenber 2003). The household consumption and

subsistence use of NTFPs are excluded from this research study because they are not a major concern speaking politically and ecologically. The NTFPs with no market value also do not hold promise to raise the income level of the rural people.

1.2.2 Research Objectives

The research objectives for the research study are:

- To critically review the forest policy and other public policies related to NTFP commercialisation in Bhutan.
- To examine the role of NTFP commercialisation in the local and national economy.
- To undertake case studies to identify policy issues and NTFP problems and prospects in the field.
- To identify and outline NTFP policy and research issues and to develop recommendations for policy development.

1.2.3 Research Questions

The questions for the research study can be grouped under three main subheadings, as follows:

Policy

- i) How is the forest policy in Bhutan evolving with regard to NTFP? How does the general forest policy in Bhutan relate itself to NTFP commercialisation? Why is there no separate forest policy on NTFP in Bhutan? How are the formal forest regulations implemented in reality?

Economic

- ii) What is the economic value of NTFP at the community and national level? What are the processes and issues of NTFP commercialisation? How is the marketing organised? How do the policy-makers arrive at decisions to allow or restrict the NTFP commercialisation?

Environment

- iii) What are the environmental problems reported of the NTFP extraction? How justified is the environmental concern? What evidence is present?

1.2.4 Study Propositions

A proposition is an assertion which is subject to verification through subsequent investigation (Wield 2002). As a forest researcher for the last 13 years, and more specifically speaking during this course of this research study, I have developed certain propositions about NTFP in the country. They have largely guided the formulation of the research aim, objectives and questions. These include:

Policy

- i) There is no uniform forest policy for NTFP. It is dealt with on an ad hoc and case-by-case basis. There is a trend to incorporate NTFP in national policies but it is more rhetoric than action.

Economic

- ii) NTFP's contribution to the national income is significant, and its income is not properly realised yet. NTFP is the major or only source of cash income for the many remote rural communities. High value NTFP provides incentive for local people to protect the resource base. Department of Forests intervention in NTFP enterprise development is weak or lacking.

Environment

- iii) Environmental concerns for NTFP extraction are overstated. From the perspective of the Department of Forestry, NTFP extraction by local people is unsustainable if not protected and regulated. NTFP property right is important because it increases the likelihood that a person can secure a livelihood from a NTFP, and is an incentive for protection of the resource base.

1.3 Conceptual Framework

A conceptual framework forms the architectural basis of the research study (Marshall 1994 in Boas 2000). When clearly articulated, it assists the researcher to build the research and to reflect about the research and its context, and to make meaning of subsequent results and analysis. It is flexible, and open for scrutiny, testing, reviewing and reforming as a result of investigation (Smyth 2004).

The significance of this research study is the context of Bhutan as predominantly a peasant mountain country. The mountains and peasant economy are important international development issues. The conceptual framework is thus built upon the special development challenges faced by a peasant household in the mountains, and the role of NTFP in addressing them. The key characteristics of mountains and peasant economy are discussed below.

- **Mountains**

Mountains cover a quarter of the total global land surface, and are host to over 12% of the world population. They are the world's water towers providing fresh water to over half of the world's population. However, the mountains due to their vertical dimension are characterised by inaccessibility, fragility and marginality. People living in the mountains face immense physical barriers, a rugged terrain, poor communication systems and inadequate motor road networks. The costs of infrastructure development in the mountains are higher as compared to the plains. The mountain people therefore suffer from physical isolation and disfranchisement from the national and economic mainstream activities. Poverty, poor health, poor sanitation and unemployment are widespread and common. They are thus amongst world's poorest and least food secure people. However, at the same time the mountains are rich in forests, biodiversity and landscapes, and are home to the largest number of distinct ethnic groups and cultural traditions. They have many comparative advantages over the plains such as tourism, hydropower development,

off-season vegetables, horticultural crops, medicinal and aromatic plants and NTFPs (ICIMOD 2002).

The year 2002 was celebrated as the International Year of the Mountains (IYM) to highlight the special development challenges in the mountains. As a follow-up to and during the IYM, there were numerous meetings on different aspects of sustainable mountain development at all levels from the local to the global. One such meeting relevant to this research study was the ICIMOD organised 'International Conference on Growth, Poverty Alleviation and Sustainable Resource Management in Mountain Areas of South Asia' held in 2000 in Kathmandu, Nepal. The Conference noted that national level policy makers have not been sufficiently sensitive to the specific mountain conditions and constraints of mountain people in coming out of poverty trap, and that local mountain communities have been denied access to resources of basic livelihood opportunities in the name of environmental conservation without offering them alternative opportunities (ICIMOD 2000). In 2002, heads of 60 mountain countries at the Global Mountain Summit in Bishkek, Kyrgyzstan endorsed a plan of action to promote mechanisms to increase access of mountain niche products to global markets, and to foster local processing to add value to mountain products (ICIMOD 2002).

- **Peasant Economy**

Peasants are here defined as people who have relationship to land, and 'who produce for their own consumption and for sale, using their own and family labour, though the hiring and selling of labour power is also quite possible and compatible with peasant society. They possess a degree of independent control over the resources and the equipment that they use in production – in other words they are not quite like workers in a factory owned by somebody else' (Harris 1982:24). The family-farm is the basic unit of peasant ownership, production, consumption and social life, but the land holding is generally small and agricultural tools and equipment used are simple, and technology employed is primitive. The return to land and labour is poor, and the production is subsistence in nature, which means they produce most of what they consume and consume most of what

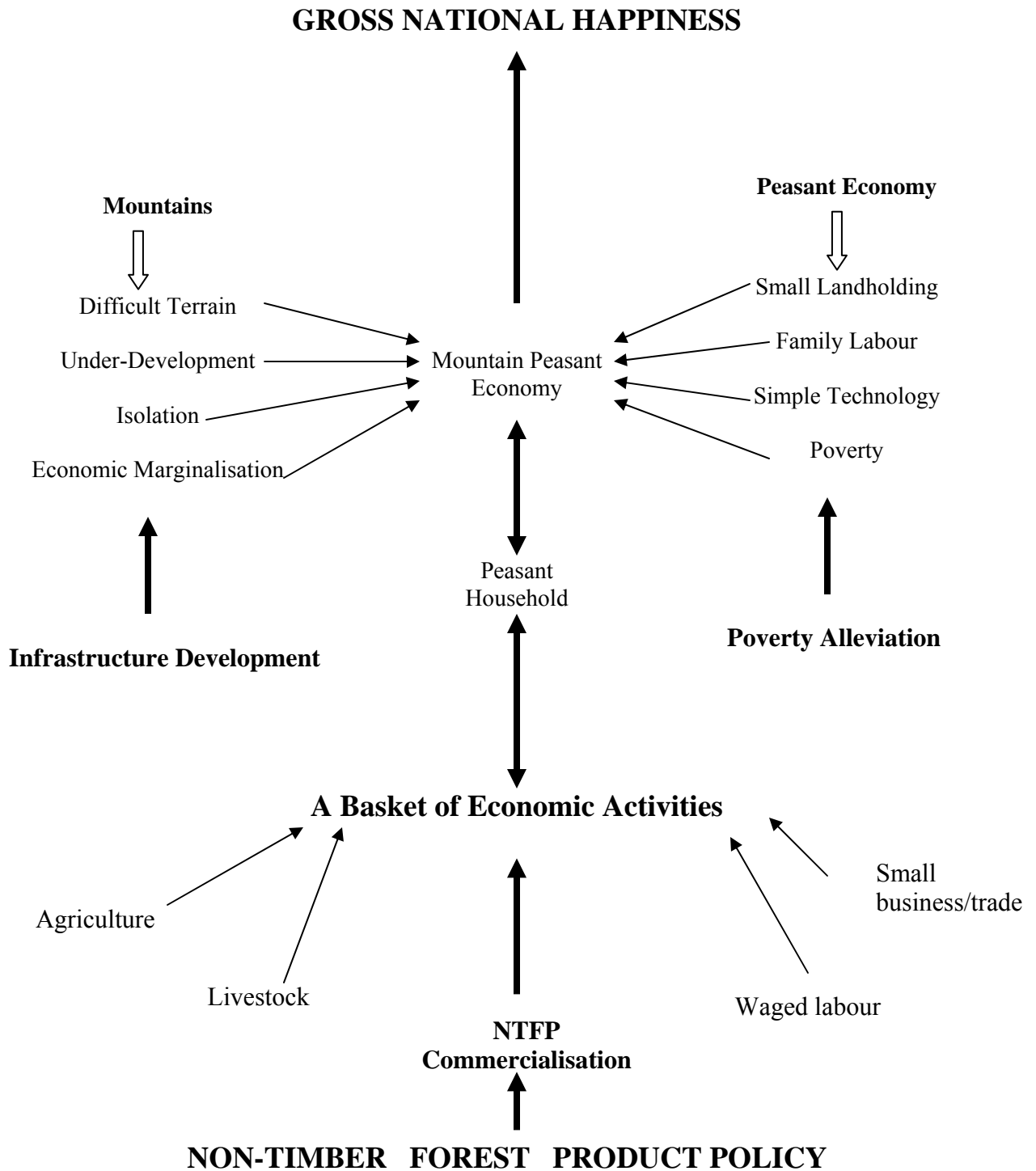
they produce (Shanin 1990). Peasantry is also characterised by their subordinate relationships to external markets, the state and the dominant culture (Harris 1982).

Once self-sufficient, the modernisation process is placing new demands on the peasant households. For example, the construction of a road network in Bhutan saw many imported goods appear in remote areas, in particular food provisions such as rice, edible oil, sugar, salt, and household items such as kitchen utensils and plastic buckets. The consequence of this market integration has been the creation of new needs, and dependence on cash (Guenat 1991). The few or no economic opportunities in the rural areas to earn cash are driving young people to move out to urban areas. Rural-urban migration is an emerging issue in Bhutan today (RGOB 2002). The government programmes on infrastructural development and poverty alleviation are bringing development to the rural areas, but rural people still remain poor.

In a peasant economy, there is no single economic activity which can sustain the household livelihood. The peasant households pursue a ‘basket’ of economic activities that can include agriculture; livestock; waged labour; small business; trade and NTFP extraction (Guha 1991). A sustainable peasant livelihood is dependent upon five natural capital assets viz. natural, human, financial, physical and social (Carney 1998). The rich forest-based natural resources in the mountains constitute a major part of the natural capital asset for the peasant households, which enable them and communities to cope with and recover from stresses and shocks of their livelihood vulnerability.

People aspire to a range of outcomes, but the ultimate aspiration is happiness. Layard (2005) defines happiness as feeling good – enjoying life and feeling it is wonderful. Unhappiness on the other hand is feeling bad and wishing things were different. Bhutan’s development principle, discussed in Chapter 2, is Gross National Happiness. The premise for the framework is that with a well-developed NTFP policy, NTFP commercialisation can contribute in important ways to the household’s overall basket of economic activities, ultimately leading to Gross National Happiness for people (Fig. 1.1).

Fig. 1.1 Conceptual Framework – NTFP Contribution to the Household Basket



1.4 Epistemology and Motivation for the Study

A researcher is not neutral, but carries prior knowledge, presumptions and biases that affect the scientific enquiry. This corresponds to the philosophical concept of epistemology. Epistemology is about understanding the claim to the nature of knowledge, and the relationship between the knower and the known. It asks, ‘how do we know what we claim to know’ and ‘what underlies your claim to the knowledge?’ (Shipman 1988; Punch 1998; Silverman 2000). So what is my epistemology, and how this could have affected the research?

I am a forester. When I joined the forestry service 14 years ago, I remember feeling a sense of achievement in life. One reason was the romanticisation of the life of a forester being with nature, and as a schoolboy, I have always loved the outdoor life. The other reason at a more subconscious level I guess was the thought of power and prestige of being a state forester. Family and friends also took pride in the fact that they had amongst them a forester. As a young forest officer in the Department of Forests, I was motivated by and believed in the cause of forest conservation and protection from people. I still remain loyal to forest conservation, but feel now that a forester need not be so overly protective of forests from rural people. I believe it is time we trust people, and create policy conditions in which they can take forest ownership, management decisions, and derive economic benefits from forests around. This change in my belief has been developed through my research work on social aspects of forestry, and working together with agricultural and livestock colleagues. The government agricultural, livestock, and forest sector research in Bhutan are integrated under one administration. This integrated research system is managed through a network of four research centres spread across the country. I was head of the centre for the western region for four years, and as a research manager I found myself going beyond forestry, strongly involved in agricultural, horticultural and livestock development. The work association with colleagues from other disciplines has since broadened my professional outlook, and triggered my interest in rural development as a whole. This research study is a continuation of my earlier research

works on NTFP, and is based on my strong belief that with appropriate policy support, NTFP can contribute in important ways to the cash income of the rural households.

I have over the years as a researcher been questioning current forest practices, therefore was aware of my research enquiry having strong elements of ‘critical ethnography’. Critical ethnography ‘refers to the reflective process of choosing between conceptual alternatives and making value-laden judgements of meaning and method to challenge research, policy and other forms of human activity’ (Thomas 1993:4). Thomas says that two difficult questions confront critical scholars. The first question is how do we remain scientific while simultaneously practising a critique? The second is why should we bother to be critical at all? The answer to the second question, Thomas says, is a personal one, but for the first question, he lists a set of traps in critical research, and the tricks to avoid them. These traps include: seeing only what serves our purposes; using conceptual clichés; placing passion before science; making claims beyond demonstrable evidence; and replacing reason with stridency. The tricks include: avoiding imposing meanings on data; avoiding buzzwords; avoiding axe grinding; avoiding over generalising; and avoiding sledgehammers. I have tried to avoid falling in the traps but I may have done so in some instances. If I have, I bear the responsibility.

1.5 Thesis Outline

The thesis has nine chapters. Chapter 1 has set out the broad aim of the thesis in a changing context. It has talked briefly about the continuing dominance of the state forestry tradition in much of the developing world, and its institutional discrimination against the traditional uses of forests by rural people, including NTFP. This policy attitude is currently under review. It has also discussed the research aim, objectives and questions, finally concluding with the epistemology and motivation for the research.

Chapter 2 introduces the reader to Bhutan, a country not much known by many. This is felt to be important especially for an international reader to understand the setting for the research. The chapter provides an overview of geography, history, culture, the

forest sector and economy. The highlight of the chapter is the introduction to and discussion on Bhutan's development philosophy of Gross National Happiness, especially as it fits into the conceptual framework.

Chapter 3 is the literature review, providing the current leading concepts, theories and data relevant to the study on NTFP. It begins with the history of state forestry concept in medieval Europe, and its transfer to the tropical countries; and the changing forest context, policies and strategies. Decentralisation and devolution of forest management, dominant themes in international forestry today are also discussed. This historical analysis of state forestry is considered essential to understanding how the NTFP has been defined, perceived, established and developed over the years. The policy, economic and ecological issues related to NTFP commercialisation is discussed in greater detail. It concludes with the history of state forestry and importance of NTFP in Bhutan.

Chapter 4 discusses the methodological framework for the research study. This includes the debate between the qualitative and quantitative research tradition; the justification for the choice of a qualitative research approach in general and the case study in particular; as well as details of research procedures; data sources; data management and analysis; access and ethics; and limitation of the research study.

Chapter 5 brings the reader to the documentary analysis of forest policy documents in which documentary evidence relating to forest policy regarding NTFP is presented. The chapter is significant as the documents provide an important empirical basis for analysis of policy decisions and actions, thus lending credibility to validation of the research questions.

Chapter 6, 7 and 8 present the three field case studies. The purpose of undertaking the case studies was to identify policy issues and NTFP problems and prospects in the rural areas. The first case study is on *Cordyceps sinensis*, a high value high altitude medicinal plant whose collection was banned by law at the time of undertaking the fieldwork. The second case study is on *Tricholoma matsutake*, a highly priced mushroom

exported to Japan. The third case study is on *Piper pedicellatum*, a low altitude low value medicinal plant. Justification for selection of these cases is already presented in Chapter 4.

Chapter 9 presents the final discussion, conclusion and recommendations of the whole research enquiry. It offers a synthesis of the research as planned and research findings investigated during this study. While it addresses the research questions of the study it also raises new research questions which may be addressed in the future. The main findings relate to the policy, economics and environment of the NTFP debate in Bhutan, but are relevant to developing countries in general.

CHAPTER 2: BHUTAN BACKGROUND

“The world has few secrets, but Bhutan is one of them...”

Katie Hickman, Author, ‘Dreams of the Peaceful Dragon, A Journey into Bhutan’.

“If there is any country on Earth that qualifies as Eden – not just in part, but in its entirety? I believe it is Bhutan.”

Harry Marshall, Producer/Director, ‘The Living Edens: Bhutan’.

“You never go to Bhutan, or you will go there twice”.

Nienke Tander, a Dutch student.

Not many people in the world know about Bhutan. International travels can be upsetting for Bhutanese when the name of the country draws blank expression from people behind the counters. However, the country is recently in the international news for its indigenous development philosophy of Gross National Happiness, and being the first country in the world to ban smoking. It is also being touted by the international travel industry as the most exotic location (Margolies 2005; Rippon 2005). The country had come out of its self-imposed isolation from the deep folds of the high mountains over four decades ago, yet it continues to evoke the image of the last frontier, magical, mysterious and a lost world for the people who hear about it for the first time. This chapter introduces the country with the aim of setting the stage for the research study.

2.1 Area, Position and Climate

Bhutan has a land area of 40,006 square kilometres bordered by Tibet (China) in the north and by India in the south (Fig 2.1). The country is divided into 20 *dzongkhags* (districts) (Fig. 2.2). It lies between the latitudes of 26° 45' N and 28° 10' N and between longitudes of 88° 45' E and 92° 10' E. The land area is relatively compact with a maximum latitudinal distance of 170 kms and the maximum longitudinal distance of 300 kms.

It is entirely mountainous and landlocked. The natural relief rises from about 300 m above sea level (asl) in the south to the towering Himalayan mountain in the north, many of which are over 7000 m asl. Gangkar Punsum at 7541 m in Bhutan is reported to be the world's highest unclimbed independent peak (Hutchinson n.d.). The country can be broadly divided into three zones; the southern foothills, the inner Himalayas and the Greater Himalayas. All but two of the main rivers rise within the country and journey north to south to join the Brahmaputra in India (CSO 2003).

The climate is extremely varied ranging from hot and humid in the foothills in the south to permanent ice and tundra conditions in the north. In the southern foothills the average daily temperature ranges from 15° C to 30° C. At 1500 m asl, the climate is cool and misty as clouds from the plains move up the mountains. In the inner valleys, the climate is temperate with temperature variations from 5° C in January (winter) to 25° C in July (summer). Above 3500 m, average daily temperature is said to be 5° C. The climate becomes increasingly severe with increasing altitude (MoA/ISNAR 1992). Over the whole Himalayas it gets wetter from west to east. The monsoon rainfall from the Indian Ocean lasting from June to September is the dominant factor accounting for 60-90 % of the annual precipitation. Rainfall ranges from less than 500 mm in the higher Himalayas to over 5000 mm in the southern foothills (DoF 1991a; Gyamtsho 1996).

The Himalayan system, created by the collision into the central Asian continental plate of the Indian continental plate some 20 million years ago, still remains dynamic with severe thrusting and faults. Detailed classification and mapping of the distribution of bedrock and associated soils are not yet available for the country although several comprehensive geological studies have been carried out (Gansser 1964; Gansser 1983). Known mineral resources of economic importance include calc-tufa, coal, copper, dolomite, graphite, gypsum, lead, zinc, limestone, marble and tungsten. Soils in the country are generally said to have good permeability and moderate retention. They allow cultivation of a wide range of crops, vegetables and trees (DoF 1991a).

Fig. 2.1 Bhutan Geographic Position



Source: www.usatoday.travel-guides.com/country.jsp?Re.

Fig. 2.2 Bhutan – Administrative Map



Source: RGOB (2002)

2.2 History, Culture and Society

Archaeological studies of stone implements indicate that Bhutan was inhabited as early as 2000 – 1500 BC. However, the chronicled history of the Kingdom begins only with the visit in 747 AD of Guru Padmasambhava, a great Buddhist master in India who visited and introduced Buddhism in Tibet and Bhutan. He is today revered as the Patron Saint of the Kingdom (RGOB 2002). Before the advent of Buddhism, people practiced an animistic religion known as Bon which is still followed in parts of the country during the celebrations of local festivals (Pommaret 1997; Tsering 2002).

The second watershed in the history of the Kingdom was the visit of Shabdrung Ngawang Namgyel, a great Buddhist Master of the Drukpa Kagyue sect in Tibet. He came to Bhutan in 1616 and soon consolidated the country under a unified power. He built monastery fortresses known as *Dzongs* in the major valleys and introduced for the first time in the country a theocracy, an administrative system and a code of law. He gave what is today the country's distinct national and cultural identity. His dual system of governance where temporal and religious authority was separated continued for the next 250 years. However, internal dissent and power struggle began to divide the country towards the later part of the period. Political instability threatened the sovereignty of the country particularly at a time of British rule in India, a neighbouring country (RBE 2002; RGOB 2002).

It was against this background of political instability, when there emerged a strong national leadership in the person of Ugyen Wangchuk. He was enthroned as the first hereditary king in 1907, thus marking the third watershed in the history of the country. The establishment of the institution of Monarchy unified the country under one central authority and brought about an unprecedented degree of political stability. The second King, Jigme Wangchuck (1926 – 1952) continued with the process of consolidation of authority and engagement with the outside world. During the time of the third King Jigme Dorji Wangchuck (1952 – 1972), the country shed centuries of self-imposed isolation and embarked upon a programme of modernisation. He instituted the

National Assembly in 1953; the Royal Advisory Council in 1965 and the High Court in 1968. Most importantly, for national independence and sovereignty, he guided the country to membership of the United Nations Organisation in 1971, securing the Kingdom a place in the international community. The present king, His Majesty King Jigme Singye Wangchuck (1972 -) is the fourth monarch, and is popularly known in the country as the 'People's King' (RBE 2002; RGOB 2002).

There are nineteen different languages spoken in Bhutan. This rich language diversity is incredible for a small and under populated country (Pommaret 1997). The official language policy is aimed at both respecting and preserving the linguistic diversity and establishing a single national language. Dzongkha, "the language of the fortresses," is the national language of the country. English has been adopted as medium of instruction in schools.

Population of the country was 734,340 in 2003 with a population density of 19.1 person per square kilometre (NSB 2003). The basic country statistics are shown in Box 2.1 below.

Box 2.1 Basic Country Statistics

Area (km ²)	40,006	Land Use	(%)
Population Urban (%)	21	Forest	72.5
Population Rural (%)	79	Pasture	3.9
Average household size	5.5	Agriculture	7.8
Life expectancy (1994)	66.1	Horticulture	0.1
GDP (Nu. in million) (2003)	33,159	Settlement	0.1
Agriculture share to GDP (%)	32.7	Others	15.6
GDP real growth (%)	6.5		
Per capita GDP (2002) ¹ (US \$)	835	Agriculture	(mill. Tonnes)
Economic dependency ratio (1999)	122	Paddy	37.9
Unemployment rate (1999) (%)	1.4	Wheat	4.6
Economically active population (%)	69.7	Maize	41.7
Population per doctor (2002)	6,019	Livestock Population	
Health coverage (%)	90	Cattle	339,904
Gross primary school enrolment (%) ²	72	Horses	27,895
Student to teacher ratio	31	Poultry	41,493

Source: NSB 2003

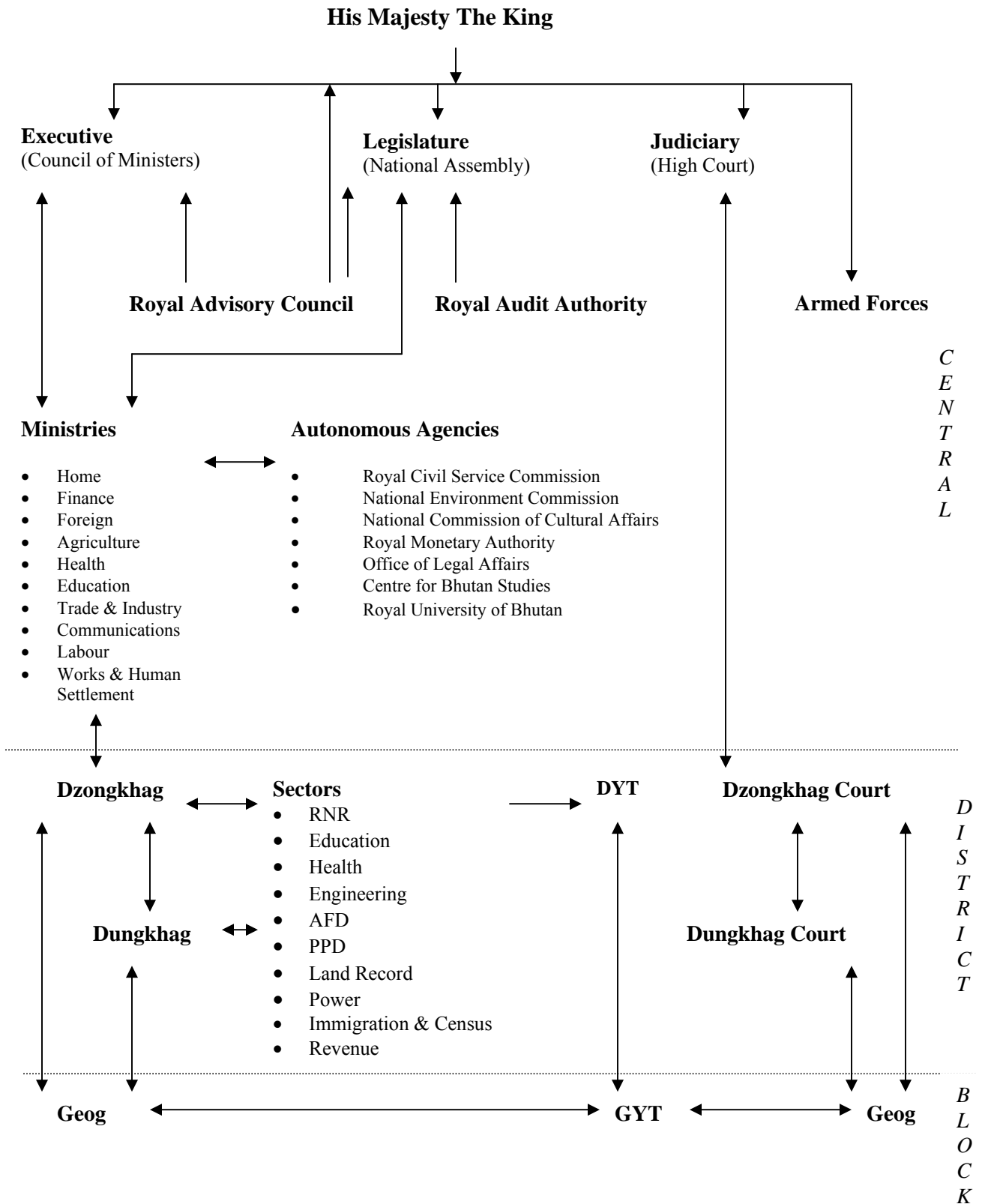
¹ Source: Kuensel 2004a

² Source: RGOB 2002

2.3 Political System

Bhutan is a monarchy. However since 1998 the King has relinquished his executive power to the Council of Ministers. The King is now only the head of the state. A draft constitution for the country was unveiled in March 2005 that will see the introduction of democracy. The general population has received it with reservation, saying why change the system which is working. The King has however said that a country is more important than a king and it was not right to depend upon one individual (BBC 2005a). The present political system is illustrated in Fig. 2.3.

Fig.2.3 Political System in Bhutan, adapted from RBE (2002)



2.4 Gross National Happiness – Bhutan’s Development Philosophy

His Majesty the King coined in the 1980s the now famous development concept of **Gross National Happiness** (GNH) which emphasises development beyond the Gross Domestic Product (GDP). The main essence of GNH is the happiness of people as a government policy concern and a government policy objective in contrast to GDP which concerns only material growth. The GNH is the guiding development philosophy as well as the development framework for the country. The GNH framework is based on the four pillars of 1) equitable and sustainable socio-economic development 2) environmental conservation 3) promotion of traditions and cultures, and 4) good governance (Thinley 1998).

The international community is sometimes a bit bewildered that such a great development innovation should come from a small remote medieval-like mountain kingdom. The concept of GNH is increasingly drawing the attention of development researchers and specialists seeking a development ‘re-think’. In 1998, the Prime Minister of Bhutan was invited to share the GNH concept in making the keynote address at the UN Millennium Meeting for Asia and Pacific in Seoul, Republic of Korea. In 2004, Bhutan hosted an international conference on GNH in which 400 participants from over 20 countries participated. Canada will host the second conference on GNH in 2005 (CBS 2004).

Some are sceptical about happiness as a development object, saying it is a ‘mission impossible’. However, Tideman (2001) cites His Holiness the Dalai Lama as saying,

*“Finding a way to connect economics and altruism is most difficult. However, these two fields can – and should – meet on global and individual levels.”*²

² H.H. the Dalai Lama and F. Ouaki, *Image all the People, A Conversation with the Dalai Lama on Money, Politics and Life as It Could Be*, Wisdom Publications, Boston, 1999.

Happiness is what all of us want. All our actions are driven by the desire to feel good. Andrew Oswald, a British academic specialising on ‘happiness economics’ says that in the not so distant future, happiness surveys and job-satisfaction surveys will become central part of British life. They may appear unusual notions now but economists are already realising the hopelessness of GDP in measuring people’s well being in already rich countries. As society grows richer, less attention will be paid to material concerns. The social science of happiness is going to gain importance in the world (Oswald 1999). A new book on happiness was released in the UK in the beginning of 2005. Entitled ‘Happiness: Lessons from a New Science’, it talks about paradox in life of income and happiness (Layard 2005). An anonymous reviewer for the book writes that, “If more money doesn’t make us happier than capitalism starts to look a bit rocky ” (www.amazon.co.uk).

2.5 Forest Sector

Grierson and Long (1983:23) write that:

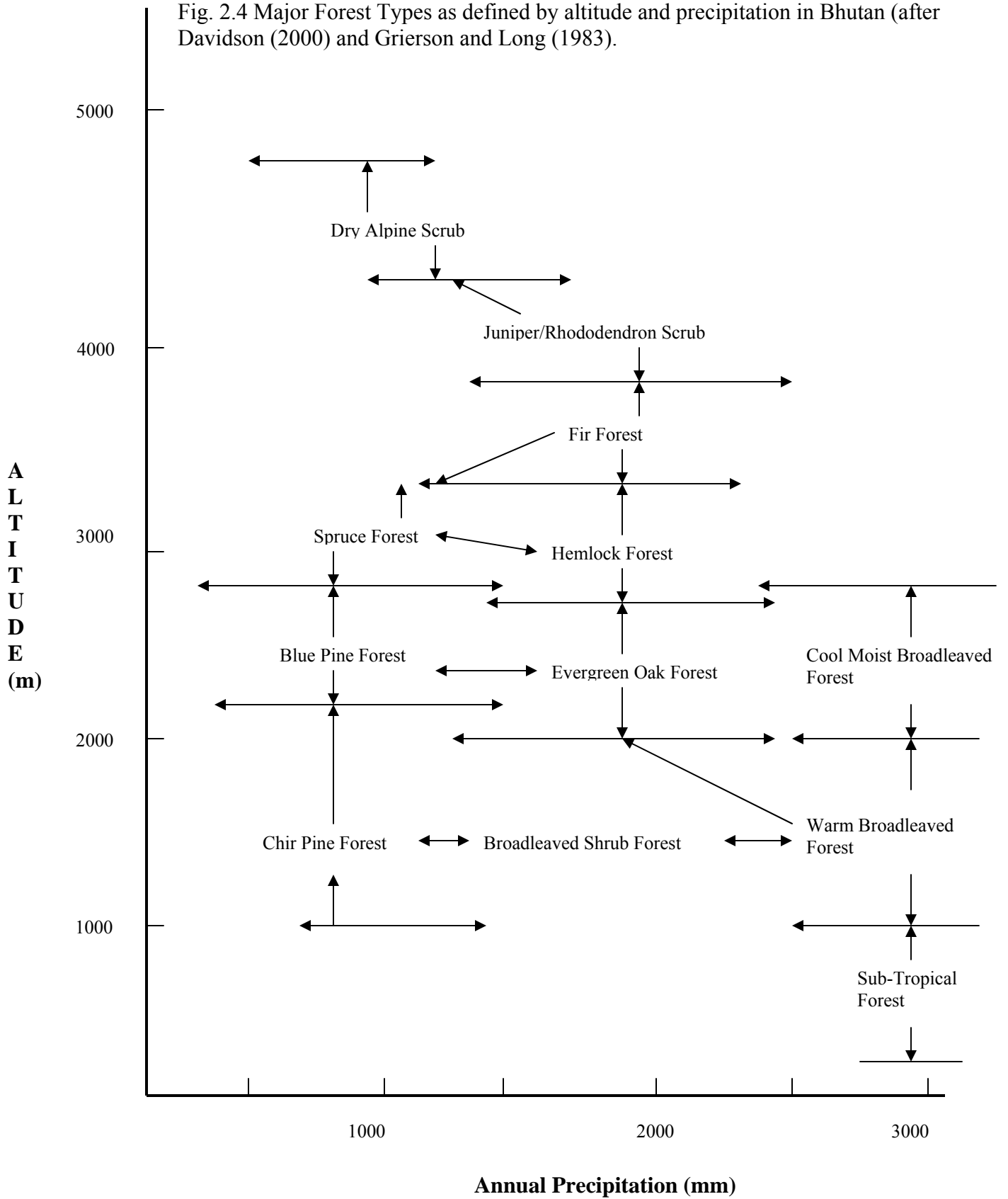
“For Bhutan, its vegetation is one of the most important and valuable national assets, representing a huge long-term resource, of which only a small fraction is utilised at present. Economic uses apart, the vegetation and its constituent genera and species are of great scientific value to botanists and ecologists around the world, not only for their richness and diversity, but also because of the excellent state of preservation of most of the country’s forests and mountain areas, in comparison to some other Himalayan areas in NW India, Nepal and Sikkim.”

Bhutan, for its small size, has a very rich biodiversity. Located in the Eastern Himalayas, it is recognised as one of the 10 global biodiversity ‘hotspots’. The country is reported to host 5500 species of vascular plants, 770 species of birds and 165 species of mammals, with many species said to be endemic. It is also said that Bhutan and adjoining Himalayan areas are the origin of about 168 species of horticultural plants in Britain and Europe. The government’s policy is to maintain 60% of the country’s territory under forest at all times. And about 35% of the country’s area is already under the protected

area network, constituting four national parks, four wildlife sanctuaries, one strict nature reserve, and biological corridors (MoA 2002).

The biodiversity and forest types in the country are influenced by altitude and rainfall. Grierson and Long (1983) describe eleven forest types based on dominant forest trees for the country. The relationship of these forest types with changing elevation and precipitation is illustrated in Fig. 2.4.

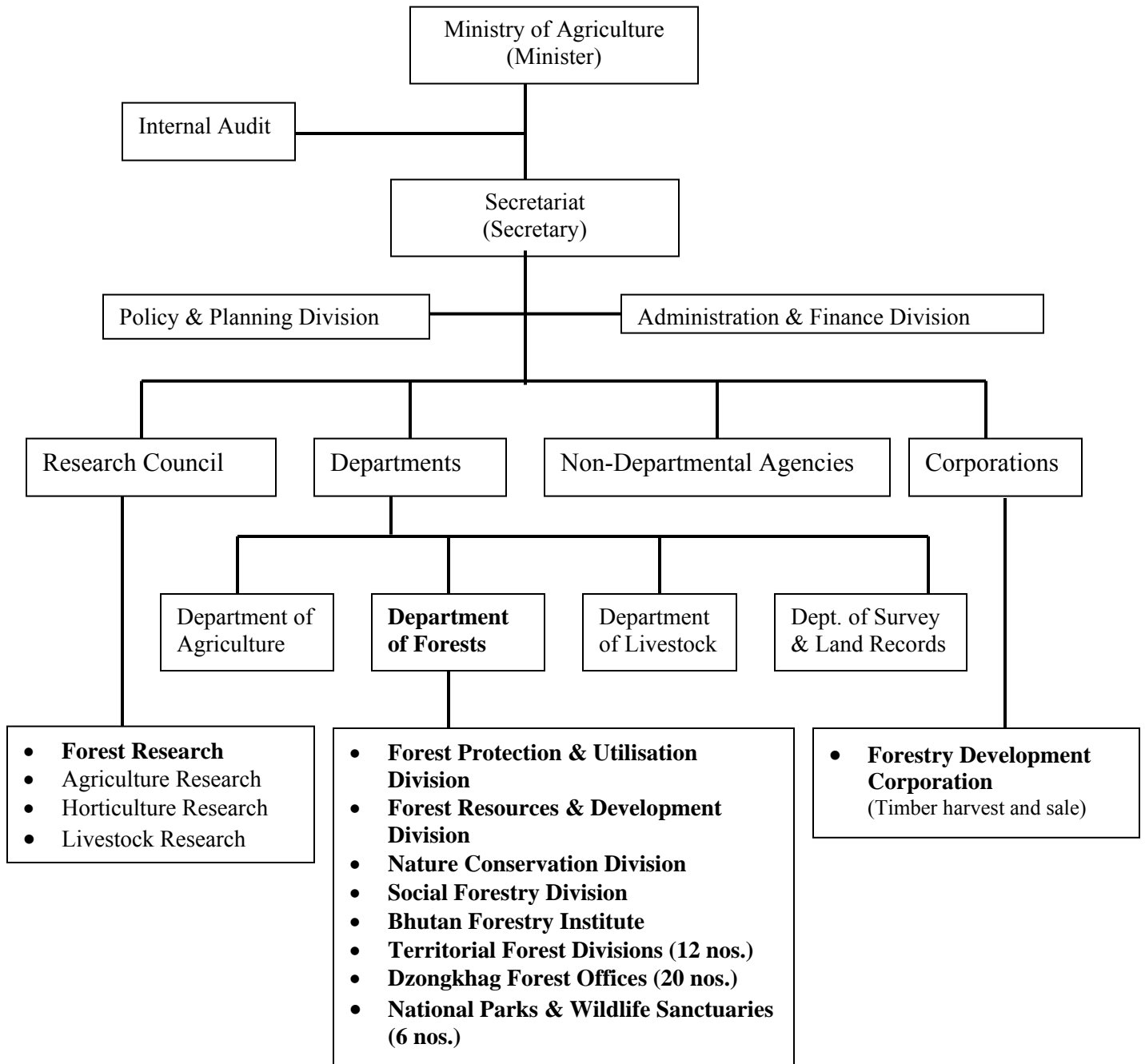
Fig. 2.4 Major Forest Types as defined by altitude and precipitation in Bhutan (after Davidson (2000) and Grierson and Long (1983)).



2.5.1 Forest Ownership and Organisation

First by the Bhutan Forest Act 1969 and later by the Forest and Nature Conservation Act 1995, forest in the country is state owned. The Department of Forests (DoF) is responsible for 90% of the country's territory. The DoF in the early years functioned independently and its headquarter was based in Samtse in the south, due to the fact that the south had road access to India, and forest extraction was wholly concentrated there. The forests headquarter moved from Samtse to Thimphu, the capital, only in 1973 (DoF 2002b). When the government ministries were being rationalised and established, and given the importance of forest as a revenue-generating source, DoF was incorporated into the newly established Ministry of Trade, Industry and Forests in 1974. It was later shifted to the Ministry of Agriculture in 1985. And since then, together with the Department of Agriculture and Department of Livestock, it constitutes the Ministry of Agriculture. In 2002, the Department of Survey and Land Records with the Ministry of Home Affairs was also relocated to the Ministry of Agriculture. The organisational structure for the Ministry of Agriculture with special reference to Forests is illustrated in Fig 2.5.

Fig.2.5. Ministry of Agriculture Organogram with special reference to Department of Forestry (adapted from MoA (2005))



2.5.2 Timber Stock and Production

The Pre-Investment Survey (PIS) in 1981 estimated a total timber growing stock of 529 million m³ with the net annual allowable cut of 14 million m³ (PIS 1981). The Master Plan for Forestry Development in 1991 determined a safe operational area of 902,000 ha out of the total 2 million ha, after subtracting the forest for protected areas, of over 4000 m, steep slopes and river and road buffers. The operational area was estimated to have a total growing timber stock of 184 million m³ with an annual allowable cut of 1.2 million m³ (DoF 1991a; DoF 2002a). The annual domestic demand for timber for the construction and wood industry is said to be within the range of 0.3 to 0.4 million m³, but the supply is said to be only 0.124 million m³. The timber supply therefore does not meet the demand in the country. The Department is constrained by trained people and resources to prepare plans for new forest management units (DoF 2002a; pers.comm. DB Dhital³).

Law requires the preparation of a forest management plan for regulating the production, protection, transport and trade of timber, other forest produce and wildlife (RGOB 1995). A forest management plan is prepared for a geographic area known as forest management unit, usually a watershed with areas ranging from 4,000 to over 15,000 ha. It is a resource demanding exercise taking anything from two to three years to prepare. As of today, there are 15 forest management units in the country, covering an area of 152,000 ha (pers. comm. DB Dhital). The motive for preparation of all of these plans is the timber production. It is the desire of the Department of Forests to have management plans covering all of the country's forests. A management plan is among the most central aspects of the 'scientific forest management'. The forestry profession generally views with concern any action without it or outside of it.

³ Chief, Forest Resources and Development Division, DoF.

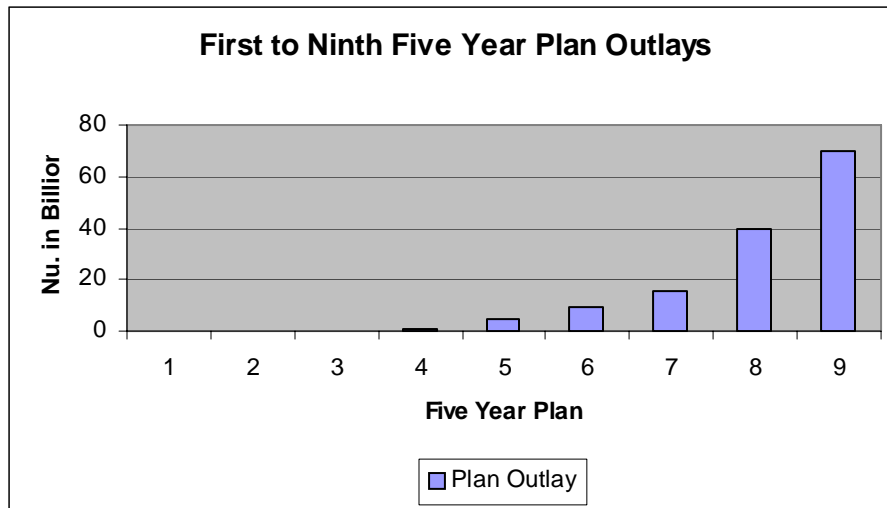
2.6 The National Economy

Bhutan today has come a long way in the last 40 years from a traditional subsistence economy to a free market economy. When the country shed its self-imposed isolation and embarked upon the modernisation process in 1961, it was characterised by a complete lack of the most basic infrastructural facilities such as motorable roads and communication. Due to a largely non-monetised economy, it also completely lacked financial resources and trained manpower to start development projects (DoP 2004).

India financed completely the country's First Five Year Plan (FYP) (1961-67). This enabled the country to construct a total of 200 kms of road network and other social, physical and administrative infrastructure. Bhutan's internal revenue managed to meet only 1% in the Second FYP, rising to 7% in the Third FYP. Since the Sixth FYP (1987-92), the country has been meeting all its current expenditures from its own domestic revenue. Donor aid and international credit are today sought for capital investments only (DoP 2004). The economy as indicated by the size of FYP outlays has been growing significantly (Fig.2.6). The current FYP (2002-7), which is the ninth, has a total budget outlay of Nu. 70 billion (US \$ 1.63 billion)⁴. The domestic revenue is expected to cover the current expenditure of Nu. 32 billion, and the debt servicing of Nu. 3.5 billion. About Nu. 35 billion is for capital investment, the financing of which will be met by external assistance and credit (RGOB 2002).

⁴ In this budget outlay, major hydroelectric projects and private investments have been kept out of the framework.

Fig.2.6 Five-Year Plan Outlays



The GDP in 2002 was Nu. 33,159 million. Since the beginning of development planning in 1961, the country has been experiencing a strong macroeconomic performance with real GDP growth of 5 to 9 %. With 79% of the population living in rural areas, the economy is still dominated by the agricultural sector, including livestock and forestry. However, its share to GDP dropped from 63% in 1980 to 32.7 % in 2002. The share of the agricultural sector is expected to drop further over the years due to high growth in construction, manufacturing, service, transport, and government and electricity sectors. During the period from 1980 to 2002, the combined sectors of hydro-energy, manufacturing, and construction rose from 11.4% to 33.4% of GDP. The per capita of GDP is estimated at US \$ 835 in 2002 (Kuensel 2004a).

2.6.1 Balance of Trade

Bhutan's overall trade balance is negative, and growing at a compound rate of over 16 % (Fig. 2.7). India remains the country's main trading partner, accounting for 78% of total import, and 92% of total export in 2001. The hydropower developments are expected to close the gap in the balance of payment or even lead to a positive balance with India in the near future. But, the Royal Government of Bhutan is worried about the trade gap with third countries. The export to third countries in 2001 was Nu. 295 million only while import was Nu. 2001 million (DRC 2003). Sovereign foreign debt outstanding in 1998-99

was US \$ 155 million with annual principal and interest payments of US \$ 4.8 million in hard currency and US \$ 9.2 million in Indian rupee. The country's debt-to-GDP (including the Indian rupee) stood at 38%. As the major loans have been sought on revenue generating projects e.g. hydropower development, the debt service is reported to be manageable and sustainable. But, the government is concerned about the pressure felt on convertible foreign currency reserves (RGOB 2000b; RGOB 2002). The top ten export items in 2000 were electricity, calcium carbide, Portland cement, ferro-silicon, particle board, oranges, mixtures of juice, potatoes, bituminous coal and rum, and the top ten import items were computer and parts, passenger motor cars, rice, diesel, trucks, edible oil, bulldozer spare parts, electro-mechanical appliances, wheat and iron and steel (RBE 2002).

Fig.2.7 Overall Balance of Trade



2.7 The Rural Economy

Bhutan is predominantly a peasant society. About 79% of its population live in rural areas and derive their primary livelihood from family owned lands and animals. The family land holdings are small. About 69 % of farm households are said to own less than 5 acres of land; 30 % between 5 and 25 acres; and only 1 % own over 25 acres of land. Due to low productivity of most land types, even a 25-acre land is reported to be barely

enough to sustain an average family (RGOB 2002). Being mountainous, the primary livelihood strategies of the people are dictated by altitude and precipitation, and they are very diverse. However, they can be broadly divided into three main geographical zones: the high northern belt, the broad central belt and the narrow southern belt.

The high northern belt constitutes the great Himalayas, bordering the great Tibetan plateau. Living between 3500 to 5000 m asl, people are pastoralists depending primarily on yaks. The region is characterised by long harsh winters with heavy snow and short wet summers. The spring and autumn seasons are dry and cool. Cut off from the north (Tibetan plateau) and the central valleys in the south by high passes, there are no motorable roads to this region. In summer, people move with their animals to yet higher altitudes (over 4000 to 5000 m), and this is the season for preparation of butter and cheese for sale and trade in the central valleys against rice, other cereals and chilli. Villagers generally do all their trading in autumn, ready in time to stock their food provisions before the passes close with snow in winter. Only a few selected communities grow barley, wheat, turnips and parsnips, and lately potatoes. The area is unsuitable for rice cultivation (Gyamtscho 1996; Pommaret 1997).

The broad central belt constitutes the area of main human settlement in the country. The climate is generally temperate. In the past, people traded either with the north (Tibet) or with the south (India) but there was little communications between the different communities across the width of the country. Traditionally this belt was divided into regions on historical and economic basis: West, Centre and East. Today the road communications are good, and trading between the valleys is common. The altitudes of the main valleys in the belt rise from 1000 m (Tashigang) to 2800 m (Bumthang). Many varieties of cereal, vegetable and horticultural crops are grown, and livestock animals reared (Pommaret 1997). The important cereal and vegetable crops are rice, wheat, barley, buckwheat, maize, millet, cabbages, cauliflower, radish, and chilly. The horticultural crops that are the main source of cash include the apple and potato. The livestock animals include cattle, sheep, pig and poultry.

The narrow southern belt constitutes the pockets of plain lands and low hills rising up from the plain lands of India. Road communications from north to south, and from and to India are good. The climate is sub-tropical, thus wide varieties of cereal, vegetable and horticultural crops can be grown. The important cash crops are mandarin (oranges), cardamom, and ginger (Pommaret 1997).

2.7.1 Market Integration

Guenat (1991) notes that the low household income in rural areas reflects still the low monetised subsistence production, but with the modernisation process, new needs have appeared even in the remotest of rural villages. For example, social services such as schools have been established in all villages. While the education is free, farm households still incur expenses for children's clothes, footwear and transportation. Also, market goods such as imported rice, edible oil, sugar, and utensils etc. have become essentials in farm households. Further, the past tradition of in-kind tax has long been replaced by tax in cash. The increasing need for cash introduced by the modernization process has created the necessity for cash earnings in the rural areas. Cash cropping of potato, mandarin, apple, cardamon is gaining popularity with the farmers (Guenat 1991).

2.8 Development Challenges for Bhutan

The Asian Development Bank (2003) says that Bhutan is on track to achieve the Millennium Development Goals. Universal primary education is expected to be achieved by 2007, about 8 years before the target date. At 90% coverage currently, the universal health care could also be achieved much ahead of the target date. However, Bhutan faces many major development challenges. These include:

External Assistance: Bhutan is still heavily dependent upon external assistance for its development financing. Given growing pressures on global official development assistance, it is possible that the quantum of external assistance available to Bhutan may decline in the future. The country may be forced to borrow from both outside and inside to fill the financing gap (ADB 2003).

Balance of Trade and Foreign Exchange Earning: Imports are outpacing exports for Bhutan. The services and transfer of payments to the third countries (other than India) also exceeds the receipts, thereby widening the current account deficit. The limited capacity for foreign exchange earning is a matter of concern for the country.

Dutch Disease: It is so called because the concept has its origin in the Netherlands. It relates to a significant foreign exchange boom from the discovery and exploitation of natural gas in the Groningen field. The government used the huge foreign income for additional public expenditure, which drove up domestic incomes, wages, demand and inflation. The Dutch export industry found it difficult to compete in the international market due to its high wages, which meant industrial profitability declined. The term is often painted in economics today as an example of how bad things can get if 'easy money' makes the government lose control of fiscal expenditure (Wunder 2003). In Bhutan, the World Bank (2000) has expressed concern that the 'Dutch disease' might arise due to the predominance of hydropower development. The hydropower currently accounts for 45% of government revenue, and it is expected to rise dramatically when the Tala Hydropower Project of 1020 MW comes on stream in 2006. The World Bank suggests diversification and expansion of the Bhutanese economy.

Rural Income: At the macro-economic level, Bhutan has been doing extremely well with an average GDP growth of over 6% over the years. However, the rural people do not seem to have benefited from it sufficiently, despite the government's efforts to enhance the rural income. The Bhutanese rural people with a per capita per day income of US \$ 0.80 are poor and live in poverty as measured against the international poverty line of a dollar a day. The government strategies to enhance rural income have included: the political decentralisation; infrastructural development of roads; credit facility; introduction of high yielding varieties of crops and animals; improved management practices; cash cropping of potato, cardamom, apple and mandarin. But, the government is yet to appreciate the role of timber and NTFP in poverty reduction programmes in the rural areas.

CHAPTER 3: LITERATURE REVIEW

The study of NTFP, as a forest products group, has come to be a distinct area of forestry policy and research just in the past decade. This literature review through an historical perspective discusses the origin of state forestry in medieval Europe and its transfer to tropical countries, and its treatment of NTFP. Phillips and Pugh (1994) write that it is important for a research student to understand the history of the subject he or she intends to study in order to become acquainted with the current research and debate on the topic. State forestry advocated highly centralised decision-making, and put trees at the centre of the policy objective. However, today's forests are found to be too important to be left to the foresters. The literature review goes on to discuss the shift that is taking place in forestry in the world from state to local level, and the growing international interest about NTFP. The NTFP topics discussed include the following: the development assumptions about NTFP; NTFP research; the confusion associated with the definition of NTFP; the significance of NTFP in the local and national level; and NTFP commercialisation. Also discussed in detail are the policy, the economic and environmental issues concerning NTFP. Bhutan's own history of state forestry and the significance of NTFP to the country are presented at the end of the chapter. The purpose of the chapter is to rationalise the significance of NTFP and to establish the context and structure of the topic.

3.1 History of State Forestry

The peasant communities in the tropics have depended and subsisted upon wild plants and animals for food, clothing and shelter for centuries (Godoy and Bawa 1993). Many of the NTFPs were of great historical and commercial value e.g. spices, agar wood, rubber, chicle, gum copal, oil palm, cocoa and palm rosa. For centuries the spices were the most sought after product in medieval Europe. It is said that Columbus voyaged to the New World in search of India and its black pepper. Black pepper was classed with gold, silver and gems, and western traders sold it for 600 times more than what it cost them in Indian

ports (Jackson 2004). In the nineteenth century, British sponsored scientific explorations and studies to the tropical countries in search of medicinal plants, vegetable tanning agents, fibres, oil-nuts, gums and resins, waxes and rubbers (Worboys 1990 in Neumann and Hirsch 2000). However, the importance of NTFP in the past was wholly driven by state or corporate interest, not linked to rural development (Neumann and Hirsch 2000; Wong 2000). The neglect of NTFP in the past as a topic of forestry can be explained by the historical context, in how the state forestry evolved in medieval Europe, and later exported to the tropical countries during the period of colonialism. ‘State forestry’ for this research study is defined as a system whereby forest ownership rest with the government, and the government takes control over forest access and management.

3.1.1 Forestry in Medieval Europe and Origin of Scientific Forestry

The phenomenon of deforestation that is currently taking place in the tropics was a common feature in Europe starting as early as the fourth and fifth centuries AD in England, and a few centuries later in mainland Europe. In England, the forestlands were cleared for agriculture and settlements, and to provide wood for energy, construction, industry, and the navy (Westoby 1989). They were also the source of exciting sports, meat and money for the kings and noblemen. The kings and noble men, in order to extend their wealth and power, spread their title to the remaining forestland and claimed rights to ‘what stood on it and lay under it’. They paid scant regard to the needs of the peasantry dwelling in or around the forests, and were often savagely punitive when they considered their rights trespassed (Westoby 1989; Whitlock 1979). A forest offence was punishable by imprisonment, and if the offender was a ‘serf’ it was execution. The common people, in order not to get into trouble with the foresters, cut the toes of their dogs so that they did not chase the game animals, and only collected the branches of fallen trees. The foresters had the power both to arrest and to adjudicate the forest offence. The common people feared the foresters and hated them the most. Peasant resistance and uprisings were a common feature in many places over the years (Whitlock 1979). A similar situation persisted in mainland Europe. The noblemen and lords in Germany extended their claim to forests, making lives of the peasants difficult. The peasants’ frustration with stricter

policing of the forest and curtailment of the rights they had hitherto enjoyed culminated in the Peasants' War of 1524 (Klose 1985).

The iron and glass works industry developed and flourished in Europe in the Medieval Period (1066 to 1800 A.D.), consuming huge amounts of fuel wood. Additionally, rapid urbanisation and ship building also placed extra demand for timber resources on an already shrinking forest area. The growing scarcity of timber resources, once thought to be inexhaustible, was beginning to become a matter of concern to people during this period (Rackham 1986; Kuechli 1996). As a response to the shortage of timber for industry, and the need to manage the forests, German scientists in the early eighteenth century, using knowledge based upon biology, ecology and mathematics, developed forest science as a separate professional discipline. They introduced the concept of 'scientific forest management'. The central principle was the 'sustained yield', which advocated that the productivity of a forest area should remain unchanged through replacement of cuttings of trees by natural or artificial regeneration of new crops of forest trees. The primary interest in forests was timber for industrial use (Westoby 1989; Banuri and Marglin 1993; Kuechli 1996).

The 'scientific forest management' marked the beginning of the belief that the state was better placed to take responsibility for forest resources, as forest management required planning and action over many years and generations, and large forest areas for rational management based upon rotation. It also presented the traditional use of forest by the peasantry for timber, fuel wood, NTFPs and cattle grazing as constituting practices that directly caused degradation of forest resources. The traditional forest uses were thus considered incompatible with the practice of the art of silviculture and forest management. Foresters therefore engaged in an exclusion policy of keeping away peasants from the forest areas. This was achieved through the enactment of forest legislation, the establishment of a forest administration and the introduction of police control (Banuri and Marglin 1993; Kuechli 1996). It was in theory and practice a continuation of the 'king's forest' model, where the authority of state replaced that of the king.

The state employed foresters for forest administration, and the loyalty of the foresters was therefore to the state, the employer. The state's interest was in maintaining and gaining control over more forestlands from the common people, and creating revenue through the sale of timber to urban centres and industries. The foresters thus represented far away urban interests, and wanted the forestlands undisturbed by peasants (Shepherd 1992a; Pathak 1994; Kuechli 1997). This attitude was clearly reflected in the forest regulations which restricted peasant access to the forest, and the terminology that developed during the time: the timber was referred to as the 'primary' product from the forests, and the other forest products, which peasants considered important as 'minor forest products' (Kuechli 1997).

3.1.2 Colonial and Post-Colonial Forestry

Blaike and Sadeque (2000) note that much of what constitutes forestry in the Anglophone tropical countries today is based on the British forest experiences in India. In the early period of the colonisation of India in the eighteenth century, British saw the vast tracts of forestlands as "an obstruction to the prosperity of the country, as they were not a part of the land revenue yielding tracts. Thus, the initial emphasis was on destroying forests, both for the revenue earned from timber supplies and for maximising land revenue by putting the cleared tracts to cultivation" (Pathak 1994:18). In the 1800s, there was increased demand placed on the forestlands in India to meet the timber requirements for shipbuilding in England, and later in the 1850s, for the expansion of the railway networks in the country (Guha 1983). With approximately 1800 sleepers required for every mile of the railway track, some 66 million sleepers were consumed for the 37,000 miles laid by 1920 in India. Further, the railway network transformed the world of commerce, and it made the distant and remote forest areas economical to exploit (Kuechli 1997). To identify and make available timber for the expansion of railways and industrial use, the British government in India established the Forest Department in 1864 and commissioned Dietrich Brandis, a German forester in 1865, as the First Inspector General of the Imperial Forest Service (Guha 1983; Pathak 1994; Kuechli 1997).

The new Imperial Forest Service then successfully campaigned within the British administration to make the case that the forestlands in India had suffered severe damage and that further unscientific exploitation would severely impair the potential of the forest stock to yield timber. Therefore, it was of urgent matter that the forests should be protected from use and only mature timber be extracted on a regular basis to ensure timber supply in perpetuity (Guha 1993; Pathak 1994; Kuchli 1997). Guha (1993:83) notes that “in one fell swoop, through the India Forest Act 1878, the state asserted its rights of ownership and control over one fifth of India’s land area”. All unoccupied land and customary usage of the peasantry, since time immemorial, was interpreted to be at the mercy of the King and thus the British State. The state extinguished customary rights by paying compensation or allocating land elsewhere to free the patch from all encumbrances. It also “carefully regulated peasant access by restricting it to areas of forest not deemed commercially profitable, and while forbidden to enter areas under commercial working, peasants were no means at liberty to use the rest of the forest at will” (Guha 1993:85). The new state control of forest resources led to the breakdown of traditional village systems of resource control and use, and turned the forestlands to open access (Kuechli 1997). Forests bore two superimposed imprints: those of the state to meet market demands for timber, and those of the forest dwellers to subsist (Pathak 1994). This provided a fertile ground for social unrest and protests, a replay of medieval Europe forest-people conflicts in India (Guha 1993; Pathak 1994).

Post independence in 1947, a well-developed forest bureaucracy in India was “quick to assert the continuity of the colonial structures in forestry” (Pathak 1994:21). According to Blau and Meyer (1987), bureaucracies are powerful instruments of administration, and once established they tend to use their power to maintain the status quo rather to promote change or innovation. Also, an intense period of education and training yields a professional culture with a common attitude, norms and values (Schein 2004). The norms of state forestry maintained that it was only the forest department that had the long-term interest of forests and only a forester had the required knowledge and skills for forest management. It mistrusted people as being motivated by short-term interests ready to destroy the forests if not policed (Van Gelden and O’Keefe 1995). A

state forester therefore did not see injustice in keeping rural people out of the forest but allowing contractors in (Shepherd 1992a). For many years India was the only country in the tropical world that had forestry training institutions, namely the forestry college in Dehra Dun, and was the hub of the state forestry ideology not only in India but also in much of Asia.

3.2 Decentralisation and Devolution in Forestry

Forests are seen today as central to the sustainable development concept. This is no more confined only to technical and scientific discussion (Juma, Oksanen et al. 1999). About 1.6 billion people depend to varying degrees on forests for their livelihood, out of which 60 million are indigenous people almost wholly dependent on forests. About two-thirds of the 1.2 billion who earn less than a \$1 a day are the forest dependent people (WB 2002). The centralised decision making, authoritative legislative strategies and management attitudes and practices have over the centuries marginalized the forest dependent people. The abject poverty and economic insecurity of the forest people are therefore embedded in the state forestry structure. The forest officers are mostly office-bound and heavily burdened with administrative duties, yet responsible for monitoring the forest use of these millions (Poffenberger and McGean 1996; Poffenberger, McGean et al. 1996).

The world is also losing forest areas at an annual rate of 14.6 million ha (FAO 2001), which is about three and half times the size of Bhutan. There is a widespread perception of, and considerable experience of, government failure in the forest sector. The state is an inefficient custodian of forests “because its locus of power is far away and it depends upon poorly paid forest guards who are often tempted to live off the resource they are supposed to be guarding, either by the collection of bribes, permit fines, and fines or direct theft” (Shepherd 1992a:13). The loss of forest area and poverty are said to be reinforcing each other in a vicious cycle (Dove 1993).

Since the early 1980s, policy makers and politicians in the world have become more interested in and concerned about forests and issues related to forests, especially in the tropical countries (CSD 1996). The first principle in the Rio Declaration in 1992 was “human beings are at the centre of concern for sustainable development. They are entitled to a healthy and productive life in harmony with nature” (UNCED 1992). This has largely been possible because international NGOs and other civil society groups have been making their voices heard in international discussions, and spearheading actions for forest decentralisation and devolution from state to local level, through the adoption of participatory process (FAO 2001). Decentralisation and devolution are dominant themes in the international forestry today, but Fisher (1999) notes that, in practice, the genuine devolution of power over forest resources in Asia and Pacific region has been occurring only to a very limited extent. There is only the tendency to pass responsibility for protecting forest resources to local communities, without the accompanying rights to use those resources in a significant way for their own benefits. Forestry officials seem to be reluctant to let go of their responsibility for forest management because they have major interests in continuing their command and control structure. According to Mayers and Bass (1999), policy is what organisations do, and is based on prevailing narratives. The narrative of forest destruction by forest dependent people, and public goods of forests as biodiversity reservoir and watershed protection still sticks.

3.2.1 Social / Community Forestry

Under the umbrella of forest decentralisation and devolution are included a variety of forestry programmes such as social forestry, community forestry, joint forest management, agro-forestry and farm forestry. In the broadest meaning, whatever programme it is known by in whichever country, they all mean people-centred forestry: that is, that local people are involved in key planning and decision-making, in implementation, in sharing the benefits, not just as salaried labourers (TFDP 2000). Most forestry projects in the tropical countries until the early 1970s were large scale, centrally-driven forest management and industrial plantations, founded on the theory of ‘trickle down’. The ‘trickle down’ refers to the notion that monetary benefits directed to big

projects at ‘the top’ will eventually reach down to the local poor ‘at the bottom’. Subsequent experience has demonstrated that the theory is seriously flawed (ibid). As international attention began focussing on the plight of tropical forests and widespread poverty there were disappointments expressed at the state forest policies and practices. One of the earliest institutional responses to state forestry was the 1978 Eighth World Forestry Congress with the theme of ‘Forest for People’(Hobley 1996). In the same year, the World Bank issued a Forestry Sector Policy Paper which indicated a major change in direction away from support mainly for industrial forestry to forestry to meet local needs. The World Bank noted that only four of the 17 projects financed between 1953 and 1976 were specifically intended to benefit rural people (WB 1978; Hobley 1996). As discussed in Section 3.2, decentralisation and devolution in forestry is gaining momentum in the tropical world today, but in a halting manner.

It was also recognised that state foresters, under whose custody the forests are, could not provide effective services to rural people without cultural re-orientation, institutional development and support (TFDP 2000). The differences in attitude and philosophy between the old ‘top down’ forester as protector and the more modern forester as consultant and facilitator can be great, as shown in the Box 3.1 below.

Box 3.1 The ‘Consultant’ Forester vs. ‘Protector’

Top-down Forester / Protector	Consultant / Facilitator
<ul style="list-style-type: none"> • Does not value village life, village customs or village cultural life (he or she is ethnocentric). • Believes himself/herself superior to villagers. • Does not want to work in villages. • Commands the villagers, tells them what to do (undemocratic). • Assumes he knows all the answers (is close-minded). • Believes his technical forestry science is superior to other ‘soft’ (social) sciences. 	<ul style="list-style-type: none"> • Works side by side with villagers to develop projects (is respectful); provides helpful professional know-how as appropriate, needed or required. • Treats villagers with respect (is culturally relative). • Likes going where the work is; likes to be with the common people. • Seeks village cooperation (is democratic). • Tries to learn from the people and other professionals (is open-minded). • Respects all good science (including social science); seeks harmonious interaction.

Source: Morrison 1991 in TFDP 2000

3.3 NTFP: Why the sudden international interest?

Godoy and Bawa (1993) note that it was against the background of deforestation and growing poverty amongst the forest dependent people that research studies by Peters et al. (1989), de Beer and McDermott (1989) and Panayotou and Aston (1992) drew international interest on NTFP. They captured people's attention on the subject with titles such as 'Valuation of an Amazonian rain forest', 'Economic value of NTFP in South-East Asia' and 'Not by timber alone'. The first study appeared in the highly acclaimed science journal 'Nature', and the International Tropical Timber Organisation (ITTO), and the International Union of the Conservation of Nature (IUCN), two highly profiled agencies, commissioned the later two studies respectively. The three studies highlighted the case for NTFP with the assumptions that (Godoy and Bawa 1993):

- NTFPs, much more than timber, contribute in important ways to the livelihoods and welfare of rural populations. Millions of people in the tropics derive a significant part of their livelihood from forest products. An inclusion policy of involving local forest communities in both forest utilization and conservation can reduce the conflicts between local people's livelihood needs and the conservation aims of government.
- Forest dependent communities will tend towards careful, sustainable management of forests if they receive direct economic benefits from harvesting their resources.
- Increased commercial harvest of NTFPs should add to the perceived value of the tropical forest at both the local and national level
- NTFP extraction is less ecologically destructive than timber harvesting. Tropical forests have a greater long-term economic value if they are left standing.
- Poverty in forest dependent communities is both a cause and result of deforestation and environmental degradation. If poverty can be alleviated through the harvesting of forest resources, then deforestation pressures will be reduced.

Sheil and Wunder (2002), however, in a critique of Peters et al. (1989) express discomfort at the implicit message of the research that 'standing tropical forests can

provide large incomes through sustainable NTFP'. They are also uncomfortable with another study by Godoy et al (2000) that concludes with an opposite message that 'standing tropical forests tend to provide low returns to local communities, or tropical forests can't pay for themselves'. Sheil and Wunder argue thus that the valuation of NTFP against timber for a hectare of forest is oversimplification of a complex issue.

Since the three studies in the late 1980s discussed above, the body of literature on NTFP has grown hugely. Neumann and Hirsch (2000) note only four pieces were published on NTFP prior to 1987, the earliest being in 1985. Godoy and Bawa in 1993 produced just over 500 citations in their review of the NTFP literature. A general *google* search today yields hits in thousands, and in titles only over three thousands. National, regional and international conferences, seminars and training workshops on the subject are today a common place. Many forest agencies and units have websites devoted to NTFP.

3.4 NTFP Definition

The concept of NTFP refers to any and every natural product from the forestlands except timber (FAO 1995). These products were historically referred to as 'minor forest products' (MFP) but this terminology has come up against a heavy criticism in that it reflected an institutionally biased view, which recognised timber as the primary product from the forest, and the other forest products, which the common people depended for food, fibre and medicine as secondary (Kuechli 1997). There are today a multitude of terminologies, loosely defined and interchangeable. The main ones include 'minor forest products'; 'non-timber forest products'; 'non-wood forest products'; 'special forest products'; and 'other forest products' (FAO 1995).

The terms often mean different things to different people, causing disagreement and tension over the underlying concept and scope e.g. NWFP and NTFP. In the NWFP, fuelwood and small timber are excluded while they are included in the NTFP. FAO defines NWFP as (FAO 1999:63):

“NWFPs consist of goods of biological origin other than wood, derived from forests, other wooded land and trees outside forests.”

NTFP on the other hand is defined as Wickens (1993:3):

“All the biological material (other than industrial round wood and derived sawn timber, wood chips, wood-based panels and pulp) that may be extracted from natural ecosystems, managed plantations, etc., and be utilized within the household, be marketed, or have social, cultural or religious significance.”

There are also new perspectives being added to the definition due to the growing interest on NTFP. For instance, Belcher (2003) is not comfortable at the distinction made between timber and non-timber. He argues that maintaining the distinction could have negative consequences in terms of both conservation and development, with implicit assumptions that timber is for the rich and NTFPs for the poor. In reality, people value both the timber and non-timber products from the forest, and improving the livelihood opportunities of forest dwellers must take into account the full range of forest products that people use, including timber. Further, the large-scale and capital intensive NTFP development, for example rattan plantations are just as likely to displace and alienate forest dwelling people as in an industrial timber plantation. It is also likely to lead to deforestation through land clearing with the negative consequences of inequality and biodiversity loss. The real issue, therefore, is in the scale of the operation and the control that local people have over the use of resources, not between ‘timber’ and ‘non-timber’. Whatever the different underlying arguments, the concept of the importance of forest products group besides timber is hard to ignore in the forestry development today (Wollenberg and Belcher 2000; Belcher 2003).

I have for this research study chosen to adopt the definition for the NTFP, firstly for its inclusive nature of all forest products besides timber, and secondly it is more widely used now in the international literature. I have however not included in the study fuelwood and small timber because while they are important to people, forest rules

prohibit their private sale and there is no established system of cash income from them as yet.

4.5 Significance of NTFP at Local and National Level

Timber is no doubt the most valuable forest product with huge potential for significant cash income for the forest dependent people in the tropical countries. But, first in the name of national interest, and today in the name of environment, timber production and trade are almost always under the control of the forest department, thus hands off to the local communities (Fisher 2000; Wollenberg and Belcher 2000). An important aspect of NTFP is therefore the political message it carries that the forest will remain standing more or less biologically intact under sustained NTFP harvesting while, at the same time, bringing economic development to the local and indigenous people living and dependent upon the surrounding forestlands (Godoy and Bawa 1993; Neumann and Hirsch 2000). Rural people use a wide variety of NTFP for foods, medicines, building materials, agricultural tools and rituals. These are mostly used for household consumption, and often play critical roles as 'safety-nets' by providing food or income in times of shortage, as important dietary supplements, and as important cultural artefacts. However, such products do not, in most cases, improve the financial conditions of the households (Wollenberg and Belcher 2000).

There are only a smaller number of economically important NTFPs that can contribute significantly to rural cash income. However, Fisher (2000) notes that in many Asian rural communities, states generally tolerate NTFP collection of low values, and when a product becomes valuable, new restrictions are imposed or existing ones reactivated. NTFP extraction is often dirty, arduous and dangerous work, requiring high labour input. It is a symptom of poverty (Wilkie, Clark et al. 2000). People collect NTFP because it requires very little capital investment, only their physical labour, and there is no alternative source of cash income. Further, people have access to NTFPs, more than to timber (Neumann and Hirsch 2000).

In Bangladesh, over 75 percent of rural dwellings use bamboo as the prime building material. This is due to the fact that most rural people are too poor to buy processed building materials, and they therefore collect unprocessed forest products which are available at little or no cost, often gathered free of charge, from the householder's own farm or from forest and common lands (Arnold 1995). Employment and income from small-scale forest enterprises constitute an important and growing economic sector in the tropics. About 20-45 percent full-time employment in rural areas and 30-40 percent of rural household income is derived from forest-based enterprises (Kilby and Liedholm 1986; Haggblade and Hazell 1989). For many forest dependent people, the forest-based activity can be the sole or principal source of income. Infield (1988 in Arnold 1995) writes that in the villages around the Korup National Park in Cameroon, hunting was the single most important source of cash income for the majority of village households and for the villages as a whole. In a study in the lowland village in the Philippines, it was found that about three-quarters of the total households collected forest products for supplementary and emergency income, as income from agriculture was inadequate. The average earnings from rattan collection were greater than the average wage for agriculture or timber production (Siebert and Belsky 1985, in Arnold 1995). Women in particular are more dependent on NTFPs for household income. For instance, a study in West Bengal, India shows that about three times more women than men are involved in NTFP collection, twice as many women as men are involved in the NTFP marketing, and while men harvest 23 NTFP species, women harvest 71 NTFP species (Rijsoort 2000).

Arnold (1995) states that the NTFP is significant at the national level in the tropical countries as hundreds of millions of rural people are engaged in gathering, hunting, processing, trading and other aspects of NTFP production and use. For example in India, about 7.5 million people are employed part time in *tendu* (*Diospyros melanoxylon*) leaf collection; a further 3 million people are employed in *bidi* processing; and 3 million people in lac production (Tewari 1982). In the Brazilian Amazon, about 1.5 million people derive a significant proportion of their income from extractive activities (Browder 1989). Liedholm and Mead (1993 in Arnold 1995) report that wood and forest

products, together with textile and wearing apparel and food and beverages are three most important categories among micro and small manufacturing enterprises around the world. Lintu (1995) notes that in the Brazilian Amazon in 1987, the total trade value of NTFPs amounted to US \$ 110 million. In the international market, about 2.8 tonnes of cinnamon bark oil per year, 120-150 tonnes of cinnamom leaf oil per year, and 100 tonnes of rosewood oil per year are traded. The export of Brazil nuts is estimated at US \$ 50 million annually, and the essential oils for fragrances and perfumery raise some US \$ 1 billion (Arnold 1995).

NTFP has escaped the attention of national policy makers despite the evidence that NTFPs offer an opportunity to improve the socio-economic conditions of the poor. This neglect can be attributed to a variety of reasons, as presented by FAO (1995) and Neumann and Hirsh (2000):

- NTFP as a category of forest products is extremely heterogeneous, highly dispersed and varies considerably in distribution and concentration.
- Most NTFPs are often associated with traditional uses that are not widely known and/or are linked to the problem of poverty and subsistence.
- The NTFP use and commercialisation largely take place in households and small-scale units, mostly outside the establishment marketing systems, thus forming part of the unorganised, informal sector.
- Poor publicity on NTFPs.

3.6 Developed Economies and NTFP

The popular impression about NTFP is that it is a Third World forestry issue with little relevance to the developed economies. But, this according to Jones et al. (2002) is a gross misconception. NTFP is as much an issue in the developed economies. Local and regional conflicts in the US over NTFPs such as Pacific yew, wild mushrooms, beargrass, and ginseng are common and regular, and they often make front-page news. There are people asking for commercial access to NTFPs on both public and private lands. Private

landowners are also exploring options for using incomes from NTFPs to supplement or supplant revenues from timber harvests (McLain and Jones 2002). Medicinal herbs and edible wild mushrooms now figure commonly on the shelves of mainstream drug and grocery stores, and are big business in the US. The herbal market in 1992 was estimated at US \$ 1 billion, and growing to US \$ 2.5 billion. Of the twenty-five top-selling botanicals in US commerce, over 50 percent are species found only in the USA. American ginseng at \$ 138 million, Echinacea species at \$ 33 million and saw palmetto at \$ 27 million were the biggest sellers among the species native to the United States. Edible wild-growing mushrooms also have wide popularity, especially in the North Central and Pacific Northwest states. The wild mushroom market in Washington, Oregon and Idaho had an annual turnover of over \$ 21.5 million (Alexander et al. 2002).

In British Columbia, the NTFP industry employs over 32,000 people with direct corporate revenue of over Can. \$ 280 million, and provisional revenues in excess of \$ 630 million. The province is overly dependent on resource-based industries, which constitute over three-quarters of total merchandise exports. While looking for ways to diversify its economies, it wants to develop further its natural resources for export earnings. In 1999 it drafted an economic strategy to develop the NTFP industries (Wills and Lipsey 1999). In the UK, the wild elderflower is a business worth £10 million, and 'greenwood' trade of over £1.3 million (Prendergast pers. comm.) Common stinging nettles have become a growing industry with 2.5 tonnes gathered each year to wrap around maturing cheeses (Radford 2002).

Contrary to the view of NTFP as 'rural resources', they are as well an urban resource. Urban forests or woodlands which include avenue trees and parks can be a very rich source of many NTFPs such as berries, nuts, mushrooms, decorative greens and cones. People pick berries as they walk through parks, collect chestnuts or edible mushrooms as ingredients for a special dinner, cut grapevines from roadsides to decorate their houses in the autumn, or gather and can fruit for the winter or to give as gifts. Some people make holiday wreaths and other natural decorations to supplement Christmas season incomes (Jahnige 2002).

3.7 NTFP Commercialisation

Not all NTFPs have market value. It is only a small number that are economically important to rural people in terms of improving their living standards. However, commercial opportunity for the NTFPs in the world is on the rise due to economic liberalisation and rise in income (Fisher 2000; Neumann and Hirsch 2000). The commercialisation of a NTFP, defined as creating and increasing the market value for the product, also raises a wide range of issues. According to Arnold and Perez (1998), these include:

- Prevailing simple rules for subsistence use become irrelevant when a NTFP becomes a high value product. The high value NTFP provides an incentive for people to appropriate the commodity, and not cooperate.
- Enforcement of rules is likely to be complicated by high value NTFPs, especially if the commodity is desired by elites. Bribes and coercion to escape enforcement are more likely when high value NTFPs bring in cash.
- Many organisations may not be flexible enough to adapt to rapid changes induced by commercialisation. There may be no current rules on commercial products and there may be no past rules to learn from.
- High value NTFPs create incentives for outsiders and the state to appropriate the land, which generally results in legal claims.
- Local efforts to take advantage of the opportunities presented by high value NTFP can be complicated or frustrated by forest policies. The forest policies give higher priority to conservation objectives, leading the Department of Forests to put in place regulations designed to limit rather than to encourage the production and sale of NTFPs.

NTFP commercialisation can also cause a variety of ecological consequences, including resource depletion, changes (positive or negative) in biodiversity and changes in resource quality. Resource depletion can either lead to extinction or to cultivation, domestication and geographic relocation. The negative ecological consequences from

NTFP commercialisation arise in situations when tenure rights are poorly defined or altogether absent. NTFPs are derived from land that people do not control giving rise to an open access situation. In an open access situation, free riding by everyone results in the ‘tragedy of the commons’. The ‘tragedy of the commons’ refers to the social dynamics where individuals maximise their own best good at the expense of other individuals, ultimately affecting everybody and the resource base; yet, rural rights do not readily interest national government and may in certain circumstances be seen as a threat to the dominance of the centre (Shepherd 1992b). However, NTFP commercialisation provides an incentive for organizing and strengthening community action, and this can benefit forest conservation (Neumann and Hirsch 2000). Main policy changes that would best promote the long-term sustainable use of NTFPs would be a community-based natural resources management system (CBNRM) (Clay 1995).

3.7.1 Challenges to NTFP Commercialisation for rural development

The high expectation of NTFPs is that they will bring economic development to the rural areas, and provide incentives for the people to protect the forests. But, in practice NTFP commercialisation is characterised by many special challenges. According to Belcher and Schreckenber (2003), these include:

- National Forest Policy

NTFPs have not only been overlooked in many national forest policies but also in some cases discriminated against. The same kinds of transit permits that apply to timber are often applied to NTFPs. The NTFP traders therefore must pay relatively high official fees and/or unofficial fees collected at every checkpoint, thus pushing down the price paid to producers. For example, in Indonesia, farmers pay a fee for cultivated rattan because the Department of Forests cannot distinguish between the cultivated material and wild grown material.

- Production small and dispersed

Many NTFPs are produced in small amounts, dispersed over wide areas. The source areas are the remote forest areas with poorly developed communications and transportation infrastructure. It is difficult and costly to move products to market, and they are therefore unreliable in both quantity and quality. The small volume production draws limited attention or investment. When demand is created, supply becomes a problem. Niche markets are the most useful starting point because the supply can absorb the limited demand.

- Markets diverse and faddish, and development long

Many and diverse industries use NTFPs including the pharmaceuticals, botanical medicines, cosmetics, abrasives, and food and beverage companies. These industries are interested in the NTFPs for their new properties, their novelty and substitution of existing products. The markets are extremely fickle and trend-driven. For example, *Garcinia gummigatta* was promoted as a weight-loss supplement, which led to a ‘boom’ for the product, but it went ‘bust’ when scientific tests showed it to be ineffective. Development of a product in these industries is long, at least 5 to 10 years, and involves a significant investment of resources (Clay 1992).

- Barriers to entry

A high degree of technological innovation may be necessary to achieve value-addition for the product in the country of origin. Many low-income countries do not have the necessary infrastructure, strict quality control and sophisticated supply chain management practices to enter the international market with a new product. This makes selling products to mainstream markets beyond the possibility of most small-scale NTFP producers (Laird and Guillén 2002).

- Substitution and large-scale cultivation

NTFP markets are vulnerable to substitution, and large-scale cultivation. For example ‘chicle’ fuelled the modern chewing gum industry, and its extraction was the main industry in the Yucatan Peninsula of Mexico. But, the development of much cheaper petroleum-based gum had almost eradicated the demand for natural chicle by the 1960s (Laird & Guillén 2002). In addition to substitution, NTFP producers may have to compete with large-scale cultivation e.g. rubber plantations in South-East Asia forced out of business small-scale rubber production from natural forests.

- Certification

Certification is a mixed blessing. It opens opportunities to niche markets but is also a major trade barrier to small-scale producers, because it requires a high level of institutional capacity with regard to management planning, monitoring, product tracing and marketing. It also involves cost to obtain certification which is often beyond the means of many small producers.

- No ‘magic-bullet’ products

Given the many challenges to NTFP commercialisation discussed above, there is no ‘magic-bullet’ NTFP. One therefore must not be too optimistic about the potential of NTFP as a means of rural development. Government support is essential in NTFP commercialisation.

3.8 Forest Policy and NTFP

NTFP use and trade contribute to the livelihood strategies of the millions of people dependent on forests, and are worth millions of dollars in national and international trade. However, many governments in the tropics do not appear to take the NTFP development sufficiently seriously (Belcher and Schreckenberg 2003; Clay 1995). An ‘International Expert Consultation on NWFP’ organised by FAO in 1995 noted that in most countries in

the tropics, there were no forest policies specifically governing the management, harvesting, processing and marketing of NTFPs. The forest policies were strongly biased in favour of timber production, and they were more protection-oriented, designed more to restrict the NTFP use than to encourage NTFP development. The Expert Consultation therefore recommended that national governments draft a forest policy framework on NTFPs. Such a forest policy, among others, should specify the relative role of NTFPs in supporting sustainable forest management, socio-economic development, poverty alleviation, protection of indigenous knowledge systems and environmental conservation, suited to the situation of the country concerned (FAO 1995).

Formulation of NTFP policies is currently constrained by the large information gap that exists in countries in the tropics. As a priority, countries should identify all the important NTFP resources, which are used or required by local forest communities or needed by trade and industry within the country or for export. Additionally, countries also should undertake a thorough understanding of the ecology, economics and socio-economics of the NTFP resource base (Silva and Atal 1995).

Much of the NTFP collection in the tropics is from state land managed by forest departments or from common property resources. The state assertion of control, first over the forest resources and then over the land, has widely reduced access and rights of the forest dependent communities. The intrusion of the central authority at the expense of local systems of leadership, control and management of forestlands has in effect created a situation of open access with no management regime (Arnold 1995). Secure land and resource rights are necessary prerequisites for successful sustainable management of the public forestlands used as a common property resource. The forest dependent communities need long-term tenure and clearly defined boundaries if they are expected to take ownership and responsibility for sustainable management of the NTFP resources (Clay 1995; Ostrom 1999). Security of tenure is defined as protection from involuntary removal from land or residence except through due legal process. The emphasis is thus on preventing the forcible and arbitrary eviction of individual households or of entire settlements (WB 2002). Neumann and Hirsch (2000: 18) write:

“ Tenure arrangements govern the most direct interactions between a society and living NTFP resources: harvesting, control and management. Tenure systems provide the rules for governing who gets to harvest a resource, where they can harvest, how much they harvest, and for whose benefits. Thus, the concept of tenure includes both the notion of ownership and a corresponding parcel of rights. The widely accepted classification of tenure systems defines four types of ownership – state, private, communal and open access- and four basic kinds of right – use, transfer, exclusion and enforcement.”

Unfortunately, tenure is primarily a political issue, and it is one of the major factors that make forest policy in the tropics one of the most controversial and heated issues in development. Failure to recognise the link between people and forestry make forests in the developing countries the most mismanaged natural resources (WB 2002). There is, therefore, urgent need for research to clarify NTFP issues related to tenure, access, user-rights and benefit sharing to contribute to the political decision making process. Also in the countries in the tropics there exist contradictory laws, policies, rules and regulation with regard to NTFP use and trading. According to FAO (1995), national governments should on a priority review existing forest legislation and policies that have a negative adverse impact on NTFPs and take suitable legislative action to make necessary changes. In Chapter 9, the tenure implications for Bhutan will be discussed.

3.9 Biodiversity Conservation and NTFP

Miehe and Miehe (1998) write that biodiversity, expressed as species richness, is considered to be one of the ultimate goals for environmental conservation. However, the term does not represent a neutral scientific concept of same value to all people. Different people, communities, institutions and cultures view and attach values differently to biodiversity. Thus whose value and reality count? For example, nature conservation agencies are generally concerned about species richness; foresters in the maintenance and regeneration of timber species; and farmers in the maintenance of a high diverse woody system for supplying construction timber, fuelwood, fodder and NTFPs. It is also important to recognise that species richness is only one aspect of the variety of life, and

therefore it should not be regarded as a value per se, or even as an indicator of the degree of an integrity of an ecosystem. The contrary might be the case that pristine forests are often poorer in species and structure than disturbed ones. Molnar et al. (2003) note that the scientific basis for conservation is changing as we understand better the concept and historic role of humans in shaping ecosystems.

In late nineteenth century America, conservation thinking suggested that people and wildlife were in conflict with each other, and that wild areas should be set aside purely for aesthetic (non-consumptive) enjoyment. This American model of state management of protected areas based on human exclusion and wildlife preservation has spread around the world (Roe 2001). As of 2003, the number of protected areas in the world was 100,000 covering 18.8 million km² of the globe or 17.1 million km² (11.5%) of the Earth's land surface (IUCN 2003).

Over 3000 people gathered in Durban, South Africa for the Fifth IUCN World Parks Congress in 2003. The Congress noted that local communities are not yet sufficiently engaged in the identification and management of protected areas, and that while they bear most of the conservation costs they receive few benefits, while society as a whole gains the benefits but bears few of the costs. In many countries, protected areas also lack broad public support and their management is not based upon a set of widely shared values, principles and objectives. The Congress acknowledged that in the drive for biodiversity conservation, many mistakes have been made and continue to be made at the grievous cost of the indigenous people. For examples, the roles, knowledge and customary laws have frequently been disregarded or undervalued; people have been expelled from their ancestral territories, thereby severing their relationship with their land, culture and traditions; and many places which have been conserved over the ages by local communities are not given recognition, protection or support. It pledged that protected areas make a full contribution to poverty alleviation, and called for the strategy of putting people at the centre of conservation (IUCN 2003).

NTFP represents the subset of biodiversity actively sought and collected by humans (Wong 2000). It provides an entry point and framework for biodiversity conservation by the local communities. There is mounting evidence that if people are given security of tenure, and there is a perceivable economic benefit to be gained from the forests, people are protective of the area and the resource base. NTFP access and rights of local communities therefore constitute the important concept of placing people at the centre of conservation. It is making biodiversity work for the people. Therefore, to ignore NTFPs in forest management is to ignore the important components of biodiversity (Jones et al. 2004).

However, from the point of ecological research, the single most frequently recurring problem in NTFP research is the lack of basic ecological knowledge of many NTFP species and ecosystem relating to identification, reproductive biology, distribution and abundance, ultimately determining the sustainable harvest levels. The forest science for tropical forests is not well developed, thus making it difficult even to formulate the appropriate research questions and test hypotheses, and evaluate the ecological effects of NTFP use (Neumann and Hirsch 2000).

3.9.1 Sustainable Harvest Level

Hall & Bawa (1993:235) define the sustainable harvest level as:

“ In ecological terms, extraction is considered sustainable if the harvest has no long term deleterious effect on the reproduction and regeneration of populations being harvested in comparison to equivalent non-harvested natural populations. Furthermore, sustainable harvest should have no discernable adverse effect on other species in the community, or on the ecosystem structure and function.”

The definition encapsulates the best of forest conditions and practices but it is unrealistic in its demands, especially for NTFPs. In the case of trees, which are long-lived and slow-growing, the growth variation from year to year is averaged over long periods

giving an illusion of constant, invariably productivity. For many NTFPs, extensive, highly regulated management is not the norm and the productivity of ephemeral products is highly variable from year to year. Consequently, the concept of sustainable harvest level is inappropriate. Also, given the closely interwoven nature of ecosystems, it is virtually impossible to remove anything without creating noticeable change.

Sustainable harvest level is dependent upon a sound knowledge of the reproductive biology, distribution and abundance of the resource species (Hall and Bawa 1993; Wong 2000; Lynch et al. 2004). Unlike for timber, there are few methods available for the objective quantification of NTFP resource, given the sheer diversity of NTFPs, and nature of NTFPs which range from tree-like climbers to annual plants, and from fruits to roots, and from tree bark to mushroom. Inventory of non-tree-like plants is problematic because the scale, spatial distribution, botanical identification, detectability and lack of known relationship between productivity and easily enumerated characteristics of the plant can be highly variable or pose quite severe difficulties. Addressing this problem will require substantial theoretical and methodological development of novel techniques and new approaches to the assessment of plants and animals in tropical forests. They will invariably involve huge financial cost. A species-specific inventory can perhaps be justified for a very valuable NTFP, or subject to requirement by legislation. Meanwhile sociologists stress that at the community level methods need to be very cheap and accessible to poor people. In many cases, sustainable harvesting should not be a serious issue (Wong 2000). Two simple assessment methods are discussed below.

3.9.2 Rapid Vulnerability Assessment

Rapid Vulnerability Assessment (RVA) is a research method which integrates the indigenous knowledge and scientific knowledge to quickly assess vulnerability of the NTFP species to collection. Indigenous knowledge is defined as the wealth of knowledge held by the local communities on the ecology, yield variation and harvesting impacts of resource species. Where scientific knowledge is lacking, indigenous knowledge can fill in

the information gap or complement and supplement it. Principle 22 of the Rio Declaration on sustainable development recognises the vital role of indigenous knowledge in environmental management and development, and asks the governments to duly support their identity, culture and interest (UNCED 1992). The synergy between local and scientific knowledge is more valuable than either one.

The method was first developed by Cunningham, Wild et al. (1993) and formalised by Wild and Mutebi (1996). It is an innovative interpretation of information and knowledge on life form; abundance and distribution; parts used; market demand; traditional conservation practices; and substitutes. For example, fast growing, high yielding species are less likely to be exploited than slower growing, low yielding species; widely distributed species are less likely to be endangered than species with small and narrow range; harvesting of fruits, seeds or leaves is less likely to be over exploited than the harvest of whole plants and root parts; products with high market demand are more likely to be over-exploited than products with low market value; species with traditional management practices are likely to be less over-exploited than species with no traditional management regime; and products with substitutes are less likely to be over-exploited than products with no substitutes. The assessment of sustainability commences with the completion of a set of standardised field sheets for each species.

However, Wong (2000) cautions that integration of information to assess the sustainability is non-quantitative and therefore subject to some degree of subjective interpretation. This is not a serious problem as the information is available for re-assessment, modification and updating. To guide less experienced assessors, it should be possible to develop a scoring system for each criterion and simple transparent means for combining criteria into management categories.

3.9.3 Harvest Records

A harvest record is a popular means of monitoring NTFPs and is relatively quick and straightforward to collect. Such a record is simply a measure of the quantity of product

that has been collected. It has the advantage of measuring directly the value of the extracted product, especially if market price is recorded concurrently. The data collected are of great interest to socio-economists and market researchers. Harvest data is also maintained by statutory agencies such as customs and excise for taxation and export-import monitoring purposes. However, care is needed in interpretation of harvest levels to resource population level. For example, dealers in American ginseng have to report sales every day during the season to the forestry agency. These data are supposed to serve as a proxy for the species population status but in reality they are most closely correlated (80%) to unemployment figures: when people have jobs, the harvest is down (Wong 2000). Even in developed economies, forest-based resources are an important component of the natural capital upon which poor and unemployed draw to build their livelihoods during difficult economic times.

3.10 History of State Forestry in Bhutan

Bhutanese society was wholly characterised by subsistence-based lifestyles until the modernisation process began in 1961. Peasants grew crops and reared livestock, and depended heavily upon the surrounding forests for construction timber, fuel wood, food, cattle grazing, and many other day-to-day household requirements. According to Ura (2004), the notion of citizenship in Bhutan in the past was situated in the institutional setting that was local, which generally was the social unit of *geog*. A *geog* was the main identifiable administrative, social and political unit where there was a clear relationship between the peasants and the forest resources. The history of use generally defined the rights and obligations within and between the communities, and they were respected.

India helped Bhutan to start the new Department of Forests (DoF) in the early 1960s. Indian forest officers on deputation from India headed and manned the DoF, and the Bhutanese students went to India for forestry training. The DoF lost no time in drafting forest legislation. The National Assembly passed the Bhutan Forest Act in 1969. The Act not only nationalised the forest but also the trees on private lands. Forest was defined as “any land under forests which no person has acquired a permanent, heritable

and transferable right of use and occupancy” (RGOB 1969:2). The preamble to the Act read, “The forest is most important natural wealth of this country...To ensure this objective it has been considered necessary to have a Forest Act to consolidate the law relating to forests, the transit of forest produce and duty leviable on timber and other forest produce” (RGOB 1969). The Act entitled the state to ownership of over 90% of the country’s land area.

Ura (2004)⁵ writes that the nationalisation of the country’s forests profoundly altered property relationships whereas earlier it was only communal versus private, the state as property owner came into the lives of the peasants. The state replaced the centuries old tradition of community stewardship and ownership of the natural resources. Nationalisation caused practical difficulties to Bhutanese peasants, and people continue to make representations of their grievances in the National Assembly. This will be discussed later in Chapter 5.

3.11 Significance of NTFP for Bhutan

Bhutan is a traditional peasant society with intimate association with the forests. Forests, mountains and streams, as domains of deities and spirits, have predominance in village life. People make oblation-offerings to them as well as invoke them. The oblation offering is generally performed by monks, and takes many forms. They include: the construction of dough images (*torma*); water purification (*thrusel*); air purification rite (*sang*: incense burning); spirit libation (*serkem*) and crop harvest offer (*thog fued*). In the invocation ceremony, shamans (*pawa/nejom*) make meat and blood offerings. The shamanic practices are of pre-Buddhist origin, and are still found in many pockets of the country. During shamanic performances, audience inquire into the health and well-being of dead relations, and possible obstacles and accidents in the village for the forthcoming year (Ura 2001).

⁵ Ura (2004) refers to *Thrimzhung Chenmo* (Supreme Law of Bhutan) enacted in 1950s for the start of state ownership of forest and land resources. The *Thrimzhung Chenmo* has only a provision dealing with the *tsheri* cultivation, the ‘slash and burn’ agriculture. I would therefore argue the profound change in forest property relationship in Bhutan was following the Bhutan Forest Act 1969.

As subsistence peasants, people are heavily dependent upon the surrounding government forestlands. A forest is like a big super market to the peasants where they can walk into it for supply of their construction materials; food and fruits, medicines, agricultural implements and sometimes cash; and to graze their animals (Namgyel and Ghimiray 1997). In a village in Zhemgang Dzongkhag, Central Bhutan, Wagner (1994) notes that nearly every item one finds in a house is connected to the forest, and the forest is a source of food during difficult times of crop failure. It is the same in East Bhutan (Dorji 1995). Namgyel (1996b: 12) notes a village headman in West Bhutan as saying:

“ The forest is important to us! For us farmers, there is nothing we don’t need. Our working tools and tool handles, they are all from forests. Our cows graze in the forests, and our construction timber and fuelwood are all from forests...Without the forest, our farming life has very little meaning...”

In the village study conducted in West Bhutan, people identified a total of 107 plant species as being useful to them. About 24 species were identified as sources of food: 15 as vegetables; 6 as fruits and 3 as beverages. They also identified 13 as fodder species; 8 species as sources of roofing materials; 16 medicinal plants; 7 species as good for making agricultural implements such as ploughs; and 11 species with cash value in the local market. They had names for 22 species of wild mushrooms (Namgyel 1996b). In East Bhutan, people identified 167 species as having medicinal uses; 19 essential oil and aromatic species; 21 dye species; 37 fodder species; 16 spice species; 33 edible fruits and nuts; 10 edible roots and tubers; 20 edible shoots and flowers; and 15 mushrooms (Dorji 1995).

People rank fuelwood as the most important NTFP (Namgyel 1996b; Namgyel 1996c; Dorji 1995). It is the main source of household energy in the rural households for lighting, cooking and space heating. Fire in the hearth in a village in West Bhutan stays alive on an average for 11 hours a day, and this can rise to 14 hours on special social occasions. People say that fire in the hearth never dies, and it can be re-lighted easily as and when required. The crucial importance of fuelwood for a farm household is captured

best in a village meeting called to discuss the forestry issues for the revision of the forest management plan in the valley of Khotokha, West Bhutan (Namgyel 1996c:32):

“Friends, when we talk let us talk about matters very important to us. House construction timber, this is once a while requirement, and when we need it, we get it. We just have to apply to the government. But, fuelwood and fencing materials they are our basic needs. We require fuelwood in the morning, afternoon and night. And for fencing material we require every year. We can’t live without them. When we don’t have enough of them, we have no choice than to go into the forests, and get into problem with the forestry people. So let us reflect and discuss these two very important issues.”

Village Meeting, Khotokha, 1996

Bhutanese people also exhibit great skills in arts and crafts. Of the thirteen traditional crafts in Bhutan known as *Zorig Chusum*, six are related to wood and plant products. These are (i) paper making (*dezo*); (ii) wood, slate and stone carving (*parzo*); (iii) wood turning (*shagzo*); (iv) woodwork (*shingzo*); (v) weaving (*thagzo*); and (vi) cane and bamboo works (*tsharzo*). Each region has its specialities; bamboo works from Kheng region and high altitude valleys, and wood works and paper making from Trashigang region. These traditional crafts represent hundreds of years of knowledge and ability that have been passed down through generations. The production of the crafts is mostly at the household level, and it is, for most of the remote villages with no road access, the major or only source of cash. These products include bamboo food baskets (*bangchung*s and *palang*), and wooden bowls and containers (*dappa*). The regional specialisations also provide the basis for the traditional exchange of products and skills between the different village communities. For example, the people from the high altitude valleys descend every winter to the rice growing valleys with their bamboo products for sale or exchange for food grains. The bamboo crafts assure the people in the high altitude areas of their supply of rice and other food cereals (Namgyel 1996a; Dema 2004).

With growing urbanisation, and the establishment of weekend farmers markets in district headquarters, there is a commercialisation of many NTFPs that traditionally have no cash value. These products are generally the wild vegetables such as asparagus, orchids, mushrooms, fiddleheads, *damru*, and cane shoots. The forest foods are a much sought after delicacy by urban Bhutanese. New products such as decorative plants, floral greens and rhododendron flowers have also made their appearance in the market. The other traditionally popular products include high altitude incense plants, low altitude broom grass, bamboo products and wooden bowls (please see a sample of NTFPs in Bhutan below).

A Sample of NTFPs in Bhutan



Pic.3.1 Traditional wooden bowls



Pic. 3.2 Men weaving a bamboo mat



Pic. 3.3 High altitude aromatic plants used as incense



Pic. 3.4 A lady selling wild mushroom on the road



Pic. 3.5 Fiddlehead – a wild vegetable



Pic. 3.6 *Piper* sp. Leaf is chewed with betel nut

The NTFP contribution to the national economy is also significant. However, it is not yet appreciated or sufficiently recognised by policy makers, planners and resource managers. This is largely because there are no consolidated statistics on NTFP. In the government statistics, NTFPs are presented as vegetables, essential oil, and paper. There is no separate trade code for NTFP, as a product group. One has to make a special effort in the trade statistics reports, firstly to identify NTFP items and secondly to consolidate them, a very painstaking job. The information below has been obtained from the Bhutan Trade Statistics, maintained by the Department of Revenue and Customs, Royal Government of Bhutan. The source of the trade information is the customs declaration made at the entry and exit points of the country (DRC 1996).

Table 3.1 shows the NTFP export to India and third countries from 1995 to 2001. Main NTFP exports to India are gum rosin, turpentine oil, lemon grass oil, pipla and chirata (Table 3.2), and to third countries are the mushroom, lemon grass oil, handmade paper, and incense products (Table 3.3). The total value from 1995 to 2001 ranged from Nu. 28 – 49 million (US \$ 664,471 - 1,140,971)⁶. Out of this, export to India was between Nu. 13 – 29 million (\$ 305,699 - 664,627), and to third countries between Nu. 11 – 27 million (\$ 245,082 - 616,574). The figures are an underestimate because most NTFPs are often associated with traditional uses that are not widely known and take place in households and small-scale units which are mostly outside the established marketing system or channels, thus forming part of unorganised informal sector.

Table 3.1 Total NTFP Export (Nu.)

	1995	1996	1997	1998	1999	2000	2001
India	22,371,448	13,145,074	28,578,955	20,323,205	19,521,481	20,168,697	14,974,573
3 rd Countries	10,538,535	21,281,019	20,482,803	26,512,693	11,171,450	15,579,147	13,058,399
Total	32,909,983	34,426,093	49,061,758	46,835,898	30,692,931	35,747,844	28,032,972

Source: Bhutan Trade Statistics 1996 - 2003

⁶ US \$ = Nu. 43

Table 3.2 NTFP Export to India (Nu.)

Item	1995	1996	1997	1998	1999	2000	2001
Pipla	1,500,886	1,277,197	2,300,586	607,265	350,801	800,286	
Chirata	484,994	103,446	92,650	432,519	265,131	560,981	234,225
Bamboo	34,437	18,028	27,248	11,400	7,150		
Cane	44,800	120,300	138,632		132,200		
Lemon grass	1,830,240	2,615,324	8,680,354	8,898,340	4,600,835	7,831,935	4,575,340
Turpentine Oil	1,547,600	948,250	855,000	536,100	717,500	2,332,500	637,600
Gum Rosin	16,597,741	7,766,046	12,892,935	7,412,463	12,570,684	8,403,295	6,252,342
Mushroom (packed/canned)		196,708	137,450	226,508	200,358	239,700	954,056
Katha, agar-agar		99,775	204,320	2,018,610	641,210		
Khair Roots			3,094,530	180,000			387,260
Handmade Paper	330,750		155,250				449,500
Medicinal Plants					33,600		1,484,250
Grass for Broom					1,162		
Poe					850		
Sub-Total	22,371,448	13,145,074	28,578,955	20,323,205	19,521,481	20,168,697	14,974,573

Source: DRC (1996 – 2003)

Table 3.3 NTFP Export to Third Countries (Nu.)

Item	1995	1996	1997	1998	1999	2000	2001
Mushroom	6,168,692	9,046,647	13,224,629	18,689,961	6,762,117	4,144,819	414,765
LG oil	1,044,990	2,329,767	4,777,254	1,062,215	1,879,578	7,865,577	5,062,167
Incense	89,600	38,265	24,680	7,580	32,947	217,914	316,666
Handmade paper	3,115,610	9,866,340	1,581,073	2,848,810	310,612	3,110,785	1,294,796
Wooden mask	11,700		118,835				
Bamboo crafts	11,500						
Altar	65,400						
Handicrafts	31,043		755,332	3,825,260	126,947	240,052	2,281,931
Wine container			1,000				
Herbal medicine				78,867	2,059,249		3,688,074
Total	10,538,535	21,281,019	20,482,803	26,512,693	11,171,450	15,579,147	13,058,399

Source: DRC (1996 – 2003)

NTFPs are already the engine for a number of artisanal and cottage industries such as traditional paper making (*deysho*), incense production (*poe*), wooden bowls and cups (*dapas*, *phops*), bamboo baskets (*palang*, *bangchungs*), lemon grass oil, and resin tapping. There are opportunities for development of many new NTFP export products.

One recent success story of product development is the herbal tea ‘Tsheringma’ (long life) produced by the Institute of Traditional Medicinal Services. It has already proven popular in the domestic market with officials and expatriates as a medicinal tea and as gifts to family and friends outside Bhutan. The current annual production capacity is 18,000 packets with total revenue of Nu. 900,000 (US \$ 20,930). The Institute is in the process of upgrading its production capacity from the current 10-15 packets an hour to 800 packets an hour (Kuensel 2004). With forest and pastureland combined constituting over 76 % of the country’s land area, and 79% of the country’s population being rural, the forest resources offer enormous opportunity for diversification and expansion of the Bhutanese economy.

Chapter 4: Research Methodology

NTFP is a new forest research area, and the research methodologies applied to it are also at the developing stage. Wollenberg (1998) says that NTFP research aiming to improve the income opportunities of forest dependent people is situated in a set of three-way relationship of ecology, economy and social implications. There is thus the need to use many, diverse research methods due to huge information requirement if NTFP research has to result in some practical use. This raises issues of how to select and prioritise methods, combining techniques efficiently, and integrate and aggregate findings that result from their use. This chapter discusses the methodological framework for qualitative research and justifies the case study research design chosen to study the NTFP in Bhutan. The topics covered include: the debate between the qualitative and quantitative research; issues of reliability and validity in qualitative research; ethics; theoretical consideration of the case study; case design; data collection techniques; rapid vulnerability assessment and data management and analysis.

4.1 Qualitative Research

There is limited research on NTFP in Bhutan, and this has so far been mainly concerned with the listing and part documentation of plant species and their uses. There is as yet no national level consolidated information and policy analysis undertaken for the NTFP. The documentation of NTFP species, while important, is a task with a long time frame which requires huge resources. The listing and documentation also on its own has less practical value to inform policy, especially when rapid policy actions are needed. The general rhetoric in the country, that NTFP is important in local and national economies, is due more to the influence of international discourse on the subject than arising from local evidence. The limited research and publicity on the NTFP have been the main reason for the lack of attention from policy makers and resource managers. There is, therefore, an urgent need in Bhutan for a detailed description, exploration, case building and explanation of what NTFPs are and how they are important in the overall forestry

development of the country. This research study is therefore a study of the NTFP phenomenon in as much detail as possible and context driven. The data are sourced from a wide range of materials such as personal experience, government documents, archival materials, field visits and interviews. Punch (1998) says that for such a research study the appropriate research type is qualitative research.

Wolcott (1990, in Silverman 2000:230) notes that after a century of qualitative research:

“ There is no longer a call for each researcher to discover and defend (qualitative methods) anew...Neophyte researchers who only recently have experienced these approaches first-hand need to recognize that their audiences probably do not share a comparable sense of excitement about hearing them described once again.”

However, I will not so much defend the qualitative research, but discuss some of its limitations and strengths vis-à-vis quantitative research, especially for the Bhutanese audience. In Bhutan, where experimental research in natural resources management is a dominant research tradition, there is a general tendency to think of qualitative research as ‘soft science’, therefore subjective. This research study also presents an opportunity to introduce qualitative research to Bhutanese researchers in the natural resources sector, and to discuss how it can play an important role in the understanding, exploration and explanation of the many issues relating to development policy, natural resources and the rural economy.

4.1.1 Qualitative versus Quantitative Research

In scientific research the quantitative approach was the dominant research tradition until the middle of the last century. According to Punch (1998), beginning in the 1960s, there were reactions to it as the only way of doing empirical research in social sciences. People rejected the idea that social sciences can be studied with the same methods as the natural

or physical sciences. Some of the criticisms of quantitative research, according to Silverman (2000:7) were as follows:

- it amounted to a quick fix, involving little or no contact with people or the ‘field’
- statistical correlations may be based upon ‘variables that, in the context of naturally occurring interaction, are arbitrarily defined.
- after-the-fact speculation about the meaning of correlations can involve the very common-sense processes of reasoning that science tries to avoid.
- while it is important to test hypotheses, a purely statistical logic can make the development of hypotheses a trivial matter and fail to help in generating hypothesis from data.

Silverman (2000:7) continues that qualitative research, on the other hand, “emphasises words and images rather than numbers, observation rather than experiment, unstructured rather than structured interviews. It seeks for meanings of the world from the point of view of the people studied rather than behaviour, thus showing preference for inductive, hypothesis-generating research rather than hypothesis testing”. One of the great strengths of qualitative research is to observe behaviour in its natural setting and to make use of different techniques to answer the research question(s). This is useful in the description, contextualisation, continuous learning and progressive focusing of research issues (Boas 2000).

However, the distinction between the two research types is really one of epistemology and research paradigm. Quantitative research generally follows a positivist approach which recognizes an objective reality not dependent on the researcher while the qualitative research is interpretive, and views reality as subjective and socially constructed (Denzin and Lincoln 2000). Depending on the nature of the research questions, researchers may use qualitative or quantitative research methods. It is also common for research studies in which both methods are used in a complementary way to enrich the analysis (Boas 2000). Whatever and whichever research type one adopts, the value of the scientific enquiry will be evaluated for

trustworthiness, credibility, confirmability and data dependability. These are the tenets of external and internal validity and reliability (LeCompte and Goetz 1982; Yin 2003).

4.1.2 Reliability and Validity

Research reliability and validity are the central pillars in a scientific investigation, both qualitative and quantitative. There are two types of reliability i.e. external and internal. External reliability is defined as the discovery by independent researchers of the “same phenomenon or generate the same constructs in the same or similar settings”. And, internal reliability is the “degree to which other researchers, given a set of previously generated constructs, would match them with data in the same way as did the original researcher” (LeCompte and Goetz 1982:32). Similarly the validity of research is also discussed at two levels of external and internal. External validity refers to “establishing the domain to which a study’s findings can be generalised”, and internal validity as “establishing a casual relationship, whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships”. Also important to the principle of validity is the concept of ‘construct validity’, defined as “establishing correct operational measures for the concepts being studied” (Yin 2003:34).

LeCompte and Goetz (1982:32) say that qualitative research suffers more from the criticism of failing “to adhere to canons of reliability and validity”. Some qualitative researchers ignore such criticisms, and thus weaken the credibility of the research. It is important to recognise these potential threats to the credibility of research results, and to develop strategies to address them. Following Yin (2003), the strategies for addressing the reliability and validity issues for this research study include the careful research design, development of a conceptual and analytical framework, establishing correct operational measures of the questions being asked and multiple sources of evidences.

4.2 Research Design

A research design is the framework in which the connection between the research question and data is made, and finally the analysis. In other words it is a plan “for getting from here to there, where here may be defined as the initial set of questions to be answered, and there is some set of conclusions (answers) about these questions. Between ‘here’ and ‘there’ may be found a number of major steps, including the collection and analysis of relevant data” (Yin 2003:20). Every empirical study has an implicit, if not explicit, research design. The design also helps to articulate the ‘theory’ about the research enquiry, and to operationalise it. The research methodology adopted for this study is the case study. The theoretical considerations for case study, case design, case study protocol, unit of analysis, field methods, sources of information, and data analysis and reporting are discussed below.

4.2.1 Why Case Study?

Perez (1995) and Arnold (2004) note that much research on NTFP has failed to take into account the complex nature of NTFP, particularly their characteristic of high variability and site specificity. The socio-political and ecological links of NTFP have also not received adequate research attention. The research therefore has remained unrelated i.e. without a clear idea of the different interactions of the factors or full implications of them. Consequently, this has prevented a global view of the current situation, experiences and evolutionary trends of NTFP. The global view is particularly important at the present time when rapid policy and management actions are required. To address this methodological problem for the NTFP research, Perez (1995) and Perez and Byron (1999) suggest the case study as the most appropriate research strategy. They argue that a case study uses a representation of real system structure to describe system behaviour, and helps to clarify the issues in debate. Spearheaded by the Centre for International Forestry Research (CIFOR) based in Bogor, Indonesia, the case study approach for the NTFP has become popular as a research methodology. CIFOR recently completed the

study of 21 case studies of NTFP from Asia, 17 from Africa, and 23 from Latin America (Kusters and Belcher 2004).

According to Yin (2003:13-14), the key strengths of the case study approach are that it:

- i) copes with the technically distinctive situation in which there will be many more variables of interest than data points
- ii) relies on multiple sources of evidence, with data required to converge in a triangular fashion, and
- iii) benefits from the prior development of theoretical propositions to guide data collection and analysis.

But, the final choice of research method is dependent upon three conditions of (a) the type of research questions posed, (b) the extent of control an investigator has over actual behavioural events (c) the degree of focus on contemporary as opposed to historical events. The relationship of these three conditions to the five main research methods of experiment, surveys, archival analysis, histories, and case studies is illustrated in Table 4.1.

Table 4.1: Relevant Situations for Different Research Strategies

Strategy	Form of Research Question	Requires Control of Behavioural Events	Focuses on Contemporary Events?
Experiment	how, why?	Yes	Yes
Survey	who, what, where, how many, how much?	No	Yes
Archival analysis	who, what, where, how many, how much?	No	Yes/No
History	how, why?	No	No
Case study	how, why?	No	Yes

Source: COSMOS Corporation in Yin (2003:5)

Defining and determining the right research questions is probably the most challenging task in the research process, especially establishing the correct operational measures. The research questions should have substance (e.g., What is my study about?)

and *form* (e.g., Am I asking a “who”, “what”, “where”, “why”, or “how” question?). It is the form of the research question that provides the clue regarding the appropriate research method, as illustrated in the Table 4.1 above.

According to Yin (2003:5-7) if the question is “what”, the research focus can be exploratory with question type such as “What can be learned from a study of an effective school?”; the goal being to develop pertinent hypotheses and propositions for further enquiry. As an exploratory, ‘what’ is appropriate for an exploratory survey, an exploratory experiment, or an exploratory case study. The “what” question can also be a form of a “how many” or “how much” line of enquiry, for example “What have been the outcomes from a particular managerial restructuring?”. This second type of “what” question with “who” and “where” are likely to favour survey or archival analysis. These methods are useful when the research goal is to describe the incidence or prevalence of phenomenon or when it is to be *predictive* about certain outcomes. In contrast, “how” and “why” questions are more explanatory, appropriate for case studies, histories and experiments. However, a distinction among history, case study and experiment is the extent of the investigator’s control over and access to actual behavioural events. In history, an investigator has virtually no access or control because of dealing with the “dead past” whereas in the experiment, the investigator manipulates behaviour directly, precisely, and systematically. As in history, the investigator in a case study cannot manipulate behavioural events, but the focus is on contemporary events, relying on additional evidences such as direct observation of the events being studied and interviews of the persons involved in the events.

In the early phase of the research study prior to the fieldwork, I had 63 questions identified from the literature review; out of which 32 were “what” questions, 25 “how”, four “which”, and one each for “who” and “why”. My research enquiry was to be part exploratory and part explanatory, therefore the choice of case study. In the pre-field seminar for the staff of the department and student colleagues, it was pointed out that my 63 questions represented an ambitious research enquiry, beyond the capacity and resources of a student researcher. I had listed the questions only to get a sense of the wide

range of issues present in the study of NTFP. In the field I intended to review and organise the questions in an order and in ways that fitted with the manner in which the enquiry proceeded. Rightly so, during the fieldwork I found that many of the questions were out of context, or leading to a separate line of enquiry away from my three main propositions for the study, that is:

- i) there is no uniform forest policy on NTFP
- ii) NTFP is the major or only source of cash income for the many village communities in the remote areas, and
- iii) environmental concerns are over stated.

4.2.2 Case Type: Multiple-Case Studies

Defining what the “case” is is a difficult matter since almost anything can serve as a case. For instance, a “case” may be an individual or individuals. It can also be some event or decision-making process. One should therefore take time to define the “case” in order to ensure that the “case” in fact is relevant to the issues and questions of interest (Punch 1998; Yin 2003;). A research study may also contain more than a single case, and when this occurs, it is said to have used a multiple-case designs. For this research enquiry, the study of NTFP as a whole at the country level also covers the studies of three individual case products at local community level; therefore the research strategy is a multiple-case design. The unit of analysis is also multiple at two levels i.e. country level and product level. At the country level, national legislation and policies, and overview of NTFP are discussed, the sources of information being mainly documents. At the product level, the dynamics of people and products are studied, the source of information mainly direct observation and interviews.

In the multiple-case studies, every case should serve a specific purpose within the overall scope of enquiry, analogous to multiple experiments in experimental research. The case must also be carefully selected so that it either (i) predicts similar results (a literal replication) or (ii) predicts contrasting results but for predictable reasons (a

theoretical replication). An important point in the selection of cases is the development of a rich theoretical framework. The theoretical framework should be in a position to explain that under what conditions a particular phenomenon is likely to be found (a literal replication) as well as the conditions when it is not likely to be found (a theoretical replication) (Yin 2003).

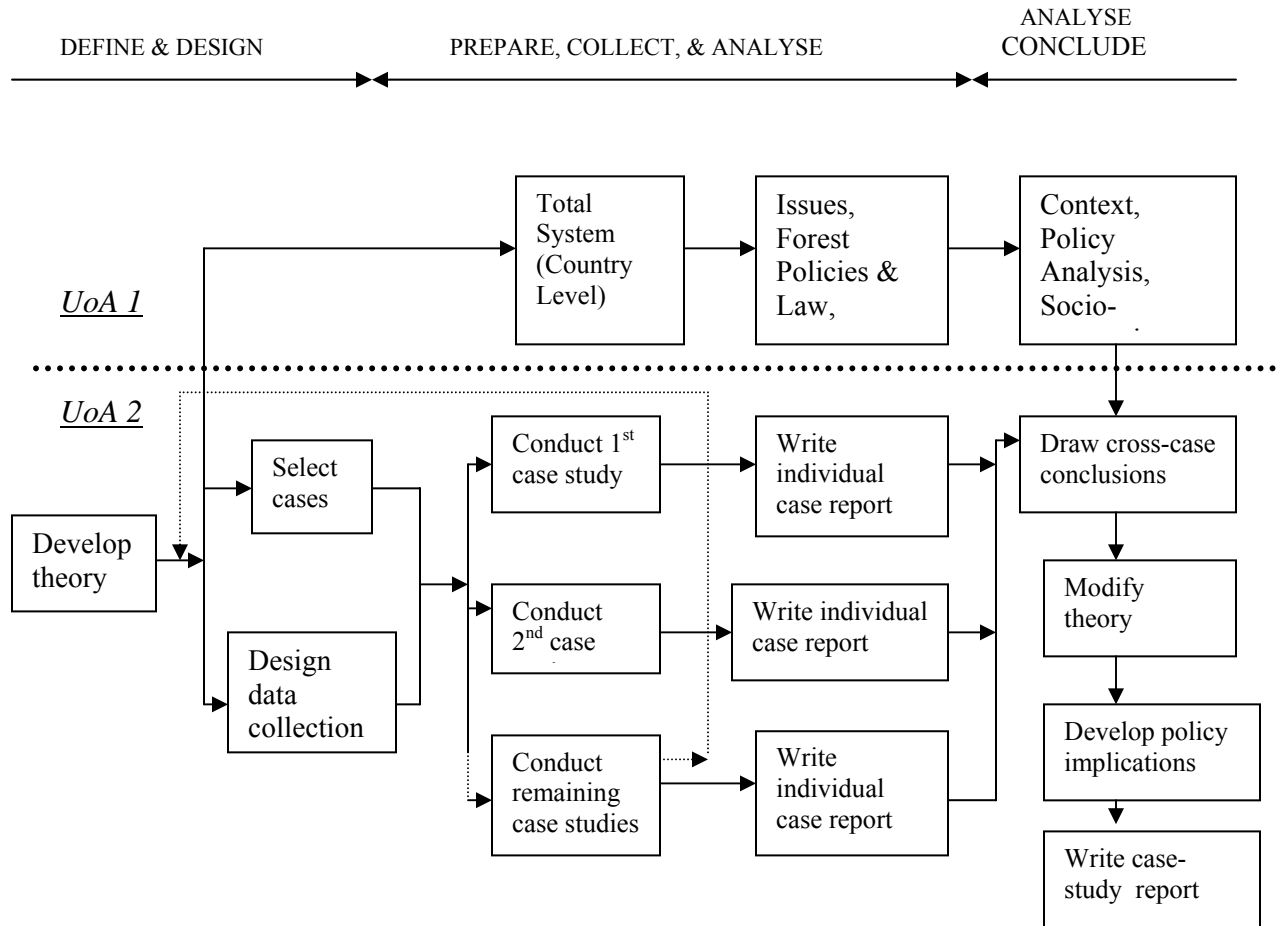
An excellent example of a multiple-case is the book by Peter Szanton (1981, discussed in Yin 2003). Titled *Not Well Advised*, it is about addressing a common problem in the US in the 1960s and 1970s, which was how to get good advice to city governments. In the review of experiences of numerous attempts by university and research groups to collaborate with city officials, Szanton starts with eight case studies, showing how different university groups all failed to help cities. “The eight cases are sufficient “replications” to convince the reader of a general phenomenon. He then provides five more cases, in which non-university groups also failed, concluding that failure was therefore not necessarily inherent in the academic enterprise. Yet a third group of cases shows how university groups have successfully helped business, engineering firms, and sectors other than city government. A final set of three cases shows that those few groups able to help city government were concerned with implementation and not just with the production of new ideas, leading to the major conclusion that city governments may have peculiar needs in receiving advice. Within each of the four groups of case studies, Szanton has illustrated the principle of *literal* replication. Across the four groups, he has illustrated *theoretical* replication” (Yin 2003:49).

Both single-case and multiple-case designs have their own advantages and disadvantages. For instance, the evidence from multiple cases is often considered more compelling, and more robust. At the same time, the rationale for single-case designs cannot be satisfied by multiple cases, e.g. the unusual or rare case, the critical case, and the revelatory case. An unusual or rare case commonly occurs in clinical psychology, in which a specific injury or disorder may be so rare that any single case is worth documenting and analysing. In the critical case, a single case represents the critical test of

a significant theory e.g. study of an innovation theory in an organisation. In the revelatory case, a situation exists when an investigator has an opportunity to observe and analyse a phenomenon previously inaccessible to scientific investigation (Yin 2003).

The case design for this research study, modified from Yin (2003) is illustrated in Fig. 4.1. A special feature of this modification is the embedding of the multiple unit of analysis. The first level of analysis is at the country level, representing the total system. It defines and discusses the context for the research, the evolution of forest policy, policy and programme priorities, significance of NTFP, NTFP issues and opportunities in the country. This constitutes an important component of the overall theoretical framework for this research study. The second level is the individual case study, representing the product and production area. Here, the case studies look at evidence of NTFP problems and opportunities in the fields.

Fig. 4.1 An Analytical Framework for the Multiple Case Study Method



UoA: Unit of Analysis (level 1 and 2)

Source: Adapted and modified from COSMOS Corporation (Yin 2003:50).

4.2.3 Selecting Case Studies

The subsistence uses of NTFP have been deliberately left out in this research enquiry. Firstly, it is well recognised that rural people depend upon a wide range of forest products for food, fibres, fuelwood and agricultural implements. Secondly, the subsistence NTFP is not an issue from the point of politics, economics and environment. The Department of Forests whose job is to regulate the people and monitor their uses of forests do not generally mind or bother about local people collecting the NTFP for subsistence uses. It is only when these NTFP products have a market value that they enforce new rules or

reinforce the old rules. There is also no competition for subsistence NTFPs amongst the local people. The subsistence NTFP, serve a safety net during famine, but otherwise is in no position to raise the living standards of the rural people.

It is the economically important NTFPs that draw the political and social interest (Godoy and Bawa 1993; Wong 2000). There are many economically important NTFPs in Bhutan. However, there is no uniform forest policy or standard procedure dealing with this forest products group. It is generally dealt with on an ad hoc or case-by-case basis. Some of these products are prohibited from collection by law while for some others there is the government encouragement and support. Some have been in trade for a long time while others are new products. Some production areas have road access while others are extracted from remote rural areas. These different conditions relate to eco-region (alpine, temperate and subtropical); road access (yes or no); product history (old or new); and level of government control (e.g. low, medium, high). These conditions in which the NTFPs operate were used to select the three case studies (Table 4.2). Initially, five case studies were identified but during refining of the research plan two, ‘chirata’, a sub-tropical medicinal plant, and ‘lemon grass’, an essential oil plant in the dry valleys, were left out due to time and resource constraints.

Table 4.2 Selection of Case Study

NTFP	Eco-Region			Road Access		Product History		Government Control		
	Alp	Tem	Sub	Yes	No	Old	New	Low	Med	High
Cordyceps	√				√		√			√
Matsutake		√		√			√	√		
Pipla			√	√		√			√	

Alp Alpine eco-region in the northern part of Bhutan
 Tem Temperate eco-region in the central part of Bhutan
 Sub Sub-tropical eco-region in the southern part of Bhutan

Cordyceps represents the case study from the alpine region with the characteristics of being a new product with no road access and tight government control. Matsutake also represents a new product but from temperate forests with road access and no government control. Pipla is a case study of an old product from the sub-tropical forests with road access but with some level of government control.

4.2.4 Study Areas

Cordyceps sinensis, the first case study, is a high value medicinal plant found growing over 4200 to 4800 m asl in the alpine region in the northern part of Bhutan. It was a protected species and its collection was illegal at the time of undertaking the fieldwork in 2003. The case description and discussion however follow the condition in 2003 and before.

The fieldwork covered the *geogs* of Soe and Lingshi of Thimphu Dzongkhag, and Laya *geog* of Gasa Dzongkhag. There is no motorable connection to this region, and it is only accessed by foot or on horses and yaks. People are semi-nomadic yak herders. As *Cordyceps* collection was illegal, it was a sensitive topic people avoided discussion, and denied knowledge about it. It was also a topic very little known in the country, except for anecdotal bits and pieces. It was for these reasons that an extended period of stay and wide geographic coverage of the production area was required as compared to the other two products.

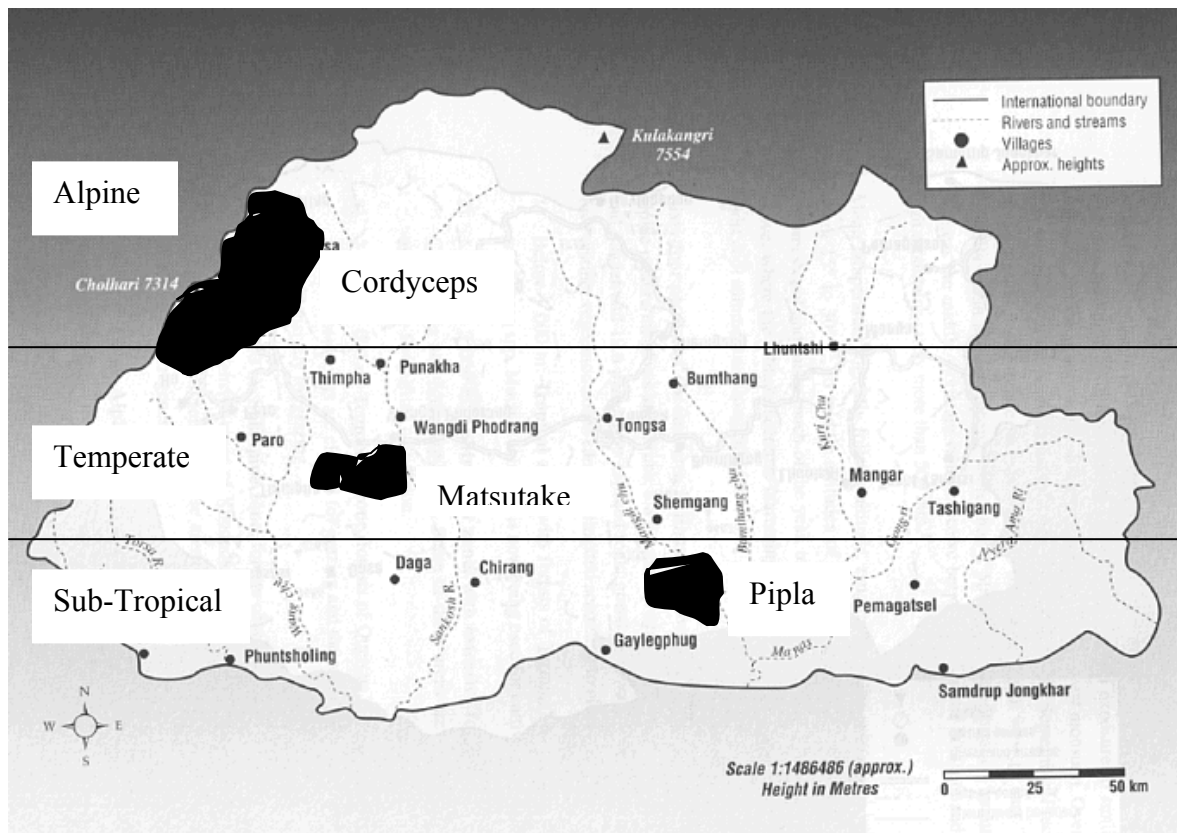
Tricholoma matsutake is a high value mushroom exported to Japan, Singapore, Malaysia and Thailand. It was discovered in the country as a highly priced mushroom in Japan only in the early 1990s. Prior to this, it was one of the many wild mushrooms. It grows in the temperate conifer forest of the central part of Bhutan. This region has a fairly good network of motorable road connections. Its collection and trade is legal, and there is government support in terms of research and market information.

It is found growing in many areas but the most important production area is Genekha, about one and a half hour's drive from Thimphu, the capital. This mushroom has to be shipped fresh within 24 – 48 hours of being picked from the forests, and the production areas can only be close to Thimphu and Paro, where the airport is, to have economic viability.

Piper pedicellatum is a shrub found growing abundantly in the sub-tropical forests in the southern part of the country. Its berries have a long history of uses in India in homeopathic medicine and as an ingredient in many Ayurvedic medicinal formulations. There is no local use of it but people living in the border areas have been selling it to Indian merchants for many years. It was thought that the people were not getting a fair price for the products, and the government asked the Food Corporation of Bhutan to help farmers auction out their products. This rule while well intended, has practical difficulties for the farmers. The demand for and price of the product have fallen significantly in the last two-three years. The study site was the Nangkor *geog* of Zhemgang Dzongkhag in Central Bhutan. It is about two day's car drive from Thimphu.

The location of the three case studies is illustrated in Fig. 4.2.

Fig.4.2 Location of Case Studies



4.2.5 Fieldwork

Yin (2003) notes that it is a common belief that the case study method is easy to use but it is among the hardest types of research to do because there is no routine formula available. In laboratory experiments or in surveys, for instance, research assistants can largely, if not wholly, undertake the data collection, with a minimum of discretionary behaviour. In other words, the data collection activity is routinised. However, in the case of case study, a well-trained and experienced investigator is needed because of the continuous interaction between the theoretical issues being studied and the data being collected. Case study investigators require a basic set of skills. These include (i) the ability to ask good questions and interpret the answers, (ii) being a good listener, (iii) being adaptive and flexible, (iv) having a firm grasp of the issues being studied, and (v) being unbiased by preconceived notions.

In this regard, I have had a number of advantages both from doing the research in my home country, and from my previous research and work experience. There was no culture or language barrier in the study areas for me as I could naturally assimilate with the local people. I had also undertaken a number of Rapid Rural Appraisal studies in the past, thus familiar with the principles and art of asking questions and listening (Namgyel 1996b; Namgyel 1996c; Namgyel 2000). As a government officer for the last 15 years, I also have a reasonable inside knowledge of issues and decision-making process in the natural resources sector. I also have had the advantage of knowing local government field officials in the study areas, and through them, I was readily accepted in their community. I could thus engage in uninhibited talks with the village people.

The fieldwork took place over a year, March 2003 to April 2004. The visits to the three case study areas were scheduled, where possible, according to the season of fruiting and trading of the product. For instance, the field visit was in the months of June and July for *Cordyceps*; August to October for matsutake; December for lemon grass; and January for pipla. Lemon grass has been left out from the research study due to inadequate field information, and the thought that it would not add significantly in the cross-case analysis.

When not undertaking visits to field sites, I participated in departmental meetings and seminars, and engaged in discussions with forestry, agriculture and livestock colleagues. I also addressed and accessed the relevant government documents and information. I was also managing and coordinating the community-based natural resources management programme with the Council for Renewable Natural Resources Research for Bhutan (CoRRB).

The primary information for the research study comes from the government documents, inside knowledge (participant observation), semi-structured interviews and direct observations. They are discussed below.

4.2.6 Ethics / Access

“Knowledge is Power.” Knowledge is not a politically neutral product. As all research is implicated in power relations, one key issue in the social science research is the relationship between the production of research and the use to which it is subsequently put. A researcher must therefore be aware of ethics in research, and be bound to the codes and principles of moral behaviour, and appropriate research procedures. These include the principle of access, informed consent and the guarantees of confidentiality and anonymity (May 2001).

I carried a general letter of introduction from the Minister, and also letters from Heads of Departments (Appendix 5). They were helpful: firstly, they provided me the legitimacy to access people and information; and secondly, I could present them to anyone who wanted to know about my research work. I was also particularly aware that the most direct benefit from the research study would be me in terms of getting a degree, and I did not have the right to take away people’s time more than necessary, especially when physical labour is the primary capital for the farmers. I therefore tried to cater as much as possible to the schedule and availability of the farmers. Confidentiality and anonymity become necessary when the study is on a sensitive and controversial topic. They serve to protect the research participants. This research study does not maintain

confidentiality and anonymity as I see no way in which research might in any way affect the subsequent actions of the participants or participant groups.

4.3 Sources of Data

A case study research is about investigation into a contemporary phenomenon within its real-life context. A major strength of the case study is its ability and flexibility to employ a wide array of data collection methods. The different methods complement each other, and provide the case study with the multiple sources of evidence. According to Yin (2003), the six commonly recognised data sources for the case study include (i) documentation, (ii) archival records, (iii) interviews, (iv) direct observations, (v) participant-observation, and (vi) physical artifacts. However, for this research study, I try to combine the *documents* and *archival records*, and the last data source *physical artifact* is not included as it is not relevant to this research study. The four sources of data are discussed below.

4.3.1 Documents

A document is defined as a piece of paper providing an official record of something or refers to official correspondences or reports, or anything written such as letters, memoranda, announcements and minutes of meetings (Yin 2003). In addition to being itself a source of evidence, it can corroborate and augment evidence from other sources as well. It is important in a case study to make systematic searches for relevant documents (Yin 2003). The key documents accessed and reviewed for the study included:

- National Laws, and Rules and Regulations
- National Assembly Proceedings
- Royal Government of Bhutan Documents
- Department of Forest's Official Correspondences on NTFP
- Research / Technical Reports
- Consultancy Reports

- Trade Reports
- National Statistics Reports
- Kuensel – the National Newspaper

The National Assembly proceedings, and Five-Year Plan documents were of great chronological value in terms of tracking the forest policy priorities and changes over the last 40 years. They were a rich source of information for the question, “How is the forest policy in Bhutan evolving?”.

4.3.2 Interviews

An interview is an exchange of questions and answers (Wengraf 2001). It is one of the most important sources of case study information. Interviews can be structured or semi-structured, the most common case study interviews being semi-structured. In a semi-structured interview, the interviewer asks respondents for facts as well as for the respondents’ opinions about events. The research questions are sufficiently open that the subsequent questions, depending upon the situation, are improvised in a careful and theorized way or guided by the propositions set out for the study. They assume a conversational manner, and place a heavy demand on the researcher for creative probing of the issues (Wengraf 2001; Yin 2003).

The interviews, when appropriate and possible, were recorded in a micro-cassette recorder. People did not seem to mind or be disturbed by it, and I did not find it culturally appropriate to seek permission for its use. The permission seeking in fact may have made them suspicious, and uncomfortable. There is generally a strong trust between people and government. However, I did seek permission for its use when interviewing the traders group. All of them except for one sub-group consented. I had a total of 56 hours of recorded interviews. I also additionally maintained field notes.

Special efforts were made not to impose time demands on the farmers. My research colleagues and I generally visited people at their homes in the evening, and in

the fields. We chatted with people as we met them on the way. One interview with a key informant took place in the pouring rain in the middle of a dense forest. People were always kind to invite us to their houses for tea and food and lodging. They also came over to see us in the evenings at our places of night halts. These were generally at farmers' homes. The local guides and porters were an excellent source of information as over the days we developed trust and intimate relationships. They were always available when I wanted to make sense of the issues, to corroborate and confirm the facts. I undertook group interviews when I met people in groups or when the farmers met for their village meetings. We also visited the community schools, community health units, and other government units such as the local forest, agriculture and livestock offices. The frontline government agents, working as they are in difficult conditions, helped us to gain insights to the challenges of rural development. The other major respondent groups included the government officers, NTFP traders, and poachers.

4.3.3 Direct Observation

Yin (2003) refers to “direct observation” as making a field visit to the case study “site”. The field visits serve the purpose of direct observation of relevant behaviours or environmental conditions, and they provide additional information about the topic being studied. Multiple observers increase the reliability of observational reliability. I was fortunate that I could ask research colleagues to join me in the field visits. For the first case study - *Cordyceps*, I had Mr. Tshitila, the research officer leading the programme on the sustainable management of high altitude medicinal plants. He has also recently initiated an ecological study of *Cordyceps*. As I had not known earlier of *Cordyceps* in its natural habitats, direct observation of the growing sites gave an account of its ecological features as well as the nature and extent of the poaching problem, and the effectiveness of the government decisions and control. In the second case study – matsutake, I had Mr. Dawa Penjore, a mycologist from the National Mushroom Centre join me in the field visit. And for the third case study – *Piper*, it was Mr. Tshering Phuntsho, district forest extension officer who was developing a community-based management plan for *Piper*.

The participation of these professional colleagues was very valuable as we discussed and debated over many issues.

I have also been able to take a number of pictures in the field, thanks to digital camera technology. These pictures have been valuable to recap memories. A set of pictures showing the case study areas and interviewing is illustrated on page 89.

4.3.4 Participant-Observation

Participant-observation is a special mode of observation in which the investigator is not merely a passive observer but actually participates in the events being studied. This technique has its origin in anthropological studies of different cultural or social groups. It is now also used in more everyday settings, such as in large organisations or informal small groups. Its attraction lies in its many special features as a technique for collecting information. The first relates to the ability to gain access to events or groups that are otherwise inaccessible to scientific investigation. The second is the ability to perceive reality from the viewpoint of some one “inside” the case study rather than external to it (Yin 2003:94). As an active government officer, I would like to think of the many views I hold on the issues of forestry in the country as one of “inside” or having inside knowledge.

Interviewing



Pic.4.1 Joining the foreign poachers in *Cordyceps* picking (alt. 4700 m asl)



Pic.4.2 Interviewing a lady at her summer camp site (alt. 4500 m asl)



Pic.4.3 Interviewing matsutake collectors in the forest (alt. 2700 m asl)



Pic.4.4 Participating in a village meeting (alt. 2600 m asl)



Pic.4.5 A group meeting in a farm house (alt. 1200 m asl)



Pic.4.6 A farmer showing two types of Piper species (alt. 1300 m asl)

4.4 Rapid Vulnerability Assessment

As addressing the environmental concern of NTFP extraction is a major component of the study, the Rapid Vulnerability Assessment was run against each of the three case products. This is because a key concern of the forest policy makers is resource sustainability, and extinction of species (Kerns et al. 2002). Conceptually, resource sustainability can be defined as the rate of extraction remaining the same as rate of natural replacement, without adverse impact on the ecosystem as a whole (Godoy & Bawa 1993). But, this is a grossly simple construction of a complex ecosystem and reality at best and tall order at worst. It is nearly impossible to design a research model that measures the response of plant population to harvest, taking into account for climatic variations that affect population demographics, recruitment, mortality, and reproduction, and other factors such as species distribution, abundance and growth, or if the huge cost of an expensive research project justified the benefits. More importantly, at the end of the day the research questions are as good as the theories and assumptions made (Vance 2002). For instance, one could think whether sustainable harvest level is relevant when viewed against the assumption that economic extinction precedes the species extinction (Olsen 1997b).

Compared to timber species, there is very little or no information for many NTFPs, making the task of determining sustainable harvest level very difficult (Mallet 2002). Policy makers generally use the lack of information on sustainable harvest levels as a means to justify the application of the ‘precautionary principle’, thus denying the local communities the economic benefits from the commercialisation of NTFP. Wild and Mutebi (1996) say that this need not be the case. They say that even if the NTFP species lack detailed scientific information, one could always fall back on the rich traditional knowledge stored in the collective experiences of the local people derived from their generations of living in the area, and day-to-day interactions. Commercialisation of NTFP also does not necessarily lead to over-exploitation as factors such as life form of the species, parts used, tenure security, population density, or technology used play an important role in the overall scheme of resource dynamics. Wild and Mutebi designed a

field research method known as ‘Rapid Vulnerability Assessment’ (RVA), which allowed quick assessment of the vulnerability of NTFP species to harvesting. The RVA lists 12 factors for assessment. They include (Wild and Mutebi 1996:17):

i. Life form: A plant’s life form is easy information to collect. Slow growing, long-lived, slow reproducing trees are more vulnerable than fast growing, short-lived, fast reproducing ephemerals.

ii. Habitat specificity: Species with very narrow habitat requirements are likely to be rarer and more vulnerable.

iii. Abundance and distribution: Abundant widely distributed species are less vulnerable to overuse.

iv. Growth rate: Slower growing species will be more vulnerable to use.

v. Response to harvesting: The ability of species to re-grow or increase its growth rate as a response to harvesting affects its vulnerability

vi. Parts used: The part used significantly affects sustainability. Use of leaves has the least impact on the plant, followed by twigs, branches, bark, stems, and last the whole plant.

vii. Pattern of selection: If a certain size, age or quality of a plant is used, the remaining population may ensure the survival of the species.

viii. Demand: The level of demand has a major impact on the plant.

ix. Seasonal harvesting: Demand maybe reduced if harvesting is restricted to seasons.

x. Traditional conservation practices: Many cultures have developed practices to control use.

xi. Commercialisation: Once a product moves from subsistence use to commercialisation, the chances of unsustainable use increases.

xii. Substitutes: The availability of substitutes affects species’ vulnerability indirectly by reducing demand.

For this research study I have adopted only six of the above 12 factors, and added two factors of my own: population density and technology use. I have left out the six factors for reason of their being similar in nature (e.g. plant form and growth rate; habitat

specificity and abundance and distribution; demand and commercialisation), and the factors I have found difficult to understand and operationalise (e.g. response to harvesting; seasonal harvesting).

For ranking and scoring the factors, I used the methodology adopted by Messerschmidt et al. (2001). In this system, a factor is ranked into four levels (no, low, medium, high), and given a score of 0 for no vulnerability, 1 for low vulnerability, 2 for moderate vulnerability, and 3 for high vulnerability. They are then added up. The maximum score is 24 i.e. 8 factors x score 3, and minimum score is 8 i.e. 8 factors x score 1. A score of 0 is no vulnerability, 1 to 8 implies low vulnerability and is no cause for alarm; a score of 9 to 16 implies moderate vulnerability, indicating some concern; and a score of 17 to 24 reveals high vulnerability, indicating the need for some management intervention.

4.5 Data Management

A proper data management is one of the important means of addressing the issue of construct validity and reliability of the research enquiry, in that other persons, including the investigator, can retrieve data efficiently at some later date or know where to look for them (Yin 2003). However, it is not an institutionalised practice in a case study to have a separate database. Often, the case study data are considered to be synonymous with the narrative presented in the case study report, and a critical reader has no recourse if he or she wants to inspect the raw data that led to the case study's conclusions. The lack of a formal database for most case studies is a major shortcoming of case study research and needs to be corrected. It is important for case study investigators to recognise this problem, and make special efforts to address it. There are two ways to address this database issue. The first is that the case study report should contain enough data so that the reader may draw independent conclusions. The second is to discuss the database in terms of notes, documents, tabular materials, and narratives (Yin 2003). For this research study, the database refers to 56 hours of recorded audiotapes, written transcripts, field

notes, digital pictures and the key policy documents. The written transcripts are available as attachments to the thesis (see Appendices 1, 2 and 3).

4.6 Data Analysis

In a case study, data analysis like data collection is the most problematic part of the research investigation. There is no “cookbook” available for it as for statistical analysis in an experimental research. It is so much dependent on the individual investigator’s own style of rigorous thinking, along with the sufficient presentation of evidence and careful consideration of alternative interpretations. Miles and Huberman (1994 in Yin 2003:111) suggest a helpful procedure in analysing qualitative data, data that are words, not numerical. They include:

- putting information into different arrays
- making a matrix of categories and placing the evidence within such categories
- creating data displays – flowcharts and other graphics – for examining the data
- tabulating the frequency of different events
- examining the complexity of such tabulations and their relationships by calculating second-order numbers such as means and variances.
- putting information in chronological order or using some other temporal scheme

Yin (2003) says that while this set of procedure is helpful in carrying forward the analysis, it will hit the wall soon if not done within a general analytic strategy. The analytic strategy helps to treat the evidence fairly, produce compelling analytic conclusions, and rule out alternative interpretations. Yin lists three general strategies. They include (i) relying on theoretical proposition that led to doing the case study, (ii) thinking about rival explanations, and (iii) developing a case description. I have used this general framework to analyse and report this case study.

4.7 Limitation of the Research Study

Yin (2003:47) notes that “the conduct of a multiple-case study can require extensive resources and time beyond the means of a single student or independent research investigator”. Despite the large professional and personal contacts in Bhutan, I realized during the fieldwork that my earlier scope of the research study was indeed an ambitious project, as pointed out by staff of the department and student colleagues during the pre-field seminar. I had planned five case studies but managed to undertake only four of them. However, this study uses only three cases. The fourth case ‘lemon grass’ has not been included in the study, firstly, it did not receive the same detail of investigation as the other three, and secondly, I felt that it would not add significant value in the comparative analysis. I also earlier included a unit of analysis at the household level. This was with the objective of capturing the contribution of NTFP to the household economy. The investigation into this area was difficult because the village economy is essentially a subsistence economy, and time at hand was not enough for it. A long-term anthropological study would be more appropriate.

Last but not least, Bhutan is a small country in area terms but, because of its mountainous terrain, it is a large country in temporal terms. Travel in the country is envisaged in days and weeks. Fieldwork planning and logistical arrangements demanded a lot of time when the case study sites were the remote inaccessible rural villages. The case study areas were also spread across the country, taking days and weeks of travel between them.

4.8 Discussion and Conclusions

The case study approach was selected as the appropriate research methodology for this research study. Firstly, it made possible the investigation of a contemporary phenomenon within its real-life context. Secondly, its dependence on multiple sources of information and multiple units of analysis also made it possible to build a coherent picture of the NTFP issues in Bhutan by integrating pieces of information relating to policy, economic

and the environment. Thirdly, it is an efficient technique to shed light on important issues, interactions, and processes as a basis for comparison, and decision-making. Fourthly, undertaking a case study is an enjoyable research experience.

Chapter 5: Documentary Analysis

This chapter seeks to meet one of the main objectives of the research study: that is, the critical review of forest policy and other public policies related to NTFP commercialisation. It looks for documentary evidence to address the research questions:

- i) how is the forest policy in Bhutan evolving with regard to NTFP?
- ii) how does the forest policy relate itself to NTFP commercialisation?, and
- iii) why is there no separate forest policy on NTFP in Bhutan?

The discussion on trees and timber is also included to get the overall picture of the state forestry's territorial and property claim to forests, and its implications on the NTFP commercialisation. Yin (2003) writes that documents over a long span of time, listing many events and many settings provide an empirical basis in illuminating the decision-making process and implementation, and also lend credibility to validation of the research. The documentary analysis is organised by source of information, and includes the following key documents:

- i) National Assembly Proceedings (1958 – 2003)
- ii) Five Year Plans (1961 - 2002)
- iii) Master Plan for Forestry Development 1991
- iv) Forest Legislation
- v) Forest Subsidiary Legislation
- vi) Department of Forest NTFP Correspondences

5.1 National Assembly Proceedings (1958-2003)

The National Assembly, known in Bhutan as *Gyalyong Tshogdu*, is the highest legislative body established in 1953⁷. The 84th Session was held in 2004. Forestry is a recurring topic in the National Assembly sessions. In the first of the written proceedings in 1958, two out of the eleven resolutions for the session were concerned with levying fees for hunting and fishing. This is interesting in that hunting and fishing were a matter of discussion at the national level in this early period of the development process. It would appear quite out of the subsistence character of Bhutanese society then. However, as Bhutan was soon to embark upon an economic development programme, the fees from wildlife might have appeared to be an attractive source of revenue to the government.

Bhutanese people are traditionally skilful in wood and bamboo works. Indian Prime Minister Jawaharlal Nehru and his daughter Indira Gandhi showed great appreciation for the Bhutanese arts and crafts when they visited Bhutan in 1958. The National Assembly in its 13th Session in 1959 discussed the need to promote the traditional arts and crafts as a way to assist rural development.

The Bhutanese economy was beginning to be monetised in the 1960s. People and communities found it easier to pay tax in cash than paying in-kind of cereal, livestock and forest products. People's representatives asked the government to do away with the in-kind taxes. Depending upon the specialisation of the individual village communities, the forestry in-kind taxes included paper fibres (*dhey*), paper, bamboo products such as mat, basket, milk churner, tea churner and butter container, wooden container and incense sticks (NA 16; NA 20⁸). A 'wood tax' (*Shingthrel*) was also levied on households in order to supply timber, shingles and firewood to the *Dzongs* and the monks. The in-kind taxes included physically demanding works and thus put heavy burden on family labour.

⁷ In the early years of establishment from 1953 to 1959, the National Assembly was occupied in enacting the *Thrimzhung Chenmo*, the Supreme Law of the country. The National Assembly started keeping minutes of the proceedings from the 11th Session in 1958. I have for the research referred to the digital copy of the proceedings maintained by His Lordship the Chief Justice of Bhutan Lyonpo Sonam Tobgye. The hard copy run into tens of volumes, thus the digital copy was a vital resource allowing me access despite working away from the country.

⁸ NA stands for National Assembly; Numeric for the Session Number.

Some communities preferred to supply rice in lieu of the wood tax, and others collected money to buy the corrugated galvanised iron (CGI) sheets so that they could replace the wooden shingles that required regular replacements (NA 23).

The Bhutan Forest Act was to pass only in 1969, but there were already forest rules in place. People complained that the government prohibition on cutting down the blue pine trees was causing them a lot of practical difficulties with regard to their fuelwood supply. They said that the village communities in this forest zone had no other source of tree species. It was a recurrent issue in the National Assembly (NA 17; NA 19; NA 24).

People, traditionally used to the free use of forest resources, were frustrated with the system of royalty introduced by the government. They appealed to the government to exempt the common people from making the payment, but it was resolved that the royalty would be waived only in the cases of ‘houses gutted by fires or washed away by land slides or destroyed by any other natural calamity’ (NA 27). People were also restricted from felling of trees on *tsheri* land (shifting cultivation). The forest fire was a serious offence. It was three months of imprisonment, and if no offender was apprehended, households in the forest fire area were liable to 15 days imprisonment that was commutable on the payment of a fine of Nu.3 per household per day (NA 19).

The institutional capacity of the Department of Forests (DoF) was confined to the southern part of the country in the beginning. As late as 1966, the *Thrimpons* (judges) at the respective districts were responsible for forestry matter (NA 24). The Bhutan Forest Act was passed by the 31st Session in 1969. Soon thereafter in the 32nd Session in 1970, people’s representatives complained to the government that the Act created difficulties for the common people by prohibiting and restricting a number of traditional forest activities. These included (NA 32; Kuensel 1970):

- collection of leaf litter from forest areas traditionally registered in their names (sokshing).
- felling standing trees for fuel wood.

- selection of trees for shingles (people were forced to accept only the trees marked by the forest guard, and these trees often turned out not suitable for making shingles).
- the Act levied tax on bamboo growing on registered pasturelands.
- extraction of tree resins for polishing traditional wooden containers.

In the 43rd Session in 1975, the DoF said that people would forfeit their grazing and cultivation rights over the lands falling within the plantation areas. It also said that in order to ‘develop forest resources’ in the country, people forfeited their right to trees in private or community ‘sokshings’ and pasturelands (NA 43). As control and enforcement capacity of the DoF got stronger over the years, common people found it difficult to understand the forest rules. The government always maintained that the forest resources were of the ‘immense economic importance to the country’, and if private right to trees were allowed, it would ‘lead to a steep decline in the nation’s forest resources’ (NA 45; NA 46; NA 47).

The Land Act was passed in the 48th Session in 1978. It recognised the people’s right to trees on private lands without the need to obtain a permit or pay a royalty for home use; however a permit was required for commercial purposes (NA 48). But, it remained a different story in the field. In the 49th Session in 1979, people complained to the House that the DoF was not honouring the Land Act passed only in the previous session. The House resolved that it was important for everyone to honour and adhere to the Land Act (NA 49).

In the same 49th Session, the people also requested the government for the deregulation of the sale of ‘pipla’ and ‘chirata’, the non-timber forest products. Only one private party held the right to buy, collect and trade these two products. The DoF said that it would tender the right to trade these products annually to the highest bidder, thereby bringing more revenue to the government (NA 49). In the 51st Session in 1979, people complained that sales tax was levied on bamboo products despite the exemption by an earlier resolution of the National Assembly. The government acknowledged that there were deviations and variations in the rules in the country, and asked the district administrators to look into the matter (NA 51). In the 54th Session, people asked the government for an

explanation for the large number of foreign workers imported into the country for the extraction of resin from the Chir pine trees. The government said that resin tapping was a profitable industrial venture, and there were insufficient domestic workers to meet the demand of this industry (NA 54).

People again complained in the 57th Session in 1982: the forestry field personnel were not honouring the Land Act. The DoF said that as:

“... the new Land Act had been circulated only recently, therefore it may not have been understood by the Forest Department personnel working in remote areas. If any inconvenience has been caused to the public due to any misunderstanding, the matter should be reported to the Forest Department headquarter or to the Ministry of Trade, Industry and Forests.” (NA 57).

In the 61st Session in 1984, people said that knowing that the forests were a valuable resource to the country, they restrained and exercised control in felling trees even for the most basic needs. They said that they would like to be informed what annual revenue the DoF made from the forest resources. The DoF said that it generated a total revenue of Nu. 22.3 million from timber sale, and Nu. 2.8 million from other forest products from 1981 to 1984 (NA 61). In the 64th Session in 1986, people asked the DoF to install forest demarcation pillars only after consultation with the landowners and verification of the land registration records.

The Forest and Nature Conservation Act in 1995 repealed and replaced the 1969 Forest Act. In the new Act, a separate chapter is devoted to the establishment of private and community forests. The forest arguments are still far from resolved in the national debate. In the 73rd Session in 1996, people complained that the Department of Forests and Survey of Bhutan were undermining the provisions of the Land Act by their refusal to measure private lands with trees. In 2003, people once again raised the issue that the forest regulations were creating problems for the rural people.

It is evident from the discussion above that forest is a contested domain between the state that wants to exercise control in the name of the national interest, and the peasantry who feel their traditional rights are being trampled upon, and their day-to-day interactions with the forest made difficult. The central concern of the forest bureaucracy was trees and national revenue, and it had scant regard for the property rights of the people.

5.2 Five Year Plans (1961 -2002)

Bhutan follows a five-year development planning cycle. Called Five Year Plans (FYP), they have been the cornerstone of the country's policy development and priority setting since 1961. The Plans provide an important development evolution of the country. The current plan is the Ninth covering the period 2002 - 07.

5.2.1 First Five Year Plan (1961-1966)

The government saw the country's forest as the largest natural asset. It pinned its hope on the rich forest resources to finance its development projects. But the forest sector acutely lacked the professional and technical manpower to carry out timber exploitation, and it had to depend upon Indian forest officers. The forest development objectives for the First FYP were (i) conservation of the forest wealth, and (ii) exploitation of the forest products. Conservation of forests then meant something different from the present time; it generally meant bringing the forests under government control in order to generate revenue, in contrast to the present idea of protection of biodiversity.

5.2.2 Second Five Year Plan (1966-1972)

Just into the Second FYP, the DoF was already talking about the considerable depletion of timber stock in the forests in the south due to extensive extraction. The new forest objectives were:

- i) re-stocking the forests in the south of the country
- ii) opening up the forests in the north for timber exploitation

- iii) assessing the feasibility of establishing forest based industry and
- iv) increased supervision and control of further forest clearings by the villagers in the east of the country.

During this period, the DoF also talked about experimenting resin tapping, lemon grass oil extraction and shellac production, but as state enterprises, not linked to rural development. DoF did not pursue the idea, as the initial cost calculation did not work out favourable.

The implementation of the DoF's forest demarcation policy met with a lot of resistance from the rural people. The DoF notes that:

“ During demarcation innumerable administrative difficulties arise as cultivators are apt to treat forest areas as no man's land and surreptitiously encroach on the forest boundaries and clear more and more of the forest areas.”

5.2.3 Third Five Year Plan (1972-1977)

In this period, it was the Department of Industry, rather than the DoF, which was showing interest in the idea of production of resin and turpentine, activated carbon and pine tar, and lemon grass oil. The forest sector priorities were the continued forest demarcation work; forest survey and inventory; preparation of working plans; opening up of more forests for timber extraction; and setting up a new forest division which would look after timber sales. As in the Second FYP, the DoF established a total of 5000 acres of forest plantations, and in the Third FYP, it planned to raise an additional 8000 acres of plantation of valuable timber species. The DoF also noted the great significance for the forest sector in the country of the enactment of the Bhutan Forest Act 1969. It said:

“The forests in Bhutan are all state-owned. Special mention deserves to be made of the Bhutan Forest Act 1969, which has been brought into effect from 01 November 1969. This is an enactment of far-reaching importance and should be able to preserve this important natural resource in Bhutan in the vital national interests. Besides declaring the forests as government reserved forests, the Act also regulates shifting cultivation and grants of rights and concession of timber etc.”

5.2.4 Fourth Five Year Plan (1977-1982)

The forest priorities remained the same as those of the Third FYP.

5.2.5 Fifth Five Year Plan (1982 – 1987)

The development strategies of decentralisation and people’s participation were introduced during this period. Until then, development planning and resource allocations were undertaken centrally at the government ministries and departments in the capital. In the new system, the *Dzongkhag Yargye Tshogchung* (District Development Committee) comprising the district administrator, village representatives and elders were to identify and prioritise the developmental projects, and also take responsibility for supervision of their implementation.

The DoF also for the first time talked about meeting the forest products needs of the rural people and of the opportunity the forests offered to increase rural incomes. It acknowledged that rural people harvested a number of valuable minor forest products such as medicinal herbs, rosin, bamboo, bee wax etc., but noted that they did not have resources to develop these products into large-scale commercial operations except on a trial basis for mushroom and saffron.

5.2.6 Sixth Five Year Plan (1987-1992)

The government noted that:

“While the overall growth and development in the country has been steadily increasing, there has not been an equally satisfactory rise in rural incomes. Given the fact that 80% of the country’s population live in rural areas, the present level of incomes of the rural population is a matter of serious concern...Therefore a determined effort must be made to bring about the enhancement of rural incomes, and accordingly this has been adopted as an important objective of the Sixth Plan.”

Enhancement of rural income was an important objective of the Sixth FYP, but the DoF had no programmes and activities addressing the objective. Instead, its programmes included:

- i) survey and demarcation of forests
- ii) control on illicit and indiscriminate felling of trees, forest encroachment and forest fires
- iii) regulation and containment of tsheri cultivation
- iv) forest education and extension
- v) establishing forest research base
- vi) soil/river Protection, and
- vii) solicitation of people in implementing the programmes.

5.2.7 Seventh Five Year Plan (1992-1997)

The role of forests in rural development still does not get mentioned in the new Plan, but instead the DoF reinforces its primary function of forest protection. It notes that:

“The Royal Government of Bhutan’s policy has been to put protection of forests as a higher priority to commercial exploitation and to deliberately slow the pace of development. This has involved laws and regulations restricting grazing in critical watersheds and protected forests, the banning of logging on steeper slopes, and restriction on the conversion of forest lands to other uses.”

5.2.8 Eighth Five Year Plan (1997-2002)

The DoF creates a new division for Social and Forestry Extension. The work mandate for the Division was (i) establishment of community forests, (ii) rehabilitation of degraded lands by the communities, and (iii) private forestry. The Division was later disbanded, and reconstituted again in the Ninth FYP.

5.2.9 Ninth Five Year Plan (2002-2007)

Driven by the overall national development strategy of decentralisation and enhancement of rural income, the DoF drafted a vision statement for its Ninth FYP:

“To bring about increased benefits from natural resources for rural people, particularly the poorest of the poor, through empowerment, control of natural resources and appropriate incentives; and economic and environmental services for all sections of the society through a managed and viable system of sustainable use, increased productivity and improved conservation of natural resources.” (DoF 2002a:16).

The DoF also noted that it could significantly contribute to the overall Ministry of Agriculture goals. These included:

- i) enhancement of household and national food security
- ii) conservation and management of natural resources
- iii) enhancement of rural income, and
- iv) generation of employment opportunities.

In order to meet the four goals, DoF identified four new priority programmes. These were:

- i) private and community forests
- ii) strengthening the DoF capacity for forest extension works
- iii) development of timber and non-timber forest products for employment generation and rural income, and
- iv) review and develop appropriate policy and legal frameworks for development of wood-based industries.

For the first time, NTFP was incorporated as a programme in the plan, and the following activities were identified:

- i) problem and opportunity analysis of harvested NTFPs
- ii) development of a national strategy for sustainable management of NTFPs
- iii) piloting of locally adapted NTFP management regimes
- iv) marketing support to NTFP enterprises
- v) capacity building of extension agents to support management of NTFPs
- vi) review of the Forest and Nature Conservation Rules to ensure that they support sustainable utilisation of NTFPs.

NTFP has received specific attention by the Forestry Department only in the current plan period. When it was discussed in the past, it was done so in the context of state enterprises with the intention of generating additional revenue to the state. The DoF could then not see itself as having an important role in rural development.

5.3 Master Plan for Forest Development 1991

The Master Plan for Forest Development 1991 was a 20-year strategic plan to guide the development of forestry in the country. As part of this overall planning, there was a separate study undertaken for NTFP with the aim of determining the current use and future potential. The report was constrained for detailed analysis by lack of information on the

subject, but it acknowledged that some NTFPs such as resin tapping of chir pines, lemon grass oil extraction and traditional paper production were already providing employment and income to the rural people. The general recommendations included:

- i) priority setting of NTFP species based on an agreed set of criteria
- ii) resource inventory and assessment of the prioritised NTFPs
- iii) establishment of marketing and post-harvest infrastructural facilities, and
- iv) creation of an agency that will serve as the clearing house for development related NTFPs.

It appears from the review of the Five Year Plan documents that the DoF never followed up on these recommendations.

5.4 Forest Legislation

Forest legislation is defined here as the legislation passed by the National Assembly of Bhutan. These include (i) Bhutan Forest Act 1969, (ii) National Forest Policy 1974, (iii) Draft Forest Policy 1991, and (iv) Forest and Nature Conservation Act 1995.

5.4.1 The Bhutan Forest Act 1969

The Act covers NTFP under the definitions of ‘tree’ and ‘forest produce’. ‘Tree’ is defined as including “palms, bamboos, stumps, brushwood and canes” (Sec. 4b). The definition of ‘forest produce’ covers everything organic and inorganic that is on top and below the forestland. It is considered a forest offence to be “quarrying of mineral, rock, stone, boulder, sand and any other forest produce” (Sec. 6d). The government reserves the “right to the absolute ownership of trees, timber and other forest produce on private land” (Sec.10). However, “the local people may continue to exercise the right to collect leaf-litter, boulder, stone and sand for bonafide domestic use free of royalty provided such removal does not endanger safety of the highways or accelerate erosion” (Sec.12). The government “may make rules to regulate granting of licence or contract to persons felling and removing

of trees or timber or other forest produce from Reserved Forest for the purpose of trade” (Sec.26c)

People could extract NTFP for subsistence use but could not engage in NTFP trade of products even from private lands without the permission of the DoF.

5.4.2 National Forest Policy 1974

The National Forest Policy 1974 reinforces the importance of forests for national interest. It notes:

‘The overall objective of the National Economic Policy of Bhutan is the achievement of self-reliance. A major share of the contribution to the national exchequer will have to be from forests. Therefore, the starting premise of this policy should be that the entire forests belong to the State and there should not be any private right to any part of them. The economic policy contemplates a growth rate of 10% per annum in the revenue generation from forests. The National Forest Policy of Bhutan is based on the above cardinal principles of vital national interest’ (RGOB 1974:1).

The Forest Policy under utilisation programme identifies cultivation of valuable herbs and plants to generate additional revenue to the state. It says that it will draw up suitable programme for cultivation of *Rauwolfia serpentina*, *Podophyllum*, *Mentha*, *Citronella spp.*, lemon grass etc.

It is clear from the review of the FYPs that it was never taken up.

5.4.3 Draft Forest Policy 1991

As part of the preparation for the Master Plan for Forestry Development, a new Forest Policy was drafted in 1991. However, it was never put to the National Assembly nor formally adopted by the government, but it is commonly quoted in government documents. It identifies four goals: (i) protection of the land, its forests, soil, water resources and

biodiversity, (ii) contribution to the production of food, water, energy and other commodities, (iii) meeting long term needs of Bhutanese people for wood and other forest products by placing all of country's production forest resources under sustainable management, and (iv) contribution to the growth of national and local economies.

The new Policy recognises the forest as a “national resource and part of the country's common heritage”, instead of the ‘national interest’ in the past. It advocates diversification of forest into protection, production and community forests, and asks the government to (i) encourage and support the social and community forestry, (ii) improve management of the multiple uses of forests for timber production, cattle grazing and production of fodder, firewood and non-timber forest products, (iii) develop and encourage agro-forestry and agro-silvo-pastoral systems as an alternative to shifting cultivation, (iv) conduct research on traditional knowledge of NTFP, and (v) encourage and develop favourable conditions for forestry on private registered lands.

5.4.4 Forest and Nature Conservation Act 1995

It was again during the Master Plan preparation that drafting of a new Forest Act was undertaken. The new Forest and Nature Conservation Act 1995 passed by the 73rd Session of the National Assembly in 1995 repealed and replaced the Bhutan Forest Act of 1969. The Act is composed of IX Chapters with a chapter devoted to Social and Community Forestry. However, the same forest provisions with regard to NTFP as of the 1969 are maintained.

5.5 Subsidiary Legislation

Subsidiary legislation refers to the various instruments issued by a government to implement principal legislation e.g. an Act. The most significant instruments include the ‘rules’. They are issued by the branch of the executive responsible for the sector concerned, generally in the person of the minister, while the principal legislation normally is passed by the National Assembly. ‘Rules’ are quasi-legislative instrument, but generally easier to modify than the principal legislation, and are therefore a fairly flexible means which can be

adapted to changing needs in the implementation of laws. They should be as easily accessible as possible, because it is indispensable for those who are subject to them to know their contents. Subsidiary legislation may also consist of ‘orders’, ‘circulars’ or other types of instruments such as letters and notifications. These are legitimate and valid to the extent that they are in compliance with the principal legislation. ‘Orders’ and ‘notifications’ are generally less significant than rules or regulations. In forestry in Bhutan they tend to be used to express commands, which apply only to specified persons or situations, or to formulate lists of protected areas or protected species. And, ‘circulars’ might be used within an administration to clarify the contents of provisions already in force (Cirelli 1994).

The forest subsidiary legislations discussed here include (a) the Manual on Forestry Orders (b) Rules on supply of timber, transit of timber by land, resin tapping, land allotment and fishing, and (c) Forest and Nature Conservation Rules of Bhutan 2003.

5.5.1 The Manual on Forestry Orders (1974 – 1992)

This two-volume ‘Manual on Forest Orders’ is a collection of forest ‘rules’, ‘orders’, ‘circulars’, ‘notifications’ and ‘letters’ from 1974 to 1992, with the primary intention of providing reference material for forest officers. Cirelli (1994) notes that the collection contains various redundancies and contradictions, making it hard to identify provisions that are still significant. The rules or orders only dealing with NTFP are discussed in Table 5.1.

Table 5.1 Forest orders with reference to NTFPs

Order No.	Date	Content
TIF/FOR/IV-2/77/224	03.07.1977	The order bans the villagers from collecting 'mipchi', resinous pinewood used for lighting.
TIF/PA/1-1/NA49/78310	07.11.1978	The order allows the free collection of bamboo and cane for local handicraft production.
TIF/FOR/IV-3/79/813	07.05.1979	The order allows the communities of Mongar and Zhemgang to take bangchung, palang and other bamboo products of bamboo and cane anywhere as gifts.
TIF/FOR/IV-3/79/4016	05.11.1979	The order allows the free collection of incense plants by communities of Laya, Lingshi and Lunana.
TIF/FOR/IV-3/79	04.01.1980	The order waives the royalty and sales tax on collection and sale of lac and its waste products in order to promote the dying art of cultivation of lac. Villagers are given complete freedom in marketing the lac and its waste product and no monopolistic right of dealership in these products to any individual shall be permitted.
TIF/FOR/IV-2/84/910	01.05.1984	The order announces the revision of royalty rates for forest produces. About 41 NTFP is in the list for payment of royalty, amount ranging from Nu.0.20/kg for wangri / kejum to Nu.2000/kg for agarwood.
TIF/FOR/IV-3/84/2258	07.09.1984	The order allows the Monpa community in Trongsa Dzongkhag free collection of bamboo and cane for bonafide use.
DF/2E(c)-1/85/4537	22.03.1985	The order calls for establishment of the Forest Research Cell. Minor Forest product is mentioned as one of the research areas that the unit will take up.
MAF/FOR/A5/1/85810	09.08.1985	The order bans the export of vegetable colours. Vegetable colours refer to dyes from the plants. About 20 plant species are used by rural people for dyeing textiles e.g. <i>Strobilanthus flacidifolius</i> , <i>Laccifer lacca</i> and <i>Rubia manjit</i> (Tshering 1990).
DF/IF-2/86/858	27.02.1986	The order bans the export of semi-finished cane products. The Department will undertake collection and supply of cane.
DF/RAD/IF-3/87/1271	18.03.1987	The order allows for free collection of <i>chirata</i> by the villagers.
-	25.05.1988	The order bans the export of medicinal plants, except for National Institute of Traditional Medicine.

The forest orders demonstrate clearly that forest bureaucracy viewed NTFP commercialisation negatively, by banning sales and exports. The orders for free collection of certain NTFPs were also not uniform across the country. The collection restriction on lac seems to have led to death of a traditional art form in the villages.

5.5.2 Rules on supply of timber, transit of timber by land, resin tapping, land allotment and fishing

The rule forbids the movement of forest produce without a transit permit obtained from the Department of Forests, and even with transit permit, movement of forest produce is prohibited between the hours of sunset and sunrise.

The rule on resin tapping from the chir pine trees provides a detailed guideline on the tapping, equipment and its operations. It is the only forest rule available dealing specifically with a NTFP.

5.5.3 Forest and Nature Conservation Rules of Bhutan 2003

The DoF in the past engaged in the loose practices of the subsidiary legislation, not always in line to standard practices with the potential for challenges by citizens if they took recourse to courts (Cirelli 1994). To address this issue, the DoF came out with a comprehensive rule in 2000. This was revised in 2003. The provisions of the Rule relating to the NTFPs are discussed below:

Section 11, 15 and 67

Local people can take forest produce for personal or home consumption but commercial harvesting of edible forest products is to be permitted based upon resource availability and an approved management plan.

Section 18

Resin tapping is to be discouraged as far as possible due to potential negative impact on the environment.

Section 55 (6b)

Only the Ministry shall decide export of any items of NTFP from Government Reserved Forest.

The newly revised forest regulations are still restrictive in spirit and letter. The sale and export of NTFPs are not free but subject to the government sanction of the products on a case-by-case basis, and preparation of a management plan.

5.6 Department of Forest Correspondences on NTFP

The ‘correspondence’ here refers to the exchange of communication by letters between the DoF and the people seeking permission for harvesting and trading of NTFP, for the two calendar years of 2002 and 2003. In the two-year period, there were 60 applicants who sought the permission of the Department of Forests. People applied for some 40 plant species or products. They ranged from medicinal plants used in traditional medicine and incense production to harvesting of cones and leaves, and from resin tapping to collection of tree barks left in the logged over forests.

An application took 25 days on average to be acted upon by the DoF. Some applications were processed within a day, while others took as long as 128 days. The procedure involved the applicant writing to the field Range Officer or Divisional Forest Officer, and the application then moving up the command structure, normally to the Minister for the final decision. Sometimes, an applicant approached the Forest Director or Minister directly, and the application was then generally passed down the command structure for views and comments.

People commonly cited as their reasons to engage in the NTFP trade the fact that they had a large family, were unemployed and disabled or had debt and financial problems. They also said that through their own efforts they had identified the markets for the products. However, the applicants were generally traders from other areas. Some of the important decisions taken were:

Pipla (*Piper pedicellatum*)

In 2003, the DoF seized from a person 7840 kgs of pipla for moving the forest produce without a transit permit, and with the intention to sell outside the country. The person said that this was a collection of many years, and of substantial investment. He also said that he possessed a valid trade licence, and he pleaded for consideration of the rule, which was not accepted.

Pine needles and cones

A number of people applied for permission to export pine needles and cones, but the permission was not granted. The reason cited was that the collection of pine needles and cones would have a negative impact on the environment, and there was no provision for the export of such products under the prevailing rules.

Resin tapping

The DoF stopped the resin tapping in six villages in Trongsa Dzongkhag, and one village in Zhemgang Dzongkhag as the areas fell within the newly established Thrumsingla National Park. The two Dzongdas (District Administrators) and people petitioned the Ministry of Agriculture to lift the restriction as the people were poor and resin tapping was an important source of income. The petition was turned down citing the negative environmental impact of resin tapping.

Star anise (*Illicium anisatum*)

The star shaped spiny fruit is used as a spice in South-East Asian cooking, and is reported to have carminative, stimulant and diuretic properties. In Bhutan it is found growing wild, and has no traditional use. Many Bhutanese people are currently applying for permission to export it. The permission is granted only for collection of fallen fruits so that there is no damage to the trees. There is little or no information as where its market is but most likely India.

New uses and new products are being discovered or identified. The forest bureaucracy is not able to seize the opportunity offered by private entrepreneurs wanting to link the products to market. Forest decision-making is centralised and environment centred.

5.7 Discussion and Conclusions

The chapter chronicles the institutionalisation of state forestry culture in Bhutan. In the National Assembly proceedings, the classic forestry territorial claim and strict regulation of the rural people's access to forest resources come out clearly. The traditional uses of forests are restricted, and there is scant regard to people's complaints and grievances. Rural welfare is seen to conflict with forestry development; instead the forest bureaucracy is interested in seeking rent from the rural people through the system of payment of royalty and permit fees. The forest bureaucracy, with the power of the state behind it, continues to flout the provisions of the Land Act of 1979. It sees itself as the 'protector' of forests and environment. The rural people on the other hand feel their traditional rights curtailed and life made difficult, but people, in a every day form of resistance (Scott 1985) are not letting forest issues go away from the national debate, and they are never tired of raising them time and again in the National Assembly, and they are increasingly questioning the government.

It is clear from the forest legislation and Five Year Plan documents that while DoF is primarily interested in timber, it also holds absolute ownership to NTFP resource. The rural people are not free to use economically important NTFPs for they are either restricted from extraction e.g. vegetable dye, '*mipchi*' (resinous torchwood) or regulated through a permit system, and to whom they can sell e.g. pipla and chirata. The export of NTFPs can take place only under express approval of the government. The NTFP rules are also not uniform as some communities are permitted extraction of NTFP while others are not e.g. incense collection for Laya, Lingshi and Lunana. The movement of forest products are strictly regulated and enforced through forest checkpoints set up on the motorable roads. The forest decision-making is centralised, and suffer from rationalisation as a permit application for NTFP extraction is dealt on a case-by-case basis. Oftentimes the

environmental concern is over-emphasised e.g. granting of permit for collection of only fallen fruits for star anise; refusal of permit for collection of pine needles and cones, and banning of resin tapping in remote villages in Trongsa and Zhemgang. It is only in the current Ninth Five Year Plan, NTFP receives some significant attention of the DoF.

Chapter 6: Case Study One

Cordyceps sinensis: A High Value High Altitude Medicinal Plant

Cordyceps sinensis (Berk.) Sacc. is an important medicinal plant in the Chinese Traditional Medicine system. The farm gate price for a kilogram of the dry plant in the collection areas can range from US \$ 950 to 2500 (Sharma 2004; Boesi 2003). The wholesale price is said to be in excess of US \$ 3000 per kilogram (http://alohamedicinals.com/press_release.html). It is about a decade now since this extraordinarily high priced product from the wild has become a key trade item in the high alpine regions of the Himalayas, and China.

Pic. 6.1 *Cordyceps sinensis*

Cordyceps is a mushroom growing from the head of a dead caterpillar, thus it manifests an extraordinary physical form (Pic. 6.1). The local people believe that it takes the form of a ‘plant’ during summer, and an ‘animal’ during winter. The Bhutanese and Tibetans call it ‘*Yartsa Guenboob*’⁹, and the Chinese call it ‘*dong chong xia cao*’, both terms meaning ‘summer grass winter worm’. The Nepalese call it ‘*kira ganz*’- the insect grass (ANSAB 2003), and Indians ‘*keera jhar*’ – insect herb (Sharma 2004).



Cordyceps was a totally protected species in Bhutan at the time of undertaking fieldwork for this research study in 2003, and its collection by the local people was thus illegal. This had resulted in government-people conflict, large influx of foreign poachers from across the border, and huge lost revenue. The Royal Government of Bhutan lifted

⁹ In Nepali literature, it is commonly known as *Yartsa gumba*. The *gumba* is perhaps a corrupt use of Bhutanese/Tibetan word of *guenboob*, meaning winter insect.

the total protection status of Cordyceps in 2004 following a series of field research reports (Jones 2002; Namgyel 2003; Namgyel and Tshitila 2003). But the government continues to remain highly concerned about issues of sustainability, and the probable extinction of *Cordyceps* due to its intense commercialization (Namgyel 2004). This case study discusses the social and economic implications a high value NTFP, relevance of policy restriction, and also assesses the justification for environmental concern.

6.1 History of Use and Commercialisation

It is said that in Tibet thousands of years ago, the pastoralists observed that the yaks that grazed on *Cordyceps* rangelands showed increased strength and renewed energy (<http://216.55.141.125/Cordyceps.htm>). And in China, *Cordyceps* was known for a number of far reaching medicinal effects. However, due to its growing in high remote mountain tops, being difficult to spot and, perhaps not being widely known amongst the rural people, *Cordyceps* was considered rare, thus available or known only to the emperors and their courts in the past (Holliday and Cleaver 2004). Perennin Jean du Halde in his historical account of China in 1736 gave the following accounts of *Cordyceps* (cited in Pegler et al. 1994:3):

“You must take five drams of this root entire to the very end, stuff the belly of a tame duck with it, and boil it over a gentle fire; when it is boiled take the duck out again, the virtue of which will have entered entirely into the flesh of the duck; eat of this morning and night for eight or ten days together. I accordingly made the experiment when I immediately found my appetite return, and my strength restored; the Emperor’s physicians gave me the same account but told me that they only prescribed at Court because of the difficulty they had to procure it.”

With growing affluence in China in the last 50 years, and the development of the market economy, items once beyond reach have become available to the masses, including the wider use of *Cordyceps* in China as a health tonic. However it has been only in recent years that *Cordyceps* has attracted scientific interest and has gained

international prominence (Pegler et al. 1994; Zhu et al. 1998; Jones 2002; Holliday and Cleaver 2004). This started with the World Outdoor Track and Field Championships in Stuttgart, Germany, and the National Games, Beijing in 1993. In the two sporting events, the long distance Chinese runners not only took the gold medals but also broke nine world records. People suspected the Chinese runners of taking a performance-enhancing drug but this suspicion was unfounded. The Chinese trainer instead boasted of his runners taking *Cordyceps*, and the popular press heralded it as a ‘wonder herb’ (Anon n.d.; Pegler et al. 1994; Zhu et al. 1998; Jones et al. 2002; Holliday and Cleaver 2004).

The high profile reinforcement of *Cordyceps*’ ancient medicinal potency in the international athletic meets created overnight international markets demand. This also dovetailed with the global trend as more and more people turned to ‘alternative medicines’ or ‘traditional medicines’. The demand has been further increased by a wide range of amazing research results which show *Cordyceps* to be reputedly an all round medicine for treating circulatory, respiratory, immune and sexual dysfunction and for improving energy, stamina, appetite, endurance and sleeping problems (Zhu et al. 1998; Holliday et al. 2004). It is also reported to lower total cholesterol level, to arrest tumor size in cancer patients, and to be an effective agent for anti-aging (Northwest Botanicals, Inc. n.d.). A search in the Internet is dominated by information on clinical research rather than on the ecology and economics of *Cordyceps*.

Cordyceps is a highly priced product from the wild. Boesi (2003) notes that in 2000 in Li thang County, Sichuan Province, China, the collectors received a price of over 8000 to 10,000 Reminbi for a kilogram of dry *Cordyceps* (US \$ 976 to 1220¹⁰). Sharma (2004) reports a price range Indian Rs. 80,000 to 90,000 per kilogram (\$1860 – 2093¹¹) in Nepal; and Rs. 125,000 to 130,000 per kilogram (\$ 2907 – 3023) in India. In the first legal sale in Bhutan in 2004, the farm gate price ranged from Nu. 37,000 to 87,000 per kilogram (US \$ 860 – 2023¹²). The higher prices reported from Nepal, India and Bhutan compared to the price in Tibet, the *Cordyceps* heartland, could be due to the reporting

¹⁰ US \$ = 8.2 Reminbi

¹¹ US \$ = Indian Rs. 43

¹² US \$ = Bhutanese Nu. 43

years i.e. 2000 vs 2003/2004, indicating a steep rise in price over the last few years. The price of *Cordyceps* is also much influenced by cropping year (good or bad crop year), moisture content (fresh or dry), quality and season, but its lowest price still remaining highly attractive compared to other products. This high price has made it an important trade item and the source of main cash income for pastoral communities in high altitude areas.

In Tibet, the picking season runs from the beginning of April to the end of July. The pickers are mostly Tibetans, and they sell their produce either directly to the small local traders or to the big traders, mostly Chinese. The big traders, after bulking the produce bought from small traders and the pickers, sell to the still bigger traders coming from lowland China. The lowland Chinese traders are the wholesale dealers who supply the retailers and processors all over China, and also arrange for export outside China (Boesi 2003). In the study area, the picking season starts from mid May to July end.

There are no international trade figures for *Cordyceps* available. Jones (2002) estimates an annual trade volume of around 5000 kgs. China and Chinese people living overseas have traditionally been the main market for it. Lately, non-Chinese demand from Japan and the west has also been growing rapidly (Jones 2002; Boesi 2003). However, due to its rarity and high price, there have been attempts at artificial cultivation since the 1970s, and by the mid 1980s, artificially cultured *Cordyceps* have found their way in the world's market place (Holliday and Cleaver 2004). Much of the western demand for *Cordyceps* is met from cultivation, and western herbal companies are currently engaged in aggressive marketing as indicated by one press release below in 2003 (http://alohamedicinals.com/press_release.html):

“Analysis of wild collected Cordyceps and cultivated Cordyceps reveals startling news! For the first time ever, Cordyceps has been cultivated in the laboratory which not only matches the chemical analysis of wild Cordyceps, but actually exceeds the potency by a factor of 5!”

Artificial cultivation or substitution of natural products by industrial products can be either positive or negative. From the point of conservation, it is said to be positive because the industrial substitution reduces the demand for the natural products, thus putting reduced collection pressure on the resource base. However, from the point of rural development, it is a disaster because industrial substitution deprives the local people of their main source of cash income. The classic examples of other such products include natural ‘chicle’ and ‘rubber’ in South America, where the cheap synthetic substitution for ‘chicle’, and large-scale rubber plantations in South-East Asia killed the demand for the two natural products, and the source of livelihood for the local communities (Laird and Guillen 2002).

6.2 Taxonomy, Ecology and Distribution

The first written record of *Cordyceps* is traced to China in AD 620 at the time of the Tang Dynasty (AD 618 to AD 907). It spoke of a magical creature that transformed itself from animal to plant in summer, and then again from plant to animal in winter. The Tibetan records from fifteenth to eighteenth centuries also mention *Cordyceps*' mysterious healing power. However, the earliest objective and scientifically reliable depiction of the *Cordyceps* was written by Wu-Yiluo in 1757 in Ben Cao Congxin (“New Compilation of Materia Medica”) during the Qing Dynasty (Holliday and Cleaver 2004). The first time *Cordyceps* came to be mentioned in the western scientific literature was in 1736 by the French Jesuit priest, Perennin Jean du Halde, who was a guest at the Emperor’s court in China. Perennin’s illustration of the never-before seen association between mushroom and an insect sparked interest in the west, but it was not until 1842 when the first *Cordyceps* specimens arrived in England. Dr. M.J. Berkeley in 1843, formally described it as *Sphaeria sinensis* n.s. Later in 1878, Pier Andrea Saccardo transferred it to the genus *Cordyceps* (Fr.) Link, as *Cordyceps sinensis* (Pegler et al. 1994; Holliday and Cleaver 2004).

Globally there are 300 to 680 species of *Cordyceps*, but the number is subject to rapid change as taxonomic classification is not clear or complete (Jones 2002; Holliday

and Cleaver 2004). Zang and Kinjo (1998) report 33 species of *Cordyceps* from the alpine areas of China and Nepal, of which, *C. nepalensis*, *C. kangdingensis* and *C. multiaxialis* are described as new species. *Cordyceps* are found in all six continents, many climatic zones and habitats, and feeding off a range of hosts which include plants, insects, arachnids, and even other fungi (e.g. truffle). Recent research show that medicinal benefits of *Cordyceps* are not relegated to one species, but include many species such as *Cordyceps militaris*, *C. sobolifera*, *C. subsessilis*, and *C. ophioglossoides* (Holliday and Cleaver 2004). The three new Himalayan species described by Zang and Kinjo (1998) are perhaps passing off as *Cordyceps sinensis*.

Cordyceps belongs to the entomogenous fungi, the group that attacks the egg, larval or adult stages of insects (Cooke 1977). The *Cordyceps* spores are dispersed by wind and water in autumn. Some of the spores fall, germinate and penetrate into the caterpillar larva of *Hepialus* spp. of the Lepidoptera order of insects (moths and butterflies). The infected caterpillars are killed by spring, and the larvae and the fruiting body of the fungus are placed vertically in the soil with the upper part of the fungus sticking out from the ground. The uninfected caterpillars pupate into relatively large primitive moths and take two years to complete their life cycle. The fungus can remain dormant inside the insect for long periods, particularly when conditions are dry. The caterpillars live in vertical tunnels in the soil and emerge at night to feed on roots and aerial parts of plants such as *Polygonum*, *Astragalus*, *Salix*, *Arenaria* and *Rhododendron*. The fluctuations in *Cordyceps* populations are related to weather conditions (Cooke 1977; Pegler et al. 1994; Luk 1998; Zhu et al. 1998; Jones 2002; Boesi 2003).

According to Boesi (2003), the Tibetan conception of *Cordyceps* is a single species that undergoes a metamorphosis on passing from spring to summer. People recognise two distinct phases in the transformation process. The first phase is the fungus protruding from the head of the worm. The worm at this stage is whitish in colour and still alive, and can be seen moving over the ground with a short horn (*rwa*). The second phase is when fungus has grown long and the worm dies. People do not collect *Cordyceps* in the first phase as it is said to have life, and taking life is against the

Buddhist principles. This conception is shared by the Bhutanese yak herders in the study area.

Cordyceps sinensis is found in the cold alpine pasturelands of mountain ranges from 3000 to 5000 metres above sea level, with the common occurrence between 4200 to 4800 m (Jones 2002; Boesi 2003; Sharma 2004). In China it is found growing in the provinces of Tibet, Sichuan, Gansu, Hubei, Zhejiang, Shanxi, Guizhou, Qinghai and Yunnan (Jones 2002; Holliday and Cleaver 2004). However, the high price and high demand for it has led to discovery of new production sites. It is now found growing in the Bhutan, Nepal and India Himalayas (Fig. 6.1). Termed as the ‘Himalayan Viagra’, it has become a valuable natural resource in these countries (RAOnline 2004).

Fig.6.1. *Cordyceps* distribution in Bhutan, Nepal, India and China



6.3 Study Area

Cordyceps, growing over 4000 m is found in the northern part of Bhutan. This northern region, constituting 32.5 % of the country's total land area, represents the Greater Himalayas with many towering snow peaks of over 7000¹³ m asl. The snow-clad peaks and high mountain passes form the natural boundary between Bhutan and the Autonomous Region of Tibet (China). About 60,000 people live in more than 9000 households in these high mountain ranges (MoA/ISNAR 1992, cited in Gyamtsho 1996). They are predominantly semi-nomadic yak herders with yak husbandry as the main economic activity. The yak is a multipurpose high altitude animal producing milk, meat, fibre, draught power and fuel energy. Only a few crops like wheat, barley, turnips and parsnips can be grown in some selected areas. Difficult terrain and lack of motor transportation and communication infrastructure geographically isolate the region. It generally takes several days of journey by foot or on animals to reach it. As local food production is limited or non-existent, food provisions have to be acquired from great distances from lower valleys at high cost, and stocked to last for months (Gyamtsho 1996; Pommaret 1997).

The study area includes the two *geogs* of Soe and Lingshi of Thimphu Dzongkhag, and Laya of Gasa Dzongkhag (Fig. 6.2). Set in beautiful mountain scenery due to high altitude mountain landforms sculpted by weathering rocks, glacial lakes, open landscape, narrow valleys, alpine rangelands, and many specialist plants (e.g. *Cordyceps*, *Fritillaria* etc.) and animals (e.g. snow leopard, takin etc.), the area forms part of Jigme Dorji National Park. The Park with an area of 4,349 km² is the biggest park in the country, and is also the most important trekking area for tourists.

¹³ The main snow peaks are Jumo Lhari (7314 m), Masa Kang (7100 m), Kula Gangri (7600 m) and Gangkar Punsum (7500 m). Bhutanese consider these peaks as abodes of gods, and thus are out of bound for climbing (Gyamtsho 1996).

Fig. 6.2: Study Area (Dark Area)



6.3.1 Land Use

The study area comprises a total land area of 1,544 km². The most dominant land type is snow covered and glaciers at 26%, followed by natural pastures at 21%. The forests at the lower elevations constitute just over 10% of the total land area. The agricultural land is insignificant at 0.05% (Table 6.1).

Table 6.1 Land Use Types

Land Use	Soe Geog		Lingshi Geog		Laya Geog		Sub-Total	
	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
Agricultural Land	7	0	22	0	50	0	79	0.05
Conifer Forest	170	0.96	3,634	9	12,215	12	16,019	10.37
Broadleaved Forest	0	0	274	1	209	0	483	0.3
Scrub Forest	642	3.62	1,459	4	22,177	23	24,278	15.71
Natural Pasture Lands	5,312	29.16	15,122	39	11,557	12	31,991	20.71
Snow/Glaciers	6,459	36.43	4,077	11	29,209	30	39,745	25.73
Rock Outcrops	2,578	14.54	9,311	24	18,127	18	30,016	19.43
Landslips/Eroded Areas	2,504	14.12	4,588	12	3886	4	10,978	7.1
Water Spreads	59	0.33	95	0	752	1	906	0.59
Marshy Areas	0	0	0	0	4	0	4	0.00
Sub-Total	17,731	100	38,582	100	98,136	100	154,499	100

Source: LUPP (1995)

The altitude for the study area ranges between 3000 m asl at the lowest points to over 7000 m at the snow peaks. The tree line, defined as the uppermost altitudinal limit for trees, is about 3700 m asl on the south facing slopes to 4000 m on the shady northern slopes. The permanent snow line ranges between 4700 to 5500 m. The topography is characterised by rugged mountain with snow-clad peaks, steep slopes and narrow gorges. The valley bottoms where human settlements are located are flat but narrow (Gyamtscho 1996).

6.3.2 Climate

No systematic climatic data are available for the study area. However, the study area representing the high alpine region is generally known for its wet rainy summer, icy cold winter, and dry and cool spring and autumn. Mean annual temperatures are estimated at 5.5° C with a maximum of 12° C and a minimum of – 0.9° C. Most areas above 4000 m remain under snow cover except on the sunny aspects. Annual precipitation is estimated to be less than 650 mm occurring as monsoon rainfall between July and September (Gyamtscho 1996). The vegetative growing season, which is mainly limited by low temperatures, is very short lasting from mid-June to mid-September. Soil moisture is generally not limiting since snowfall in winter and rainfall in summer provides adequate supply (ibid).

6.3.3 Vegetation

The vegetation is largely characterized by alpine meadows. Worldwide, about 3% of the earth's surface lies in the alpine zone, defined as the area above the treeline where low temperatures limit the growth of trees, and give way to scrub and dwarf shrubs, and meadows. Compared with the lowlands, alpine vegetation and wildlife have been less modified by human activities (Nagy et al. 2003). The alpine meadows in the study area extend upwards from the tree line roughly at 3700 to 4000 m asl to the permanent snowline at 4700 to 5500 m asl. The species diversity is exceptionally rich due to rich mosaic of habitat conditions resulting from the interplay of microclimate, parent rock and

hydrology. The vegetation type in the study area can be broadly divided into Alpine Scrub, Alpine Meadows and Alpine Scree. The Alpine Scrub (3700 – 4200 m) is characterized by scattered bushes of various species, e.g. *Ephedra gerardiana*, *Juniperus pseudosabina*, *Lonicera myrtillus*, *Rosa serica*, *Rhododendron lepidotum*, *Cotoneaster microphylla*, *Rumex nepalensis*, *Salix* spp., *Myricaria* spp., and *Sorbus* spp. The Alpine Meadows (4000 – 5000 m) is characterized by rich herbaceous species, e.g. *Potentilla* spp., *Geranium* spp., *Trachydium* spp., *Primula* spp., and *Juncus* spp. Many of the horticultural plants in Britain and Europe have their origin in the Alpine meadows of Himalayas. Bhutan’s national flower *Meconopsis grandis* (Blue Poppy) is also a resident of the Alpine meadows. The Alpine Scree (4800 – 5500 m) constitutes bases of high mountain peaks and their slopes with loose rocks and gravels. The many plant species here are important medicinal plants e.g. *Fritillaria delavayi* (Tshika), *Saussurea gossipiphora* (Gangla metog), *Gentiana urnula* (Gangachung), and *Picrorhiza kurroa* (Putishing). The Institute of Traditional Medicine Services in Bhutan collects annually over 100 plant species from the study area for use in traditional medicine formulations (JDNP 1997; Namgyel and Tshitila 2003).

6.3.4 Socio-Economic Context

The total population of the study area is about 1300 living in 189 households. The male and female populations constitute 53 % and 47 % respectively. Children below 10 years of age form 28 % of the total population. The population distribution by geog and age is shown in Table 6.2.

Table 6.2. Population Distribution

Age Group	Soe ¹				Lingshi ¹				Laya ²			
	M	F	Total	%	M	F	Total	%	M	F	Total	%
< 10	15	13	28	19	64	55	119	28	119	95	214	30
10 – 25	26	25	51	34	73	74	147	34	120	112	232	32
26 – 50	15	23	38	26	58	53	111	26	96	84	180	25
> 50	19	13	32	21	29	22	51	12	50	47	97	13
Total	75	74	149	100	224	204	428	100	385	338	723	100
%	50	50		100	52	48		100	53	47		100

¹ Source: Fieldwork 2003

² Source: Gyamtsho, P (1996)

The main villages and the corresponding number of households are shown in Table 6.3. The average household size for Soe, Lingshi and Laya are 5.96, 6.34 and 7.4 respectively. Not all members of the household reside full time in the village. The non-resident household members include members working outside the village in the army, on waged labour, in business, and studying in monasteries and school. The household size with resident members only thus constitutes 4.68 and 5.31 for Soe and Lingshi respectively (Table 6.4). Johari (1994) using official records estimates the household size of 7.5 and 7.7 persons for Soe and Lingshi respectively. The official figures do not capture fast enough the splinter household i.e. household members who set out to establish new homes. They also do not distinguish between resident and non-resident household members.

Table 6.3. Villages and Household Numbers

Soe ¹		Lingshi ¹		Laya ²	
Village	HH (No.)	Village	HH (No.)	Village	HH (No.)
Jomphu	4	Zangmithang	6	Pashi	22
Dozoten	4	Guephu	1	Toko	16
Tikithang	4	Chaphu	3	Lubja	12
Dotabithang	5	Mesayul	7	Naylo	15
Dangojang	4	Gangyul	28	Chongra	12
Jangothang	4	Chebisa	22	Lungo	20
Total	25		67		97

¹ Source: Fieldwork 2003 (HH: Household)

² Source Gyamtsho, P (1996)

Table 6.4. Household Size

Residency	Soe (25 HH) ¹		Lingshi (67 HH) ¹	
	Population	HH Size	Population	HH Size
Resident	117	4.68	356	5.31
Non Resident	32	1.28	72	1.07
Total	149	5.96	428	6.34

¹ Source: Fieldwork 2003 (HH: Household)

The primary economic activity is yak husbandry. The milk and meat products of a yak fetch premium prices in the market compared to cattle products. This is because yak milk has a high butter fat content and is best for making the traditional butter tea. The meat is considered a great delicacy. There is thus a great demand for yak butter and meat in the domestic market and availability is only seasonal (Gyamtsho 1996). Other

activities which sustain livelihoods in these hard conditions include: portering services; medicinal plants and incense plants collection; and small-scale crop production of barley and wheat. The informal cross border trade with Tibet also forms an important source of income.

Using the CSO (2001) category of household income, an approximate annual income was determined for three households in Soe and five households in Lingshi (Table 6.5). This was a difficult and tricky field exercise given the fact that the economy is largely subsistence and informal. However, the figures provide a rough estimate of household income, and are useful for comparison with other study populations, or to compare with figures from other similar studies.

Table 6.5. Household Income

HH	HH Size (No.)	Crop (Nu.)	Livestock (Nu.)	Forest (Nu.)	Wage (Nu.)	Non-Agri (Nu.)	Remittance (Nu.)	Total (Nu.)
Soe1	3	0	45,000	0	0	90,000	0	135,000
Soe2	11	0	15,000	1,200	0	20,000	0	36,200
Soe3	4	0	0	0	0	0	36,000	36,000
Ling1	3	300	1,800	5,500	800	3,600	0	12,000
Ling2	8	0	65,000	0	0	80,000	0	145,000
Ling3	7	0	43,200	12,000	0	10,000	0	65,200
Ling4	8	500	91,000	26,000	0	24,200	0	141,700
Ling5	9	0	24,000	5,750	12,000	10,000	0	51,750
Sub-Total		800	285,000	50,450	12,800	237,800	36,000	622,850
Mean		100	35,625	6,306	1600	29,725	4,500	77,856
Mean (%)		0.13	46	8	2	38	6	100

Source: Fieldwork 2003

The annual mean income from livestock was the highest at 46% of the total income. The next major economic activity was the non-agricultural enterprise, which in this case was the portering service (38%). The study area is a popular tourist location, and with no motorable road network, the people and goods transport on horses and yaks are becoming important sources of cash income for the local people. Income from the wild plant-based products was below 10 % of the total income.

Johari (1994) notes an annual mean household income of Nu. 48,169 and Nu. 33,666 for Soe and Lingshi respectively. Gyamtsho (1996) estimates for Laya Nu.

32,177, with livestock accounting 49%; business 18%; and portage 14% of the total income. Johari (1994), Gyamtsho (1996) and my own figure show much higher annual household income for the study area compared to the national mean of Nu. 11,136 for the rural area, as estimated from a countrywide Household Income and Expenditure Survey in 2000 (CSO 2001). The estimates above conform to the common perception that people living in alpine regions are generally richer in cash and more secure in food provision than people in lower valleys. However, the alpine people live a very vulnerable life in the cold harsh climate of the high mountains where they can be cut off for 3 to 6 months in winter. One young herder woman said that she lost 35 yaks to the long cold winter two years ago, and she was devastated by the large loss of her animals. It is crucial as a survival strategy, to find ways and means to barter or earn enough to buy and stock food provisions to last the whole year round.

The study area can be accessed only on foot, by horses or yaks, taking on average three days or more of hard trekking from the road. It is a full day travel from Soe to Lingshi, and three days from Lingshi to Laya. The inter-community travel is also envisaged in terms of days and weeks. There is only a very limited infrastructure, with one community school and health unit each at Lingshi and Laya. Recently, a two-line telephone communication has been installed at Lingshi.

6.4 National Policy and Regulation

The common perception of *Cordyceps* in Bhutan is that it is a rare and endangered species (Kuensel 2003). Listed in Schedule I of the Forest and Nature Conservation Act 1995, it was a totally protected species as of 2004. Its picking amounted to a fine of Nu. 5 apiece or Nu. 22,000 (US \$ 512) a kilogram.

Boesi (2003) reports that while Tibetans revere *Cordyceps* as a ‘marvellous thing’, the local use of it is however not widespread amongst the people and the local Tibetan doctors. The same story was found in the study area, as indicated by people’s responses below.

“When we were children, our parents used to say that Cordyceps was a good medicine for treating joint pains and ‘drangwa’¹⁴”.

Ms. Karma Choden, Soe Geog (age > 40), a medicinal plants grower

“We did not know any use of Cordyceps. When the Indigenous Hospital in Thimphu started to collect it a few years ago, only then did we know that it is used in the traditional medicine.”

Mr. Gyep, Soe Geog (age > 60), a former Gup (headman)

“We only came to know about the Cordyceps when Tibetans from across the border started coming into our areas around the year 1995 and 1996.”

Mr. Sonam Wangdi, Soe Geog (age 29), porter and horseman

“We knew about Cordyceps from childhood that it is a medicinal plant, good for treating stomachache and ‘drangwa’. We used to dry it, and eat it fried.”

Mr. Gay Gay, Lingshi Gangyul (age > 60), 30 years of experience in medicinal plants collection for the Institute of Traditional Medicine Services, Thimphu, Bhutan.

“Yes, we know that Cordyceps is a medicinal plant but it does not seem to cure anything, not even the stomachache.”

Mr. Tandin, Lingshi (age >60), a yak herder at his summer grazing camp, Chewla (4440 m)

The Schedule I of the 1995 Forest Act list a total of 7 plant species, out of which four are from the alpine region. There is no information available with the DoF with regard to scientific evaluation of the protected species. It appears that the listing has been largely driven by perception of high value of the species and their rarity in geographic distribution. Miehe and Miehe (2002) note that it is a common habit in Bhutan to compile lists of endangered and rare plants in appendices of management plans and policy papers, which are not borne by evidence in the field. With *Cordyceps* fetching an extraordinarily high price, the government’s protection policy had alienated local people, caused park-

¹⁴ Bhutanese refer drangwa generically to mean piles, tuberculosis etc.

people conflict, attracted large number of foreign poachers from across the border, and resulted in loss of revenue to the local people in particular, and country in general.

6.4.1 Problem of Foreign Poachers and Lost Revenue

Tibetans from across the border started coming into the Bhutanese territory for *Cordyceps* picking sometime in 1995. Ever since, the number of Tibetans has been rising steeply. Table 6.6 shows the Park figures for Tibetan poachers apprehended in the last three years for the study area.

Table 6.6. Number of Tibetan Poachers Apprehended

Region	No. of Tibetans Apprehended		
	2001	2002	2003
Soe	64	21	311
Lingshi	138	179	94
Laya	16	36	86
Total (No.)	218	236	491

Source: JDNP 2003.

However, the Park figures are gross underestimates as the great majority of them go undetected, given the vast expanse of the alpine wilderness and acutely limited law enforcement resources. Only seven to nine Park personnel were available to patrol a rugged mountain area in size ranging from 177 to 981 km². The Park personnel admitted that when they covered an area, the other areas went unguarded. The resources were severely limited with one antiquated 303 rifle, and a pistol for the group. There was no helicopter nor horse service for patrolling, just the hard trekking over the mountains and valleys. For fear of attack by poachers and lack of firearms, they always patrol in a group.

Local people reported of 10 to 40 Tibetans on a daily or weekly basis during the season (Pic.7.2 & Pic.7.3). Oftentimes one saw 200 to 300 of them at just one collection site only. According to Mr. Dorji Drakpa, a village elder in Lingshi:

“Last year, there were more Tibetans than ever before. I would guess not less than 1000 of them in Lingshi area only. This number would still be conservative, as we may not be seeing all of them”.

Tibetan poaching of *Cordyceps* is reported right across the 500 km border between Bhutan and Tibet (China). On the assumption that 400 Tibetans visited Bhutan daily for 60 days, Namgyel and Tshitila (2003) estimated a total figure of 24,000 Tibetans in Bhutan during the two months of *Cordyceps* season from mid May to mid July. Assuming again that one Tibetan picker picked a total of 250 gms of dry *Cordyceps* for the two-month period, and a price of US \$ 2000/kg, the revenue loss to the country was estimated at US \$ 12 million. Jones (2002) also worked out a similar estimate of about 2000 kgs of *Cordyceps* supply from Bhutan and a revenue loss of US \$ 4 million. He based his estimate on extrapolation of the products amount seized by the authority, and the assumption that a Tibetan picker would not tolerate more than a 20% ‘loss’ to the authority. *Cordyceps* seized from Tibetans per operation ranged from nil to as much as 53 kg fresh weight.

Local people expressed helplessness and sadness at the large number of foreigners appropriating valuable natural product right from their grazing grounds.

“We feel sad to watch the foreigners appropriate our ‘norbu’ (precious jewels) right from our sight.”

Mr. Sonam Wangdi, Soe Geog (age 29), porter and horseman

“If the government reviewed the current policy ban, it would mean a great blessing to the poor people like us. We can then extend cooperation to the government in stopping the foreign poachers, and the sustainable management of the Cordyceps resource. Here in Lingshi, we already have the experience of sustainable management of the medicinal plants used by our traditional medicine system. It is sad at the moment that local people derive no economic benefits from the highly valued Cordyceps. When we see

the Tibetans pick Cordyceps from our grazing grounds, we indeed feel very sad and helpless.”

Group Interview, Lingshi Geog (3 men + 2 women)

The large number of Tibetans in an otherwise thinly populated and scattered settlements had also become a matter of concern and problem for the local people. For instance,

“Tibetans use our summer firewood and tent poles to cook their meals and keep themselves warm at night. When we go to set up our summer camps, we find ourselves without tent poles and wood.”

Group Interview, Lingshi Geog (3 men + 2 women)

“I worry a lot. The foreign poachers are in large numbers. We are few and live far apart from each other in our summer grazing camps. The foreign poachers over the years have become bolder in their attitudes. They burn our summer firewood and tent poles, and damage our camping stones. We therefore experience great difficulties in establishing our summer camps.”

Mr. Dorji Drakpa (age > 40), Lingshi Gangyul, Mangi Aap (village official)

“We feel intimidated by the large number of Tibetans in our summer camps. They walk over to our camps and ask to prepare tea. We have no choice but to oblige to their request... I don't know how much price the Cordyceps gets across the border but I find it hard to understand this madness.”

Mr. Tandin, Lingshi (age >60), a yak herder at his summer grazing camp, Cheuwla (4440 m)

Pic.6.2 Foraging for *Cordyceps*



Pic. 6.3 Tibetans apprehended by Park authority



6.4.2 Park-People Conflict

The Park statistics also show an increase in the number of local people apprehended for the illegal collection of *Cordyceps* (Table 6.7). It increased from five in 2001 to 55 in 2003.

Table 6.7 Number of Locals Apprehended

Region	No. of Local People Apprehended		
	2001	2002	2003
Soe	0	6	0
Lingshi	5	10	3
Laya	0	10	52
Total (No.)	5	26	55

Source: JDNP 2003.

The Park personnel in the field were highly motivated in their work, and were also genuinely concerned about the possibility of the *Cordyceps* population declining, which they think would be a sad national loss. But, working in such a difficult and isolated environment, some of them imposed their law enforcement power over the local people. The fining system was largely discretionary and dependent on the individual staff officer, and sometimes they physically abused people for information. For example,

“My two brothers and I had gone to another village to collect yaks from a person. We came across Tibetans picking Cordyceps on the way, so we joined them. The forestry personnel beat us for information. They fined three of us Nu.30,000 each. We had to sell 4 yaks and a horse to pay the fine.”

Man (35), offender

“I had only picked 5 or 6 pieces of Cordyceps when I learnt about the approaching forestry people. I threw them away, and ran for my life. Later they summoned me to their place, and I was fined Nu. 5000. They said that the very act of looking at Cordyceps amounted to a fine of Nu. 5000, thereafter it was Nu.5 per piece.”

Man (30), an offender (from notes, not audio transcripts)

“Here, we have a good set of forestry personnel. They are educated and well behaved. But, we have forestry people in other areas that are different. It seems that in the same country, there are two sets of rules. Here our people have not been fined more than Nu.4000, but in our neighbouring areas we have heard that forestry personnel fine people excessively.”

Laya Gup (age>45)

The high price of *Cordyceps* made local people's life difficult. No matter how law abiding or law fearing they maybe, many of them found hard to refrain from breaking the law or taking a chance with the law. According to Mr. Gyep, Soe Geog:

“People are not scared of the law. They want to gamble with the law. If they get away with the collection of Cordyceps, they make big money. If not, it is their misfortune to pay the heavy fines instead. It is interesting how some become rich, and others poor.”

The local people also lived in constant fear of being stopped and approached by Park personnel or being unnecessarily harassed on ground of suspicion.

“We have to live in constant fear and anxiety of being stopped and approached by the forestry people.”

Mr. Sonam Wangdi, Soe Geog (age 29), porter and horseman

“The forestry people are very suspicious of us. Forget meeting them in the high rangelands and passes, even here in the village when they see us in shops or in groups, they ask us a lot of questions, and check our bags. The army personnel also ask us questions and check our bags and loads.”

Ms. Wangmo, Laya (age 20)

“There isn’t a serious conflict at the moment between local people and forestry personnel, but it could develop into one when a greater number of people engage in Cordyceps collection.”

Mr. Dorji Drakpa, Lingshi Gangyul (age > 45), Mangi Aap (Village Elder)

“When the forestry people come on patrol, they harass us, saying that we provide and extend support to the Tibetans.”

Mr. Gomchen Tshering, Lingshi Gangyul (age 35)

The Park people conceded that there was growing animosity amongst the local people towards them. The people, they said, were sweet and smiling on the surface, but angry and bitter at heart. According to Mr. Gyom Dorji, Dy. Park Warden, Soe Ward:

“We never venture out alone. If we have to go alone, we must take firearms with us.”

6.5 Value Chain for Cordyceps

The ‘value chain’ constitutes all of the functions that occur from raw material producer to the final consumer of a finished product (Blowfield 2001). Belcher (1998) refers to the same process as ‘production to consumption system’ (PCS). The various functions include production, collection, processing, storage, transport, marketing and sale. The

relative importance of each of this function differs from product to product, and they may not occur sequentially and some may even be repeated or omitted for particular products. Some chains, particularly for locally traded products, can be short and simple. The products for export can be longer and more complex (Marshall et al. 2003 in Belcher and Schreckenberg 2003).

6.5.1 Production

Cordyceps grow on a wide range of habitats that include mountain slopes with dwarf rhododendron scrubs, and grasslands at both top and valley bottoms. They commonly occur in the study area between 4400 to 4800 m. The lowest altitude recorded was 4100 m behind the Lingshi Dzong. When harvested from amongst the dwarf rhododendron meadows known in Bhutan as *Balu-salu* area, it can be easily removed from the soil and vegetative carpet by hand. The *Cordyceps* plant sticks out as a dark brown club amongst the grass blades and other plant materials. Pickers crawl on their knees to scan the ground for *Cordyceps*, and it takes a trained eye to spot it¹⁵ (Pic. 7.2). We noticed minimum or no soil disturbance from the harvesting operation. However, a simple tool becomes necessary to scoop out carefully the *Cordyceps* growing in the grass meadows in valley bottoms. Here small holes on the ground are created. As a single piece is valuable, soil and debris surrounding it are removed carefully. It is then placed in a secure container where it will not be damaged or broken from the body motion. A soil-mixed mucous lining covers the insect part of *Cordyceps*. Once at home, the mucous lining with soil is removed very carefully with fingernails or old tooth brushes, yielding a golden yellow colour product. It is then dried in the sun.

Cordyceps is sold at any intermediate stage between fresh and dry, and price differences can be huge. There is very little processing requirement. The purchase test for dryness constitutes the product snapping in the middle when bent from the two ends.

¹⁵ My team members and I visited over 10 *Cordyceps* sites. In all of them, I on my own did not locate a single piece of it. I had to be either guided by local guides to spot it or watch them pick it. In one instance, we encountered a group of 11 Tibetan women and they provided us the opportunity for a live demonstration of *Cordyceps* picking operation (see Picture 4.1).

Boesi (2003) reports that in Tibet price is agreed upon with a lot of bargaining each time. The whole ‘plant’ i.e. both the caterpillar and fungus intact is valued more than the parts. The other quality assessments include the texture, and length and thickness of the caterpillar.

In Lingshi, my research team and I had access to 1.7 kg of *Cordyceps* which the Park people had seized a day earlier from a group of 10 Tibetan poachers. Using a weighing scale and the drying facility at the ITMS Drying Unit¹⁶, we undertook to determine the number of *Cordyceps* pieces both fresh and dry weight in a kilogram (Table 6.8). The difference is huge, thus the price difference between fresh and dry products. The ratio of cleaned and dried to unclean is 1:6, and to cleaned and fresh is 1:4. The soil and mucous layer covering the product constitutes a significant weight. This quite conforms to what people say.

“5 to 6 kgs of fresh weight constitute 1 kg of dried Cordyceps”.

Men’s Group from Lunana

Table 6.8 *Cordyceps* pieces per kilogram

Cordyceps	Category		
	Unclean ¹	Cleaned and Fresh ²	Cleaned and Dried ³
No. of pieces/kg	1,660	2,500	10,000
Ratio	6	4	1

¹Unclean refers to freshly picked pieces with soil

²It refers to the pieces with removed mucous membrane and clean of soil

³It refers to the dried pieces, the test being the dryness test mentioned in the text i.e. product snapping in the middle when bend from the two ends.

However, the ratio should be taken as a rough guide only as *Cordyceps* come in different sizes. Local experts rated our sample specimens as belonging to the smaller size category.

¹⁶ The Institute of Traditional Medicine Services in Thimphu has set up the Drying Unit for drying its medicinal plants collection. It is run on a micro-hydro power station.

6.5.2 Collection

Cordyceps is considered very rare, and its collection is only in small amounts. Boesi (2003) notes that an experienced picker in Tibet can manage to collect only 30 to 40 pieces a day, and sometimes less than 10 a day. In Central Himalayas in India, Sharma (2004) says that in 2002, 900 persons collected about 186 kgs of *Cordyceps* i.e. 206 gm a person. ANSAB (2003) in a video documentary on *Cordyceps* in Western Nepal says that 5 persons can collect in a month a kilogram of *Cordyceps*. In Bhutan, information from the Park officials of the products seized from Tibetan poachers per operation ranged from nil to 53 kgs (fresh). This 53 kg was seized from a Tibetan group of 39 people, and it represented two-three days of collection time. The Tibetan poachers find their collection time limited to a few days per expedition as they have to carry their food provisions. According to Mr. Gomchen Tshering from Lingshi who was caught picking *Cordyceps* in 2002 by the Park officials:

“Three of us got over a kg each in the three days collection. There were plenty of Cordyceps. They were like weeds in a barley field”.

It is obvious that the amount a picker can pick is highly variable across countries and years. It is perhaps influenced by population density, picking intensity, and cropping year. One from Nepal in 2004 shows pickers in thousands; with such a high number many pickers could not expect to pick anything (Pic.6.4). Despite concern over destruction of *Cordyceps* resource base in Nepal, it is likely that many people would not return to pick as they would find the effort not worthwhile; i.e. economic extinction preceding ecological extinction (Olsen 1997b).

Pic. 6.4 *Cordyceps* pickers in Nepal - 2004



Source: Kantipuronline, Nepal

Local people say that the *Cordyceps* cropping year is cyclic and much influenced by weather conditions.

“Cordyceps production is dependent upon weather conditions. Some years one could get only a few pieces after searching all mountains, and other times you could find a lot from a small area only.”

Mr. Gay Gay, Lingshi Gangyul (age > 60), 30 years of experience in medicinal plants collection for the Institute of Traditional Medicine Services, Thimphu, Bhutan.

“It all depends upon one’s luck. Sometimes, we don’t find a single piece for the whole day. Other times, we find a lot.”

Mr. Sonam Wangdi, Soe (29), porter and horseman

“Cordyceps follow a cycle of production. If the season this year is a good crop year, there will be poor crop years for the next three years. Again, after that, there will be the good crop year.”

Group Interview, Lingshi Geog (3 men + 2 women)

“Last year was a good crop year. In some sites, the grounds looked black with Cordyceps. This year, the season is again poor.”

Mr. Dorji Drakpa, Lingshi Gangyul (age > 40), Mangi Aap (village official)

The flood year in Lunana in 1994 was a good crop year. The next good crop year was four years later in 1998. Last year (2002) was also a good crop year. In a good crop year, one could see Cordyceps like weeds in a barley field. In a day, a person could easily collect about a kg of Cordyceps (fresh weight).

Men’s Group from Lunana

6.5.3 Trade and Marketing

There is no formal contact between Bhutan and China, and trade across the border is officially illegal. But the local people in the study area engage in clandestine trade, and there has always been traditional contact between the communities across the border. Bhutanese sell *zaw* (puffed rice) and chilli, and buy from the Tibetans goods such as flasks, clothes, shoes and other consumer items. *Cordyceps* have for the last few years become a ‘hot cake’ sale in Tibet, and the main means of getting cash. According to Sonam Wangdi, porter and horseman,

“As soon as they see us in Phari (Tibet), they wave to us asking for Cordyceps. Everyone there is interested in it.”

Since the *Cordyceps* picking was illegal, most collection by the local people was either opportunistic when herding the animals, or it was an underground operation. People either sold directly to the Tibetan towns across the border when they visited them

for their annual trading trips or to local traders. If the amount of *Cordyceps* was small, people sold by pieces. Each piece fetched a price of 1 to 2 Reminbi (Nu.6-12¹⁷). The larger amounts of *Cordyceps* were sold by weight, fetching a price of 6,000 to 15,000 Reminbi per kilogram (Nu.36,000-90,000; US\$800-2000). According to local people:

“I have taken Cordyceps across the border for the last two years. The amounts were small because I don’t go hunting for it. I just pick when I come across it during the herding, and portering works. For the small quantities I collected, I got each time about 600 Reminbi (US \$ 73), and this amount was more than enough for me to buy whatever household items I needed.”

Mr. Sonam Wangdi, Soe (age 30), porter and horseman

There were many people with lots of money who came to the village. They pay us Nu. 10,000/kg for fresh weight and Nu. 35,000 – 40,000 for the dried weight

Men’s Group from Lunana

Cordyceps have brought economic benefits to the daring individuals and communities. In Laya particularly where people are said to be enterprising, economic prosperity is obvious in the area. There were about 20 new houses built in the last 4 to 5 years. On asking where all the money came from, people coyly said,

Of course, the cash is mainly from the sale of Cordyceps. Otherwise what economic opportunities do we have living in such high altitude valleys and difficult life conditions?

However, the greater number of households in the study area, for fear of prosecution, did not engage in the collection or trade of *Cordyceps*. They felt strongly that the government’s greatest gift to them, the people living in the high altitude areas, would be to permit the legal collection of *Cordyceps*. In 2004, the government made the

¹⁷ 1 Reminbi = Nu. 6 (field information).

collection by local people legal across the country. The official figures on total collection of *Cordyceps* and breakup by region in 2004 is shown in Table 6.10.

Table 6.9 Cordyceps collection for the year 2004

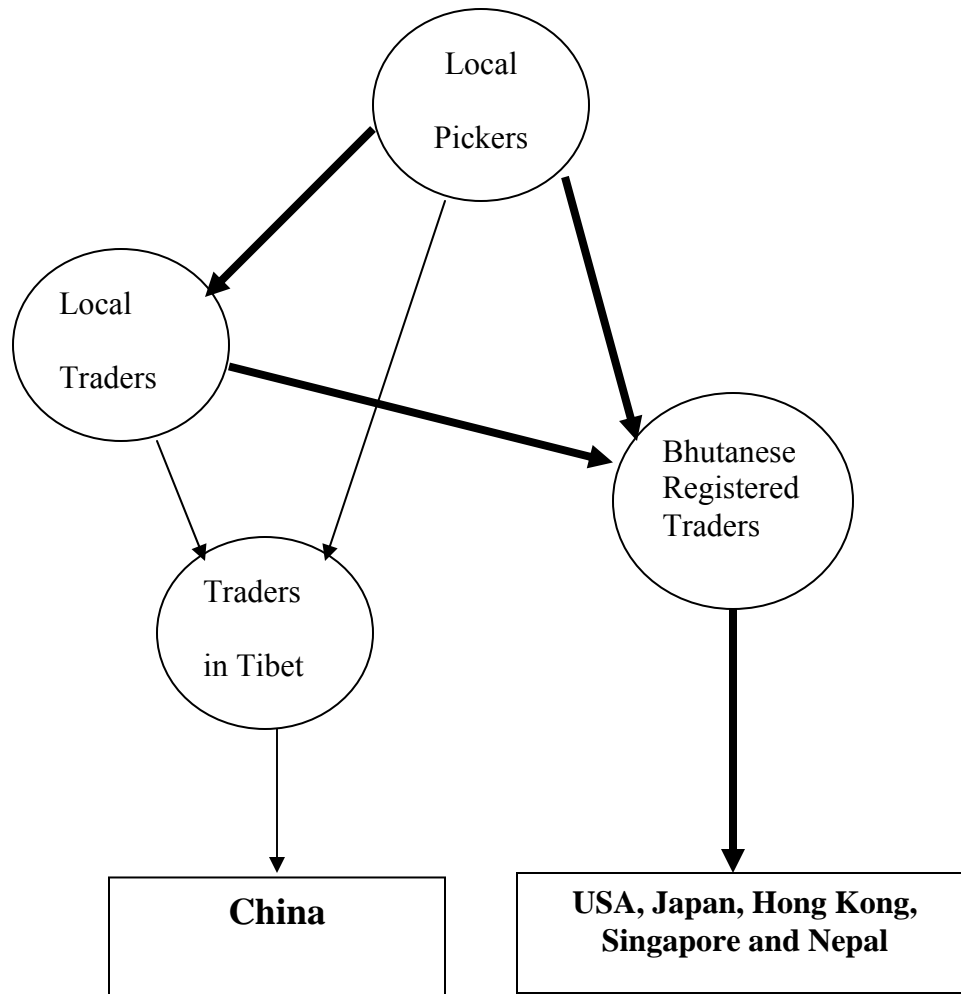
Region	Quantity(kg)	Unit Price (Nu.)	Amount (Nu.)	Royalty (Nu.)
Sephu	39.40	52,500	2,068,500	147,000
Gangtey	20.00	51,000	1,020,000	74,000
Dangchu	96.98	87,100	8,446,958	358,833
Tsento	0.86	44,000	37,840	3,182
Naro	1.52	45,000	68,400	4,500
Lunana	1.70	37,000	62,900	6,290
Soe	0.90	40,000	36,000	3,330
Lingshi	4.02	39,000	156,780	14,874
Laya	10.15	37,000	375,550	37,595
Total	175.53		12,272,928	649,604

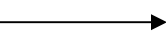
Source: Marketing Division, MoA

The official figure of 176 kgs of *Cordyceps* is significantly lower than the estimates of 2000 kgs by Jones (2003) and 6000 kgs by Namgyel and Tshitila (2003). This can be partly explained: firstly, by the fact that the government order for legal collection came out just before the season, and traders and communities may not have had time to prepare for picking and collection. Secondly, the Tibetan poaching continued unabated. Thirdly, forest rules demanded the pickers to sell only to the government registered traders in an open bidding system which meant people could not sell upfront, but had to wait until such a bidding was arranged. Many communities may have found it convenient to walk across the border to sell the product. Fourthly, forest rules also levied a royalty rate of 10% on the sale price, and the traders paid this amount, thus accounted it in their cost calculation, which meant at the end the collectors received a lower price.

The marketing channel for *Cordyceps* is as illustrated in Fig.6.3.

Fig.6.3 Marketing Channel for *Cordyceps*



Informal Channel 

Formal Channel 

6.6 Rapid Vulnerability Assessment

The RVA is discussed in Chapter 3 and 4. The ranking and score for the eight factors for *Cordyceps* is as follows:

i. Life form: *Cordyceps* is a fungus, thus fast growing, prolific sporulation, short lived, fast reproducing ephemerals.

Rank: No Vulnerability **Score:** 0

ii. Abundance and distribution: *Cordyceps* is found stretching across the whole Himalayan mountain ranges, and interior mountains in China. It is a widely distributed species.

Rank: No Vulnerability **Score:** 0

iii. Parts used: The product constitutes of two components i.e. fungal and insect. While the fungal component used is the whole plant, the insect component constitutes only the infected population. The uninfected insect populations continue to complete the life cycles. It is difficult to assign a ranking and score. However, a middle path approach is adopted.

Rank: Moderate Vulnerability **Score:** 2

iv. Demand: There is currently high market demand for the product.

Rank: High Vulnerability **Score:** 3

v. Traditional conservation practices: Policy ban on collection had created an open access situation.

Rank: High Vulnerability **Score:** 3

vi. Substitutes: Laboratory isolation and development of active compounds of *Cordyceps* available in the market. However, its impact on the demand for wild products not known. Again, a middle path approach ranking is adopted.

Rank: Moderate Vulnerability **Score:** 2

vi. Population density: Low population density has less impact on harvesting than high population density. In the study, population density is 1.2 persons per square kilometre.

Rank: Low Vulnerability **Score:** 2

vii. Technology use: Use of simple technology has less impact than the use of modern large-scale technology. Technology use for *Cordyceps* picking is by hand or simple digging tool.

Rank: Low vulnerability **Score:** 1

Table 6.11 is the summary of the RVA result.

Table 6.10 Rapid Vulnerability Assessment for *Cordyceps*

Factor	Remark	No (0)	Low (1)	Moderate (2)	High (3)
1. Life Form		√			
2. Abundance and Distribution		√			
3. Parts Used	Whole plant			√	
4. Demand					√
5. Traditional Conservation Practices	No traditional management				√
6. Substitutes				√	
7. Population Density			√		
8. Technology use			√		
Sub-Total			2	4	6
Total		12			

The overall vulnerability score for *Cordyceps* in the study area is 12, indicating a moderate vulnerability. If the traditional right of the collectors is recognized and a community-based natural resources management system is put in place, the total score could fall down to 11 or 10. The score indicates that it is not as rare or vulnerable to collection as many believe it to be.

6.7 Discussion and Conclusions

The listing of *Cordyceps* in the totally protected category was undertaken without a scientific evaluation. It was based on the opinion of forest policy makers. The RVA shows that it is not as rare and vulnerable as many believe it to be. The protection policy not only deprived local people of a real source of cash income for about a decade, it also brought them anxiety, trouble and conflict with the forestry personnel. It also encouraged poachers in large numbers from across the border.

The expressed policy concern about the species extinction is not justified. The control of natural resources is related to the power and priorities of government and conservation agencies who now need to move away from their ideological creed of nature preservation and wilderness. The pastoralists have lived in the area for generations, and what wilderness there is today is the proof that they have lived in harmony with the

environment. It is time that there is a political trust of people who use the land and depend on the natural resources for livelihood (Child 2003). The lifting of the total protection status of *Cordyceps* in 2004 is a historic milestone, opening up a brave new world for forest policy and forest bureaucracy in Bhutan.

Chapter 7: Case Study Two

Tricholoma matsutake: The ‘Buddha Mushroom’

Matsutake, a wild mushroom with a strong aroma, is an autumnal delicacy in Japan. Growing amongst pine trees, ‘matsutake’, a Japanese term, literally translates as ‘pine mushroom’. Symbolizing fertility, good fortune and happiness, the Japanese have revered it for than a millennium. A gift of matsutake is considered special and is cherished by those who receive it.

Pic. 7.1 *Tricholoma matsutake*

Matsutake has a phallic shape, and in ancient Japan, women were prohibited from saying ‘matsutake’ openly but instead were required to speak of it honourifically as ‘O-Matsu’ (Hosford et al. 1997). The scientific name for it is *Tricholoma matsutake* (Ito and Imai) Sing. (Pic.7.1). The annual demand for matsutake in Japan is estimated to be over 3000 metric tons



while its domestic production is below 300 metric tons. Artificial propagation or cultivation of it has yet not been successful. The forestlands still remain the primary source of it. To meet the huge demand-supply gap, Japan depends upon imports of matsutake from a number of matsutake growing countries including Bhutan. Japanese import of matsutake is valued over US \$ 100 million per annum (JETRO 2004).

In Bhutan, matsutake is found growing in pine and oak forests. While local people had been consuming the mushroom, it was not traditionally valued or commonly known. Today, with commercial picking for export to Japan, the rural communities where matsutake is found are experiencing rises in income level. Local people call it ‘Sangay Shamu’, the ‘Buddha Mushroom’, due to the good fortune it has brought to the communities.

7.1 History of Use and Commercialisation

Matsutake represents an ancient tradition in Japan. The nobles and priests sent and received matsutake as gifts, a tradition which continues today in the corporate world. In the 17th and 18th centuries, matsutake was beyond the reach of common people (Hosford et al. 1997). The characteristically strong aroma of matsutake is said to be almost a religious experience for the Japanese. Prepared in many different ways, it is consumed as a great delicacy on special occasions. The best way to prepare matsutake is by baking but due to its high price many people cannot afford this luxury. People therefore slice it and mix it with rice, thus getting the most of its unique fragrance (Yoshizuka n.d.; Wang et al. 1997; Namgyel 2000).

Matsutake was once common in the mixed pine forests of Japan from Hokkaido in the north to Kyushu in the south (Hosford et al. 1997). The maximum matsutake production recorded in Japan was 12,000 metric tons in 1941 (Wang et al. 1997). In 1998 production was a mere 247 metric tons (JETRO 2004). The dramatic decline of matsutake production in Japan is attributed to two main reasons (Hosford et al. 1997; Wang et al. 1997). Firstly, the pine trees in Japan that were the hosts to matsutake were repeatedly destroyed in large numbers by the pine nematode or pine weevil at the beginning of the 20th century. Secondly, the Japanese started depending less upon forestlands after World War II. This led to the aging of pine trees and thick forest understories of brushwood and bushes that prevented light reaching the pine seedlings. The excessive leaf litter collection on the ground also prevented the growth of matsutake. In the pre War period, people harvested brushwood and oak trees to make charcoal, which favoured the growth of shade-intolerant pines and the matsutake associated with them.

Japan initially started importing matsutake from North and South Korea and China in the 1970s (Hosford et al. 1997; Wang et al. 1997). The rise in demand in Japan, led to discoveries of matsutake in a number of countries. Today about 10 countries export matsutake to Japan. The major exporting countries are China, North Korea, South Korea,

Canada and USA (Table 7.1). Bhutan first began the export of matsutake in 1989 and its share is less than 1% of the total Japanese imports.

Table 7.1 Major Matsutake Exporting Countries by Volume and Percentage

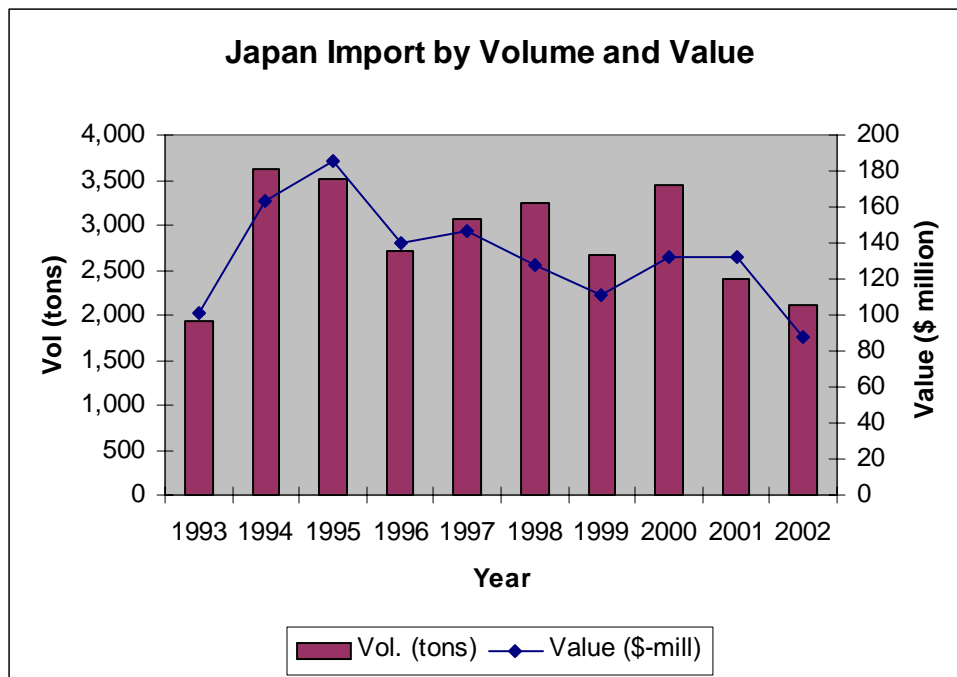
Country	1993		1994		1995		1996		1997	
	Vol (tons)	% of Total	Vol (tons)	% of Total	Vol (tons)	% of Total	Vol (tons)	% of Total	Vol (tons)	% of Total
China	1,064	54.76	1,127	31.11	1,191	33.88	1,152	42.62	1,076	35.17
N. Korea	383	19.71	1,761	48.61	1,141	32.46	541	20.01	615	20.10
S. Korea	131	6.74	139	3.83	633	18.00	170	6.29	249	8.14
Canada	279	14.35	447	12.34	340	9.67	510	18.87	618	20.20
USA	50	2.57	47	1.29	163	4.64	172	6.36	284	9.28
Mexico	15	0.07	22	0.60	36	1.02	23	0.09	9	0.29
Morocco	19	0.98	72	1.99	1	0.03	86	3.18	126	4.11
Turkey			2	0.06	4	0.11	44	1.63	80	2.62
Bhutan	1	0.05	1	0.03	2	0.06	3	0.11	3	0.10
Total	1,943	99.23	3,622	99.86	3,515	99.87	2,703	99.16	3,059	100

Source: JETRO 2004

7.1.1 Trends in Japanese Matsutake Import

Japan is the singular matsutake market in the world. Its annual consumption of matsutake is over 3000 tons with domestic production of below 300 tons. Importation thus constitutes over 90% of total consumption with a value over US \$ 100 million. It has a wholesale mean price of US \$ 47 per kilogram, with price ranging anything from \$ 27 to 560 per kilogram. The total consumption of matsutake in Japan, domestic production, and imports from 1993 to 2002 are shown in Fig. 7.1.

Fig. 7.1 Japan Import by Volume and Value



The matsutake share of the total import of ‘Fresh and Chilled Mushroom’ category in Japan is below 10 % by volume but over 57 % by value (Table 7.2). The Japanese refer to matsutake as ‘king of mushrooms’ (Yoshizuka n.d).

Table 7.2 Share of Matsutake in Total Mushroom Import by Volume and Value

	1998		1999		2000		2001		2002	
	Vol	Value	Vol	Value	Vol	Value	Vol	Value	Vol	Value
Fresh, Chilled Mushroom (Total)	35,489	28,159	35,218	25,345	46,110	25,343	39,472	25,597	31,121	19,377
Matsutake	3,248	16,671	2,674	15,490	3,452	14,567	2,395	15,835	2,109	11,468
Matsutake Share (%)	9	59	8	61	7	57	6	62	7	59

Units: tons, ¥ million
Source: JETRO 2004

7.1.2 Matsutake Grading and Pricing

The aroma, taste, flavour, colour and shape determine the value of the matsutake which is sorted into seven grades from 1 to 7. The grade 1 are mushrooms longer than 80 mm with unopened caps; grade 2 are 60-80 mm long with caps less than one third opened; grade 3, less than 60 mm long with unopened or longer and more than one third opened caps. Once the mushroom begins to open, it is downgraded. The lowest grade 7 is awarded to fully opened mushrooms badly affected by insect larvae and worms (Wang et al. 1997). The wholesale price for grade 1 matsutake in Tokyo can range between ¥ 3350 and 70,000 per kilogram (US \$27 –560), and the retail price as high as ¥ 160,000/kg (US \$ 1275) (Wang et al. 1997).

The Japanese rate their homegrown matsutake as the best. The average wholesale price ranges between ¥ 26,000 and 46,000/kg (US \$ 205-365). The South Korean matsutake at a wholesale average price over ¥ 14,050/kg (US \$ 112), is the next highly priced (Wang et al. 1997). The average wholesale price for a country in some years can be as low as US \$ 18/kg. Bhutan's mean price is over US \$ 40 (Table 7.3).

Table 7.3 Matsutake Comparative Price by Countries

	1995			1996			1997		
	Vol Kg 000	Value \$ 000	Mean \$/kg	Vol Kg 000	Val \$ 000	Mean \$/kg	Vol Kg 000	Val \$ 000	Mean \$/kg
China	1,191	47,716	40	1,152	60,285	52	1,076	59,811	56
N. Korea	1,141	37,034	32	541	9,628	18	615	25,402	41
S. Korea	633	61,079	96	170	27,963	164	249	34,673	139
Canada	340	13,692	40	510	24,458	48	618	23,264	37
USA	163	7,110	44	172	8,465	49	284	10,482	37
Mexico	36	1,869	52	23	1,418	62	9	666	74
Morocco	1	52	52	86	3,344	39	126	4,085	32
Turkey	4	110	28	44	1,272	29	80	2,328	29
Bhutan	2	78	39	3	156	52	3	143	48

Source: JETRO 2004

7.2 Taxonomy, Ecology and Distribution

There are globally over 50 different species of *Tricholoma* (Rinaldi and Tyndalo 1974), and its taxonomy can be confusing even for experts (Hosford et al. 1997). The matsutake

we know today was first scientifically described in Sweden in 1905 as *Armillaria nauseosum*. However, Ito and Imai separately described it as *Armillaria matsutake* in 1925. As *Armillaria* has amyloid spores and matsutake, like all *Tricholoma*, have inamyloid spores, Singer renamed it as *Tricholoma matsutake* in 1949. According to the rules of botanical nomenclature, the older species name has priority. However, due to the fact the name matsutake is so commonly used, and since two different names may give the impression that there are two different species, the name *Tricholoma matsutake* (Ito and Imai) Singer is retained (Wang et al. 1997). *Tricholoma matsutake* (Ito and Imai) Singer is the true Japanese matsutake, and the principal commercial species in Asia. Growing in either pure or mixed forests of pines, hemlock, spruce, firs and oaks, it is found in North Korea, South Korea, China, Laos, and Bhutan. The principal North American counterpart of the Asian matsutake species is *Tricholoma magnivelare* (Peck) Redhead. While it is similar in texture, taste, and odour, it is morphologically distinct from the Asian species. It is white in colour compared to Asia's brownish colour (Hosford et al. 1997). In Morocco and Europe, the species is said to be *Tricholoma caligatum* (Wang et al. 1997). Matsutake is essentially a Northern Hemisphere mushroom (Fig. 7.2).

Fig.7.2. World distribution of matsutake (stars)



Matsutake is a symbiotic fungi belonging to the ectomychorrhizal group. It obtains its nutrients from the roots of living trees, which serve as hosts. The fungi form nodules on the roots of these trees. The trees provide sugars that the mushroom needs and the mushroom helps the tree gather water and minerals. Both the mushroom and the tree flourish in this arrangement (Namgyel 2000).

Matsutake forms distinctive fungal colonies in the soil called *shiro* or ‘matsutake ring’. They are white to pale grey in colour. Research in Japan suggests that mushroom fruiting begins when trees are 20 years old when there are 2000 to 5000 trees per hectare. However, the production is maximum when the trees are 40-50 years old but gradually declining after the age of 60 years. But, in the USA 200 year old *T. magnivelare* forests are still productive. Production is also greatest when the forest canopy provides about 75% cover and the shrub layer is relatively sparse (Hosford et al. 1997; Wang et al. 1997). In one experimental forest in Japan, there was one *shiro* developed in the 20th year that produced 40 x 70 gm matsutake, i.e. 2.8 kg/ha. Five years on, there were seven

shiros producing a total of 20 kg/ha. And in the 35th year, the number of shiro increased to 100 to 200 with a total mushroom production of 100 kg/ha (Wang et al. 1997).

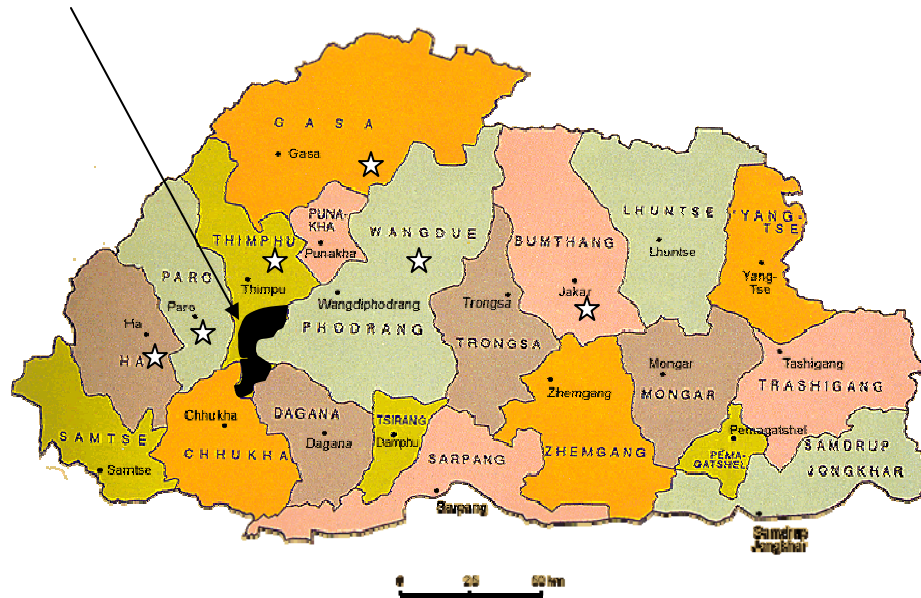
Matsutake fungus performs well in soil with a pH of 4.5 to 5.6 above which its growth is retarded. The temperature range is 5 to 28°C, with optimum temperature range of 15 to 19°C. At 31.5°C, the fungus dies. Monthly rainfall of about 300 mm with the ideal temperature encourages mycelium growth. At ideal moisture and temperature, a two-time matsutake harvest is possible (Namgyel 2000).

7.3 Study Area

Matsutake is found in the temperate central region of Bhutan. Thimphu, the country's capital and other major valleys and settlements are located in this region. Giesch (2000) refers to the temperate region as the cultural and historical heart of Bhutan. The dominant forest trees present in the region are blue pines, spruce, hemlock, fir and oaks, providing the ideal habitat for matsutake. Matsutake grows in these forest types at an altitude range of 2600 to 3600 m asl.

Matsutake was first discovered in Bhutan in the village of Jabana in Paro Dzongkhag, and later in Genekha in Thimphu Dzongkhag. Since the start of the commercial harvesting for export, there have been discoveries in more and more areas. Currently, it can be found in villages in Haa, Wangdi, Gasa and Bumthang Dzongkhags. However, as matsutake has to be shipped fresh to Japan within 24 to 48 hours of collection, only the few production areas close to Thimphu, the capital and Paro, where the international airport is, have commercial viability. The area selected for study is Genekha Geog under Thimphu Dzongkhag. It supplies over 90% of the total matsutake export from Bhutan. The study area (dark shade) and other matsutake growing areas (stars) are illustrated in Figure 7.3.

Fig. 7.3 Study Area (dark shade) and other matsutake growing areas (stars)



7.3.1 Land Use

Genekha with an area of 144 km² is one of the ten *geogs* in the Thimphu Dzongkhag. It lies 30 kms southeast of Thimphu, the capital. An 8 km feeder road connects it midway to the 60 km Thimphu-Paro highway. The elevation range of the *geog* is from 2023 to 4033 m asl. The dominant land use is forestlands. At 11,498 ha, this constitutes about 80 % of the total land area. The agricultural land at 522 ha is only 3.63% (Table 7.4) (LUPP 1995).

Table 7.4 Genekha Land Use

Land Use	Area (ha)	%
Agricultural Land	522	3.64
Conifer Forest	8,593	59.84
Broadleaved Forest	746	5.20
Scrub Forest	2,155	15.00
Natural Pasture Lands	2,229	15.52
Snow/Glaciers	0	0
Rock Outcrops	56	0.39
Land Slips/Eroded Areas	45	0.31
Water Spreads	12	0.08
Marshy Areas	0	0
Total	14,358	100

Source: LUPP 1995

The study area has traditionally been famous for its iron ore deposits, and its traditional tax paid to the central government was in pig iron (Ura 1995). The ore extraction stopped over half a century ago. The forest in the area is mostly young forest of blue pines, spruce, hemlock and oaks. The area in the past must have been deforested by the smelting of ores. There are still senior citizens who as children helped their parents in the production of pig iron. They talk of establishing furnaces in the wooded areas and when the wood finished moved on to the next place. One can see hundreds of remnants of furnaces in the forests today.

7.3.2 Climate

There is no climatic data available for the Genekha Geog. However, it represents the cool temperate ecological zone with a cold winter and warm summer, similar to Thimphu, the capital. In Thimphu, the minimum temperate is about -5° C and maximum 23° C. The mean annual rainfall is 670 mm (Upadhyay 1995).

7.3.3 Vegetation

The major vegetation types present in the study area are blue pine, evergreen oak, spruce, hemlock and fir forests. In the blue pine forest, the dominant species is *Pinus wallichiana*. Blue pines can be found between 2000 to 3000 m asl. Depending upon aspects and rainfall amount, there is a gradual transition between it and the evergreen oak forest and spruce forest. The evergreen oak forest growing in the same altitude band is characterized by *Quercus griffithii* and *Quercus semicarpifolia*. The spruce (*Picea spinulosa*) and hemlock forests (*Tsuga dumosa*) are found at higher elevations of 3000 to 3500 m asl. The fir forest (*Abies densa*) occupies the higher mountain ridges, forming the tree line at 3600 to 4000 m asl (Grierson and Long 1983). The conifer forests types mentioned above are also rich in mushroom species. During the fieldwork, about 35 species of mushroom were collected.

7.3.4 Socio-Economic Context

About 800 people live in 101 households in the Genekha Geog. The male and female populations constitute 51 % and 49 % of the total respectively. About 23 % of the total population consists of children under 10 years and 16 % above 50 years of age. Table 7.5 shows the population distribution by age.

Table 7.5 Population Distributions

Age Group (year)	Male	Female	Total	%
< 10	90	91	181	23
10 – 25	144	118	262	33
26 – 50	115	112	227	29
> 50	60	65	125	16
Total	409	386	795	
%	51	49		100

Source: RNR Centre, Genekha Geog (2003)

The geog consists of five main villages (Table 7.6). The overall mean household size is 7.87, with size ranging from 1 to 21 members. However, not all household members are full time residents in the villages or are they available full time for household labour; being absent as students, monks or waged workers. About 2.2 members per household on average are non-resident. The effective mean household size in the geog therefore is about 5.45 persons (Table 7.7).

Table 7.6 Villages and Household Numbers

Village	HH (No.)	Population (No.)
Bama	31	223
Chizib Goenba	14	116
Zanglekha	20	139
Genekha	16	137
Tshocheykha	20	180
	101	795

Source: RNR Centre, Geney Geog (2003)

Table 7.7 Household Size

Residency	Population (No.)	HH Size
Resident	551	5.45
Non Resident	224	2.21
Total	795	7.87

Source: RNR Centre, Gene Geog (2003).

The main economic activity in the study area is small-scale mixed farming i.e. growing crops and keeping cattle to meet subsistence needs. As a large part of the *geog* is over 2500 m asl, the main crops are wheat and barley. Rice is grown in a small pocket in the lower part of the *geog*. Potato in the upper part of the valley, and apple in the lower part, are gaining importance as cash crops. The total cultivable land in the *geog* is 431 acres with average landholding of 4.26 acres per household (Table 7.8).

Table 7.8 Agriculture Land Types and Animal Numbers

Dryland¹ (acres)	Wetland¹ (acres)	K/Garden¹ (acres)	Orchard¹ (acres)	Pangshing¹ (acres)	Cattle² (No.)	Horse² (No.)	Pig² (No.)	Poultry² (No.)
247.89	44.27	10.40	31.60	96.39	631	92	116	61

¹ Source: Dzongkhag Agriculture Office, Thimphu Dzongkhag

² Source: MoA (2000)

The study area was traditionally well known for iron products such as knives and agricultural tools in the upper villages, and pottery in the lower villages. People bartered their iron implements and pottery products for rice and chilli with the neighbouring rice growing villages, thus supplementing and complementing their food grain requirements. Some households still continue the iron work but today they make implements from the iron and steel scraps obtained from the automobile workshops in Thimphu. The pottery tradition has largely disappeared.

The discovery of matsutake in the area in 1990, and the commercial harvesting of it for export thereafter, is now the most important source of cash income. All households are engaged in the collection of matsutake. Depending upon the household size and price, the household income from matsutake in the two-month season ranged from Nu. 10,000 to over 100,000 (US \$ 233 – 2,326). This regular source of cash income has enabled people to obtain credit from the Bhutan Development Finance Corporation (BDFC). The

recovery rate of credits for the *geog* is over 85%. There is a feel of economic prosperity in the *geog*. All houses except for one or two have replaced their wooden shingles with CGI sheets, and most houses are colourfully painted. The CGI roof-sheets and house paintings are demonstrations of doing well in the rural areas in Bhutan. The *geog* got its first power-tiller in 1994, and as of 2003, there are 11 power-tillers in the area. Before matsutake, life conditions in the *geog* were difficult and people were poor. The area, while close to the capital, suffered from economic isolation due to its secluded location high up in the mountains. According to the people interviewees:

“I remember during my time as Gup people had difficulty paying taxes, amounting to even Nu. 5 (\$0.1) ... I still have the tax receipts of people for whom I paid for when I was the Gup in 1979. People lived in difficult life conditions...”

Mr. Nim Dorji (age>60), a former Gup (Geog Administrator)

“Before, we had only wheat for meals, morning, afternoon and evenings all. Now with matsutake, we can eat rice, drink tea and buy edible oil.”

Ms. Makhum (age 80), the first household to take matsutake to market in Thimphu

“People in the area were generally poor; their clothing included ‘bora’ (old sacks).”

Mr. Pasang Dorji, matsutake exporter

“Genekha generally was a poor village. The land holdings are small and people grow only wheat and barley. They even have to buy a piece of chilli. When we started the matsutake business in Genekha, the roofs of the houses were all wooden shingles, and falling apart. The grasses would grow on the roof shingles. People were very poor.”

Mr. Kinley Gyelpo, matsutake exporter

7.4 Discovery of Matsutake in Bhutan

The first interest in matsutake in Bhutan started around 1986 with the Tashi Commercial Corporation, a prominent business house in the country. Already engaged in shitake production, the Corporation was making efforts to locate the high priced Japanese matsutake in Bhutan. According to Pasang Dorji, the General Manager:

“Our boss Dasho Rim brought pictures of matsutake from Japan in 1986. From the pictures, we did not make much headway. Some said that it was found, and others said no. We sent many sample specimens to Japan but they were not to be. The Company spent a lot of money...In 1988, Nidup, Rinzin and I got the opportunity to go to Japan on a three-month training programme on mushroom production. During our time there, we visited a matsutake wholesale market at Echiba, Tokyo. The day was a lucky day...As soon as we saw matsutake, Nidup immediately said that he was 100% sure that the mushroom was found in his village Jabana. He said that when he was a schoolboy, he picked them. He also said that an old Tibetan lam who lived in his village loved this mushroom very much, and he used to call it ‘Sangay Shamu’. In the 1989 season we sent Nidup to his village, and he returned with six or seven pieces of matsutake. As soon as I saw them I confirmed them as matsutake having seen them in Japan the previous year. Fortunately, at the time one Japanese official was on a visit to the country. He also confirmed it 100%. We relayed the news to our contacts in Japan, and they asked us to send the samples. Dasho Rim was very happy with the matsutake discovery in Bhutan, and he presented Nidup with Nu. 10,000. He said to Nidup that he had done a great service to the country...Our good fortune was to shine even brighter. In the following year i.e. around 1990, Dasho and I when strolling at the Sunday Market in Thimphu, we encountered an old lady from Genekha with a basketful of matsutake. We were astonished at this accidental discovery of matsutake! We learnt from the lady that her village forests had plenty of it. In fact Genekha today is the most matsutake rich area in the country.”

In Genekha the poor households from the upper part of the valley were selling wild mushrooms out of economic desperation. Taking mushrooms to the Thimphu market involved a great effort: firstly, it was over a half to a day's trek to the Thimphu-Paro highway; secondly they had to wait on the highway for a bus or truck to take them to Thimphu, about 30 kms away. The 8 km feeder road due to its poor condition was non-functional. Socially also, households selling wild mushrooms were not looked favourably by neighbours. According to Dorji, a farmer from Tshochekha village,

“In the beginning, we were only 5 or 6 households selling matsutake. Farmers from the lower valley used to make fun of us. They would call us ‘mushroom sellers’.”

7.5 National Policy and Regulation

The wild mushrooms in the past in Bhutan, except for household consumption, had no commercial value and therefore, had no specific mention in the Bhutan Forest Act of 1969. The NTFPs that were specifically mentioned in the Act included palms, bamboo, canes, catechu, wood-oil, resin, natural varnish, bark, lac, flowers, seeds and fruits, grasses, creepers, reeds and orchids. The Act, based largely on Indian forestry experiences, concerned itself mostly with the tropical NTFPs. With the government's right confirmed to the absolute ownership of trees and forest produce on both public and private lands (RGOB 1969), legally speaking, local people required permission from a forest officer to harvest any forest produce. However, practical difficulties in implementing the rule meant that local people collected forest products freely without a permit.

The same basic principles of state control and central regulations were maintained in the newly revised Forest and Nature Conservation Act 1995, except that more details were provided. The new Act outlines provisions for the taking and movement of a forest product with or without a permit (RGOB 1995). Subsistence use by farm households of forest products does not require a permit or payment of royalty. However, a transit pass from a forest officer is required to move the product between areas. The forest products

for sale are subject to a permit system and payment of a royalty. However, a permit for commercial sale is only issued when, in the opinion of the forest officer, taking of the products will not cause landslides and soil erosion, and when a resource inventory information is available (RGOB 1995).

In the case of matsutake, the exporters buy the permits from the forest office in bulk for the farmers. At the buying station, the permit volume is adjusted against the purchased volume from the farmers. The farmers, exporters and forest officers find this method convenient. The farmers are saved the time and expense of visiting the local forest office at Khasadrapchu, which is 15 kms away. With no public motor transport system, this could otherwise cost farmers from half to a full day of walking. The exporters on the other hand with private transport can visit the forest office, which anyway lies on their travel route, and can there buy the permits for the farmers, which is not very costly. This system is convenient both for the businessmen and local forest office in that businessmen have the permits, and the local forest office needs to deal with fewer people. The royalty rate for matsutake was Nu 4/kg but it was raised to Nu. 20/kg in 2003. The rise in the royalty rate has made exporters think again about whether they should continue to pay for the permits for the farmers.

7.5.1 Government Support

Seeing that there was an unexpected opportunity for rural income from the attractively priced matsutake, the National Mushroom Centre (NMC) of the Department of Agriculture took responsibility for information and coordination of collectors and exporters, and farmers training on sustainable harvesting methods of the mushroom. It also entered into dialogue with the local Divisional Forest Office for support in its efforts for the regulation of the commercial harvesting of matsutake (Sherub Gyaltsen pers comm.¹⁸). These included the starting and ending date of the picking season and the minimum size of the mushroom for picking. Farmers appreciated these education and

¹⁸ Director, Department of Agriculture

training opportunities in the sustainable management of the matsutake resource. In the annual matsutake meeting in 2003, Karma Gyaltshen, the Gup of Genekha said:

“We have rules on the starting and ending date for the collection of the mushroom, and we keep telling this to the people...now over the years everyone is aware of the rules, and people respect them...We would request the government to continue to educate us on environmental conservation and on the sustainable management of the resource. We should tell people that this is the country’s important natural resource. The government, if possible, like in the past years, should provide us training on a regular basis, and the Forest Department should continue to strictly enforce the rules. I would like to make it known that these initiatives have been helpful to us.”

In the early period of matsutake commercialisation, the NMC also asked the sole exporter then to be more responsible in pricing for farmers, and invited more exporters to join in the trade to establish market competition. According to Dorji from Tshochekha Village:

“In the early period of matsutake sale, we used to take the mushrooms to the 4 km point, and Tashi would come there to buy from us. It would take half a day to reach the point...Tashi paid us Nu 35/kg for two years. Then one year an agricultural officer came to our village and raised the price to Nu. 350. He said to the exporter that people should not be paid lower than that.”

The NMC continues to hold an annual meeting of forest officials, farmers and exporters. In 2003, a marketing team from the Ministry of Agriculture visited Japan to undertake an analysis of the matsutake market there (Tshering and Vinning 2003). The exporters have also managed to obtain favourable treatment from the Druk Air, the National Airline, which is the only airline flying in and out of the country. In the early days, exporters suffered losses as their consignments got off-loaded due to the small cargo capacity.

7.5.2 Community Control of Matsutake

When the farm gate price of matsutake moved quickly from literally a no cash value to Nu. 300 a kilogram in 1994, it fired the imagination of the people in the Genekha *geog* and neighbouring areas. The price for a kilogram of matsutake was three times the national wage of Nu. 100 a day, and this cash value for a mushroom was unthinkable. It was like striking gold for the poor farmers. People in the lower valley who had earlier derided their upper valley neighbours as ‘mushroom sellers’ were now requesting them in the *geog* meetings for permission to collect the mushrooms from their areas where matsutake grew. Though they had intra-*geog* village boundaries and resource use areas, the *geog* meeting decided that since they were people of one administration, everyone in the *geog* should have equal access. There was a rearrangement of local policies and practices. According to a local farmer from the upper valley,

“Our Gup said that we are people of the same geog. And people from the lower valley therefore should be allowed to collect matsutake from the upper valley, and cattle from the upper valley should also graze in the lower valley, provided they don’t enter the agricultural fields. Earlier the farmers from the upper village had to pay fees for grazing their cattle in the lower valley. Now, we don’t pay the fees anymore.”

The high price and high demand of matsutake also attracted many people to Genekha from the neighbouring areas. The forests however are government-reserved forests with every citizen having the right of access to it. During this early period of commercialisation there were a series of burglaries and vandalism of local homes and monasteries. The local people said that these things had never happened before, and then decided in their *geog* meeting that they would prohibit outsiders from coming over to the area to pick the mushrooms. They also petitioned the *Dzongda*, the district administrator for support in their *geog* resolution. The main reason was of course the loss of revenue to outsiders. According to Mr. Kencho, the Mangi Aap (village official):

“When matsutake started getting attractive prices, there were people from outside our geog coming into our forests. There were a few thefts from a few houses and lhakhangs. We discussed that outside people are the cause of the new problems, and we should prohibit them from coming over to our forest areas. We petitioned Dasho Dzongda for support. We then discussed and agreed that individual villages should look after their own forest areas, and this is not a difficult job because we know the area and we know who the outsiders/strangers are. We thus agreed to appoint two matsutake tshogpas (matsutake committee member) per chiwog (sub-geog) whose primary job is to identify outsiders and enforce the harvesting rules. We have today a total of 12 tshogpas in the geog.”

The geog so far has been effective in keeping away pickers from the neighbouring areas. However, one neighbouring geog Gaselo, Wangdi Dzongkhag retaliated with the prohibition of the cattle from Genekha coming over to their areas in the winter, which ended up in court. The case was settled with Genekha people having to pay an annual grazing fee to Gaselo people.

There is today in the geog a matsutake management committee, locally known as ‘Sangay Shamu Tshogpa’. It is composed of two members from each of the six main villages. The job functions of the members are to report in their individual areas of outsiders, and to enforce the rules on minimum size, prohibition of plastic carriers, and destructive picking practices. They are also to represent their geog interest to government officials, and to inform people of new developments. The *Gup*, the geog administrator, is the *de facto* chairman of the committee. The members do not receive any remuneration.

7.6 Value Chain for Matsutake

7.6.1 Production

Over 80% of Genekha geog is under forest cover. The forests are mostly the young regenerated blue pines, oaks, spruce and hemlock after the large-scale deforestation from

smelting of iron ores in the area about 50 to 60 years ago. Research from Japan show that matsutake grows best in young forests, with production peaking when the trees are 40 – 50 years old, thereafter production declines after the age of 60 years. One of the reasons why Japanese matsutake production dramatically dropped was the aging of pine trees in post War period in Japan (Hosford et al. 1997; Wang et al. 1997). The people in Genekha also observe that while matsutake is found in all forest age classes, young forests however bear them the most.

“Young forests generally bear more matsutake than the older forests. Also the forests with thick leaf-litter bear more matsutake, but something of an open woodland type. In the forest areas with thick shrubs and undergrowth, we don’t find matsutake.”

Mr. Chaithey, Genekha Village, Tshogpa (matsutake committee member)

In the old and thick forests, we get big pieces of matsutake but they are fewer in numbers. We find more matsutake in the young forests areas but they are smaller in sizes.

Mr. Dorji, an expert matsutake collector

The figures available with the Khasadrapchu Forest Range Office show that the Genekha farmers picked a total volume of 3,222 kgs of matsutake in 2002, and 5,188 kgs in 2003. This amounted to income of Nu. 1,045,320 (US \$ 23,229) and Nu. 1,955,430 (\$ 43,454) respectively (Table 7.9). This is not including the commission paid to the local agents in the *geog* who receive Nu.40/kg.

Table 7.9 Matsutake Production in Genekha Geog

Year	Grade A (kg)	A - Value Nu.450/kg	Grade B (Kg)	B - Value Nu.120/kg	A + B (kg)	Value (A+B) (Nu.)
2003	4039	1,817,550	1149	137,880	5188	1,955,430
2002	1996	898,200	1226	147,120	3222	1,045,320

Source: Khasadrapchu Forest Range Office

People said that they observed no decline in matsutake production in the area over the years, and they also displayed a sound understanding of the functioning of matsutake production. According to the people:

“As far as we see it, there is no decline of matsutake production in our area. It has remained the same. We have been now picking matsutake for the last 10 years, and during this period, new collection sites have been discovered.”

Mr. Karma Gyaltsen, the Gup of Genekha, in the 2003 Matsutake Meeting in Thimphu

“In our opinion, we don’t see decline in matsutake production. It has remained the same. People who say that production has increased or fallen are I guess referring to the price. When the price is low, we get less money, and feel that production has fallen, and vice versa. And when the price is low, not all households go to pick matsutake. For example in my village, out of 25 households, only 10 households are picking matsutake this year.”

Mr. Kencho, Bama Village, Mangi Aap, Genekha

“This matsutake is incredible. It is indeed the Buddha Mushroom. This mushroom has no insect infestation, and no seeds. All we have to do is take care of the white mass (mycelium) in the soil. This white mass will give rise to new mushrooms.”

Ms. Makhum (80), Tshochekha Village

“Matsutake is found most where the humus layers are thick. If we damage the humus layers, the mushrooms do not grow again. So we have to carefully dig out the mushroom as not to disturb the soil as well as not to cause injury to the mushroom. The injured mushroom has not much cash value.”

Mr. Kencho, Bama Village, Mangi Aap

7.6.2 Collection

The total forest area (11,494 ha) divided by total population (800) gives a per capita forest in Genekha geog of 1:14, that means more than enough forest for pickers. There is no village competition over collection sites. The villages have their own collection areas, generally in the close by forests. The five main villages are scattered across the valley and are all in the middle of forests. The travel time to forests for most villages is a few minutes except for Bama village which is located in the lower valley. The people from Bama leave their houses and camp in the forests during the season.

People generally make two trips a day to the forests. All available able-bodied household members go to pick the matsutake. During the fieldwork, I came across pickers as young as 10 and as old as 60 years of age. They use simple tools such as a wooden stick, sharpened at the end to scoop out the mushroom. I observed no serious leaf-litter raking nor soil disturbances in the forests. Most pickers said they were aware of the government training on proper picking methods, and they followed them, and also said that it was in their interest to take care of the forest area for future benefits. The high price of the mushroom motivated people to forage the forest. According to Mr. Karma Gyaltshen, the Gup:

“The high price of matsutake is a great incentive for us to forage the forests. We don’t feel tired but instead we feel light and highly spirited...How much we pick depends upon luck. Sometimes, in two hours we can collect 2 kgs, and other times, a few pieces only for the whole day. Depending upon the size of mushrooms, 4 or 5 pieces to 9 or 10 pieces could yield a kilogram.”

There is very little processing transformation required of the product on the part of pickers. The product mushroom is just picked, collected and sold to the buyers in two grades i.e. grade A and B. The grade A includes the mushrooms over 7.5 cms long with caps unopened or slightly opened. The rest of the mushrooms with opened caps and with poor shapes or injury are categorised in grade B.

During the season, a buying station is established in the village where on designated days trade takes place (Pic.7.2 and Pic. 7.3). The buying station with temporary makeshift shops and restaurants and bars has become a type of fair in the *geog*. The schoolteachers, students, health and agriculture workers said that they look forward to the matsutake season. They said it was the only time in the year when there was a crowd and life in an otherwise a very lonely rural area.

On one trading day in September 2003, there were 78 farmer pickers and three buyers. There was a total collection of 187 kgs of mushroom for the day with total disbursement of Nu. 48,857 (\$1086). The individual farmer's sale ranged from as low as 100 gms to as high as 7.8 kgs. The picking is undertaken on a household basis i.e. income is not for the individual picker but the household. The trading days are generally on alternative days, adjusted with the Druk Air flight days to Bangkok. The exporters take their collection of mushrooms to their stores in Paro or Thimphu where they are re-graded, air dried and packaged for shipment the first thing in the morning. As Japanese consumers value matsutake for its unique fragrance, colour and taste and since the mushrooms lose these with time, matsutake is shipped fresh to Japan within 24 to 48 hours of collection of it from the forests so as to obtain the best price.

Pic.7.2 Buying Station, Genekha



Pic.7.3 A young lady selling her mushroom



7.7 Trade and Marketing

Matsutake supply from Genekha constitutes over 90% of the total Bhutanese matsutake export. The other 10% of matsutake come from Paro, Haa and Thimphu. The production areas far away from Thimphu and Paro are not commercially viable. For a few years, the exporters collected matsutake from Ura, Bumthang that is over 12 hours car drive from Thimphu. The exporters found the quality of Ura mushroom seriously deteriorated when it reached Japan due to the long time lag. It was a similar case for matsutake from Laya region, which does not have a road access.

Japan is the primary end market, but smaller amounts of Bhutanese matsutake are also dispatched to India, Thailand, Malaysia and Singapore. Table 7.10 shows matsutake production and value figures for the 11-year period from 1993 to 2003.

Table 7.10 Matsutake export from Bhutan by volume and value⁰

	Bhutan Figures ¹		Japan Figures ²		FGP-Gene ³
	Vol (kg)	Value (\$)	Vol (kg)	Value (\$)	Nu/kg
1993	2,278		1,199		250
1994	649		1,157		300
1995	6130		1,747		600
1996	7475		3,299		650
1997	15711		2,811	130,858	650
1998	11004				800
1999	12128				550
2000	3229				450
2001	1458				250
2002	1524				330
2003	3729				450

⁰Bhutanese and Japanese figures of production do not match. This could be explained that Bhutanese figures pertain to gross packing weight while Japanese may be referring to the net weight. The gross weight, which includes a kilogram of ice for every kilogram of matsutake, could therefore be twice the net weight. There is also the fact, small amounts of matsutake from Bhutan go to other countries.

¹Source: National Mushroom Centre and Bhutan Agriculture and Food Regulatory Authority

² Source: JETRO 2004

³ FGP-Gene: Farm Gate Price at Genekha

In the early period of the matsutake trade, there was stiff price competition amongst the exporters. The price per kilogram shot from Nu. 250 in 1993 to Nu. 800 in 1998. Some years, some exporters were reported as paying over Nu.1000/kg.

Additionally, the exporters offered incentives to the farmers and community, and hired local leaders as agents whose jobs were to mobilise more farmers to sell to them. The farmers were showered with generous advance payments, free transport of food items, and prize systems for best collectors and end of the season partying. The exporters also competed to finance the community work of renovation and roofing of *lhakhangs* (monasteries).

With the economic recession in Japan, the year 2000 saw a drastic drop of matsutake export to 3,229 kgs from the previous year's 12,128 kgs. The previous six numbers of exporters also dropped to just three. The farm gate price also tumbled to Nu. 250/kg in 2001. There is today no price competition but a fixed price agreed before the season between the exporters and farmer representatives. This is the same system that the exporters follow with their overseas buyers. It is said to provide security of price in the highly volatile matsutake marketing in Japan where price fluctuates on a daily basis.

The local agents whose job earlier was to mobilise farmers now help the exporters in the weighing and grading of mushrooms, keeping records of the payment to the farmers. They are paid Nu. 40 per kilogram of matsutake purchased. It is a good business for the agents. According to Mr. Nim Gyaltsen, ex-Gup, an agent now:

“It all depends upon the production. If we handle about 1500 and 2000 kgs of purchase, we make about Nu.60,000 to 80,000 a season. Never below Nu.10,000.”

After the collection of matsutake from the farmers, the exporters in their four-wheel trucks drive back the hour-long journey to their storerooms in Thimphu or Paro in the late afternoon. Once at the storerooms, they have to rush to get the mushrooms ready for shipment to Japan in the next 6 to 8 hours of time available. The mushrooms are re-graded, cleaned and air-dried for a few hours to a required moisture level before packing. They are packaged in thermo-cool containers with ice. The exporters in Thimphu then drive before the break of dawn to Paro, 60 kms away to catch the Druk Air flight to Bangkok to dispatch the consignments to their contacts in Japan.

The exporters incur an average cost of US \$ 21 for a kilogram of matsutake shipped to Japan. They also bear a considerable risk of financial loss due to their dependence on the only Bhutanese air transport carrier Druk Air. As the matsutake season coincides with the monsoon season, Druk Air is frequently unable to take off because of cloud cover and small cargo capacity. The most serious consequence of this is that the Bhutanese suppliers lose the trust of the Japanese contacts. According to Kinley Gyelpo of Dekiling Company:

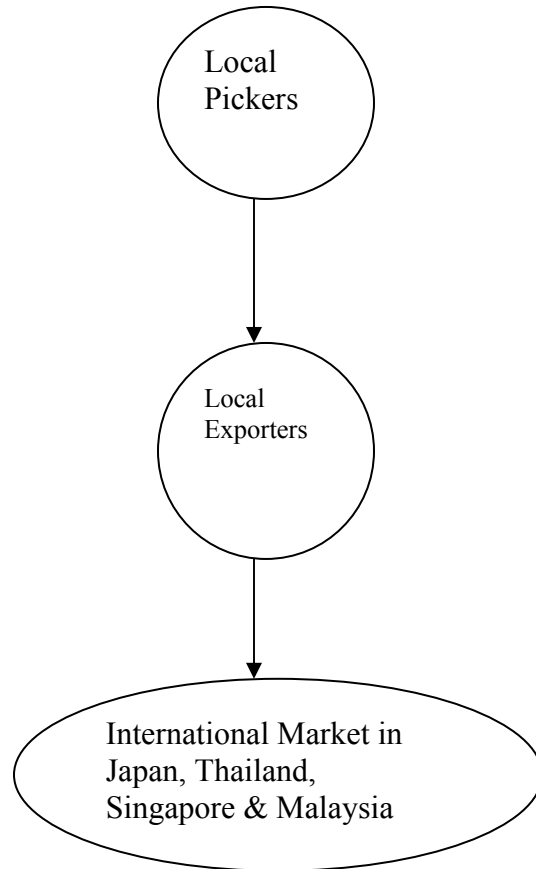
“The Druk Air transportation remains a major problem in the matsutake export. The off flights and off loads by Druk Air cause us considerable loss, and problems with our overseas business contacts. The international trade is very particular in the matter of timing, delivery, quality and quantity. When we fail in the obligations, the overseas contacts breathe fire down us, but we remain helpless...One year, my Singapore contact was very angry with me because the Druk Air could not fly due to the weather condition. He was desperate and he flew to Bangkok to get matsutake from another hotel contact. He threatened me with having to bear the costs of his travel. He is a contract matsutake supplier to a 5 star hotel in Singapore. In the 5 star hotels, things have to be very precise, so that they don't displease their customers, and dishonour their obligations.”

In international trade terms, the Bhutanese matsutake export size is very small. According to Pasang Dorji of Tashi Commercial Corporation:

“The reason why the Japanese take our small quantity mushroom is because our quality is good. Our Japanese buyers are not wholesale buyers. If we have to go for wholesale auction, we cannot compete because of our poor packing techniques and high operation costs. Our Japanese buyers are our old associates, and they supply to their institutional clients, thus they do book order. Our supply quantity is not much. We send net 60 to 70 kgs matsutake per shipment. Choden may be dispatching net 40 to 50 kgs mushroom, Dekiling 30 to 35 kgs and Bumri 30 to 40 kgs. All put together, not even 200 kgs. Compare this with the supply from China. We hear that they ship 600 kgs on a daily basis.”

The marketing channel for matsutake export is as illustrated in Figure 7.4.

Fig.7.4 Marketing channel for matsutake.



7.7 Rapid Vulnerability Assessment

Issues of over harvesting and habitat destruction of matsutake in Genekha have been reported in the national newspaper *Kuensel* (Kuensel 2004c). There have been attempts in the past by the National Mushroom Centre to allow matsutake collection only to those farmers who have registered and received training on harvesting. The intention was to control the over-exploitation of the matsutake resource. In order to assess how real the

ecological or environmental concerns are, the Rapid Vulnerability Assessment was run for matsutake. The theoretical considerations for RVA were discussed in Chapter 3 and 4.

i. Life form: Matsutake is a fungus, thus fast growing, prolific sporulation, short-lived, fast reproducing ephemerals.

Rank: No Vulnerability **Score:** 0

ii. Abundance and distribution: Matsutake are found stretching across the whole of Northern Hemisphere. It is a widely distributed species.

Rank: No Vulnerability **Score:** 0

iii. Parts used: The product used is the fruiting body.

Rank: Low Vulnerability **Score:** 1

iv. Demand: There is currently high market demand for the product.

Rank: High Vulnerability **Score:** 3

v. Traditional conservation practices: Community control over the resource is strong with a system of rules and sanctions.

Rank: Low Vulnerability **Score:** 1

vi. Substitutes: Matsutake is an ancient Japanese delicacy. No large-scale artificial propagation has been possible yet. The demand for matsutake from the wild will continue.

Rank: High Vulnerability **Score:** 3

vii. Population density: Per capita forest area in Genekha is 14 hectares. The population density is thus very low.

Rank: Low Vulnerability **Score:** 1

viii. Technology use: Simple technology of hand and stick used.

Rank: Low vulnerability **Score:** 1

Table 7.11 is a summary for the RVA. Matsutake gets a total score of 9 out of 24, indicating a moderate vulnerability to commercial harvesting. It is robust enough to stand the collection pressure, thus should not be a matter of immediate concern for the resource managers.

Table 7.11 Rapid Vulnerability Assessment for Matsutake

Factor	Remark	No (0)	Low (1)	Moderate (2)	High (3)
1. Life Form		√			
2. Abundance and Distribution		√			
3. Parts Used	Fruiting body				
4. Demand					√
5. Traditional Conservation Practices	Traditional management		√		
6. Substitutes					√
7. Human Population Density			√		
8. Technology Use			√		
Sub-Total			3		6
Total		9			

7.8 Discussion and Conclusions

The commercial harvesting of matsutake in Genekha is a good example of many forward-looking principles in the sustainable management of natural resources. The first principle is private sector involvement in the identification and development of the matsutake industry. The second is the principle of economic incentives for the local people to mobilise and take control of the resource base. The third principle is government policy support and interest in the commercialisation of matsutake.

Chapter 8: Case Study Three

Piper pedicellatum: Low Altitude Medicinal Berry

Piperaceae, in which *Piper* belongs, is a family of aromatic tropical and sub-tropical herbs, shrubs or climbers. The family with about eight to nine genera is said to contain 2000 to 3000 species (Yongqian, Nianhe et al. n.d.). In Bhutan, many *Piper* species grow abundantly in the sub-tropical region that border India. As early as the 1960s, the Bhutanese were selling the *Piper* berries

to Indian merchants. *Piper* species in India were widely used herbs in the 5000-year old Ayurvedic medicine system for treating cough and coughs to indigestion and respiratory problems (www.dabur.com). Known by the Sanskrit name of 'pippali', the principal species is *Piper longum* (Pic.8.1), but the berries of *Piper*

pedicellatum (Pic.8.2) are also used in Ayurvedic medicine. It appears that there is no distinction made in trade between the berries of *Piper longum* and *Piper pedicellatum*. While Bhutan has both the species, the commonly traded product from the country is the berry of *Piper pedicellatum*. It is sold by the trade name of 'pipla', and henceforth the term 'pipla' will be used in this research study to mean the

berry of *Piper pedicellatum*, unless otherwise mentioned. For Bhutan just opening up to

Pic.8.1 *Piper longum* L.



Pic.8.2 *Piper pedicellatum* C. DC.



outside world, and economically undeveloped as it was, the sale of pipla was the only major source of cash income for the many poor subsistence farmers living in the remote villages in the sub-tropical belt. The pipla thus represented one example of early NTFP commercialisation in the country.

8.1 History of Use and Commercialisation

Ayurvedic, the 5000-year-old Indian medicine system is based on natural and holistic living. Derived from two Sanskrit words **Ayu** = life, and **Veda** = knowledge, it refers to the Science of Life (www.dabur.com). The Ayurvedic texts list ‘pippali’ as one of the most powerful herbs for enhancing life longevity. Along with black pepper and ginger, pipla is part of the famous digestive formula known as *Trikatu* (Three Spices). The medicinal uses of ‘pippali’ are reported to be wide ranging, especially for treating coughs and cold to indigestion and respiratory problems, as discussed earlier. It is also highly prized for its ability to enhance assimilation and potency of other herbs in a synergistic formula, thus it is found in many of the Ayurvedic medicinal formulations (www.mapi.com).

Piper nigrum L., the black pepper, cultivated over 3000 years in India, is another historically important *Piper* species. For centuries it was the most sought-after spice in the world. In medieval Europe, black pepper was classed with gold, silver and gems. Western traders sold black pepper for 600 times more than what it cost them in Indian ports. Jackson (2004:1) notes,

Columbus voyaged to the New World in search of India and its black pepper; unsuccessful but undaunted, he named the most pungent New World food “pepper” and the people who cultivated it “Indians”.

The word ‘pepper’ also refers to chilli (*Capsicum* spp.). It is thus very confusing that ‘pepper’ is used to describe plant products as distinct as black pepper and chilli. Matsuya (n.d.) notes that since black pepper was such a valuable spice in the medieval period, it exerted influence over the names of several other spices.

Many of the Ayurvedic's ancient medicinal formulations are being product branded by herbal companies in India today. Two such branded products are *Chyawanprash* and *Hajmola* in which 'pippali' is one of the ingredients used. *Chyawanprash* is said to strengthen body's internal defence and immune system, thus offering protection from everyday infection, cough, colds and stress. *Hajmola*, to be taken after meals, eases conditions of flatulence, controls dyspepsia, increases appetite and helps in proper digestion. The two products are a part of the rapidly growing multi-million herbal industries in India (www.dabur.com).

In India, besides the recent growth of the herbal industry, it has been a tradition for family to keep small amounts of pipla where it formed a part of home treatment for everyday colds and coughs. The Indian merchants living in border towns have therefore for a long time shown interest in pipla from Bhutan. Bhutanese people picked pipla from the wild for sale to Indian merchants but forest rules restricted them from doing it openly. The Department of Forests instead engaged in state trading i.e. buying pipla from the people and selling it through an open bidding with the aim to earn profits for itself (Kuensel 1974; Kuensel 1975). According to Mr. BB Chettri, a senior forest officer with the Department of Forests,

“In the beginning, our primary task in the Department of Forests was timber production. We did not concern ourselves seriously with the NTFP. If there were forest products that had the market demands, we would put up the harvesting rights to the highest bidders, be they Bhutanese or Indians. The winning bidders then hired or paid the villagers to collect the products or we bought the forest products from the villagers and we auctioned them. The villagers were not allowed to sell directly in the market. Later, the bidding of forests and sale of forest products were either restricted or stopped on the ground of forest resources experiencing over-exploitation. The important forest products in the south were pipla, ritha-majito, chirata, brooms, dalchini –tezpat, bamboos and cane.”

Villagers could not sell the forest products where they wished, and the forest guards generally harassed them for permits or for breaking the law. However, in 1993, the government recognizing the economic benefits accrued to remote communities allowed people in four Dzongkhags the right to collection of pipla without the need of payment of royalty, but they were required to sell it only through the Food Corporation (FCB). The intention for selling the products through the FCB was to get a fair price from the Indian merchants through open bidding. But, in Bhutan itself, pipla is used only in small amounts in the Bhutanese traditional medicine system, therefore there is no domestic demand.

8.2 Taxonomy, Ecology and Distribution

About 12 species of *Piper* are reported from Bhutan (Grierson and Long 1983). It is the berry of *Piper longum* L. and *Piper pedicellatum* C. DC., which is used in the Indian traditional medicine system. *Piper longum* is a climber growing at an altitude range of 150 to 800 metres above sea level. *Piper pedicellatum*, on the other hand, is an erect shrub of 1 to 2.5 metres high, growing in the altitude range of 290 to 1800 m asl. It flowers from March to May, and fruiting from September to October. It grows best under tree canopy but can also be seen growing in open spaces. The associated tree species include *Acrocarpus*, *Ailanthus*, *Bombax*, *Daubanga*, *Castanopsis*, *Cordia* and *Pterospermum* (Grierson and Long 1983). Picking the fruits from *Piper longum*, a climber, is said to be more laborious and difficult than picking the fruits from *Piper pedicellatum*, a freestanding shrub. People say that there is no difference in price between the berries, so they collect mostly the berries *Piper pedicellatum*.

There are also many other species of *Piper* that have economic value. The leaves of *Piper betleoides* and *Piper hamiltoni* have stimulant effect (Grierson and Long 1983). It is a cultural practice in Bhutan for people to chew the leaves of these *Piper* species with betel nut and lime, popularly known in Bhutan as ‘doma pani’.

Reproductively speaking, *Piper* is polygamous or dioecious i.e. male and female reproductive parts are in separate plants. As the male and female ‘flower’ can look

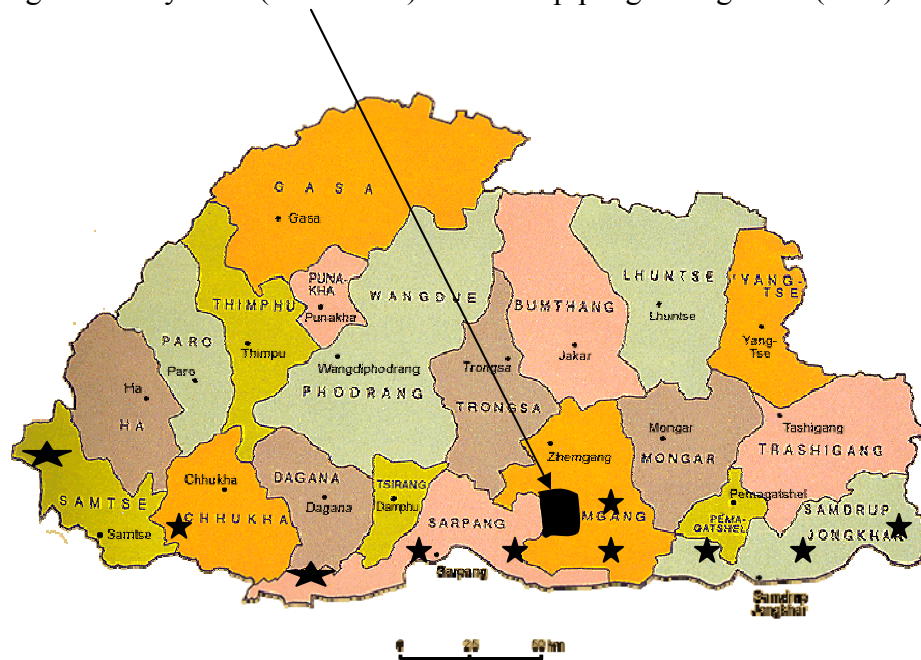
dramatically different, one is tempted to think the plants are different species. The male anthers of *Piper pedicellatum* are slender while female berries are rounded. It is only the female berries which have the economic value, not the male anthers. One problem faced by traders is the adulteration by the farmers of female berries with male anthers.

8.3 Study Area

Pipla is found in the dense subtropical forests in the south of the country, bordering India. In the past pipla collection was common from west to east of the country, but today it is important only in the central-south region, most principally the Zhemgang Dzongkhag. The district headquarter is 225 kms from the capital, Thimphu but takes one to two days to reach by car. It is one of the most isolated districts in the country. The Trongsa-Gelephu road runs through it from north to south, with a branch road from Tingtibi to Gongphu, and another recently constructed from Dakpai to Buli. The district is characterised by steep slopes and narrow valleys, and limited infrastructural development. Forests cover over 86% of the district. The villages are scattered over the district, and many of them are 1 to 3 days walk from the nearest roadheads. The population density is low at 8/km², and the out-migration rate is high at 22.4% (ISDP 1994).

Pipla collection is important in four of the seven *geogs* in the district, with Nangkhor *geog* being the most important one. The District Administration and Department of Forests have only recently completed a community-based natural resources management plan for pipla for the four villages in Nangkhor *geog*. These four villages in the *geog* were chosen as the study area. Figure 8.1 shows the study area in dark shade and other pipla growing areas in stars.

Fig. 8.1 Study Area (dark shade) and other pipla growing areas (stars)



8.3.1 Land Use

Nangkor *Geog* has a total land area of 494 km². It has not been possible to obtain the normal land use statistics for the *geog*. However, from the district office, the following information was made available (Table 8.1).

Table 8.1 Agriculture land use

Agriculture Land Type	Wetland	Dryland	Tsheri	Mandarin	Cardamom
Area (acre)	432	632	1164	71	7

8.3.2 Climate

Temperature and rainfall are strongly related to aspects and altitude in Bhutan. The altitude in the *geog* range from 1000 to 1700 m asl. There are only four meteorological stations in the whole of the district. The information from two stations at Buli (alt. 1700 m) and Tingtibi (alt. 500 m) is used to describe the study area (ISDP 1995). For Buli, the

mean temperature in summer is 24°C and mean temperature in winter is 12°C. The mean annual rainfall is 1914 mm. And for Tingtibi, the summer and winter mean temperatures are 28°C and 15°C respectively. The mean annual rainfall is 1700 mm.

8.3.3 Vegetation

Within the broad sub-tropical climatic zone, the forest types present in the study area include low montane broadleaf, chir pine and high montane broadleaf (ISDP 1995). The low montane broadleaf is found between 1000 to 2000 m altitude and with annual rainfall of 2000 mm. The principal tree species are *Schima wallichii*, *Castanopsis* spp, *Terminalia myriocarpa* and *Alnus nepalensis*. This is the most dominant forest type in the study area. The chir pine forests are found on the drier sites, generally on the south facing slopes between 700 to 2000 m altitudes. The annual rainfall is said to be below 1000 mm. The biodiversity is said to be relatively low. The chir pine trees are an important source of resin, and there existed a small-scale resin tapping operation in the recent past. The principal tree species are *Pinus roxburghii*, *Macaranga*, *Rhus sinensis* and *Quercus* spp. In the higher reaches of mountain slopes are the high montane broadleaf. It is found between 2000 to 3000 m asl with annual rainfall over 1000 mm. The principal tree species are *Castanopsis hystrix*, *Castanopsis tribuloides*, *Quercus lamellose* and *Persea odoratissima*.

8.3.4 Socio-Economic Context

The district is culturally homogenous, inhabited by a major ethnic group known as *Khengpas*. The people speak *khengkha* as their mother tongue, quite distinct from the national language *Dzongkha*. The total resident population in the district in 1994 was estimated at 16,755 persons living in 2234 households. About 51.3 % of the population are women. In the upper and middle part of the district, it is matrilineal. Women are the owners of the houses and take key decisions in the household economy. However, in the lower part of the district, it is patrilineal (Ton and Choeda 1996).

The villages in the district are one of the most geographically isolated areas in the country. The economic opportunities are limited and living conditions hard. The overall outward migration from the district is estimated at 22.4% of the total population. Nangkhon Geog, the study area, has the highest outward migration percentage at 32% (ISDP 1994).

The farm households grow crops and keep livestock. The household efforts are directed to food production for the family. As the irrigation system is limited or absent, crop production is rainfall dependent. The important crops grown are maize, wheat, barley, sweet and bitter buckwheat. Eating rice carries social prestige but its production is restricted to small pockets only where irrigation facility is available. The farm households also keep cattle for dairy production, bulls for ploughing, pigs for meat production and chickens for eggs. The livestock and their products are for subsistence use, bartering and income generation. Despite all household efforts directed to food production, many households in the study area, constrained by land, technology, labour and market are not self-sufficient. The agricultural work is generally by hand and only simple tools, hardly mechanised. The wild yam and wild vegetables from the forests are important food supplements in the household diet. Additionally, the farm household has to expend money for products it does not produce such as clothes, footwear, cooking oil, salt, sugar, tea, torch, batteries and kerosene. Payment of taxes and children's education also put demand for cash for the household.

Money, as in the rest of the country, is increasingly becoming the most important factor in the household livelihood. Farm households therefore are obliged to engage in income generating activities to obtain cash necessary for household expenses. However, the households are fraught with many difficulties in the switch from subsistence living to cash economy due to geographic isolation, underdeveloped infrastructure, limited transport facilities and lack of a functioning market (Tander 2000).

A farm household in the study area incurs an annual cash expenditure between Nu. 12,655 – 36,870 (US \$ 281 – 819). Of this, 26 to 36 % of expenditure is on food, and

18 to 32 % on children education and cultural. Education is free, but households incur expenses on children's toiletries, clothes, footwear and transportation. Cultural expenditure relates to hosting and organising an annual household religious festival known as '*lochod*' (Table 8.2). The annual household cash income is between Nu. 14,449 to 83,825 (US \$ 321 – 1,863). Livestock and livestock products at 37 - 41 % account for the highest household cash income. The food and cash crops account for only 4 to 14 % indicating cash cropping as a strategy to enhance rural income is not properly developed. Income from wage that includes hiring out labour on road construction is in the range of 13 – 16 %. The remittances make up for 10 – 17 % of cash requirement. The forest products, mostly pipla and resin tapping, account for 7 – 30 % of cash income. However, resin-tapping has been stopped due to restriction by the Department of Forests on the ground of forest conservation (Table 8.3).

The above figure ranges have been obtained from group interviews and should be taken as rough estimates. The annual household expenditure range from Nu. 12,655 to 36,870 for the study area is lower than the national average for rural areas estimated at Nu. 63, 924 by a national survey on household income and expenditure (CSO 2001). The region is generally considered to have one of the highest incidence of poverty in the country (RGOB 2000).

Table 8.2 Annual Household Expenditure

	Item	Goling⁰ (Nu.)	Sobling¹ (Nu.)	Ngakhar² (Nu.)	Tsaidang³ (Nu.)	Sub-total (Nu.)	%
1	Food, Beverages & Tobacco	2000 - 5000	5000 - 10000	5000 - 8000	6000 - 15000	4500 - 9500	36 - 26
2	Clothing & Footwear	1000 - 3000	1000 - 3000			1000 - 3000	8 - 8
3	Housing, Fuel & Power	1520 - 3880	1100 - 3000	2000 - 4000	2500 - 5600	1780 - 4120	14 - 11
4	Transport & Communication	1000 - 2000	2000 - 3000	500 - 5000	2500 - 5000	1500 - 3750	12 - 10
5	Medical & Health Services	500 - 1000	500 - 1000	600 - 2000	300 - 6000	475 - 2500	4 - 7
6	Education, Recreation, Entertainment & Cultural	3000 - 13000	2500 - 11000	1600 - 10000	2000 - 13000	2275 - 11750	18 - 32
7	Personal Care & Personal Effects	2000 - 3000	500 - 1000	1000 - 2000	1000 - 3000	1125 - 2250	9 - 6
8	Miscellaneous Expenses						
	Sub-total	11020 - 30880	12600 - 32000	10700 - 31000	14300 - 47600	12655 - 36870	100 - 100

⁰ Group Interview with 4 women (Total HH number = 47)

¹ Group Interview with 7 women (Total HH number = 8)

² Group Interview with 19 persons; M=5, F=14 (Total HH number = 28)

³ Group Interview with 28 persons; M=10, F=14 (Total HH number = 26)

Table 8.3 Annual Household Income

	Item	Goling (Nu.)	Sobling (Nu.)	Ngakhar (Nu.)	Tsaidang (Nu.)	Sub-total (Nu.)	%
1	Crop farming & gardening	7060 - 11100	700 - 1800	200 - 600	150 - 1000	2028 - 3625	14 - 4
2	Livestock, Poultry	800 - 4600	6350 - 14300	7300 - 83000	9300 - 21200	5938 - 30775	41 - 37
3	Fishing						
4	Forestry & Hunting	300 - 40000	2200 - 56000	500 - 2000	1000 - 3000	1000 - 25250	7 - 30
5	Wage/salary employment	2000 - 10000	4000 - 15000		1000 - 8000	2333 - 11000	16 - 13
6	Non-agricultural enterprise	100 - 500		300 - 2000		200 - 1250	1 - 1
7	Remittances	5000 - 10000	1000 - 10000	2000 - 5000	2000 - 10000	2500 - 8750	17 - 10
8	Interests and Dividends						
9	Others (alcohol)	300 - 1000	200 - 4000	1000 - 7000	300 - 700	450 - 3175	3 - 4
	Sub-total	15560 - 77200	14450 - 101100	11300 - 99600	13750 - 43900	14449 - 83825	

8.4 National Policy and Regulation

Pipla was once commonly traded across the southern part of the country bordering India. According to Mr. KB Gurung (42), a professional driver who originally was from the southwestern region,

“I picked pipla as a young boy in the early 1970s in Kalikhola (southwestern region). My family was very poor. We did not have any land. So we had no choice but to pick pipla to survive. Pipla provided us an opportunity to earn cash, and its price was attractive. We got Nu. 16 a kilogram. This was about three times the day’s wage of Nu.6 then. All the people in my village were generally poor. So everyone picked pipla. At the Kalikhola market, there would be many Indian merchants asking and rushing to buy pipla from the farmers. With the money from pipla, we bought rice and other food provisions.”

The forest rule prohibited the free sale of pipla. Rural people were required to sell the products to either the contractor who won the licensing right or to the Department of Forests, which then sold the products through an open auction. But, the enforcement capacity of the Department of Forests was limited in the beginning, therefore could not cover all areas. According to the women’s group of Sobling Village:

“There were no forestry people in our district in the beginning – about 20-25 years ago. In the later years, when forestry people started coming to our village on visits, they said that we were not allowed to collect and sell pipla. They fined people possessing and carrying pipla.”

At the same time, the government was aware of the economic benefits pipla brought to the poor districts and poor people. His Majesty the King issued a royal command in 1993 giving the people in four Dzongkhags (Zhemgang, Mongar, Pema Gatsel and Samdrup Jongkhar) the right to harvest and trade pipla without the need to pay royalty. The Royal Command also asked the Food Corporation of Bhutan (FCB) to organise the auction of pipla so that the farmers got a fair price for their products. This

was to be achieved through the elimination of middlemen and competitive bidding for products at an open auction. Since then the FCB has been assisting the farmers to auction pipla through its network of auction yards based in the major border towns. The people in the study area take their pipla to the FCB Auction Yard in Gelephu, 70 kms away.

The rule on trading of pipla through the FCB was well intentioned, but the dynamics on the ground made it obsolescent. According to the people,

“When the prices are good, the Indian businessmen in Gelephu would wait at the bus terminal for people with pipla. The pipla then would be carted straight to their godowns (store rooms). In the following day, they would help us take the consignments in their threla (cart) to the FCB Auction Yard. In my opinion, the bidding is only a namesake. There is a syndicate formation amongst the Indian businessmen. At the most, there would be four Indians bidding in the auction. They raise the bid by such small amounts as 25 to 50 chetrums. The bidding takes place so quickly, and before we are able to make sense of the things, the bidding is over...The auction rather serves the interest of Indian businessmen, that is the auction is a certification for them that the purchase is legal, thus facilitating movement of the consignments in India.”

Mr. Dorji, shopkeeper and pipla trader, Dakpai

“We have pipla only in small quantities, and it does not make sense to take it all the way to Gelephu. But, when we do take pipla we combine it with other works such as annual household purchases. And in Gelephu, we sell directly to the Indian businessmen. It is so much convenient to sell to them, rather than wait the next day to take to the FCB. We go from one Indian businessman to another to get the best price from them.”

Women Group – Ngakhar Village

“Last year I earned Nu. 1330. I took the pipla to Gelephu and sold directly to the Indian businessman as soon as I reached the place in the evening. I wanted money immediately to buy things and return home in the morning next day. I didn't have time to wait to take pipla to the FCB, and waste my time for nothing.

Ms. Chitem Wangmo (30), Goling Village

The Indian businessmen also concede that the FCB system is not the best deal for the farmers. Firstly, pipla holdings by individual farmers are in small amounts of tens of kgs, and taking them to FCB meant investing a full day for the transactions. It also meant more days when their arrival coincided with the weekends and government holidays. The farmers prefer fast and simple transactions. Secondly, the FCB charges 3 % commission each to the seller and buyer. The Indian bidders incorporate their 3 % commission in their cost calculation, thus passing it onto the farmers. In essence, the farmers pay a total of 6 % commission charge; small-scale producers lose in the FCB system.

While the farmers do not need to pay a royalty for the harvesting right of pipla, they are required to obtain a transit permit when moving the produce from the village to the market. The transit permit and sale only through the FCB rules can sometimes cause farmers and traders problem with the Department of Forests. In 2003, the Sarpang Forest Division seized a pipla consignment of 7,840 kgs without a transit permit. As forest offices are far from the villages, obtaining a transit permit though free can be problematic to farmers and local traders. According to Mr. Dorji, a pipla trader:

“The forestry people do not allow us to move forest produces without a transit permit, and we also need to produce it to enter the FCB Auction Yard. It can be a lot of work for us to obtain the permits. Often the forestry people don’t check but if some forest individuals want to harass us they can do so on this basis.”

8.4.1 Community Control

Supply and demand largely determine the claim to property rights of pipla in the study area. When the price is low, there is no motivation for people to lay claim to property rights. Pipla is found growing widely on the edge of agricultural lands, along the footpaths and in the forest areas within a distance of half an hour to one-hour walking. For instance,

“The furthest we may go to pick pipla is half an hour to one hour. Pipla is abundantly available in the nearby forest areas of our village. It is open to all. There is no restriction. We pick from anywhere and wherever we like. We even go over to Talipa’s area. Their village is high up the mountain, and we are closer to their pipla areas than them. But, they don’t say anything when we pick from their areas.”

Women’s Group – Goling Village

However, when the price of pipla is high, there are claims made over the property rights.

“When the price is good, people can be protective and hostile to outsiders picking pipla in their local areas. And when the price is poor, nobody bothers about anybody picking it. I also pick pipla when the price is good.”

Mr. Dorji, shopkeeper and pipla trader, Dakpai

Except for some hostility to outsiders in some years and in some places, access to the resource base is generally open to all. This has led to some farmer collectors picking immature berries. The immature berries weigh less, do not dry well, and fetch low price. The Dzongkhag Administration with support from Department of Forests is currently piloting a community-based natural resources management (CBNRM) for pipla for the four villages of the study area. The CBNRM, amongst others, will agree on a common starting and ending dates.

8.5 Value Chain for Pipla

8.5.1 Production

There has been no demand for pipla in the last two to three years. The local traders have stopped visiting villages for its collection. The auction price for pipla in 2003 at the FCB, Gelephu was Nu. 31/kg, and only about 71 kgs of it were auctioned for the year. There was no auction at all in the previous year. During the high demand years, the local traders paid farmers as high as Nu. 90/kg, with average price range of Nu. 50 – 70/kg. The

women collectors said that it was not worth the effort to pick pipla when the price is less than Nu.50/kg, but they remained worried over their main source of cash income drying up. According to women collectors:

“We have had no traders coming to our village for some years now. Generally one or two of them come. We are worried about not earning any cash now.”

As the study area is remote and isolated, sources of cash income are extremely limited, and people suffer from seasonal food shortages. According to the people,

“Our agricultural produce is not enough, and cannot see us through the year. We need money to buy food for the family. And also, the government asks for money in the form of taxes. That is why for the purpose of earning small cash, we pick pipla. We have no regular source of cash in the village... It is difficult to say how much we earn from pipla because we exchange it for clothes, and repay the advances taken from the traders with pipla... In the past we used to rear pigs, but we don't now after our Lama told us not to rear pigs...When we don't have cash, we feel helpless, and suffer from lack of confidence in life. People don't look favourably upon people with no money.”

Women's Group – Goling Village

“Pipla is the main source of cash income in the geog; otherwise the villagers have no other economic opportunities. It contributes greatly to the welfare of the people. It is abundantly available and renewable. The cattle do not eat it. There is no problem in its regeneration. It has no storage problem.

Mr. Dechen Wangdi, Nangkhor Geog

The product, that is the berry, is sold in raw form. The berries are picked by hand (Pic. 8.2). Once dried properly, they have a long shelf life and they can be stored in jute bags for years (Pic.8.3). There is very little product transformation required. According to the women's group in Goling village:

“After we reach home from the picking, we, first of all, measure our collections by bray¹⁹ to find out how much we have picked for the day. Then we immerse them in boiling water for a few minutes. We drain the water and dry them in the sun. The boiling water treatment is very important because pipla dries faster and maintains the black dark colour. If we dry pipla straightaway, they don’t dry uniformly and they develop white patches. And they don’t get good prices.”

There is no traditional use of pipla, nor are local people aware for what they are specifically used for in India. People have no access to market or price information. The price information has been the prime domain of Indian merchants, and their networks. There is also no information available on the marketing chain in the link after the FCB auction. According to Mr. Dorji, shopkeeper, Dakpai:

“We don’t have any local use of pipla, and we also don’t know what it is used for in India. When we ask the Indian merchants, they say that it is used in the formulation of Indian medicine.”

Pic.9.2 Pipla plant and a berry



Pic. 9.3 Sun drying of berries



¹⁹ Bray is a local measurement unit, measured by volume.

8.5.2 Collection

It is mostly women who collect pipla and during the season it is a dedicated work. Men only join in the collection when the price is attractive, or they engage in the opportunistic collection when herding animals or passing through the forests. According to the women collectors:

“It is a dedicated task for us women. We go to the forests before daybreak with our packed lunches and return late evening. It is hard work, falling over the rocks and having to fight with insects, leeches and snakes. It is either picking in the scorching sun or in the pouring rain. Mothers are also forced to leave behind their babies. Sometimes the husbands complain that they are not able to look after the crying babies, and begin to doubt if the pipla collections are worthwhile...In a day, we can pick anything from 6 to 10 brays. One bray equals 3 kilograms of fresh weight so that’s 18 to 30 kgs of pipla. 2 kilograms of fresh weight equals 1 kilogram of dried weight. So it is about 9 to 15 kgs of dried piper in a day. If we calculate an average price of Nu.50 a kilogram for dried pipla, it works to Nu.450 to 750. This is a lot of money for us, and this income is many times higher than the daily wage of Nu. 120.

Women’s Group – Tsaidang Village

“Women are fast pickers. Men are clumsy. Men do the heavy work such as collecting firewood, and portering jobs. And also we women are more concerned about the household needs whereas men are generally insensitive and indifferent. We need to order our men to do things.”

Women’s Group – Ngakhar Village

“Men do not bother about small household needs. It is only women who have to worry about everything concerning household food provisions and expenses. Pipla allows us to make some money.

Women’s Group – Sobling Village

8.6 Trade and Marketing

There are three ways the farmer collectors sell their pipla. They include (i) local traders, (ii) road side shops, and (iii) FCB or Indian merchants at Gelephu. In the first method, the local traders come visiting villages for pipla. The traders either offer cash payments or goods, generally clothes that they bring with them. As the villages have no road connections, the goods must be in a limited amount. They charge 5 kgs of pipla for one *half-kira*²⁰, 3-4 kgs for one *taego*, 3-4 kgs for trousers, and 2 kgs for a plastic mat. Women particularly find this system attractive and convenient as they get to buy new clothes for themselves and children even when they know they are not getting the right price. It also saves them the time and labour otherwise required for taking the products to the market. In the last two to three years, there have been no local traders visiting the villages. Many households have stocks of pipla waiting for traders or the right price at the FCB, Gelephu. According to Mr. Dechen Wangdi of Goling Village,

“All households will have pipla in stock. I myself have 10-15 kgs of it, and I am waiting for a trader to come by.”

In the second method, farmer collectors take pipla with them when they visit the shops at the roadside for their household purchases. Pipla is used as a currency, but it is valuable insofar as when the price is good. According to Mr. Dorji, shopkeeper at Dakpai:

“In the past when the villagers did not have cash to buy goods from my shop, I used to accept pipla as a form of currency. I used to pay them Nu.50/kg. At the Gelephu Auction Yard, I got on average, Nu. 60/kg. There was not much profit, taking into account the transportation cost. There is no demand for pipla in the last two years. I have stopped doing the pipla business, and I have also stopped accepting pipla as a form of payment from the villagers.”

²⁰ *Half-kira* and *taego* refer to women’s traditional dresses.

In the third method, the farmer collectors or the traders take their products to Gelephu for sale directly to the Indian merchants or through the FCB. Since the legal trading of pipla in 1993, the amount auctioned by the FCB for Zhemgang Dzongkhag rose from 957 kgs in 1994 to 15,969 kgs in 1999. Then it was a free fall to 3309 kgs in 2000, and zero sale in 2002. The revenue generated to the district ranged from Nu. 2,186 to Nu. 1,195,340, indicating a notorious demand/price fluctuation for pipla (Table 8.4). The price per kilogram of pipla ranged from as low as Nu.31 in 2003 to as high as Nu.120 in 1997, with a mean price of Nu. 80 (Table 8.5).

Table 8.4 Volume and Value of Piper from FCB Auction Yard – Gelephu

Dzongkhag	Year	Quantity (kg)	Amount (Nu)	Surcharge (Nu)	Labour (Nu)	Net Amount (Nu)
Zhemgang	Jul 94 – Mar 95	957	66,802	4008	28	64,770
	Nov 95 – Mar 96	10,270	9,54,540	57,272	-	9,25,904
	Apr 96 – Mar 97	11,446	1,195,340	71,720	448	11,59,031
	Apr 97 – Mar 98	8,746	6,40,514	38,431	122	6,21,176
	Apr 98 – Mar 99	15,969	9,64,390	57,863	80	9,35,378
	Apr 99 – Mar 00	3309	2,09,672	12,580	-	2,03,382
	Apr 00 – Mar 01	3820	3,38,516	2032	-	3,28,361
	Apr 01 – Mar 02	No piper sale				
	Apr 02 – Mar 03	71	2186	131	-	2120

Table 8.5 Piper Auction Rate in Gelephu FCB

Date	Auction Rate (Nu./kg)	Date	Auction Rate (Nu./kg)	Date	Auction Rate (Nu.)
16.01.94	60	06.01.97	93	08.05.98	67
15.12.94	61	08.01.97	117	01.11.98	55
26.12.94	71	08.01.97	110	10.12.98	61
23.01.94	67	17.02.97	105	11.12.98	60.5
28.01.95	90	19.02.97	105	25.12.98	6.5
28.12.95	94	26.02.97	112	30.12.98	58
04.01.96	95	19.03.97	62	08.01.99	59
09.03.96	96	09.05.97	95	15.01.99	59
21.11.96	120	20.11.97	85	27.01.99	61
21.11.96	95	20.01.97	78	11.02.99	59
25.11.96	111	06.12.97	75	15.02.99	60
28.11.96	111	11.01.98	65	12.03.99	63.63
04.12.96	120	23.01.98	67	13.12.99	63
04.12.96	116	23.01.98	66	20.12.99	63.5
15.12.96	103	04.02.98	63.5	17.04.00	88.62
20.12.96	100	27.04.98	65	24.04.03	31

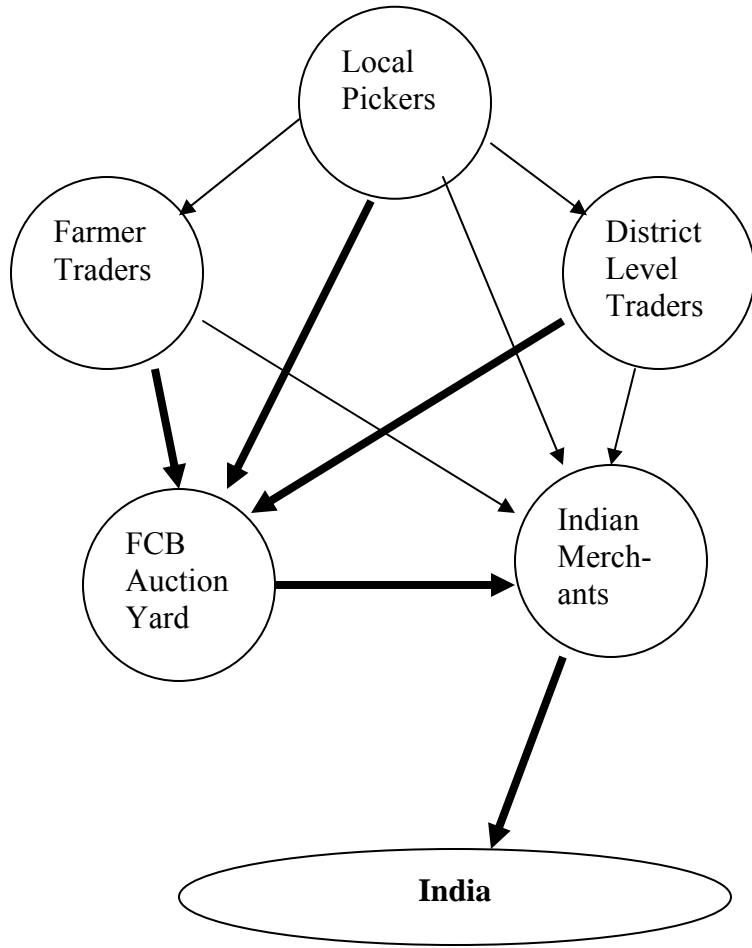
The FCB figures reflect perhaps only half of the total sale of pipla from the Dzongkhag as many farmer collectors sell directly to Indian merchants. Nonetheless, it gives a good picture of the size of pipla industry in the district, and its importance to poor subsistence farmers. Until the price crash in 2002, pipla sale was pumping into the village economy annual mean revenue of Nu. 605,429. According to the women groups:

“We wish the government had bought pipla from us or made arrangement for alternative marketing. This would have been very beneficial to poor people like us. We would also feel grateful if the government established collection or trading points in the villages where we could sell our produces. At the moment, it is impossible and inconvenient for us to transport pipla by road to Gelephu, as our pipla amounts are small. And with the traders in the villages, we don’t get good prices.”

India’s annual export of herbal products is estimated to be over Rs. 734 crores (US \$ 170 million), and it is said to be growing at an annual rate of 15 % (TF n.d.). The total annual consumption of ‘pippali’ in India is estimated at 4000 tons (www.nmpb.nic.in). A considerable effort was made for this research study to find out why the demand for Bhutanese pipla dropped in the last two to three years, but information was not available. Those Indian merchants interviewed said that they have heard India has started importing pipla from other countries such as Indonesia, and USA. It could be that in some countries pipla is being cultivated on large scale, thus bringing the price of wild pipla down.

The marketing channel for pipla is as illustrated in figure 8.2

Fig. 8.2 Marketing channel for pipla



Informal Route →

Formal Route →

8.7 Rapid Vulnerability Assessment

There is a general perception amongst foresters and forest researchers that people are carelessly harvesting and over-exploiting the resource base (Pradhan et al. 1999; Kinley Tenzin, pers.comm.). However, the farmer collectors do not share the view. According to the people:

“No, we don’t destroy the plants, not at all. We haven’t seen others do so either. Pipla plants are thick bushes, and it is easier to pick berries from the live plants than from breaking the branches. The breaking of plants could be isolated, rare cases caused by children. They may be breaking the branches as they walk back home to pick a few extra berries.”

Women’s Group – all four villages

“I don’t think that harvesting pipla by people can cause destruction to the species. Artificial cultivation on agricultural lands is possible but what is the purpose when they are all over the place like weeds.”

Mr. Dorji, Shopkeeper, Dakpai

“The only problem at the moment is that people pick the berries immaturely. If we hand over the responsibility of management to the local communities, this could be addressed easily by framing rules on boundary and picking time. The berries are ready for picking only in October. As we don’t have a rule at the moment people start picking as early as August and September. The matured berries dry well and also weigh more...”

Mr. Tshewang Dorji, a former pipla trader

In order to assess how real the ecological or environmental concerns are, the Rapid Vulnerability Assessment was run for pipla (see below). The theoretical considerations for RVA were discussed in Chapters 3 and 4.

i. Life form: Pipla is a perennial plant, thus fast growing, and reproducing annually.

Rank: No Vulnerability **Score:** 0

ii. Abundance and distribution: Pipla is distributed widely globally and in the country.

Rank: No Vulnerability **Score:** 0

iii. Parts used: The part used is the berry.

Rank: No Vulnerability **Score:** 0

iv. Demand: There is currently low market demand for the product.

Rank: Low Vulnerability **Score:** 1

v. Traditional Conservation Practices: A CBNRM system is being put in place.

Rank: Low Vulnerability **Score:** 1

vi. Substitutes: There is probable competition for Bhutan's wild pipla from artificial cultivation in other countries. There is currently no demand for Bhutanese wild pipla.

Rank: Low Vulnerability **Score:** 1

vii. Population Density: Low population density at 8/km².

Rank: Low Vulnerability **Score:** 1

viii. Technology use: Berry picking is by hand.

Rank: Low Vulnerability **Score:** 1

Table 8.6 is a summary of the RVA. Pipla gets a total score of 5 out of 24, indicating a low vulnerability to commercial harvesting. Pipla harvesting by the farmers is not a matter of concern from the point of ecological sustainability.

Table 8.6: Rapid Vulnerability Assessment Checklist for pipla

Factor	Remark	No (0)	Low (1)	Moderate (2)	High (3)
1. Life Form		√			
2. Abundance and Distribution		√			
3. Parts Used	Fruit	√			
4. Demand			√		
5. Traditional Conservation Practices	CBNRM being initiated		√		
6. Substitutes			√		
7. Population Density			√		
8. Technology use			√		
Sub-Total			5		
Total		5			

8.8 Discussion and Conclusions

Pipla is one of the early NTFPs with commercial value in the country. It shows that NTFP can be an important source of cash for subsistence farmers getting increasingly drawn into the cash economy. It also shows that its market demand can go up and down. Fruit harvesting has the least ecological problem yet the perception amongst foresters is that it is over exploited. The RVA indicates that it has low vulnerability to collection pressure. The government intervention in regulating the market, which is sale only through the FCB, is not the right policy though the intention is good. The government's role should be understanding the market system and providing this information to the people.

Chapter 9: Discussion, Conclusions & Recommendations

This final chapter reviews the context for the research study, discusses and draws conclusions and makes policy recommendations based upon the research findings. It also suggests future research areas related to NTFPs. The discussion and conclusions are presented separately for each of the categories of policy, economics and environment. The chapter also offers a set of recommendations which could see the mainstreaming of NTFP in the overall forest policy and programmes.

9.1 Introduction: The Context of the Study

Bhutan is a small nation state, entirely mountainous. Infrastructural development schemes in the mountains are more costly compared to the plains, and so are the socio-economic development programmes due to large internal distances and a scattered population. Despite the impressive progress the country has made from subsistence to a modern economy in the last four decades, 79% of the population which are rural have a cash income of less than a dollar a day, and therefore are poor as measured against the international poverty standard (RGOB 2000). The government strategies to enhance rural household income have been to encourage peasants to grow high yielding varieties of crops; to rear high yielding animals; to improve management practices and to cash crop potato, cardamom, apple and mandarin (RGOB 2002). However, NTFP interventions in the rural economy in a country with over 72% of the land area under forest covers are yet to be adequately appreciated by policy-makers. The reasons are many: firstly, the nature of NTFP which is extremely heterogeneous, highly dispersed and vary considerably in distribution and concentration; secondly NTFPs are often associated with traditional uses which take place in household and small-scale units, mostly outside the formal sector; thirdly limited research and poor publicity, and fourthly, the most important from the viewpoint of this research study, is the discrimination against it by the forest bureaucracy, dominated by a culture of state ownership, timber production and environmental conservation. The underlying argument for the thesis is that control-oriented state forestry

culture is the constraining factor in realising the economic potential of NTFP commercialisation in rural development.

9.1.1 Forester: ‘Protector’ of Forests

Forests in many of the developing countries today are state owned, and state foresters see themselves as ‘protector’ of forests. The primary objective of state forestry is timber production to generate revenue to the state. Forestry training therefore exclusively emphasizes technical and biophysical solutions, and foresters’ loyalty is to the state that recruits and pays them. Foresters think of their forestry science knowledge as superior to local knowledge, and assume they know all the answers (TFDP 2000). With the power of state behind them, they command and order villagers around, and they are hardly likely to question their role or to put themselves in the place of villagers. They see no injustice in keeping villagers out of the forest but allowing contractors in (Shepherd 1992a). Foresters by training, job function and organisational culture are thus not best placed to discuss and think about rural development (Burch 1988; Shepherd 1992a; Kuchli 1997).

In the last two decades there has been a growing recognition in development literature about the importance of commercial NTFP in both the local and national economies, but in many developing countries where the NTFP potential is huge and holds promise, the link between NTFP policy formulation, implementation and field reality is still weak (Larsen et al. 2000). NTFP regulations in developing countries are most often detrimental to rural people instead of offering facilitation and support, making the ‘poorest poorer’ (Olsen 1997a). For example, in Nepal, they are characterised by control in extraction, use, trade and marketing which result in arbitrary royalty rates, lengthy and costly export formalities, contradictions in rules, and wide latitude of forestry power (Ojha 2000). The permit system required by law seems to be a tool for rent-extraction rather than a means of controlling harvest to enhance sustainability. Abuse of power on the part of forestry field personnel has been reported, but policy makers maintain that vesting power with the forestry personnel is of decisive importance to the conservation of the NTFP resource. This forestry practice in Nepal is symptomatic of the general culture of state forestry, prevalent in much of the developing world.

9.1.2 Significance of Policy Context

The policy context is central to this research study. Firstly, the policy has the greatest impact on how we view and do things, and it has also the greatest power to change things. The overall aim of this research study is to draw policy-makers to research on an important aspect of forestry that has not received its due respect, but offers tremendous opportunity to meet many of the development challenges facing the country.

Paradigm, defined as a dominant set of ideas and belief system, exerts great influence on policy making (Stone et al. 2001). The prevailing forest paradigm in Bhutan, as discussed in Chapters 1 and 3, is the concept of state forestry. The state forestry concept espouses the belief system that the state is best placed to take responsibility for forest resources, and the people's use of forest must be controlled and carefully regulated in order to avoid damage to forests. Bhutan was never colonised by a foreign power but this forest paradigm, born and nurtured during the colonial period in India, was grafted from India to Bhutan during the process of modernisation beginning in the 1960s. The key to a policy change is the change in the belief system, thus debate and discussion on current policy and practices are important steps in the modification of prevailing narratives (Larsen, Olsen et al. 2000). According to Kuhn (1970 in Guha 1983:258):

“A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up familiar with it.”

Shepherd (1992a) says that as a result of new information and insights gained over the last few decades, the time is ripe to question the colonial traditions and models of forestry in the developing countries. The starting point for this research study is to add to the forestry debate about new forest priorities and strategies, especially with regard to NTFP commercialisation.

9.2 Forest Policy

The policy propositions and questions were:

Propositions	Questions
<ul style="list-style-type: none">• There is no uniform forest policy for NTFP. It is dealt on an ad hoc and case-by-case basis.• There is a trend to incorporate NTFP in national policies but it is more rhetoric than action.	<ul style="list-style-type: none">• How is the forest policy in Bhutan evolving with regard to NTFP?• How does the general forest policy in Bhutan relate itself to NTFP commercialisation?• Why is there no separate forest policy on NTFP in Bhutan?, and• How are the formal forest regulations implemented in reality?

9.2.1 Nationalisation of Forests in Bhutan

Since the forest was nationalised in 1969, forest policy has become an important national issue featuring in nearly every session of the country's National Assembly. Bhutanese forest policy makers may not recognise or accept the fact that forest in Bhutan is a contested domain between the state and peasantry as in any other developing country, with the state asserting its right and control in the name of national interest, and the peasantry who must depend upon the forests for daily subsistence, and resist the state regulation. Many policy makers may argue that it is different in Bhutan, and that peasantry needs are most generously taken into account, but the National Assembly proceedings and field research indicate otherwise. From the point of the Department of Forestry, the nationalisation of forest was the greatest thing that happened to the country, noting that it would henceforth "preserve this important natural resource in Bhutan in the vital national interest" (DoP 2004), and also it would greatly contribute to the country's envisaged "economic growth rate of 10% per annum in the revenue generation from

forests.” (RGOB 1974:1). The rural people on the other hand feel their traditional rights curtailed and their day-to-day interactions with forest made difficult. They, in an every day form of resistance, are not letting the forest issues go away from the national debate, and they do not mind raising them time and again in the National Assembly. They are also increasingly questioning the government for their decisions and actions.

In the review of National Assembly proceedings, the classic state forestry culture of territorial claim, rent seeking and strict regulation of the rural people’s access to forest resources emerge clearly. For example, the state lays claim to trees and NTFP resource in both public and private lands. It has the scant regard to property rights of people by declaring that people forfeit their rights to village woodlots, and lands falling under forest plantation areas. It is insensitive to people’s complaints and grievances (NA 43). The DoF introduces a system of payment of royalty and permit fees to the subsistence farmers who traditionally used the forest (NA 27). The traditional uses of forests are restricted, and strict rules are framed and implemented (NA 19; NA 32; Kuensel 1970). The DoF continues to flout the provisions of the Land Act of 1979, which recognises the right of landowners to the trees and NTFP resource (NA 49).

9.2.2 NTFP Commercialisation

Historically, state forestry was never predisposed to NTFP commercialisation as a means of rural welfare. The subsistence use of NTFP is tolerated but once market demand is identified for a product or species, the DoF starts regulating it. In the early years in 1960s and 1970s, people were not allowed to sell directly to buyers two important NTFP in the south of the country e.g. pipla and chirata. People either sold to the DoF who bulked and auctioned it to the bidders or to the contractors who won the licensing right to the two products. The DoF also levied tax on traditional bamboo products, despite the exemption by a National Assembly resolution (NA 49).

Export of NTFPs can take place only under express approval of the government. The forest bureaucracy is not able to respond to the opportunity offered by private entrepreneurs wanting to link the products to market e.g. pine leaves and cones, and star

anise. The availability of markets for goods is obviously important to commercialisation of NTFPs. The forest decision-making is centralised, and suffer from rationalisation as a permit application for NTFP export is dealt with on a case-by-case basis, underpinning the importance of political connection. For example, a permit application can take as short as one day to as long as 128 days. The movement of forest products are strictly regulated and enforced through forest checkpoints set up on the motorable roads.

The DoF's primary engagement in the Five Year Plans over the years has been forest protection through law enforcement, timber production and plantation programmes. It never saw its place in rural development even when it was the articulated national development objective. Its concept of rural development has been to create awareness amongst the rural people about the importance of forest conservation, and to distribute tree seedlings to rural households for planting (DoP 2004). The DoF's initial interest on economically important NTFPs such as tapping the chir pine trees for resin; essential oil extraction from the lemon grass; and shellac production was from the point of a state enterprise, not rural welfare. And when it could not undertake it for lack of institutional capacity, it issued the licensing right over vast areas of forests to a private corporation. The private corporation then instead of employing the local people brought in hundreds of imported labour into the remote rural areas for the extraction of the resin

It is only in the current Ninth FYP (2002-2007) that NTFP development receives some detailed discussion, but already two and half years into the plan period, strong and committed action is still lacking. For example, the current forest institutional setting for NTFP is only a one-man unit, manned by a lower level officer. A Ministry of Agriculture institutional review in April 2004 noted that the DoF structure did not gear itself to meet the rural development objectives that it has set for itself (MoA 2004).

9.2.3 Cross-Case Analysis

There was no scientific evaluation undertaken for listing of *Cordyceps sinensis* in the protected list of species in Bhutan. It was simply based on the assumption of it being rare. When *Cordyceps* developed high cash value in the international market in the mid 1990s, the DoF was inflexible to respond to economic opportunities offered by it. It, instead, embarked upon an aggressive implementation of the strict protection rule, thus alienating local people. Over-zealous field officers harassed local people, and subjected them to questioning and search. Some even said to people that very act of looking at *Cordyceps* amounted to committing a forest offence. The high cash value of *Cordyceps* instead of bringing cash income brought people anxiety, trouble and conflict with the forestry personnel. Local people were not all motivated to stop the poachers even when they felt intimidated by their large numbers, and when they burnt their summer tent poles and fuelwood. They also felt sad and disappointed when outsiders appropriated a valuable resource right under their nose and from their grazing lands. People over the years found difficult to resist the temptation of making some cash income from the high value *Cordyceps*. It is clear from the case study on *Cordyceps* that the state protection of a high value NTFP is irrelevant. The protection status of *Cordyceps* in Bhutan was removed in 2004, and this marked a milestone in the history of NTFP commercialisation. The lessons learnt from this experience could open a brave new world for the forest bureaucracy in Bhutan.

Matsutake represents the best example of NTFP commercialisation in Bhutan. Firstly, it was the effort of a business corporation who identified and linked the product to an overseas market. The government's open policy for the product encouraged other exporters to join in the matsutake business, thus creating a healthy demand and supply system. Farmers got a fair market price, and were motivated to organise and strengthen community action i.e. by restricting outsiders from coming into their areas.

Pipla is a low value NTFP in contrast to *Cordyceps* and matsutake. In remote poor districts, it still can be a major source of cash income. In the past few years, there has been no demand for it, and this has become a matter of concern for the people. People

can only sell through the Food Corporation of Bhutan. The policy, though well intentioned, causes practical difficulties for the farmers. The government's role instead should be to understand the market system and provide clear price information for the people.

9.2.4 NTFP: Magic Bullet or Not

The sudden international interest in NTFPs in the early 1990s was due to its political message that it was possible both to raise rural incomes and conserve the forests (Peters et al. 1989; Godoy and Bawa 1993; Neumann and Hirsch 2000). However, Belcher (2003) notes that large-scale and capital intensive NTFP development e.g. rattan plantations in South-East Asia is just as likely to displace and alienate forest dependent people as an industrial timber plantation, and results in deforestation through land clearing. Similarly, Belcher and Schreckenberg (2003) downplay the high expectation of NTFPs for rural income saying that NTFP commercialisation is fraught with many challenges. These challenges, as discussed in Section 3.7.1, include: NTFP production as being small and dispersed; markets diverse and faddish; long development time; high barriers to market entry; and problems of substitution and large-scale cultivation. They argue that, because of these challenges, NTFPs are not 'magic bullet' products to raise rural income. However, in contrast, this research study shows that high value NTFPs e.g. *Tricholoma matsutake* and *Cordyceps sinensis* can contribute significantly to household income.

Belcher and Kusters (2004) recognise three types of NTFP strategies at the rural household level. The first is the **coping strategy** in which the NTFP contribution to household economy in real terms is low, but nevertheless remains often the main or even the only source of cash income. People in this group live in a subsistence economy where integration into the cash economy is low. The case of *Piper pedicellatum* represents this group in this research study. In the second group, which is the **diversified strategy**, NTFP is an important source of supplementary income. The case of *Tricholoma matsutake* is a good example of such a strategy. The third NTFP strategy is the **specialized strategy** in which there is a high cash contribution of the product to the

household economy. These products are characterised by high value per weight, relative stability and mature markets, and offer good incomes for the producer households. Both *Tricholoma matsutake* and *Cordyceps sinensis* belong to this third group.

9.3 Economics

The economic propositions and questions were:

Propositions	Questions
<ul style="list-style-type: none"> • NTFP contribution to the national income is significant, and its income is not yet properly realised. • NTFP is the major or only source of cash income for the many remote rural communities. • High value NTFP provides incentives for local people to protect the resource base. • Department of Forests intervention in NTFP enterprise development is weak or lacking 	<ul style="list-style-type: none"> • What is the economic value of NTFP at the community and national level? • What are the processes and issues of NTFP commercialisation? • How is the marketing organised? • How do the policy-makers arrive at decisions to allow or restrict the NTFP commercialisation?

Bhutan has made an impressive improvement in its socio-economic conditions in the last 40 years, but it still faces many major development challenges. As discussed in Chapter 2, these include (i) heavy dependence on external assistance, (ii) negative balance of trade and limited foreign exchange earning opportunity, (iii) prospect of a Dutch disease, (iv) rural poverty. The role of NTFP in addressing these national development challenges has not yet received policy or research interest. The problem is not in the actual value of NTFP, but the failure of forest policy to recognise it, and the national accounting system to measure it (Gordon 1997). One of the main objectives of

this research study is to find out the extent of NTFP contribution to the national economy, and this is discussed under each of the major challenges.

9.3.1 External Assistance

Bhutan is still very much dependent on foreign assistance for its development financing. However, the government has from the beginning of the development process considered economic self-reliance as central to maintaining and strengthening the country's sovereignty, which underpins the development purpose for the country. Since the Sixth FYP (1987-1992), Bhutan has been meeting current expenditure from its current revenue. Bhutan today seeks external assistance for capital financing only, but this funding size can be huge as the economy grows. For example, the budget outlay for the current Ninth FYP is Nu.70 billion (US \$ 1.6 billion), divided equally between current and capital expenditure. The external assistance for the five-year period, therefore works out to Nu.35 billion (\$ 814 million), or US \$ 163 million annually.

Bhutan has so far been lucky with generous foreign assistance. However, the Asian Development Bank warns that given growing pressure on global official development assistance, it is possible that the quantum of external assistance available to Bhutan may decline in the future. The country then will be forced to borrowing from both outside and inside to fill the financing gap (ADB 2003).

NTFP Contribution

The polity and economy in Bhutan in the past, according to Ura (2004), was essentially more local than central. The modernisation process has changed the local system as people and communities came to be regulated more from the centre, and they became net recipients of resources from the state instead of being net creditors to the state, whose financial capacity was increased by international flow of development assistance. The government in the Sixth FYP noted self-reliance at the local and district level as crucial for attaining self-reliance at the national level, and adopted it as one of the five goals for the plan. However, there is no indication to date that this development goal has been

achieved because the *Dzongkhags* and *Geogs* are not entitled to levy, collect and appropriate taxes, duties, tolls and fees. More importantly, the forest resources, the only tangible resource in the rural areas, remain tightly controlled by the Department of Forests, despite legislation granting the landowners rights to trees on private lands.

A full analysis of revenue from NTFP or NTFP contribution to the national economy is not available. A separate project and sustained effort on the part of the government is required to build this information base. However, part analysis undertaken for this research study, particularly the Bhutan Trade Statistics indicates that NTFPs are important export items to India and third countries. The export value for NTFPs from 1995 to 2001 ranged between Nu. 28 to 49 million (US \$ 0.65 – 1.4 million), accounting between 0.57 % and 1.15 % of the total export from the country (Table 9.1). This contribution can be considered significant given that it is a sector that has not received its due recognition, and it represents only a part of its total value. There is under valuation because most NTFPs are often associated with traditional uses that are not widely known and take place in households and small-scale units which are mostly outside the established marketing system/channels, thus forming part of an unorganised informal sector. One example is the lost revenue of US \$ 4 – 12 million on an annual basis due to the policy restriction on *Cordyceps* collection by local people (Jones 2002; Namgyel and Tshitila 2003). There are also many medicinal and aromatic plants (MAP) in Bhutan, which have a market in India but are currently not traded. This MAP trade from Nepal to India is estimated at between US \$ 22 - 70 million annually, making it Nepal's third largest export (Olsen 1997).

A forest deregulation allowing communities and individuals to engage in NTFP trade can provide the much-needed revenue for the local governments to finance their development projects, and be net players rather than net recipients. This can then reduce the country's dependence on foreign assistance.

Table 9.1 NTFP Share of Total Country Export

Year	Total Country Export (Nu. in million)	NTFP Export (Nu. in million)	NTFP % of Total Country Export
1995	3,349.13	32.91	0.98
1996	3,553.77	34.43	0.97
1997	4,274.18	49.06	1.15
1998	4,456.62	46.83	1.05
1999	4,987.96	30.69	0.62
2000	4,615.84	32.35	0.70
2001	4,994.75	28.57	0.57

Source: Bhutan Trade Statistics (1996 to 2003)

9.3.2 Balance of Trade and Foreign Exchange

Bhutan's balance of trade is negative; import is greater than export. The overall negative trade balance was 4% in 1995 and 29% in 2001 (Table 9.2). The trade balance with India was positive from 1995 to 1998, but negative since 1999 (Table 9.3). The trade with India is expected to be positive once the Tala Hydropower Project is commissioned in 2006. Bhutan's real trade problem is with third countries outside India. The third country import has risen sharply from Nu. 1,011.70 million (US \$ 24 million) in 1995 to Nu. 2,001.42 million (US \$ 47 million) in 2001. Export figures on the other hand have remained constant at below Nu. 300 million (\$ 7 million). The third country trade deficit is exceedingly huge at 58 % to 76 % (Table 9.4). The third country trade deficit is currently offset by generous foreign assistance. If the quantum of foreign assistance to the country should diminish in future, there would be a tremendous pressure on the government for maintaining and enhancing the convertible foreign currency reserves (RGOB 2000; RGOB 2002).

Table 9.2 Bhutan – Overall Trade Balance

Year	Import (Nu. in million)	Export (Nu. in million)	Trade Balance (Nu. in million)	Trade Balance of Total (%)
1995	3,641.92	3,349.13	(-) 292.79	4
1996	4,525.19	3,553.77	(-) 971.42	12
1997	4,977.94	4,274.18	(-) 703.76	8
1998	5,516.37	4,456.62	(-) 1,059.75	11
1999	7,834.88	4,987.96	(-) 2,846.92	22
2000	7,875.00	4,615.84	(-) 3,259.16	26
2001	8,990.20	4,994.75	(-) 3,995.45	29

Source: Bhutan Trade Statistics (1996 – 2003)

Table 9.3 Trade Balance with India

Year	India Import (Nu. in million)	India Export (Nu. in million)	Trade Balance (Nu. in million)	Trade Balance of Total (%)
1995	2,630.21	3,078.95	448.74	8
1996	2,896.18	3,226.98	330.80	5
1997	3,453.59	4,041.94	588.35	8
1998	3,620.94	4,175.64	554.70	7
1999	5845.28	4,711.23	(-) 1134.05	(-) 11
2000	6,231.31	4,376.95	(-) 1854.36	(-) 18
2001	6,988.78	4,700.47	(-) 2288.31	(-) 20

Source: Bhutan Trade Statistics (1996 – 2003)

Table 9.4 Trade Balance with Third Countries

Year	3rd Import (Nu. in million)	3rd Export (Nu. in million)	Trade Balance (Nu. in million)	Trade Balance of Total (%)
1995	1,011.70	270.18	(-) 741.52	(-) 58
1996	1,629.04	326.79	(-) 1302.25	(-) 67
1997	1,524.36	232.24	(-) 1292.12	(-) 74
1998	1,895.43	279.98	(-) 1615.45	(-) 74
1999	1,989.60	276.73	(-) 1712.87	(-) 76
2000	1,643.69	238.89	(-) 1404.80	(-) 75
2001	2,001.42	294.28	(-) 1707.14	(-) 74

Source: Bhutan Trade Statistics (1996 – 2003)

NTFP Contribution

NTFP is an important source of foreign exchange (Table 9.1). It accounts for 4 to 9 % of the total third country export. It peaked from 4 % in 1995 to 9 % in 1998, falling thereafter to 4 % in 2001. Bhutan's rich biodiversity, huge forest resource and small population offer immense comparative advantage of many special or niche products in international trade. With an articulated forest economic strategy, the NTFP

commercialisation can considerably enhance the foreign exchange earnings for the country. According to FAO (1995), about 116 items of NTFPs are internationally traded, and this is taking the group of medicinal plants as one. The medicinal plants group alone is said to constitute 500 to 600 plant species. It is crucial that forest policy builds upon this opportunity, instead of being overly cautious of the environment. Today's science, technology, conservation and development theory call for efficient and effective utilisation of the natural resources.

Table 9.5 NTFP Share of Third Country Export

Year	Total 3rd Country Export (Nu. in million)	3rd Country NTFP Export (Nu. in million)	NTFP of Total 3rd Country Export (%)
1995	270.18	11	4
1996	326.79	21	6
1997	232.24	21	9
1998	279.98	26	9
1999	276.73	11	4
2000	238.89	16	7
2001	294.28	13	4

Source: Bhutan Trade Statistics (1996 – 2003)

9.3.3 Dutch Disease

Bhutan has a total hydropower potential of 30,000 MW. The total installed capacity as of 2002 in the country was 444 MW, representing 1.48% of the total potential. The hydropower today accounts for about 45% of the total government revenue, and this contribution is expected to dramatically rise in the immediate future. In March 2005, Basochu Lower Stage with 40 MW was inaugurated, and Tala Hydropower Project with 1020 MW is expected to be commissioned in 2006 (RGOB 2002). The hydropower development in Bhutan is a success story, and underpins the country's aspiration to be economically self-reliant. However, the World Bank (2000) has expressed concern that the 'Dutch disease' might arise due to the predominance of hydropower development, and suggest diversification and expansion of economy. Further, this revenue, while crucial for public financing will not be available as disposable income for the rural people, who must earn for themselves. Globally speaking, Arnold (2001) notes that in nearly every country where information is available, small-scale forest product activities

constitute among the three largest categories of non-farm rural commercial activity in terms of the numbers of people engaged in them.

NTFP Contribution

There is no consolidated information on the total value and number of people employed or engaged in the many NTFP based micro enterprises in the country. Such information will be highly valuable politically for drawing attention to the NTFP development. The part analysis undertaken for this research study shows that the NTFP based micro industry has a turnover of Nu. 20 to 30 million (US \$ 0.5 to 0.7 million) (Table 9.6). The true value of a rural based industry could be many times higher as, firstly, figures in the government statistics could be undervalued; and, secondly, figures represent only the export values (domestic consumption is not included), and thirdly, values of many other traditional based enterprises such as traditional wooden bowls production (*dappa/phop*), and traditional bamboo products (*palang/bangchung*) are not documented properly. There is a great potential to raise and expand the NTFP based small and micro industry in the country.

Table 9.6 Turn Over of Rural Based Micro Industry

Year	Turn Over of Rural Based Micro Industry (Nu. in million)				
	Lemon Grass Oil	Turpentine Oil / Gum Rosin	Handmade Paper	Incense Production	Total
1995	3	18	4	0.09	25
1996	5	9	10	0.04	24
1997	14	14	2	0.02	30
1998	10	8	3	0.008	21
1999	7	13	0.3	0.03	20
2000	16	11	3	0.2	30
2001	10	7	2	0.3	19

Source: DRC (1996 – 2003)

9.3.4 NTFP in the Basket of Household Economic Activities

As discussed in the conceptual framework, Bhutanese farming is characterised by small land holding, steep mountain terrain and geographic isolation. The return to land and labour is poor, and there is no single economic activity which sustains a farm household.

The farm household thus engages in a basket of economic activities such as crop cultivation, livestock rearing, waged labour, and NTFP extraction. It is proposed that NTFP could be the major or only source of cash income for the many remote rural communities. The three case studies show that NTFP benefit to household economy is dependent upon policy and market conditions. We can say that *Cordyceps* represented a case of wrong policy and right market conditions while it was right policy and wrong market conditions for pipla. It was only matsutake which had both the conditions right.

Cordyceps, at a farm gate price of US \$ 800 to 1000 for a kilogram, is a highly valued product, and high in demand, a 'hot cake'. However, the forest laws forbid people from picking it. The majority of the people, for fear of prosecution, did not engage in its collection or trade, but those who dared to 'gamble' with the law either made a handsome income or a huge loss from the hefty fines. As the picking was illegal, it was difficult to determine the share of *Cordyceps* in the household cash income, but in some communities the economic benefit was obvious from the number of new houses constructed in the last four to five years. Overall, respondents reported a mean household cash income of only 8% from the wild resources i.e. from sale of other medicinal and aromatic plants.

In the case of Genekha *geog*, matsutake has been providing the people with a regular source of cash income over the last 10 years. The price has fluctuated greatly from Nu. 250 to 800 per kilogram, but still remains attractive by local standards. In 2003, the 101 households in the *geog* collected a total of 5,118 kgs of mushroom, getting them a total cash income of Nu. 1,955,430 (US \$ 43,454). Additionally, local agents helping the exporters receive a commission charge of Nu. 40 per kg, giving an extra income of Nu. 204,720 (\$ 4,761). The direct sale and commission charge amounted to a total income of Nu. 1,974,791 (\$ 45,475) for the *geog*, resulting in mean household cash income of Nu. 19,361 (US \$ 450) for the two-month period. The regular income from matsutake has also enabled people to obtain micro-credits from the Bhutan Development Financial Corporation (BDFC).

It was also difficult to determine the share of pipla in the household income as people exchanged it for clothes and food items, but people reported an income range of 7 to 30% of the total cash income for the household when the demand for it was high. There has been no demand for it in the last two to three years now.

9.4 Environment

The environmental propositions and questions were:

Propositions	Questions
<ul style="list-style-type: none"> • Environmental concerns for NTFP extraction are overstated. • From the perspective of the Department of Forestry, NTFP extraction by local people is unsustainable if not protected and regulated. • Property right is important because it increases the likelihood that a person can secure a livelihood from a NTFP, and is an incentive for protection of the resource base. 	<ul style="list-style-type: none"> • What are the environmental problems reported of the NTFP extraction? • How justified is the environmental concern? • What evidence is present?

The concept of conservation to many forest policy makers is generally one of a 'primordial wilderness', untouched and untamed (Ghimire and Pimbert 1997). However, it is increasingly realised in ecological science today that climax systems, as once we believed existed, are not the norm, and that nature is in a state of continuous change. Indeed, under certain circumstances, human interference with ecosystems actually enhances biological diversity. For example, the Maasai people and their cattle have for centuries managed the grassland ecosystem in Serengeti in Africa, but when the people

and cattle were removed from the area for wildlife conservation, the grassland was taken over by scrub and woodland, resulting in less grazing for antelopes (Colchester 1997).

The cost of maintaining global biodiversity value is almost always transferred to the local people and communities (Koziell 1998; IUCN 2004; Molnar et al. 2003). According to Sato (1997), scarcity of a valued resource has historically usually induced solutions from the society to cope with that scarcity. The biodiversity resources are goods that require social/institutional effort, rather than technical effort, for the users to coordinate in order to attain optimal level of utilisation. When the resource is locally abundant, local people have no incentive to manage it. Furthermore, Olsen (1997b) states that no plant species are threatened with extinction because of commercial collection as economic extinction precedes species extinction. He challenges readers to think of a plant species that has gone extinct due to commercial use. Biodiversity conservation is considered important for its present value as well as anticipated value in the future (Koziell 1998). NTFP represents the subset of biodiversity actively sought and collected by humans (Wong 2000). Therefore, to ignore NTFPs in forest policy is to ignore the important components of biodiversity (Jones et al. 2004).

Bhutanese forest policy makers are overly sensitive to environmental conservation. For example, the DoF turned down permit applications for export of pine leaves and cones which are in great abundance in the country, and which have least environmental effect on the ground of environment. There are clauses in the permit in which extractors are asked only to pick the fallen fruits on the ground, so that trees are not damaged e.g. star anise. Resin tapping in remote village communities in Trongsa and Zhemgang were stopped when their areas fell within the park boundaries.

It is also common for forest policy makers to quickly express concern of over harvesting and destructive harvesting practices. The case studies show that the field realities do not reflect these assumptions. In the case of *Cordyceps*, people say that production is dependent upon weather conditions and its fruiting cycle. I did not see soil disturbances from digging of *Cordyceps* as a major issue. A *Cordyceps* plant growing amongst the carpet of mosses and dwarf rhododendron is easily pulled out by hand, and

there is not much contact with the soil. With *Cordyceps* growing in grass meadows, a simple tool is required to dig it out. Even here, as *Cordyceps* is highly valued, people take the utmost care to remove it. There was also no evidence of over harvesting and destructive practices for matsutake. People are instead very protective of the matsutake resource, restricting outsiders entering the areas. The competition over collection sites amongst the village communities is not strong as the forest area is huge. In the case of pipla, it is like weeds, growing everywhere, along the footpaths, edges of agricultural fields and in the forests. The RVA score was 12 for *Cordyceps*; 9 for matsutake; and 5 for pipla. *Cordyceps* and matsutake fall in the category of moderate vulnerability to collection, not a major management concern yet. Pipla should have no ecological concern at all.

In the current decision making with regard to biodiversity conservation in Bhutan, the ‘burden of proof’ rest with the people. It is people who have to convince the forest policy makers that their actions do not lead to the said environmental problem, but people do not have the means and resources to do it. This ‘burden of proof’ must shift from the people to the government. The onus should be on the government to prove that people’s actions are the cause of such environmental problem, not shield itself behind the blanket ‘precautionary principle’, thus causing negative impacts on livelihood and development.

9.5 Recommendations

One of the aims of the research study is to identify and outline NTFP policy and research issues and to develop recommendations for policy development. Research is an expensive affair, and Bhutan does not always have the resource to undertake research as it wishes. I therefore hope that the thesis to some extent meets the information needs of the DoF, as identified in its Ninth FYP document (2002-07).

9.5.1 Policy

1. The nature and behaviour of timber and NTFP are different. The current forestry policy is based on timber production, and this timber biased policy design discriminates against NTFP development. It is recommended that the DoF develops an articulated NTFP policy outlining strategic goals and key actions in socio-economic development. This should include a focus on poverty alleviation and environmental conservation. Also necessary are a clear statement on decentralisation; tenure rights and access; harvesting, processing and marketing; royalty payments and permit system; and the movement of products inside and outside the country. The DoF must create an enabling policy environment for NTFP commercialisation.
2. The forest regulations currently are control-oriented, not conducive to rural and economic development of the country. All NTFP collection and export bans should be reviewed and justified, as well as the system of collection and transport permits. The bans and the permit system work directly to the detriment of rural collectors as they depress profit margins, decrease competition and encourage corruption and abuse of power. Most unfortunately, they make the lives of rural people difficult e.g. *Cordyceps*. The NTFP rules are not uniform and oftentimes contradictory. Bhutan could be a model country if a separate policy on NTFP is put in place. The legalisation of *Cordyceps sinensis* marks a brave new world for NTFP commercialisation, and the DoF should learn lessons from it.
3. The DoF should institute a new NTFP division which will act as a clearing house to promote collection, processing and dissemination of information and for transfer of technologies, and market development. It should take up the task of formulating and drafting the NTFP policy and strategies relating to *both* subsistence and commercial NTFPs. The DoF should re-arrange or expand its organisational structure and capacity if it is serious to meet its stated rural development objective.

9.5.2 Economic

1. The NTFP currently enjoys a low profile amongst policy makers and resource managers. The DoF should invest resources to quantify, monetise and value NTFPs; estimate employment benefits from NTFP; and assess local and export markets in order to draw policy attention. This could also help to eliminate the current perception of NTFP as largely subsistence products valued only by poor people, and raise the profile of the forestry sector as being relevant in the economic development of the country. The DoF must demonstrate the stewardship of the natural resources, not just sitting over it.
2. The DoF should respond quickly and positively to requests from entrepreneurs to take up new NTFP enterprises as such entrepreneurs are efficient in linking the products to markets.
3. Rural collectors are generally disadvantaged by lack of awareness of their rights and of market information. A system for the dissemination of NTFP rules and regulations, and provision of market prices for commercial NTFPs could be made an important public service to the rural collectors.

9.5.3 Environment

1. The DoF need not be overly sensitive to environmental concerns, and it should restrain the application of ‘precautionary principle’ as it negatively impacts rural livelihood. Most NTFP harvestings are ecologically benign. The DoF should take comfort in the thought that Bhutan has an atypical case of large resource base and small population. There is less likelihood of over harvesting the resource. The three case studies do not show evidence of ecological problems arising from the NTFP commercialisation.
2. The DoF must bear the ‘burden of proof’ that the environmental problem is result of people’s actions, and only then act upon.

9.6 Further Research

In Bhutan, there is a lack of systematically collected baseline data about NTFPs and commercial harvesting, socio-economics and marketing systems, as also the case with biology and ecology of the NTFP species. The analysis of NTFP policy is also lacking. If NTFP commercialisation is to play an important role in rural development, research information covering policy, economics and environment is essential.

9.6.1 Policy

Neumann and Hirsh (2000) lament that much of the NTFP commercialisation research appears to be conducted in a theoretical vacuum. For example, NTFP extractors rarely have a well-defined social identity, making it difficult to determine whether they constitute a class within capitalism or represent a separate mode of production altogether. NTFP commercialisation is generally associated with raising rural household income. The debate and development on relevant social theory could help draw policy attention to NTFP commercialisation.

Another important NTFP policy research area is land and resource tenure, and the dynamics of the tenure relations. The state may claim property rights to the forest and its resources, but in villages, there are a variety of local rules and institutions governing forest access. Tenure studies can help the formulation of appropriate policy statements.

9.6.2 Economic

NTFP production and use is important not only at household level but also at the national level as it involves, in both formal and informal sector, a large number of people in harvesting, collecting, processing, marketing and exporting. A systematic and sustained research programme is needed to build up a baseline data and to provide economic analysis of NTFP commercialisation.

Further, research can also elucidate the income distribution from a highly valued NTFP, and its impact on local communities as well as to explain why, under what circumstances, and with what consequences individuals and communities engage in NTFP production: for example does NTFP income serve as a buffer, a supplement or a source of social mobility? (Neumann and Hirsh 2000).

9.6.3 Environment

There is very little information on the biology and ecology of many NTFP species, historically neglected by foresters. Research information is needed on production, growth rate, distribution, and response to harvesting. A system of monitoring and evaluation of NTFP commercialisation is needed, as is the scientific documentation and the use of indigenous knowledge. There is a need for more field testing of RVA.

9.7 Epilogue

This research study has, as are most, been restricted by time, money and the context in which it has been carried out. It hopes to provide for forest policy-makers indicators for further policy development by showing the present contradictions in current policy surrounding forest products. This is just a beginning, hopefully a contribution to a discussion on an important national resource that can benefit poor rural people as well as the country. I hope that this research study will trigger interest on NTFP commercialisation in the country, and there will be many young Bhutanese foresters and researchers who will take up research on the subject.

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Transcripts

Appendix 1: Case Study One – *Cordyceps sinensis*

Soe Geog, Lingshi Dungkhag, Thimphu Dzongkhag

07.06.03 Interview with Sonam Wangdi, Soe (Horseman)

SW: *Sonam Wangdi*

TA: *Tshitila*

PN: *Phuntsho Namgyel*

PN: How much does one Jama of Cordyceps get in Tibet?

SW: If the Cordyceps quality is good and dried, one could get Yuan 1500 or 1600 for one Jama, the lower grade Yuan 1100 or Yuan 800. 2 Jama equals 1 kg.

PN: How much could one collect Cordyceps in a day?

SW: It all depends on the site and luck. Sometimes, we don't find a single piece for the whole day. Sometimes, a lot...there are two types of Cordyceps. There is the bigger size Cordyceps that grow sporadically but population remains the same for the year in and year out. There is the smaller size Cordyceps that grow amongst the *Balu-Salu* areas. The population of this Cordyceps type moves from one place to the other.

PN: How do you sell Cordyceps in Tibet?

SW: It depends upon the quality we have. If we have few pieces, we sell by pieces; Yuan 1 or 2 per piece.

PN: How much did you collect?

SW: I don't get time to collect because I have to tend to portering services. I collect when the opportunity presents itself during portering and yak herding.

PN: Where did you sell the Cordyceps?

SW: Phari

PN: Who buys the Cordyceps in Phari?

SW: Everyone in Phari asks for Cordyceps.

PN: When you pick the Cordyceps, how do you feel?

SW: Yes, of course there is the constant fear and anxiety for fear of being caught by forestry people.

PN: Has anyone from Soe been caught by the forestry people?

SW: Yes, two of them...I hope my talking like this will not cause me problems.

PN: Please don't worry. I assure you 100% confidentiality. You know and trust Tshitila. Were two of them scared when apprehended?

SW: I understand they were very scared. This case is about 2 or 3 years old.

PN: How were they apprehended?

SW: I do not know the story.

TA: I know the story. The story goes that forestry people watched through the binoculars the yak herder and his wife pick the Cordyceps from their summer grazing land. They saw the collected Cordyceps being put in a hole on the ground where they kept their dog. When forestry people approached the couple, they denied engaging in the illegal collection. But, the forestry people knew all about it.

PN: We heard that one-piece Cordyceps fetches Yuan 5 or 6. But, this does not seem to be true.

SW: The Cordyceps in their area (Tibet) are bigger, and they may be getting this high amount. Our size is smaller; therefore we may be getting the lower price.

PN: We apprehended yesterday eleven Tibetans at Nubri. They said that they get Yuan 5 or 6 for one piece of Cordyceps. This means Bhutanese traders are not getting high price as the Tibetans do.

SW: Oh! (surprise).

PN: How do you feel when the foreigners collect Cordyceps from your grazing land?

SW: We feel sad that the foreigners are appropriating away our precious jewels.

PN: In your opinion, how many foreigners seem to come into our territories?
 SW: It varies. In a week, sometimes one could see 20 or 30 of them.
 PN: In Nubri, the people there talk of 100 or 200 foreigners coming into our territory. If the government asked the people to take responsibility for control and management of Cordyceps, do you think that the people will be able to do it?
 SW: Yes, we could do it. We could prevent and stop the foreigners. But, we must open up the Cordyceps market in the country only.
 TA: Why the need for internal market?
 SW: The Tibetans whom we stop coming into our territories will bear grudges against us if we take the Cordyceps to Tibet. If our Cordyceps market is Tibet, we will not be effective in the prevention of the Tibetan poachers.
 TA: But, you will still need to go there for other trading?
 SW: Here, we don't engage in big trading; its only small items such as the shoe, flasks, battery, tea, and clothes. We take 'zaw' from here.
 PN: When you trade in Phari, you would require their currency. How do you manage it?
 SW: We sell 'zaw'.
 PN: How much do you get for one kg of 'zaw'?
 SW: We get Yuan 10 per kg. We buy at Nu.30/kg in Bhutan, which is about Yuan 5/kg.
 PN: Would every household go to Phari once in a year?
 SW: Except for Tshogpas, I guess every household would go to Phari once in a year.
 TA: When did the present interest on Cordyceps start?
 SW: Sometime in 1995/1996. However, we knew about Cordyceps when we were children. The Tibetans started coming into our territory at about this time.
 TA: Did you pick and sell Cordyceps?
 SW: Yes, for two years.
 TA: How much did you get?
 SW: Yuan 600 to 800 only.
 PN: Is this a big amount?
 SW: Yes, this is a big amount. Yuan 100 is equivalent to our Nu.600. The Yuan 500/600 purchases of household items more than meets our household requirements.
 PN: If the government lifted the ban on collection of Cordyceps, do you think Cordyceps collection will impact upon your portering job and yak husbandry?
 SW: The Cordyceps collection will not impact upon yak husbandry. It may impact the portering business a little. But, this will be for two months or so, and this period is not the tourist season.
 PN: When is the Cordyceps season?
 SW: It starts from Bhutanese month 4 and ends at the close of Bhutanese month 5.
 PN: Did you ever see live caterpillars?
 SW: Yes, I saw one or two of them. It is at this time.
 PN: You have been very frank in your interaction with us. Do you think other people will also do the same?

Interview with Aum Karma, Soe, a medicinal plants cultivator.

AK: *Aum Karma*
 AK: People here don't pick medicinal plants. We have no tradition of picking and selling medicinal plants.
 PN: What medicinal plants do you use for treating illness in the village?
 AK: I only know puti-shing for treatment of cough and cold...yes people also use Yakgigyep, Pangi metok. They are also used for cough and cold. When we were children, our parents used to say that Cordyceps were good medicines for treating joint pains and 'drangsi'.

Interview with App Chuni Dorji (80) – composer of the famous yak song.

CD: App Chuni Dorji

PN: What medicinal plants do people in the village use to treat illness?

CD: Pangi metok (cough and cold), Domchoe ten (root used to treat malaria), Puti shing and Yakgihyep. There is no traditional healer in the village. We don't pick medicinal plants. People in Lingshi do. Only people with less number of yaks pick medicinal plants.

PN: What do say about the legal collection of Cordyceps?

CD: This will be very good to the people. However, only households with a lot of people will benefit. The households with fewer numbers of people will have no time to pick, as they will be occupied attending their animals, and the woola obligations. Here we don't have a motorable road, and portering services for the government take a lot of our time.

PN: Have you eaten Cordyceps?

CD: Yes. Our traditional doctors used to say many years ago that it is a medicinal plant.

PN: Do you think that if legal collection is allowed, there will be economic benefits to the people?

CD: Yes, of course.

PN: What are the main sources of cash income in the village?

CD: Yak and yak products, and the portering services.

Interview with a yak herder – Soe / Lingshi

YH: Yak Herder

PN: If the legal collection is allowed, how do you think the issue of equity between households who have tsamdro and no tsamdro be addressed?

YH: The Gup and GYT can look into the issue and address it through the public debate and discussion.

Interview with App Gyep, Village Docheyten, Soe (age 55)

AG: App Gyep

AG: Cordyceps are highly valuable. People are not scared of the law. They want to gamble with the law. If they get away with the collection of Cordyceps, it is their luck. If not, their bad luck...

PN: Is Cordyceps a common medicinal plant in the village?

AG: Yes

PN: Do you collect it?

AG: No, never have been. My son-in-law was the former Risup in the village.

PN: Why do you think that the government is so protective of Cordyceps?

AG: Because, it is a very important medicinal plant.

PN: How long were you as a Gup?

AG: Eight and half years.

TA: Please tell us the history of Cordyceps use in the village?

AG: We did not know any use of it except the name. When the indigenous hospital started collecting it a few years ago, only then did we know that it was used in the traditional medicine.

TA: Your parents and grandparents did not tell you anything about it?

AG: No, nothing except say that it is called Yartsa Guenboob, and it is a medicinal plant.

TA: Did you ever eat one?

AG: I tried eating it once but I cannot think of eating it any more. The insect part is gruesome.

TA: Do you think that population of Cordyceps is declining?

AG: It is difficult to tell about the population increasing or decreasing.

PN: What do you think if the government lifted the ban on the collection of Cordyceps?

AG: This would be a great welfare to the people.

PN: Do you think people could stop the foreigners from collecting it?
AG: I doubt if the people will be able to control the foreigners. It is a difficult task for even the forestry people.
PN: What about jointly: forestry and people together?
AG: This will be possible.

Lingshi Geog, Lingshi Dungkhag, Thimphu Dzongkhag

23.06.03 Interview with Mr. Suk Man, Forester, Lingshi Ward, Jigme Dorji National Park

SM: Suk Man

PN: When are you at Lingshi since?
SM: I am posted here at Lingshi since 1992. We were only two people, my in-charge Namgay and I. We did not have an office. We were staying in the village house at Zomaythang.
PN: What were your main work activities then?
SM: Anti-poaching patrols. But, then there was no Tibetan problem.
PN: What was the poaching problem?
SM: Musk Deer.
PN: Who were the poachers?
SM: Mainly the Paro Tshentops.
PN: What about the local people from Lingshi?
SM: They do not engage in poaching.
PN: After Musk Deer. What were the other items poached?
SM: Yartsa guenboob.
PN: When did the poaching of it start?
SM: We started apprehending the Tibetans from 1996. We were told that they came before this period.
PN: How many Tibetans were apprehended in 1997?
SM: About 18 people at Yale-la. In the beginning, we only sized the products and asked them to return to this country. But, they would stop on the way to collect more. We then started to seize items like collecting tools, food provisions & clothing from 1998/1999.
PN: When did the Park office start in Lingshi?
SM: 1995.
PN: Namgay & you, who was earlier?
SM: Namgay. He was posted in Lingshi since 1985. But, he was operating from Dodena (Dechencholing). Last year (2002), there was massive poaching of Cordyceps at Gomphu. We seized over 58 kgs of Cordyceps from one group of people.
PN: In the good crop year, how do the Cordyceps grow?
SM: They grow in close proximity to each other. In 1m², I guess there may be about 50-60 pieces.
PN: How about the Blue Poppy?
SM: There are not many Blue Poppies. The Tibetans do not collect them.
PN: How about the collection of it by the Indigenous Hospital?
SM: The whole plant is used in our traditional medicine and this harvesting practice over the years seems to have affected the blue poppy populations.
PN: What do you say if the government allowed the people to collect Cordyceps?
SM: If we allow the people to collect, people will sell half the amount here, and other half they will sell across the border in Phari.
PN: Do people here go to Phari?
SM: They go mostly to Rham to buy the dried fish. Generally Layaps go over to Tibet.
PN: Do you think it is a good idea that people derive income from the sale of Cordyceps?
SM: Yes, it is a good idea, but they will only sell half the amount here in the country.
PN: What is the problem in selling the Cordyceps across the border?
SM: The people will over collect the Cordyceps and deplete the natural resource base.

PN: Do you think the local people will be able to stop the foreigners from collecting it?
SM: No, they cannot.
PN: What about jointly with the forestry people?
SM: I doubt again. Of course, we catch them but they keep coming. They come at night, and from many entry points.

Group Interview with Dorji Dakpa, Mangi App; Dorji Penjore; Pasang Buthi; Nima Lham and Tobgay – Zomaythang, Lingshi

GP: *Group*

PN: Lingshi is the traditional collection area for medicinal plants by the ITMS. Is there a rush by people to collect the medicinal plants?

GP: No, there is no rush for it. Households with large number of people collect and households with no people have no time to pick it.

PN: How many members in a household would constitute household having adequate or inadequate labour?

GP: Households with 4 to 5 working members would be households with adequate labour, and with 1-2 members as having inadequate labour.

PN: What do you say about the picking of Cordyceps by the Tibetans?

GP: Cordyceps is a highly valuable medicinal plant, and the government policy does not allow us to pick it. So when we see the Tibetans come to our territories to pick Cordyceps, we indeed feel very sad.

PN: Do you think that there is a danger of population decline of Cordyceps?

GP: We have ourselves not much experience, but what we hear from Layaps, there is no danger of extinction of Cordyceps. The Layaps say that whether we collect or not, Cordyceps follow a cycle of production. If the season this year is a good crop year, there will be poor crop years for the next three years. Again, after that, there will be the good crop year.

PN: But, what are your own experiences?

GP: We agree with the observations of the Layaps. We observe the same things when we are with the yaks in the summer grazing grounds. We don't see any threat of extinction of Cordyceps. For instance, large scale poaching by Tibetans has been going on for some years, Cordyceps are still found. In our views, the abundance of Cordyceps has remained the same.

PN: What do you say about the present government policy?

GP: It would be a great welfare to the poor pastoralists if the government reviewed the current policy ban. We can then also extend support to the government in stopping the foreign poachers and engage in cooperation with the government in the sustainable management of the Cordyceps resource. Here in Lingshi, we already have the experience of sustainable management of the medicinal plants used by our traditional medicine system. It is sad at the moment that local people derive no economic benefits from it.

PN: Despite the policy ban, do local people collect Cordyceps?

GP: No, not at all.

PN: Then, what do you say about the four local people apprehended by the forest personnel last year?

GP: This was an isolated case, and they were fined heavily; Nu.30,000 each.

PN: Do people from Lingshi go to Tibet?

GP: We don't go. In the past we went, taking 'zaw'.

PN: Penjore, do you cultivate medicinal plants or collect from the wild?

PE: No, I don't. We are only two people in the house, my wife and I. We have no time.

PN: What are the problems in the medicinal plants collection?

GP: We have to go great distances to collect some of the medicinal plants, and their prices are not attractive enough.

PN: Then, you don't collect them.

GP: We cannot refuse to collect as they are in the list of the ITMS, and the people are the contract collectors. In Lingshi, we have a long tradition of collecting medicinal plants as way back as in 1970s. Then it was mandatory for every household to collect medicinal plants for the government.

PN: What price does Cordyceps get in Tibet?
 PE: As we don't engage in the trade, we do not know. However, people say that for one 'gama' (half kg), the price range is from Yuan 1000 to 5000.
 PN: What are the problems arising from the large influx of Tibetans?
 GP: Firstly, we have to worry about the possible conflicts between them and our forestry staff. They are in large numbers and our forest staff is small but with weapons. Secondly, Tibetans steal our summer firewood and tent poles to cook their meals and keep themselves warm. Sometimes when we go to set up our summer camps, we have no tent poles, and we thus cannot pitch the tents.
 TA: You said that some medicinal plants have become scarce, which are they?
 GP:

1. Gangkarchung
2. Tsherngo (blue poppy)
3. Ray-koen (do not get as used to earlier)
4. Jagi po (only found at Chewla)
5. Ya-ki (always has been rare; also found only in Chewla; Tshitila : it is available in Soe also)
6. Udpel Ngoenpo
7. Wangla. In Lingshi, we do not get it. In a day, one could get only half a kilogram. Tshitila says, it is available in Laya. Harvesting technique is destructive. We have to change the harvesting season. Currently it is harvested before the seed ripening.

People have been picking medicinal plants in Lingshi since 1968.

Interview with Mr. Gomchen Tshering (35), Gangyul, Lingshi.

GT: *Gomchen Tshering (35)*

GT: Thuji and I got about a kg of Cordyceps. Yes, in the beginning, we denied the picking of Cordyceps to the forestry people. We met them on the way when we were returning with the yaks.
 PN: Did you pick before?
 GT: No, this was our first time...To pay the fines, my father had to sell 3 yaks, and I, one yak and a horse. There were three of us from the same family. The fine was Nu.30,000 each, and that was a total of 90,000.
 PN: Where did you pick the Cordyceps and how much did you collect?
 GT: It was at Gomphu. We picked for three days, and we may have collected over a kg each.
 PN: Why does the government not allow the people to collect?
 GT: Don't know.
 PN: Will the legal collection bring economic benefits to the people?
 GT: Yes, certainly. It will be an immense economic benefit to the people.
 PN: What was your plan with the Cordyceps collected?
 GT: To take it across the border.
 PN: Did you engage in such a business before?
 GT: No, not at all.
 PN: Do you think that other local people would collect Cordyceps?
 GT: We don't think so.
 PN: Then, how do you know the high price of it?
 GT: We hear a lot of Cordyceps stories from Laya.
 TA: We have heard that when it concerns Cordyceps, it is a secret even amongst family members. Is it true?
 GT: Yes, it is true.
 PN: Do you think that the collection could lead to extinction?
 GT: We don't know, but what we hear from the Tibetans, Cordyceps follow a cycle of good and bad crop years. I personally don't think that the collection will lead to the extinction of the Cordyceps.

PN: Do you try to stop the Tibetans?
GT: Yes, we do but since they are in huge numbers, they don't listen to us, and we also cannot do anything. However, their intrusion is a matter of concern for us. When the forestry people come on patrolling, they harass us saying that we provide and extend support to the Tibetans.
PN: Do you bear ill feelings towards the forestry people?
GT: No, we don't. They are just doing their job.

23.06.03 Interview with App Daw Tshering (60), Chebisa

DT: Daw Tshering

PN: Are people allowed to collect Cordyceps?
DT: No, people are not allowed to collect. If picked, the government fines the people.
PN: Why does the government stop the people from collecting it?
DT: I have no idea. I don't know
PN: What do you think if the government allowed the people to collect it?
DT: This would be a great welfare to us - the poor people.

23.06.03 Group Interview with Sangay Penjore, Tshewang Dem, Kencho Tenzing, Village Chebisa

GP: Group

PN: Do you know anything about Cordyceps?
GP: We do not know anything about it.
PN: But, you surely see Tibetans pick it?
GP: Yes, we see many of them.
PN: What do you feel when you see them?
GP: Sad.
PN: Why do you think that the government is not allowing the people to pick Cordyceps?
GP: This is an important medicinal plant in the country.
PN: What if tomorrow the government allowed the people to pick Cordyceps?
GP: This will be a great economic benefit to us.

Interview with Mr. Dorji Dakpa (Mangi App), Lingshi

DD: Dorji Dakpa

PN: What is the reason for the ban on Cordyceps collect?
DD: I do not know the exact reason. However, as it is an important medicinal plant, perhaps government thinks, if not controlled, there will be over-exploitation of it.
PN: Do you agree with the current policy?
DD: Frankly speaking, I personally see no logic in the current policy. We, the poor pastoralists, are denied the economic benefits from the high cash value of Cordyceps. It would make a great sense if the government came out with guidelines for sustainable harvesting, like the one for the medicinal plants we collect for our Indigenous Hospital in Thimphu. If the local people are allowed to pick it, we will be motivated to stop the Tibetans from poaching it. Otherwise, it is a sad case at the moment to see foreigners come into our territories and appropriate away our precious natural resource while we stand and stare.
PN: Is there is a conflict between forestry personnel & the local people?
DD: There isn't much conflict at the moment because there aren't many people engaged in the illegal collection of Cordyceps. However, the conflict may develop and intensify when people over the

- years will not be able to resist the temptation of making big income from the high cash value of the Cordyceps.
- PN: What do you say about the extinction possibility of Cordyceps?
- DD: We don't have much experience in the village. However, from what we hear from Layaps, they say that Cordyceps follow a cycle of three years of good and bad crop years. If there is the case, I don't think that there is the danger of extinction of Cordyceps. For instance, a few years ago, there was bumper Cordyceps production at Gomphu; after that year, poor seasons followed. Last year was again a good crop year. People say that grounds looked black with Cordyceps. This year, the season is again poor.
- PN: If the government allowed the people to collect it, how should we go about managing the resource?
- DD: If the government allowed the people to collect it, we can manage it. We will hold *geog* meetings, from *tshogpas* and frame rules.
- PN: Many people say that if the government allowed the collection of Cordyceps, the sale of it should be inside the country only. What could be the reason?
- DD: If we sell Cordyceps inside the country, the government should be able to capture some revenue. It is important for the government to do so. The other reason, I guess is that when we sell outside the country, we need educated people. At the moment, many of the people are illiterate.
- PN: How many Tibetans, do you think, are coming over to our country?
- DD: Last year, there was the maximum number of Tibetans. I would guess not less than 1000 people in Lingshi area only. This number will still be conservative, as we may not be seeing all of them. The forestry people are also successful in apprehending them, but the Tibetans always return after few days again.
- PN: What problems do the local people encounter with the large influx of foreign poachers?
- DD: I worry a lot. The foreign poachers come in large numbers. Our local people are few and live far apart from each other in their summer grazing camps. The foreign poachers over the years have gained confidence and thus they have become bolder in their behaviours. They burn our summer firewood and tent poles, and damage our camping stones. We experience great difficulties in establishing our summer camps.

Interview with ? (Ugyen's Husband) – Mesayul, Lingshi

UH *Ugyen's Husband*

- PN: Do you collect Cordyceps while herding yaks?
- UH: No, I don't.
- PN: Why?
- UH: One should never engage in prohibited works.
- PN: How much does a Cordyceps fetch in Tibet?
- UH: I don't know
- PN: But, you must be hearing about it from people?
- UH: (*silent*)
- PN: Do you inform forestry people when you see the foreigners?
- UH: Yes we do. Otherwise, the forestry people harass us saying that we are partners.
- PN: What do you say about the extinction of Cordyceps?
- UH: I do not know.
- PN: Why do you not collect medicinal plants for the ITMS?
- UH: We have no manpower at home. There are only two of us.
- PN: Who do you think will know many about medicinal plants? Man or Woman?
- UH: I think man will know more.
- PN: But, it is women who stay at the summer grazing camps.
- UH: Yes, it is so. But, men are mostly present in meetings.
- PN: How many persons in the household constitute having adequate household labour?
- UH: 3 to 4 persons per household.
- PN: How would they be allocated?

UH: Two with cattle, one in the house, one for woola, portering and miscellaneous works.

21.06.03 Interview with App Gay Gay, Gangyul, Lingshi. He has 30 years of experiences in medicinal plant collection

GG: *App Gay Gay*

TA: *Tshitila*

PN: When did you start picking medicinal plants?

GG: I started many years ago, more than 25 years ago. More seriously about 10 years ago. Earlier, it was through the *woola* system. In the early times, we were paid for a day's collection of medicinal plants Nu. 2 or 3. It used to be mandatory for all households in Lingshi to collect the medicinal plants for the government. It is only in the last decade or so that the mandatory collection by households was stopped, and the voluntary collections by interested households began. At about the same time, a pricing system for medicinal plants was also developed.

PN: Does the medicinal plants collection help in the household cash income?

GG: Yes, it does.

PN: Who collects the medicinal plants in your household?

GG: I do the most collection.

PN: You therefore must have a good knowledge about plants used in the traditional medicine system?

GG: Yes, I know some of the commonly used medicinal plants.

PN: Where do you generally collect the medicinal plants from?

GG: They depend upon the plant species e.g. *jagey poed* and *yakued* from Chewla. I seek the assistance of herder colleagues to collect the species commonly found in their local areas. As the species of medicinal plants are many, we need to traverse all over the areas.

PN: Do you find some of the medicinal plants difficult to collect?

GG: Yes, plant species with big roots and small flowers. They take a lot of time but they are paid well.

PN: Do you find some of the medicinal plants population declining?

GG: It is difficult to say. Sometimes we think that one plant population has declined but when it is a good season for it, we again find it in great abundance. This was the case with blue poppy. We thought that blue poppy population has declined in the Lingshi area from our regular collections but this year, we have many blue poppies. I think it has to do with rain pattern. I have not witnessed an extinction of one plant species yet.

PN: What do you say about the ban on collection of Cordyceps?

GG: The forestry people are doing a good job in apprehending the foreign poachers but this does not seem to be a permanent solution, because they keep coming. It is therefore sad to see the foreigners appropriate away our precious natural resource and we don't receive any benefit from it. I personally feel that local people should be allowed to collect it. The foreign poachers are also beginning to cause us problems. They burn our summer firewood and tent poles.

PN: If the government initiated a CBNRM for Cordyceps, what do you say?

GG: If this will be the case, it will bring immense economic benefit to the local people. The forestry people are presently very suspicious of the local people and they harass us. If we are allowed to collect, this suspicion will not arise. However, the trade of Cordyceps should be within the country.

PN: We have heard people say that Cordyceps trade should be within the country, not outside. What could be the reason?

GG: If there is a domestic market demand, this will be better than selling across the border in Tibet.

PN: We have heard some people say that there are problems in doing trade in Phari?

GG: I don't think this is the case. In the trading, you sell if you like, you buy if you like. My thinking is that if we can sell within the country it will be good for the country.

PN: How do think you would you implement a CBNRM?

GG: We have our own registered land, and we could take care of our lands.

TA: But, Cordyceps is not found in all areas. How do you then deal with the question of equity in the geog?

GG: Cordyceps grows in all areas. It is only to do with good and poor crop years. In our area, we did not have Cordyceps for the last two years.

TA: You have many years of experience in the ecology of the area, do you observe population decline of Cordyceps?

GG: This is difficult to say. Sometimes, one sees Cordyceps in areas where there was none in the past. Sometimes, you don't find Cordyceps in areas where they were found previously. They don't grow in the same area. We know about Cordyceps from childhood that it is a medicinal plant, good for stomach and 'drangwa'. We used to dry it, and fry and eat it.

PN: Was there then the Cordyceps trade in Tibet?

GG: There was no trade, and people did not collect it except for home consumptions.

TA: When did the Tibetan poachers start coming to our territory?

GG: 4 years or so

TA: Did our Indigenous Hospital pick Cordyceps in the beginning?

GG: No, it was not in their list of medicinal plants. However, the traditional doctors would long time ago say that it was a medicinal plant.

TA: App Gay Gay, in your 30 years of experience in medicinal plant collection, what is your view regarding the population status of Cordyceps over the years?

GG: As far as I see it, I don't think there is a population decline of Cordyceps

PN: How about it if the number of collectors are in hundreds?

GG: I don't think the number of collectors will cause extinction to Cordyceps. The Cordyceps is dependent upon weather conditions. Some years one could get only few pieces after searching all mountains, and other times you could find many of it in a small area only.

PN: In a good crop year, how does it grow?

GG: It grows like grass in a meadow.

TA: If the CBNRM for Cordyceps is implemented, what are the sustainable practices that the community should engage in?

GG: We should take care of our areas, and frame rules with regards to collection sites and picking time.

PN: Do you think that with CBNRM, the local people could stop the foreign poachers?

GG: Yes, I think we can stop the foreign poachers. We will take ownership of Cordyceps. We will try to stop the foreign poachers first, and if they don't listen to us, we will then report to the forestry people.

PN: We heard that members of your household were fined for picking Cordyceps?

GG: Ha! Ha! Yes, it was last year. I am not the one. They were my children - two sons and son-in-law. They had gone to Gomphu to collect yaks from a man. But, the man could not deliver the animals on the agreed date, and while waiting for the animals, they saw many people picking Cordyceps. There were Tibetans and Parops, maybe from Tshento. So when they saw others picking, I guess that they could not resist the temptations, and they joined the others.

PN: What amount of Cordyceps did they collect?

GG: Two to three kgs of Cordyceps each. There was perhaps a total of over 5 kgs between them. This was the collection from the two days.

PN: Where were they thinking of selling it?

GG: I don't know, perhaps to the Tibetans.

PN: What was the total amount of fine?

GG: Nu.30000 each for the three of them.

PN: Who paid the fine?

GG: I paid the fine for them? I put three yaks to slaughter

PN: Didn't you plead with the forestry people?

GG: We pleaded a lot. Their earlier fine amount was much bigger. They said that the fine amounted to Nu.50,000 to Nu.60,000 each for three of them. They put in their report 5 kgs of Cordyceps each but they never weighed.

PN: Like your children, did forestry people fine other people in the village?

GG: Yes, one Mr. Tashi Tenzin.

PN: So people collect Cordyceps without the knowledge of forestry staff?

GG: Yes, I guess so. People are excited about the high price of the Cordyceps.

PN: If the government allowed the people to collect it, do you think it will bring improvement in the living conditions of the local people?

GG: Yes, it will certainly improve our living conditions. Its price is very handsome. Each piece fetches Nu.5.

PN: The fine payment was a huge amount for you. With whom were you angry, your children or the forestry people?

GG: I was angry with my children. The forestry people were doing just their duty.

PN: What do you think is the reason for the ban on Cordyceps?

GG: I don't know. I cannot understand the reason. There is no benefit to leave the Cordyceps in the wild. If we don't pick, Cordyceps just rot away. There is no environmental problem too. If there is an environmental problem, then the government's action is justified but the Cordyceps has no such environmental problem. It has only economic benefits to the poor people.

PN: Do you think that the government needs to review the policy on Cordyceps?

GG: Yes, if the government does that it will be an immense economic benefit to the people here living in high mountain conditions.

TA: We have heard from people that 4 or 5 species of medicinal plants have become rare in the Lingshi region? e.g Blue Poppy and *Umrim*.

GG: I don't know what other people feel and observe but I don't see the populations of these species decline or go extinct. One may not see a species for a certain period, but it always come back. However, I worry for one species, *drimoog* (*Onasma* sp.). For the collection of this species, one has to use a spade, and thus has a potential environmental problem. For blue poppy, *udpel* and Cordyceps, I personally feel that there is no risk of extinction of these species from collections.

TA: What about *tshika*, *gangachung*, *raykoen*, *jagey poed*, and *raykime*?

GG: *Yakued* has no problem because we leave behind a part of the root. *Jagey poed* also has no problem. We leave behind the roots. *Wangla* has a problem because we have to dig out the roots. We also collect the roots of *raykoen*. *Gangachung* has also no problem as a part of the root is left behind. Blue poppy (*Udpel*) is like an agricultural crop. They depend upon the seasons.

PN: You are a medicinal plants grower?

GG: Yes, I am. I am thankful to the government for the scheme. It is an important source of cash income for me.

PN: How much do you earn from the medicinal plants collection in the wild as well as from the garden?

GG: About Nu.26000 a year from both the wild collections and from the garden.

PN: When did you start cultivating the medicinal plants?

GG: 1988

TA: From your herbal garden, how much did you earn in the last 5 years?

GG: For the first three years, there was no income. There was no sale. In the last two to three years, I guess I have been getting over Nu. 3000 a year.

PN: How much do you anticipate this year?

GG: Over Nu.3,000.

PN: Currently, the ITMS is the sole buyer. Do you think it is a good idea if we have buyers from India and overseas?

GG: Yes, it will be a good idea if there are more buyers

PN: How many people cultivate medicinal plants in Gangyul?

GG: 6 or 7 people.

PN: Why don't the others cultivate?

GG: I don't know. Maybe because they have other priority works

PN: How many collect from the wild?

GG: About 27 households participate in the medicinal plants collection from the wild.

PN: How many yaks do you have?

GG: Not many. I have about 50 to 60 yaks only.

PN: Are all of them yours?

GG: About 29 yaks belong to another person – one Lam Rinzin from Thimphu

PN: What is the tenure system?

GG: It is the *kay-mid se-mid* system.

PN: In the *kay-mid se-mid* system, who benefits more, the owner or the herder?

- GG: It is about equal. In the *kay-mid se-mid* system, the number of cattle is fixed and the share ratio between the owner and the herder. If the animal number falls below the fixed number, the herder has to bear the costs, and if the animal number rises over the fixed number, the additional animals belong to the herder. The owner provides an annual quota of salt and food provisions for the herder. The herder provides to the owner 4 *sangs* of butter per animal per year (?). The other system is called *pu-yig*. In this system, the owner takes an annual census of the herd size. The herder provides 20 *sangs* of butter per milking cow. We don't have to give the *chagoes*. We don't have this system here.
- PN: Does the tsamdo belong to the owner?
- GG: No, it belongs to us

21.06.2003 Interview with App Tandin, Summer Grazing Camp (4400m) Chewla, Village Gangyul

- AT: *App Tandin*
- PN: How long does it take to travel from Rhram to Phari in Tibet?
- AT: Two hours by car.
- PN: Where do the most Tibetan poachers come from?
- AT: They are mostly from Phari. Very few from Rhram
- PN: What could be the reason?
- AT: Phari is an urban place, no agriculture and no livestock. They are mostly engaged in trading, whereas the people from Rhram rear sheep, yaks, and do a lot agricultural works. I guess the households with lot of manpower come over to collect the Cordyceps.
- PN: Did you do trading across the border?
- AT: Yes, when I was younger. It was many years ago. I took Bangladeshi clothes from Phuntsholing, and from Phari, I brought back hot water flasks and miscellanies items.
- PN: How much did you pay for the solar lighting system?
- AT: Nu.12000.
- PN: What amount of Cordyceps do you think the Tibetans would collect?
- AT: I don't know. I have no idea
- PN: Do you know how many Tibetans come over to our territories?
- AT: Before the forestry people started patrolling in the last few years, there would be no less than 10 Tibetans come everyday. Sometimes, they are in number of 20s and 30s. We are overwhelmed and feel intimidated by the presence of large number of Tibetans in our summer camps. They walk over to our camps, fetch water and prepare tea. Of course they carry their own utensils.
- PN: Do you get scared?
- AT: Yes, we are very scared. They are many in number. We are just one or two in number. We therefore stay quiet and don't say anything, and oblige to their request to prepare tea.
- PN: What is the number of Tibetans coming over these days?
- AT: Not many, I think they return home in the evenings?
- PN: Is Cordyceps creating a lot of confusion here in the area?
- AT: Yes, it is creating a lot of confusion here. I don't know how much price the Cordyceps gets across the border but Tibetans come in large numbers and I cannot understand this madness.
- PN: How many yaks do you have?
- AT: I have over 60 yaks.
- PN: How many people are there in your household?
- AT: I have four daughters, one son-in-law, a child, wife & I. We are 8 people in the household.
- PN: You have then adequate number of manpower at home?
- AT: No, not enough. Two daughters go to school, one in Lingshi & other in Thinleygang.
- PN: If you put your children to school, will there be herders in future?
- AT: I doubt.
- PN: Do you feel sad when Tibetans collect Cordyceps?
- AT: Yes, I feel sad when others take away our precious resource.
- PN: What do you think about government lifting the ban on Cordyceps?

AT: This is a very valuable resource, and if the government allowed the people to collect it, it will benefit the people very much.
 PN: Do you think that the local people will be able to stop the Tibetans?
 AT: This will be difficult. The Tibetans do not seem to be bothered by any kind of punishment.
 PN: Do you encounter problems with the Tibetans?
 AT: Yes, they burn our summer firewood and tent poles
 PN: What do you think is the reason for the ban on Cordyceps?
 AT: I really don't know. Maybe, it is a medicinal plant.
 PN: Do you eat Cordyceps for any medicinal purpose?
 AT: Yes, we eat but it does not seem to cure anything, not even the stomach.

Laya Geog, Gasa Dzongkhag

26.06.2003 Interview with the Tibetan poachers (20 nos.) at Raluta

TG: Tibetan Group
PN: Phuntsho Namgyel
RP: Risup

PN: Have you come before to Bhutan?

TG: This is our first time to Bhutan.

PN: It cannot be. Many of you have come before?

TG: It's our first time.

PN: If all of you are first timers, how did you find your way into Bhutan?

TG: We just followed footsteps of people ahead of us.

PN to forestry staff: Have you seen them before?

RP: No, we don't remember seeing them.

PN: Why do you endure such great difficulties to come and pick Cordyceps in Bhutan?

TG: We have fewer yaks and less land. The animals and land are not able to support us. We are poor people.

PN: Don't you fear to enter into the territories of a different country?

TG: Yes, we fear very much.

PN: How much do you earn in a day in your country?

TG: We earn between Yuan 10 – 15 a day.

PN: Of course all of you are first timers in Bhutan, but what would be an average household income from Cordyceps in the season?

TG: We do not know.

PN: What would be the maximum amount a household could earn from the sale of Cordyceps?

TG: Yuan 1500.

PN: What do people do with the money?

TG: We pay for our food provisions and yaks.

PN: How many households and people are there in your villages?

TG: 50 households and 500 – 600 people.

PN: How much does a Cordyceps fetch in Phari?

TG: The highest price is Yuan 2 per piece.

PN: Do you have Cordyceps in your village?

TG: Yes, we have but they have become very scarce.

PN: When did the commercial harvesting of Cordyceps start in your village?

TG: 6 or 7 years ago.

28.06.03 Interview with Lhabab Tshering (Mangi App), App Kesang Dorji and Khadiphu

LT: Lhabab Tshering (Mangi App), Laya

KD: App Kesang Dorji

KU: Khadiphu

PN: Phuntsho Namgyel

TA: Tshitila

PN: Do you think that the Cordyceps are facing extinction?

LT: There is no worry about it all. We have observed it for many years, and it follows a cycle of good and bad years.

PN: What about the legal collection of it?

LT: Legal collection is indeed a good idea. However, all people within the geog should have access to it. If the access is by tsamdro ownership, then there will be a lot of problems. The rights of access to Cordyceps should be treated differently from the rights of ownership of tsamdro. Otherwise, the poorer households will not benefit from Cordyceps.

There is a great variation in the Cordyceps emergence. In the lower altitudes, we have observed Cordyceps emerge in the third Bhutanese month, and in the higher elevations, in the fifth Bhutanese month.

KU: If the legal collection is allowed, it is important that the government buy from the people.

PN: Will the collection of Cordyceps affect the yak husbandry?

LT: No, it will not. People will have no choice but to look after their animals. The animal husbandry will remain the primary occupation of the people.

TA: What about stopping the Tibetans by the local people?

LT & KD: We can stop the Tibetans because the people can always spot them the instant they are in our territories. Also people will take special efforts to stop outsiders from picking a valuable resource. In the present case, when the forestry people are in the east, the poachers are in the rest of the areas. They don't have adequate people and resources. If the legal collection is allowed, it will be much easier for the forestry people. If the forestry people are not careful, they are much in danger from the possible attack by the Tibetan poachers.

PN: Do local people collect Cordyceps?

LT & KD: There is no point denying the fact. Yes, local people do collect Cordyceps. They say that they don't understand the rationale behind the ban. They say that there is no sin committed in the picking of Cordyceps because the insect is already dead. Here, the people are very religious, and no person in the village engages in the killing and poaching of musk deer and blue sheep.

PN: We have heard that your Gup submitted to the GYT the case of legal collection of Cordyceps. What has come out of it?

LT: The answer from the Park officer was that the government is looking for a market. And also in the GYT, there was a heated argument between us and the people of Goen Khatey and Khamed. They said that Layaps should not be allowed to go to Tibet, and pick Cordyceps. They are very jealous of Layaps becoming rich. We argued that we have no economic opportunities, and when we go to Tibet, we do not do any inadmissible things.

In the past, we used to transport timber to Tibet, and the timber used to get very good price. Timber was in great demand that the Tibetans came right up to the pass to buy it. Just about 40 years ago, timber trading was a big business, and the Tibetans would come over to our villages to place orders.

PN: What are the other sources of cash income?

LT & KD: Sale of sang-je-y (incense).

PN: Do you need to obtain permits from the Forest Department?

LT: No, we don't need to obtain permits. We pleaded to the government to exempt us from it.

Interview with Ms. Wangmo

WO: *Wangmo*

WO: The forestry people are very suspicious of the local people. Forget meeting them in the high mountain areas, here even in the village when they see us in shops or in groups, they ask us a lot of questions, and check our bags. The army personnel also ask us questions and check our bags and loads. Last year, I nearly lost my husband. When trying to avert the bridge near the army camp, he was nearly carried away by the Laya River.

Interview with the Sharchogpa – husband to a local Laya woman.

SA: *Sharchogpa*

PN: *Phuntsho Namgyel*

SA: Some people in the village buy Cordyceps at the rate of 40 to 45,000/kg.

PN: There are many new houses come up in the village. What could be the main source of cash?

SA: Laughing...The cash is mainly from the sale of Cordyceps, otherwise what economic opportunities could be available in such difficult and high altitude valleys.

Interview with a Men's Group from Lunana

MG: *Men's Group*

PN: *Phuntsho Namgyel*

TA: *Tshitila*

MG: During the flood year in 1994, it was a good crop year, and the last year was also a good crop year. In good crop year, Cordyceps could be found like seedlings in a barley field. In a day, a person could collect about a kg of Cordyceps (fresh weight).

PN: Did Cordyceps last year bring money to the people?

MG: Yes, it was very beneficial to the people.

TA: How much fresh weight constitutes 1 kg of dried Cordyceps?

MG: 5 to 6 kgs of fresh weight of Cordyceps constitute 1 kg of dried Cordyceps.

TA: How much did a kg of fresh weight and a kg of dried weight of Cordyceps fetch last year?

MG: Nu. 10,000/kg for fresh weight and Nu. 35 – 40,000 for the dried weight.

PN: Where did you sell them?

MG: There were many people with lots of money who came to the village.

PN: How much money did you make last year?

Ninda (adult, over 30 years): I sold a kilogram only and got Nu. 35,000.

Gyem Dhendup (boy): Nu. 35,000.

Gyem Dorji (boy): 35,000.

Phub Tshering (boy): 35,000

Dorji Khandu (boy): 35,000

Sacha tenzin: (boy): 20,000

TA: What would be the maximum revenue earned by a household?

MG: We don not know. However, each household would have picked a minimum of 1 kg. Children and women are better pickers than men, and there are about 170 households in the Lunana geog.

PN: What do you think about Cordyceps ban by the government?

MG: We have no idea.

01.07.03 Interview with Laya Gup

LG: *Laya Gup*

PN: *Phuntsho Namgyel*

TA: *Tshitila*

LG: I saw the caterpillar. If we keep the Cordyceps with the caterpillar, it eats them all.

TA: Really!

GP: Before I became Gup, I also went to collect Cordyceps. There I saw a lot of them. Women cannot catch them because they run like snakes.

TA: Do you know what does the caterpillar eat?

LG: We do not know. Wherever they (caterpillars) are, one could see lots of wings left behind, like some insects do.

PN: Do you think that Cordyceps population is declining?

LG: I don't think so. Even in the meetings, we always say this that there is no danger of population decline or going extinction. We are always asking the government to come up with an idea or scheme which will allow us to collect, so that trade across the border will not take place, and the government can impose fees on us...this will be a great benefit to the people as well as the government.

PN: We understand that you raised the issue of legalisation of Cordyceps in the DYT?

LG: Yes, I did.

PN: What was the outcome?

LG: The forestry people said that it was not possible as per the provision of the Act...However, we said that if the government devises a scheme, we can really stop the trading of it across the border,...and it is a natural product arising from our own environment...We put up the same request last year, and this year is the second time.

PN: What were the opinions of the other DYT members?

LG: They said that this is possible only when there is a change in policy...We said that the present policy is not working...It is not only the Laya Geog who engages in the illegal picking. Earlier it was only Lunana and Laya Geogs. Now in the last 2-3 years, everyone knows about Cordyceps. There are businessmen from Sefhu and Paro who buy Cordyceps...It is only us who live in the high mountains who could collect, and for trading, there are many men who are in the business...The government should develop Cordyceps market in the country, and for collection, the government should give us guidelines...Dasho Dzungda initially said that he received Royal Command for collection by people, but during the meeting, he did a turn around...

PN: With a change in policy change, how can the people protect the Cordyceps resource?

LG: If there is a domestic market, we can then really protect the resource base. We can stop the foreigners. At the moment, we cannot because the Cordyceps market is across the border only. Cordyceps is like 'nangten' of our house. Our Laya area is not huge, and given the responsibility, we can stop the foreigners and take care of the resource base.

PN: We have come across many people say that there should be the domestic market first, why is this?

LG: The main reason is that when we sell across the border, there is a big problem...The big problem is that large number of people across the border come over to our territories to pick up the Cordyceps. If they remain our Cordyceps market, we cannot therefore stop them, otherwise they will be very hostile to us when we go over to their areas. Therefore the domestic market is very essential. And also, there is always the danger of waylaying the travellers. Cordyceps is now more valuable than gold. A tola of gold costs Nu. 5,000, and Cordyceps fetches about equal price.

PN: How much does a kg of Cordyceps fetch?

LG: Last year, it was Nu. 60,000/kg for the grade A, fully dried. When bended, the Cordyceps piece has to break in the middle. If it does not, and two parts hang onto each other, the value drops to half the price...

PN: What do you say about the idea of Gup charging collection fees for the people in order to develop locally mobilized fund for geog development expenses?

- LG: If there is such a scheme, this will be very good. This will allow us to mobilize the fund locally and meet the expenses for our development activities, e.g. trail repair, bridge repair, school repair, and also buy essential medicines...We are pastoralists, our livelihood dependent upon animals. We have no other sources of cash income and life is difficult for us. We are staying a bit comfortable at the moment because of Cordyceps, albeit, illegal picking. Traditionally, our land is not suitable for agriculture development, only livestock husbandry. If there is a legal collection of Cordyceps, we would be very grateful to the government. The economic benefits will be not for us Layaps only but for all the people living in the 'la gong sum' (alpine region).
- PN: Are people scared of forestry people?
- LG: Yes, they are. I often have to beg the forestry personnel n people's behalf, when they are apprehended. I cannot tell and blame my people because this is the only source of cash income for them. It is a difficult issue, and I do not know what to do with it. The legal collection can only address this issue. Our income level can really rise. If the government can treat Cordyceps like other medicinal plants in our area, it would be wonderful.
- PN: So, you really think that collection will not lead to extinction of the species.
- LG: Yes, I really think so. The heavy collection of Cordyceps has been going on for the last 5 or 6 years, and if collection was harmful, it was time we notice it. Our observation is that people are collecting it every year.
- PN: You said that market for Cordyceps has to be inside the country, but what if people sold them across the border for higher price?
- LG: Yes, people will sell where they get better price. However, if the responsibility is given to us, we can monitor and control the sale across the border. We know everyone in the geog, and each other's movement. The words of mouth communication in the village is good and effective. Currently, we are not monitoring the people's movement because there is no economic incentive to do so. We have mechanisms in the village to monitor and enforce the rules.
- PN: How do the forestry personnel fine the people?
- GP: Here, we have a good set of forestry personnel. They are educated and ell-behaved. But, we have forestry people at Lingshi and Soe who are different. It seems that in the same country, there are two sets of rules. Here our forestry people have not fined more than Nu.4000, but there they fine Nu. 30,000. Also, in the forestry staff, there are ex-army personnel recruited, they are very rough with the people. We think that they are the rejects from the armed forces, or recruited by forestry for the special purposes. We are not in the position to tell on what criteria they are recruited.

Transcripts

Appendix 2. Case Study Two – *Tricholoma matsutake*

18.07.03 Matsutake Workshop in Thimphu

- KG:* Karma Gyeltshen (Gup), Genekha Geog
SD: Sangay Duba, Programme Director, RC Bajo
DP: Dawa Penjor, Programme Director, National Mushroom Centre, Semtokha
KG: Kinley Gyelpo, Matsutake Exporter, Dekiling Export House, Thimphu
KiG: Kin Gyeltshen, Divisional Forest Officer, Paro Forest Division, DoF
DR: Dorji Rinchen, Marketing Officer, Ministry of Agriculture (MoA)
PT: Pem Tshering, Manager, TCC Matsutake Export Unit, Thimphu
TA: Tshogpa, Member, Matsutake Committee, Genekha Geog (Ex-Gup)
PC: Pema Choephyel, Director, Council of Research and Extension, MoA
CT: Chimmi Tshering, Marketing Officer, MoA
WE: Woman Exporter
TD: Tshering Dorji, Matsutake Exporter, Choden Export House, Paro

- KG:* We have rules on starting and ending date for the collection of the mushroom, and we keep telling this to the people...now over the years everyone is aware of the rules, and respect them... The mushroom production in the last season may have appeared low but this could be due to weather conditions, and also the less demand of matsutake by foreign countries. As far as we see it, there is no decline of matsutake production in our area. It has remained the same. We have been now picking matsutake for the last 10 years, and during this period, new collection sites have been discovered. Maybe in 10% of our area, there must be a decline in production. Here, we would request the government to continue to educate us on the environmental conservation and sustainable management of the resource. We should tell people that this is country's important natural resource. The government, if possible, like in the past years, should provide us trainings on regular basis, and the Forest Department to continue to strictly enforce the rules. I would like to submit to the meeting that these initiatives have been helpful to us.
- SD:* The issue on decline in production was meant for general mushrooms, not just for matsutake...In the matsutake meeting last year, I remember people asking that there are other mushrooms exported but there was no regulation for them.
- DP:* In matsutake, we have a rule on minimum size but we don't for other mushrooms e.g. cantherellus (*sissi shamu*). We notice people collecting small *sissi shamu*.
- KG:* I have been exporting small amount of *sissi shamu*, but I buy them from the roadside sellers at Namselling, Babesa.
- KG:* In my opinion, there is a difference between tax and royalty. The DoF does not levy tax but realize royalty for issue of permit and the smooth transport of the forest products. For commercial NTFPs, it is easier for the DoF to monitor, as we know the areas of production. We can thus issue permits accordingly. For subsistence use, it is difficult...I agree with the Program Director of Bajo that sustainable management is the key issue in natural resources utilization...we all agree that the population is increasing every year, and with it, the growing demand for mushrooms. In the case of commercial trade, volume traded will be of limited amount. However, we see baskets of mushrooms at the roadsides, and we are not in the position to monitor them. In my opinion, the subsistence collectors are perhaps a problem.
- DR:* According to the people of Genekha, there is no decline in the matsutake production. However, we notice in the trade figures, that the export volumes have fallen over the last few years. How do we explain this situation? We would thus appreciate if the exporters could highlight on this matter.
- PT:* Yes, since 1998, the export volumes have declined. I agree with the Gene Gup that matsutake production in the forests would not have fallen. The export decline is largely due to less demand from overseas. In 1998 and prior, there was a big demand, and we could export all, including grade B and C. Now, we face competition from China and Korea. They offer competitive price in

- Japan. We are thus not able to buy the entire mushroom from the farmers. We have to be selective, buy the best quality only. Earlier, we could not see people selling in the local market in Thimphu, now you see many of them selling it...our cost of production is very much affected by freight cost. Druk Air transportation is very expensive, and we are therefore not able to offer attractive prices to the farmers.
- KiG: As discussed earlier, it would be useful to have guidelines for *sissi shamu* also.
- SD: We would appreciate if the DoF has a plan for sustainably managing *sissi shamu*.
- KiG: I don't know if I can give a detailed explanation. As far as I know, mushroom management is not a priority topic with the DoF. We give priority to trees. This is from the point of environmental conservation and revenue generation. In the past, shifting cultivation was a common practice in the country. Now due to policy ban, the practice of shifting cultivation has been greatly reduced. Today we can see greenery all over the country.
- TA: After the emergence of first matsutake mushroom, we wait for a period of 14 days before commencing the picking. Over the years, we have noticed that this is a long period and a lot of mushrooms rot in the forests. We therefore lose a lot of revenue. For the welfare of the people, we would like to submit to the meeting that the waiting period be reduced to about a week...As far as we farmers see, there is indeed no decline in matsutake production in the forests...The reduction in waiting period will also be beneficial to the exporters as we know from the presentations that early season mushrooms fetch higher prices. For instance, when the overseas people are placing orders for our mushrooms, the mushrooms are rotting in the forests. But, when we finally pick to sell, the exporters tell us that there is no demand for it in Japan because of large supply of it from other countries. We become thus helpless, and have no choice but to sell at the local market for Nu.50/kg.
- PT: For the welfare of the people, we are buying all the mushrooms, which the farmers collect. We export the grade A fresh, and for grade B and others, we export dry.
- DP: On reducing the waiting period, we have no problem. We can contract the starting period as well as the ending period.
- PC: I also feel that it is not necessary to wait for 14 days.
- CT: As per our marketing survey, matsutake fetches higher price in the 7th and 9th month, and in the month of 8th and 9th, lower prices. I will be making a presentation on the subject later.
- KG: Dorji Wangchuk from the National Mushroom Centre kept this 15 day-waiting period. He said that it was necessary for mushrooms to mature and release spores for future reproduction. As we observe the mushroom production in the forests over the years, we feel that this is not helpful to the forests. We have observed animals eat it, and I have to be frank that the rule is not effective. As soon as we have mushrooms emerge, we have people picking it for various other reasons such as special order by individuals or as gifts to special people. We therefore have to place special emphasis on the minimum size... The matsutake season generally closes on 10th of October. I would therefore suggest that collection be allowed as soon as the mushroom emerges from the soil. The sustainable management could be taken care by the minimum size, and we can contract the ending period i.e. the season could close on 01st October for release of spores.
- KiG: I do not know much about mushroom. However, my personal concern is that whether spores from the late season are viable for reproduction. In forestry, seed source and timing are an important consideration e.g. seeds from poorer trees yield crooked trees. I do not know the case with the mushroom.
- TA: We are grateful for the presentation on matsutake pricing in Japan. We would thus appreciate if the exporters for the welfare of the people could tell us that what price they would offer to us this year.
- SD: In 2002, our mushroom fetched Nu.2000/kg in Japan. Out of it, our exporters spend Nu.700/kg in the processing, packaging and freight.
- WE: Nu.700/kg is not true. For one kg of mushroom, there is one kg of ice. A box therefore will contain 4 kgs of mushroom and 4 kgs of ice. The total weight of the box then becomes 9 kgs. Sometimes, it is even 10 kgs because we make ice ourselves.
- KG: For 4 kgs of mushroom, we pay the freight cost for 9 kgs.
- TD: We also have to take into account the high wastage. For instance, out of 100 kgs we buy from the farmers, there is a rejection of 60% arising from grading and quality control. Not all the mushrooms we buy are exported because we have to comply with the Japanese standards. And

- also, we have to take this fact into consideration that Japan is the only importing country, whereas matsutake is found growing in a number of countries. Our domestic production is small compared to other countries and we have very high production costs and logistic problems. The expenses incurred do not allow us to pay higher than we do now. For instance, the flying time between Korea and Japan is about one and half to two hours. One important aspect of this matsutake trading is freshness, and it is a highly perishable item. In our case, we are talking about 36 to 45 hours of transportation. This could be one of the main reasons why our mushrooms do not fetch a premium price in Japan.
- CT: First of all, my apologies for the costing. My costing may not have taken all factors into account. When we do the final write-up, the points will be reflected.
- DP: One of the exporters said the expenses incurred for a kg of the mushroom is US \$ 21, including everything e.g. wastage, grading, packing.
- Exporters: Yes, around that amount.
- TA: During my time as Gup, people had difficulty paying taxes, amounting to even Nu. 5. Now a days people have no difficulty in paying the taxes. This is all due to the mushroom. I still have tax receipts of people for whom I paid for when I was the Gup in 1979. People lived a difficult life conditions and continue to do so. We would therefore like the exporters to be kind and understanding towards us.
- SD: The farmers have to form an association to enhance their bargaining power with the exporters.
- CT: I would like to clarify that Nu.7000/kg for matsutake is for the month of June. Our mushroom export to Japan is in August. During this period, the matsutake price is the lowest.
- DP: The mushroom this year emerged on 11.07.03. Today is 18.07.03. The opening date therefore will fall on 24/25 July.
- KG: We can not set the fixed dates on starting and ending. It has to be season based as matsutake production is much influenced by weather conditions.
- DP: There is a mismatch of trade figures. In our record, the export figure is 900 kgs whereas the Japanese figure is 454 kgs. It is important to discuss this mismatch.
- CT: We obtained the Japanese figure from JETRO (Tariff Association). The Japanese trade figure is lower, and our doubt is that Bhutanese matsutake may be getting sold as matsutake from other countries. If this is the case, we really have to think about it. We must therefore work hard to elevate our matsutake profile.
- KG: I don't think that this could happen. We fax a copy each of our consignment to the importer and the clearance agent. Over the last two years, record keeping has improved. We submit our details to QCRS and they issue us a certificate.

15.09.03 Genekha Geog, Thimphu Dzongkhag

- DP: *Dawa Penjore, National Mushroom Centre*
- KG: *Karma Gyeltshen (Gup)*
- PN: *Phuntsho Namgyel*
- DG: *Doug Henderson, Consultant*
- PT: *Pem Tshering, Manager, TCC Matsutake Export Division, Thimphu*
- FR: *Forester, Genekha*
- DP: We see many people carry plastic bags. Mushrooms in the plastic bags remain moist. Exporters have to dry them for more hours, whereas mushrooms in bamboo baskets are dry, and we feel like touching them. Mushroom in plastics exhibit dark colours.
- KG: Today we have all collectors here. It would be very helpful to us if Dashoes should talk to the people on good mushroom picking and transportation techniques...I will also talk to them. I have always been emphasizing the point to the people for the need to carry mushrooms in bamboo baskets. The large collectors bring mushrooms in baskets. It is the smaller collectors who bring half kg or one-fourth kg of mushroom. They do this for convenience. We have 12 *tshopas*, two from each *chiwogs*. We have 6 *chiwogs*.
- DG: What is the role of agents? How has their role changed in the last 5 years?

- PT: We commission agents to help us to coordinate collectors, grade and weigh the mushrooms, and also to make payments to the collectors. The agents are the local persons, and they facilitate the buying mushrooms from the collectors...Except for what I discussed, they don't have much responsibility. Last year, the agent commission was Nu.30/kg, and this year it is Nu.40/kg.
- DG: Why is there standard price amongst the 3 or 4 exporters?
- PT: The price is determined by the demand in Japan. Currently, there is not much demand in Japan. Therefore, there is no competition amongst the exporters. If there is more demand, there will be more competition amongst us. Sometimes, some exporters do not turn up to buy the mushrooms. Then the pressure falls on the exporters who are present to buy the entire mushrooms that have been brought by the farmers. For the sake of good relationship and welfare of the people, they buy the mushroom even when they know that they cannot export. However, they have drying units, and they dry the excess mushrooms for export later...In 1995, 1996 and 1997, the demand was the strongest. There were 6 or 7 exporters and farm gate price went up to Nu. 700/kg, and towards later, even Nu. 1000/kg.
- DG: How did you establish your business contact?
- PT: Personal and traditional contacts.
- DG: Why are you not establishing more business contacts?
- PT: We tried, but when we offer our prices, they drop out. Our traditional contacts are the most dependable partners.
- PN: Do you buy matsutake from outside Genekha?
- PT: Small amounts, 10-20 kgs per collection.
- PN: Where does the matsutake emerge first, Ura or Genekha?
- PT: Matsutake comes first in Ura.
- FR: Royalty for matsutake has been increased from Nu. 5 to 20 this year. Exporters are saying that it will be difficult for them now to pay the royalties on behalf of the farmers. If this will be the case, it will be difficult for us to monitor the issue of permits and matsutake collectors. The present system of exporters buying the permits in bulk is convenient to us.

13.09.03 Interview with a farmer collector

- Farmer: Earlier when the farmers from the upper village grazed their cattle in the lower valley, they had to pay grazing fees. Now, we don't anymore. Fees would depend upon the herd size. Fees would range from Nu. 200 to 500.
- PN: Why is this?
- Farmer: Our Gup said that we are people of the same geog. People from lower valley thus should be allowed to collect matsutake from the upper valley, and cattle from upper valley could also be grazed in the lower valley, provided they don't enter the agricultural fields.
- PN: Do you have village boundaries? Do people respect them?
- Farmer: Yes, we have village boundaries, and they are certainly respected by everyone...

Group Interview with women collectors in the forests

- PN: Have you all received training on matsutake picking?
- Women: No

Interview with another farmer collector

- PN: Apa, what is the reason for restricting the use of plastic bags?
- Farmer: The reason is that matsutake becomes black from the heat developed in the plastic.
- Tshogpa (guide): We have always been telling people not to carry plastic bags. They don't seem to listen to us. They generally evade us. Today we meet because I called to them.
- PN: But, we saw people bring matsutake in plastic bags at the trading point yesterday?
- Tshogpa: Maybe a few people are doing it when we are not around.

PN: Dawa, what are the reasons for the restriction on the use of the plastic bags?

DP: The first reason is of course the mushrooms do not get spoiled; secondly, in bamboo carriers, the spores from it could drop to the ground during picking and traversing. In foreign countries, this is a very important consideration, and inspectors would monitor and fine rule breakers immediately.

PN: Perhaps, plastic bag is a convenient carrier bag in the forests. Isn't it so?

Dawa Penjore: I don't think so. The basket (ba-zey) hung around the body will be more convenient.

Farmer: But, when we fall, mushrooms in the basket get damaged.

PN: Which forest type old or young, do you get more matsutake?

Tshogpa (guide): Young forests generally bear more matsutake than the older forests.
Also in areas with thick leaf-litter bear more matsutake.

Farmer: In old and thick forests, we get big pieces but fewer in numbers. The young forests have more in number but smaller in sizes.

PN: How much did you earn last year?

Dorji (Tshochekha): Over Nu. 30,000.

PN: Are you the sole collector from your household?

Dorji: Yes

PN: What was the maximum amount you got so far?

Dorji: About Nu. 60,000 in 1996/1997.

PN: What did you do with the money?

Dorji: I bought a pair of bullocks, one mule, CGI sheets, and pay for school expenses for the children...Earlier, farmers from lower valley used to make fun of us. They would say to us 'mushroom sellers'. In the beginning, we used to take the mushrooms at the 4 km point, and Tashi would come there to buy from us. It would take half a day to reach the point. When the mushroom price reached Nu.300, lower valley people got very excited. Tashi paid us Nu 35/kg for two years. Then one year one agriculture officer came to our village and raised the price to Nu. 350. He said to the exporter that people should not be paid lower than it.

Other Farmers: In the beginning, we were only 5 or 6 households selling matsutake. We did not know about matsutake. We never came this side of the forests. We could get plenty of it in the forests just above our houses.

PN: What was the matsutake called in the beginning?

Farmers:Sangay Shamu only. It is not a new name. It is a traditional name only. This Sangay Shamu is indeed Sangay – incredible. If it were another mushroom, it would be finished by now. Look at the number of collectors! This is not the case with Sangay Shamu. There is no decline in production. Every year it is the same...The village boundaries are very clear. For instance, this side of the stream belongs to the village of Tshochekha and the other side Genekha. When we herd our cattle, we cannot send them to the other side. If we do, they will object to us. In the case of timber, the boundaries do not work. This is because of nationalization of forests by the government.

Interview with Aum Makhum – the first matsutake seller in the weekend market in Thimphu

PN: Aum Makhum, how old are you?

Aum Makhum: I do not know my age. I do not hear well.

A relation: About 80

PN: How many people are there in the household?

A relation: 15 or 16 people. 13 are permanent.

PN: Who is Kuchum?

Aum Makhum: My niece. She is at the moment in the forests collecting mushroom.

PN: Who took the matsutake first time to the Thimphu market?

Aum Makhum: It was my niece Kuchum.

PN: Who noticed the matsutake?

Households (HH): It was one dasho.

PN: Was it Dasho Rim?

HH: No, it was not Dasho Rim.

PN: Was it then Japanese people?
 HH: No, not Japanese. It was a friend of Dasho Pasang.
 PN: Which year was it?
 HH: It was many years ago. We cannot remember the year.
 PN: What was the price in the beginning?
 HH: Nu.30/kg. This price prevailed for two years. It was then raised to Nu.350/kg.
 PN: Who raised the price?
 HH: Tashi only. Then other buyers came in. The price went up to Nu. 600 and 700/kg.
 PN: How many times do you go to collect mushroom in a day?
 HH: Two times.
 PN: How many members in the household collect the mushroom?
 HH: Six family members collect the mushroom on full-time basis.
 PN: How much did you earn in the last season?
 HH: We do not know. As soon as we get money, we buy food items and others. Here we have to buy even a piece of chilly.
 DP: I saw you get Nu. 2300 yesterday.
 PN: How many people go to sell matsutake?
 HH: Only one member.
 PN: Is there a difference in life conditions before and after matsutake?
 Aum Makhum: There is indeed a big difference. No telling about it. Before, we had only wheat for meals, morning, afternoon and evenings all. Now with matsutake, we can eat rice, drink tea and have edible oil. We could put CGI roof sheets in our house. This was only possible because of matsutake.
 PN: Which forest type thick or woodland, do you find more matsutake?
 Son-in-law: It is difficult to tell because you find matsutake in both types of forests.
 PN: We came across iron furnaces in the forests. Aum Makhum, do you know something about the iron works here in the village?
 Aum Makhum: Yes, I remember. I was a young girl of 11 or 12. I could do work, and I worked in the iron ore extraction at Chakula. At Chakula, there were narrow deep pits. A person was let down the pit by a rope. It was a very difficult job. We used to carry the ore materials to forested areas for burning. It consumed huge amount of wood.

Kuchum joins...

PN: So you were the one who first took matsutake to the Thimphu vegetable market?
 Kuchum: Yes.
 PN: Was Sangay Shamu a traditional name?
 HH: Yes, yes.
 Aum Makhum: The origin of Sangay Shamu is related to a story here in the village. There is a local deity on the opposite mountain. A person went there to pay his respect but he lost his piece of meat. Then he picked Sangay Shamu and offered this prayer.

Gopa Kencho sha lu ga
Sha fuelwa sha min duk
Sha gi changma
Sangay Shamu shey

HH: Sangay Shamu is indeed Sangay. There is no insect infestation of this mushroom.
 Aum Makhum: This mushroom also has no seeds. All we have to do is take care of the white mass in the soil. This white mass will give rise to new mushrooms.
 PN: Aum Kuchum, who first noticed your matsutake?
 Kuchum: One Dasho.
 PN: Was it Dasho Rim?
 Kuchum: I don't know.

PN: Besides matsutake, what are the other sources of cash income?
 HH: Nothing.
 PN: How many of you have received training on collection?
 HH: Two of us.
 PN: What are the responsibilities of a *tshogpa*?
 Son-in-law (Tshogpa): To monitor the non-collection of mushroom below the minimum size, the ground cover is not damaged, and to pass on announcements. For example, there was recently no export of matsutake mushroom to Japan owing to 10 days national holidays there.
 PN: Do tshogpas meet?
 Son-in-law: As and when required.
 PN: Who is the chairman of the tshogpas?
 HH: There is no chairman. The Gup and Mangi App coordinate the meetings.
 PN: What benefits do Gup and Tshogpas get?
 HH: Nothing. It is voluntary.
 PN: Are people scared of tshogpas?
 Tshogpa (guide): No, people do not get scared of tshogpas. They get a bit scared when we say that we will report to the forestry personnel.
 PN: So the presence of forestry personnel is important?
 Tshogpa: Yes.
 PN: Are people not scared of Gup also?
 Tshogpa: No, because he collects himself.
 PN: Does the agricultural work conflict with the matsutake picking?
 HH: If we harvest the wheat early enough, there is no conflict.

13.09.03 Interview with Mr. Kencho (Mangi App), Genekha Geog

KO Kencho

PN: Is there Cordyceps at Dagala?
 KO: I don't think so. Cordyceps are found mostly in Lingshi.
 PN: How many chiwogs are there in Gene Geog?
 KO: There are six chiwogs, and for each chiwog, there are two matsutake tshogpas. These tshogpas are different from the GYT tshogpas.
 PN: What do you say about the matsutake stocking in the forests?
 KO: In our opinion, we don't see decline in matsutake production. It has remained the same. People who say that production has increased or fallen are I guess referring to the price. When the price is low, we get less money, and feel that production has fallen, and vice versa.
 DP: But, trade figures indicate a fall in production. How do you explain it?
 KO: This is because for example in my village Bama, not all households collect matsutake, as the price is low. When the price is good, all households collect it.
 PN: How many households are there in your village, and how many of them are presently engaged in the collection?
 KO: There are 25 households, and presently only about 10 households are involved in the picking. When the price is good, all households and all able bodied members devote their time to collection of the mushroom.
 DP: How much can you collect in a day?
 KO: It all depends upon one's luck. Sometimes, in two hours, we can collect 2 kgs, and other times, a few grams only for the whole day.
 DP: If people collect before the starting date, what is the fine amount?
 KO: Nu. 500.
 PN: Who is the head of the matsutake tshogpa?
 KO: Gup
 PN: In the matsutake meeting in Thimphu in March this year, a research officer said that Genekha people do not have legal security in excluding outsiders. What do you say?

KO: Forest legislation may allow access to resources to all. While this is good, there is a problem. For instance, the outsiders are allowed to collect the matsutake, and an outsider sets a wild fire or sets traps for wild life, the forestry personnel will hold the Gup and geog people accountable. This is notwithstanding our costs to stop the wild fires and replanting the areas. There will be no fairness in the system where outsiders derive only benefits but bear no cost.

PN: Who first started the idea of forming tshogpa?

KO: It just evolved. When matsutake started getting attractive price, there were people from outside coming into our forests, and there were a few social problems. Our geog Gup and officials could not go around in the forests, as they are busy with their official works. We then discussed and agreed that individual villages should look after their own forest areas, and this should not be a problem because we know the area and we know who the outsiders/strangers are. We thus agreed to appoint two tshogpas per chiwog.

PN: What role did the NMC play in the tshogpa formation?

KO: There was no order from anyone. It was our initiative only. However, when we mentioned our initiative to the NMC, they said that it was a good idea.

DP: Was the matsutake tshogpa formation before or after the collection training provided by the NMC?

KO: I think, it was at about the same time, sometime 1996/1997. I guess the collection training reinforced our resolve to form the tshogpa.

PN: Are there musk deer in the forests? And are they poached?

KO: I have not seen poaching of musk deer in person but of course saw traps in the forests. Now since the matsutake collection, we have not seen traps in the forest.

PN: What are the main sources of cash income in the geog?

KO: Besides matsutake, it is potato.

PN: Where do you find the matsutake most?

KO: Matsutake is found most where the humus layers are thick. If we damage the humus layers, the mushrooms do not grow again.

PN: What are the associate mushrooms?

KO: *Jichu kangroo*,...there are many. I cannot remember.

PN: What do you do with the cash income?

KO: As we do not grow rice in the valley, we buy rice, salt, oil. Those of us who earn more, we invest in the repair of houses and buying CGI roof sheets. Some buy bulls and power-tillers. Others repay the loans taken. Expenses for school children are also met from matsutake. In fact, we meet most of our cash needs from the income from matsutake.

DP: Genekha was in the past an important transit point between Dagana and Thimphu. With motorable road network outside the village, Genekha is not important any more. Has this affected your livelihood?

KO: We have a small number of tourists going over to Dagala. Otherwise we don't have anything.

PN: Do people here have horses?

KO: Yes, there are a few households with horses, using them for portering. From here to Dagala is one day and to Dagana, is three days.

PN: Do you need to worry about meeting bears during the matsutake pickings?

KO: Yes.

PN: Which animals eat matsutake?

KO: There are many animals that eat or damage matsutake. The most notable animals are the birds and insects.

Doug: Does matsutake collection conflict with agricultural works?

KO: No, there is no conflict between matsutake collection and agricultural works. For instance, we would have finished harvesting the wheat and potatoes.

PN: Do you find the government people bothersome?

KO: No, not at all. On the contrary, we can learn a lot from the government who visit us.

13.09.03 Interview with collectors in the forests

WC: *Women collectors*

PN: How many people from a house go to collect matsutake?

WC: It depends upon the size of the household, 2-4 people.

PN: Do you collect other mushrooms?

WC: Yes, we do.

PN: What do you do with them?

WC: We collect other mushrooms for home consumption. We don't sell them.

Doug: During the season, do you collect every day?

WC: Yes, every day.

14.09.03 Interview with collectors in the forests

WC: *Women collectors*

PN: Who collects more, women or men collectors?

WC: We cannot say. Some women collect more than men.

PN: So you say that matsutake grows more in young forests than old forests?

WC: Yes, we find more matsutake in young forests.

PN: How many did you get today Ugyen?

Ugyen (boy, aged 20): 4 pieces.

PN: How much did you earn so far this season?

Sangay: About Nu.6,000. Both my wife and I collect matsutake. We leave behind our three children with my wife's mother.

PN: How long have you been collecting matsutake?

Sangay: 10 years.

PN: What do you do with the matsutake money?

Sangay: We buy clothes and rice.

PN: What are the sources of cash income in the village?

Sangay: In the village, there is no other source of cash income.

PN: Then, how do you meet your cash requirements?

Sangay: We hire out our labour. We get Nu.150/day plus the food.

PN: Is your farm produce enough to feed you and your family?

Sangay: No, not really. The wheat produce is not enough.

PN: What do you do with the wheat?

Sangay: We eat wheat for breakfast and lunch and use it for religious rituals.

PN: What do you eat for dinner?

Sangay: Here, traditionally we eat rice for dinner.

PN: But, where did you get the rice?

Sangay: We take our iron works e.g. knife, agricultural implements to rice growing areas and barter them for rice.

PN: Do everyone in the village know how to make iron works?

Sangay: No, only a few people are blacksmiths. We hire them.

PN: How many iron furnaces, in your opinion, are there in the forests?

Sangay: No less than 100 numbers. We find them everywhere in the forests.

PN: How old are you Sangay?

Sangay: 34

PN: When you were a child, what was the general forest condition?

Sangay: When we were children, there were more meadows. Today, trees have covered all meadows.

PN: What, in your opinion, is the stocking of matsutake in the forests?

Sangay: I feel matsutake stock is declining. We cannot find matsutake in the same area. And also, people scratch the soil and matsutake cannot grow there.

PN: Do you have a particular collection site?

Sangay: Not really. I go to different sites.
 PN: Are you a tshogpa?
 Sangay: I am not a tshogpa.
 PN: What are the functions of a tshogpa?
 Sangay: Tshogpa monitors that collectors do not collect mushrooms below the minimum size.
 PN: What if people collect below the minimum size?
 Sangay: The people get fined.
 PN: What is the amount?
 Sangay: Nu.50.
 PN: Do tshogpas also fine people who carry plastic bags?
 Sangay: Of course, we are told that we should not carry the plastic bags. Because, they are convenient as carrier bags in the forests, people really don't care about the rule. But, when we bring matsutake from our homes to the trading point, we bring them in baskets.
 PN: How much money did you get last year?
 Sangay: Only about 4000.
 PN: When the matsutake price was best, how much money did you make?
 Sangay: About 10,000.
 PN: Perhaps you got more money than it?
 Sangay: My children were small then. My wife had to stay at home to look after the children.
 PN: Do the tshogpas meet?
 Sangay: Yes, they do.
 PN: When do they meet and for what purpose?
 Sangay: They and the Gup meet before the matsutake collection time to reinforce the rules, and to discuss the price fixing.

Interview with App Nado (60)

NO: Nado

PN: How old are you, Apa? And what is your name?
 NO: My name is Nado and I am sixty years old.
 PN: You are a strong man and you can manage to forage in the forests for matsutake.
 NO: Yes, with the help of a stick.
 PN: How many people are there in your household?
 NO: I and my wife and small children.
 PN: Does your wife also collect matsutake?
 NO: No. We don't have any other person in the house. She looks after the children.
 PN: You have managed to collect a lot, and that too big ones...What do you do with the money?
 NO: We buy food, and bulls.

Interview with Mr. Nim Dorji (ex-Gup; now a Matsutake agent)

ND: Nim Dorji

PN: How much income do you make as an agent in the season?
 ND: It depends upon the production. If we handle about 1500 and 2000 kgs of production, we make about Nu.30,000 to 40,000. Never below Nu.10,000.
 PN: Does the function of an agent entail too much work?
 ND: Not really. We help the exporter in grading and weighing the mushrooms.
 PN: What are the problems in matsutake production?
 ND: We did not have any problem so far but maybe in future. This is particularly with regard to royalty rate. Until this year, the royalty rate was Nu. 4/kg. This year, the royalty rate has been increased to Nu. 20/kg. As of now, the exporters pay for the permits. Now they are saying that henceforth they will not be able to bear the permit costs. If this will be the case, we the farmers will have to pay for the permits. We are planning to take this issue to the DYT. This new system of farmers paying the

- permit costs will entail a lot of work for the forestry people, as monitoring will be difficult and impossible. They may have to install a forester for each farmer... One year, we forgot to make an entry at Semtokha in haste, and we were fined Nu.700.
- KG: The high price of matsutake is a great incentive for us to forage in the forests. We don't feel tired but instead light and highly spirited.
- PN: What is your name, Apa?, and how old are you?
- Gado: Gado. I am 42 years old...Our geog is traditionally popular for its iron production and works. We barter our iron works with rice and other agricultural produce. The lower village Bama is popular for earthen pots.

Interview with Mr. Pasang Dorji, In-charge, Matsutake Export Unit, TCC, Thimphu - 15.08.03

PD: *Pasang Dorji*

PN: When did the TCC start taking interest on matsutake?

PD: We began our matsutake interest around 1984/1985. Our Dasho (Dasho Ugyen Dorji, Proprietor, TCC) was in Japan, and there he came to know about matsutake. His Japanese friends told him that matsutake was found in Japan, South Korea and China. When told about China, Dasho took special interest in the information as China and Bhutan share the same geographical range. Dasho told his Japanese friends that if matsutake occurred in China, it could also be found in Bhutan. By that time, TCC was already engaged in the shitake mushroom (*shokey*) production. Dasho always said that mushroom production in Bhutan could bring additional source of income to the rural people because it could be integrated with the primary job of farming. Even in Japan, besides the large-scale commercial production, many households also take to small-scale backyard production of mushroom to supplement farm income...TCC, therefore initiated commercial production of shitake, oyster mushrooms (American and Indian varieties). Upon return from Japan, Dasho talked to us about matsutake. He then did not know matsutake by the name of *sangay shamu* in Bhutan. He said that matsutake grew among pine trees, and fetched a very high price in Japan...He said that as Japan is a highly industrialised country and rich, and that artificial cultivation of matsutake has not been successful yet, if we found matsutake in Bhutan, our rural farmers would therefore derive economic benefits. He therefore asked us to look for it. Dasho has brought with him from Japan the pictures of matsutake.

PN: Which year was it?

PD: It was in 1986 when Dasho went to Japan. However, it was only in 1988/1989 when we started looking for matsutake. From the pictures, we could not make much headway in the search for it. Some said that it was found, and others said no. One season, we collected *dungshing shamu*, thinking it was matsutake. We sent the sample to Japan. At that time we did not have the Druk Air service...No, yes we had the Druk Air. It was the smaller, twin-engine aircraft Dronier. We sent the sample first to Calcutta, and in Calcutta, the airport rule required keeping the mushroom for 24 hour, called cooling period. This cooling period in Calcutta, and our inexperience in packing and transport of mushroom, the consignment got all spoilt when it reached Japan...Further, the mushroom was found not to be matsutake. Our Japanese contact was very disappointed at this. However, we continued sending samples. We sent, I guess, about three times. We spent a lot of money. Finally in 1989, I and two friends (Nidup from Jabana and Rinzin) got the opportunity to go to Japan on a three-month training programme. During our time there, our Dasho's friends in Japan took us to matsutake wholesale market. There we saw matsutake at the whole-sale market at Echiba, Tokyo. The day was a lucky day...There were matsutake from three or four countries; South Korea, North Korea, China and Morocco...Now many more countries export matsutake, for instance Laos, Canada etc. There, our friend Jabab Nidup, upon seeing the matsutake, immediately said that he was 100% sure that it was found in his village Jabana. He said that when he was a schoolboy, he picked them. And also in the village there was a teacher from Tibet who took particular delight in it, and this teacher used to call it *Sangay Shamu*...From the olden times only, the particular mushroom was called by *sangay shamu* only.

PN: Where is Jabab Nidup today?

- PD: Nidup Dorji worked earlier in the Agriculture Department, and when our Dasho started the mushroom programme, he was sent to us on deputation. Later, he resigned from the government service and joined us permanently. He retired recently, and he now lives at Toeb Limishawa...His wife comes from the area. Upon return from Japan, we submitted our training report to Dasho, and we reported to Dasho that Jabab Nidup was certain that *sangay sham* was found in his village. But, the season for the year was over. We said that we must wait for the next season. We patiently waited for one full year.
- PN: Which year was it?
- PD: It was in 1989. In 1988, we went for the training in Japan. In the 1989 season, we sent Nidup to his village. He returned from his village with six or seven pieces of the mushroom. We looked at them, and we also confirmed their identity because we saw them and smelt them in Japan...Fortunately again that very particular time, Mr. Ogata, General Secretary, Japan-Bhutan Friendship Association was present in the country. He also confirmed the identity of the mushroom as 100% matsutake. We relayed the news to our Japanese contact, and he asked us to send the samples. That evening, Dasho and Mr.Ogata roasted the one piece of matsutake, and celebrated the occasion. Mr. Ogata would smell the matsutake, and would get very excited about it. Dasho was also very happy, and he presented Nidup with Nu. 10,000. He said to Nidup that he had done a great service to the country with the discovery of matsutake as it would bring economic benefits to the poor farmers. Of the remaining six pieces of matsutake, Dasho kept one as a sample to show to other people. We packed the five pieces, and sent them to Japan. We received the confirmation of the identity, and the order for supply of it. At that time, we did not have the experience in packaging and export of mushroom. However, we have an office in Calcutta and our network of contacts was very useful. There was no fixed price then. We would send our mushroom to our Japanese contact, and he would put them at the auction and send us whatever amount he received. Our mushroom could not compete in the international market because we lacked experience in packaging and transport, and our mushroom quality was poor and fetched very low prices. We suffered a loss of Nu. 78,000 in the first year of export i.e. 1989. Nidup, during the running around in the collection of matsutake from his village, met an accident and broke his leg...This is the story of *sangay sham*...
- PN: Not many of us know the story.
- PD: Yes, not many people know about it. In the following year i.e.1990, one day Dasho and I were strolling at the Sunday market in Thimphu. To our great surprise, we encountered an old lady with a basketful of matsutake. We asked where she was from, and she said she was from Geynekha. Dasho then took the old lady and her matsutake to his residence.
- PN: Were there Japanese with Dasho?
- PD: There was no Japanese with Dasho. It was one of Dasho's past time to visit the Sunday market. This was how the story of matsutake in Geynekha began. The year 1990 was also not a good business year as we still lacked technical knowledge.
- PN: What was the name of the old lady?
- PD: Aum Makhum...Makhum Pem.
- PN: Is she still present?
- PD: Yes, she is still present, and she is the best collector. During the two-month mushroom period, she and her household members may be collecting over Nu.140,000 in the good year, and minimum Nu. 75,000 in the poor year. In her household, there are seven full-time collectors.
- PN: Is matsutake an important source of cash income to the people?
- PD: Yes, matsutake is an important source of cash income to the people. Before the commercialisation of matsutake, people lived from hand to mouth...Aum Makhum and her households were particularly poor; their clothing generally included old sacks ('bora'). Today, because of matsutake, their living conditions improved considerably. Many households today have power-tillers, and nearly all households have put the CGI roof-sheets, ...and have bought *Jasams* and *Jerseys*. The condition of the feeder road also improved very much. In the early years, because of the bad road condition, people would bring the mushrooms to the 4-km point, on the Thimphu-Phuntsholing highway, where we used to go and buy the matsutake.
- PN: When did the other matsutake exporters join in the trade?
- PD: Much later...I guess sometime in 1996 or 1997.

- PN: How did they come to know about matsutake?
- PD: By then, Bhutanese matsutake was received well in the Japanese market because Bhutanese matsutake and Japanese matsutake had same aroma and same colour. From China, there were huge supplies of matsutake but they were not considered top class, maybe because of climatic conditions... We suffered losses in 1989, 1990 and also in 1991. However, in 1992, we established a contact with one sun-project company in Japan. It then sent us a person – a Japanese. He gave us training on grading, packaging in 1992. He was the main person to assist us, and since then, we did not have any problem in the packing. Earlier, we did not have any idea on the grading and packing. We did not get any support from the government. He showed us the use of thermo-cool box, card-box and ice... and drying before packing in order to bring the mushroom at the right moisture content... This drying, grading and packing was a trade secret for us.
- PN: Did you not get any technical assistance from the National Mushroom Centre?
- PD: I don't know how much they knew about grading, packing and exporting matsutake, but atleast they would give us matsutake price information in Japan. In 1995/1996, they also started talking about sustainable management of matsutake resource. They said that if we did not take care, there was the danger of matsutake going extinct. They contacted the Dept. of Forestry and coordinated the program on rules and regulations for sustainable use. Earlier, the people collected even very small pieces of matsutake despite our repeated telling them. Our Dasho is particular about sustainability issues. From the very beginning, we used to tell people that resource use should last for generations, from father to children. They thus have to put back the soil after picking the mushroom. Our Dasho used to say that mycelium is very sensitive to disturbance but people do not listen to us. They think that if they did not collect now, others will collect. Now, with the Department of Forests enforcing the minimum size rule, it is effective. The minimum size for matsutake was fixed at 7 cms. In the first year of implementation, it was difficult. Today, you would not see a single piece of undersized matsutake. This rule was very useful and I would consider it as a great contribution from the National Mushroom Centre and the Forest Department.
- PN: I hear that matsutake did not have a Bhutanese name?
- PD: I don't think this was the case. Nidup right away called it *sangay shamu* when he saw it for the first time in Japan, and Aum Makhum, on the first day only, also called it by the same name. If there was no name before, Aum Makhum would otherwise not call it *sangay shamu*.
- PN: When was the matsutake export maximum?
- PD: It was in 1996, 97 and 1998. During these years, we exported large amounts of matsutake.
- PN: It is said that the matsutake export declined over the last few years.
- PD: Yes, the export has declined. However, this would be at the individual exporter level. As the exporter number is many, the total export may have remained the same.
- PN: How many exporters were there in 1997 and 1998?
- PD: I guess there were over seven business houses exporting matsutake. This year we are only three in number.
- PN: Is there no demand in Japan?
- PD: In our case, the demand from Japan is mainly determined by the price we get for our matsutake there. Here, we only have Druk Air as the mode of transport, and the Druk Air is a small passenger aircraft. The airfreight cost therefore is very high. It costs us US \$ 21 to lift a kilogram of matsutake to Japan. The gross weight of our packing box is 11 kg. The Druk Air charge for one kg from Paro to Bangkok is US \$ 4, so a total of \$ 44, while Thai Airways charge only \$ 2.50 from Bangkok to Osaka. One can see the difference. The other expenses include Airways Bill which is \$ 9. For the 11 kg consignment, the total charge works to \$ 71.5. The net weight of matsutake is only 4 kg. The Druk Air bills us further the handling charge, which is Nu. 2 per kilogram. The customs also bill us overtime charge of Nu. 450 per consignment or the ceiling charge of Nu.50 per box. All these things put together our operation cost is high. Therefore we have to pass on this high operation cost to the buyers, and our matsutake therefore becomes expensive, whereas matsutake from China, we believe only cost CIF \$ 15, 21...say maximum 25. We therefore find very difficult to compete in the international market. The reason why the Japanese take our small quantity mushroom is because our quality is good. Our Japanese buyers are not the wholesale buyers. If we have to go for wholesale auction, we cannot compete because of our poor packing techniques and high operation costs. Our Japanese buyers are our old associates, and they supply to their institutional clients, thus they do book order.

- Our supply quantity is not much. We send net 60 to 70 kgs matsutake per shipment. From China, they are shipping 6000 kgs every day. Compare our supply amount with China. Choden may be dispatching net 40 to 50 kgs mushroom, Dekiling 30 to 35 kgs and Bumri 30 to 40 kgs. All put together, not even 200 kgs.
- PN: What do you say about nails and sticks being found in Bhutanese matsutake in Japan?
- PD: This is not true. We noticed this malpractice here in the country only. But, we have been telling the people of the consequences of such bad practices. If such incidents took place in Japan, we would be in serious trouble. I guess this happened for matsutake from China, plus I heard that Chinese made replicas of matsutake from mud and shipped them. This kind of incident did not happen to us. Except for one case. This happened here in the country, and it did not reach the Japanese buyer. I know Kuensel (national newspaper) reported about such malpractices but they are not true.
- PN: But, I remember people talking about it as being shown on Japanese TV, and written on Japanese newspapers.
- PD: I am really not aware of it. If this happened, our Japanese contacts would have passed on the news to us. Even when there is a general news item on Bhutan, they send them to us by fax.
- PN: What could the government do to encourage the matsutake export?
- PD: There is not much scope for large-scale export of matsutake from Bhutan. There is simply not much quantity of matsutake available. However, if we have to make the present export meaningful, the government has to consider reducing the cargo rate. This will enable us to compete in the international market as well as we can pay more to the farmers.
- PN: British Columbia in Canada also exports matsutake to Japan. I read a government commissioned report recommend the government to engage in publicity and promotional programme. How will such a strategy work for Bhutan?
- PD: Such a strategy will not make a difference for Bhutan because there is nothing that the Japanese do not know about Bhutan.
- PN: I understand that in Japan, matsutake forests receive special management considerations, for instance, forest canopy is adjusted for right amount of sunlight on the forest floor, clearing the bushes and brushwood, spraying light insecticides for quality matsutake production. What do you say of such a practice in Bhutan?
- PD: I have not heard about such practices. I have been to matsutake forests in Japan. Well, all forest areas in Japan are clean and clear of bushes. Insecticides and pesticides are not at all acceptable to the Japanese people. If we do it here, we will face a serious consequence. I believe this is the major problem with the Chinese matsutake. If there is an alternative country, Japanese market is happy not to buy the Chinese matsutake, therefore the current low price for it. The Bhutanese matsutake has a premium price because of our pristine environmental conditions. Our matsutake has same brown colour and strong aroma.
- PN: What research needs are there to increase the matsutake production in Bhutan?
- PD: The picking should be stopped before 10-15 days of the end of matsutake season so that there are adequate spores are left in the forests. Secondly, we need to provide training to the farmers on good picking techniques and soil management.
- PN: What lessons can we learn from the Japanese?
- PD: The Japanese will not tell us. It is said that in the case of matsutake, Japanese will not share information even between father and son. What we have to be concern about in our case is to maintain the mycelium areas i.e. put back the soil after digging the mushroom. This simple practice will ensure sustainability of the matsutake resource. Wild animals damage matsutake but we cannot do anything. The wildlife and matsutake have to co-exist. Wild boar causes the maximum damage to the matsutake in the forests. The matsutake aroma attracts them and they disturb the soil. If only the spores are not carried by the wind, wild boar damage to the matsutake habitat could cause matsutake extinction. However, we cannot blame the wild boar, the forest is their living habitat. The other animals responsible for the mushroom damage are birds. There is a red bird. But, this bird does not disturb the mycelium area except the product that the man is also interested.
- PN: What about the matsutake business from Ura and Laya?

- PD: They are not viable because of the long distances. Ura is one full day's journey by road, and Laya has no road access.
- PN: What about your visit to Laya a few years ago?
- PD: Our Japanese contact wanted me to visit Laya saying matsutake from altitude areas are best, and he could afford to give higher prices for it. And if the quantity available was minimum 700 kgs per collection, he could charter a helicopter service from Nepal. But, the area had potential to supply just 70 kgs per collection. It was a small pocket.
- PN: What about Lunana?
- PD: In fact, Lunana has more matsutake than Laya. We bought matsutake from Lunana for three years.
- PN: If the government lifted the ban on Cordyceps picking, would there be people interested to join in the trading of it?
- PD: Why not? Our Japanese contacts keep asking us about it

28.08.03 Interview with Mr. Kinley Gyelpo, matsutake exporter

- KG: I manage the Dekiling Export and I am 11 years into the matsutake export business. Before me, it was only Tashi in the business. Tashi was about two years before me, and they might have started the matsutake business sometime in 1989/1991.
- PN: When and how did you learn about the matsutake?
- KG: I have a clothes shop in Thimphu, and I travel often to Bangkok for business. One year, when I was strolling in a big shopping complex, I came across the general manager of the complex who was a Japanese. Somehow, we got into the discussion about matsutake, and both of us have come to know about matsutake in Bhutan. Upon return from Bangkok, I enquired further about matsutake here. I had a contact person in Lungtenphu who knew something about it. I also visited the National Mushroom Centre at Semtokha, and saw their samples. Matsutake then did not have the value as today. People in Genekha did not consume it except on rare occasions. It was not a popular Bhutanese mushroom. I sent the first consignment of matsutake of 700 kgs to Bangkok in cartoons. Then we did not have the idea of thermo-cool box and packaging techniques. This was in the year 1992. In the following year, the Bangkok person got one of his associates in Singapore to contact me. We did business for two years over telephones and faxes, without meeting in person. I was sending matsutake to Bangkok and Singapore. I got US \$ 30 – 40 per kilogram of matsutake. The rejects got US \$ 15. In the third year, the Singaporean contact person suggested that the matsutake be sent in thermo-cool boxes. I went to Calcutta and bought big thermo-cool boxes meant for fish transport. It was not appropriate for matsutake because of its big size. There was no separate place to keep ice, and matsutake go damaged during the transport. The Singaporean contact, a Japanese, visited me and he brought along the samples of thermo-cool box. I then took the sample to Calcutta. In Calcutta, it was not a simple affair of just buying. First, the thermo-cool company required making a mould, and it cost me Rs. 28,000. The new thermo-cool box has a tray system. In the bottom, we place 1 to 1.5 kgs of matsutake. Above it, a tray with ice and cooling cloth. By 1995/1996, my business contacts have expanded to Japan and Malaysia. I was weekly sending to Bangkok some 30-40 kgs, Singapore 40-60 kgs and Japan over 50 kgs. The consignment to Japan has to be minimum 50 kgs for it to be economical on the Japanese side. The clearance charge per consignment is US \$ 500, and the weight does not matter. So higher the weight, lower the cost per kilogram. My Japanese business contact helped me set up the storage facility of AC and deep freezer. It cost me Nu.400,000. They paid for me, but the payment was deducted from the revenue of matsutake. In the early years, the Druk Air transportation was a major problem in the matsutake export. The off-loads caused us considerable loss, and problems with our business contacts. The international trade is very specific in terms of timing, delivery and quality and quantity. When we did not deliver matsutake due to Druk Air off-loading, they would breathe fire down us, but we remained helpless. One year, my Singapore contact was very desperate because I could not deliver the consignment; he had to fly to Bangkok in a great urgency to get the matsutake from another hotel contact. He said that I had to bear the costs. In the big 5 star hotels, things have to be very precise, so that they don't displease their customers, and dishonour their obligations. During the dispatch time of matsutake, we don't get to sleep. The QCRS system started three years ago. Earlier, it was the customs people who inspected the

- consignments for inadmissible items. It is now over three or four years that there has not been Druk Air problems. As matsutake is highly valuable and perishable, the Druk Air management has been considerate to the requests of the matsutake exporters. Matsutake receive priority over other items such as mail and free tickets.
- PN: Why do you think there is less matsutake export from Bhutan?
- TG: There is much matsutake supply from China, North Korea and South Korea, and the price of matsutake instead of going up, has been rapidly falling over the last few years. Now, importers bargain for our matsutake at US \$ 22-30 per kilogram. And our production cost works out to US \$ 31/kg. For instance, the air freight for a kilogram of matsutake, and another kilogram of ice, from Bhutan to Japan cost us US \$ 13. This is not counting the office expenses, packing materials, clothes, local transportation. My service is not counted. I am free of charge. The contacts, once relationships are established, are very reliable partners. They continue to trade with you despite they receiving offers of competitive prices from others. The price for matsutake is fixed for the season, no daily pricing. The season is for two months.
- PN: This means it is similar to the pricing at Genekha.
- TG: Only in the past year, the fixed pricing was started. Earlier, it was competitive pricing. Whoever wanted more matsutake paid more to get more of it.
- PN: Then what about the agents and their group of farmer collectors?
- TG: Farmers are smart people, and they divide their mushrooms on the way. If you don't offer the competitive price, the contact farmers would sell a very minimum amount of the mushroom to you, and the majority to your rival exporters. The system caused a lot of misgivings and friction. So a year ago, the exporters and farmers got together to agree on a fixed price for the season.
- PN: What about the business dealings with the outsiders/importers?
- TG: I have had so far no problem. It's easier to do business with the foreigners. Once you fulfill your obligations, they are trustworthy. We don't have to worry about not getting money. However, I did not get about US \$ 10,000 from a company in Japan. We are ourselves to blame for a part of the problem. It was to do with a matsutake consignment from Bumthang, and when it reached Japan, it was spoilt. They sent us the pictures of it. From then on I stopped buying matsutake from Bumthang. The distance to Bumthang is a bit too long. For instance, the farmers may keep the mushroom in the house for one or two days; the buyers (middle men) one more day; transportation one day; we keep a day to grade and pack, and air freight one day...so an average 6 days, and by then matsutake quality has deteriorated so much. Even when dried, the texture and colour of the Bumthang matsutake are not good; whereas matsutake from Genekha, we manage to air freight it within 24 hours from the time of buying from the farmers. Genekha matsutake also maintains good texture and colour when dried. The Bumthang matsutake also suffers from the excessive of Wangdi during the transportation.
- PN: What was the highest price you got for matsutake so far?
- TG: US \$ 50/kg. This was for the top grade i.e. single pieces unopened and weighing over 100 gms. However, these pieces come in fewer numbers. The most are the medium sizes i.e. single pieces weighing between 60 to 100 gms.
- PN: What was the lowest price you got?
- TG: US \$ 30/kg for lumpsum for all sizes i.e. A + B. It works out better for us. Airfreight for a kg of matsutake by Druk Air is \$ 5, and from Bangkok to Singapore, it is only \$ 1/kg. There is about 20% profit margin.
- PN: What about the matsutake supply from Laya and Lunana?
- TG: Like Bumthang, it also got us into problems. There is no motorable road access to these places and everything has to be brought by men and animals. There is no communication system except for a wireless set. There is nothing we did not try. I bought matsutake from Laya for one year only. Tashi also did try.
- PN: How about the export of the dried matsutake?
- TG: I have not been successful in the export of dried matsutake. I tried hard to find a market through my contacts in Japan. They also made efforts to help me, and I sent them samples of both sun dried and machine dried. They said that sun dried is much better than machine dried, but still I have not found yet a market for it. Tashi seems to have a market for the dried mushroom because I see them export it. But, I don't know where they send it. I visited Japan one year on the invitation of my Japanese contact.

- PN: Did you get to visit an auction yard there?
- TG: Yes, in Kobe. The auction yard there is bigger than our capital city Thimphu. The auction for matsutake takes place early in the morning say at 6 or 7 a.m., so that they are ready for retail distribution for the day. The matsutake are arranged in lots by country of origin. I was told that Bhutanese matsutake is rated high for its strong fragrance. It is said that the Chinese matsutake have less fragrance.
- PN: How did people come to know about matsutake in Genekha?
- TG: I do not know the story but from what I hear from people, they say that one year Dasho Rim and his Japanese guest saw an old lady sell matsutake at the Thimphu weekend vegetable market. This was sometime in 1998/89. I believe that they took interest in the discovery of it, and try to find out more it from the lady. Her name is one Aum Makhum. She used to come in the BBS programs. In the beginning she would bring matsutake on two horses. I believe that there are five family members picking matsutake full time during the season. Genekha generally is a poor village. The land holdings are small and people grow only wheat and barley. They have to buy even a piece of chilli. When we started the matsutake business in Genekha, the roofs of the houses were all wooden shingles, and unattended. The grasses would grow on the roof shingles. People were very poor. Since the start of matsutake business, the living conditions of the people have improved so much. Most people have replaced their wooden roof shingles with the CGI sheets, and the people have built new houses, and bought power-tillers.
- PN: How much money do you think the exporters pump into the local economy?
- TG: In the last few years, the matsutake price has fallen, otherwise during the heydays, there would be a pumping of over Nu. 30 – 40 lakhs during the two-month season. There were then 6 or 7 exporters. My own expenditure amounted to 5 or 6 lakhs for the season then. I would take Nu. 60,000 to 80,000 for each trading day, and sometimes these would not be enough. When this is the case, then we buy in credits from the farmers.
- PN: Where do you think I can get the information on the total amount pumped into Genekha for the last 10 years?
- TG: This will be difficult. The export figures will not tell the correct picture because not all matsutake bought from Genekha are exported as there are rejects, and also matsutake are bought from other areas. In the beginning for 3 or 4 years, there was no royalty levied by the Department of Forests. Later, they levied royalty at Nu.4 per kilogram...And we don't keep a proper record, and the business is seasonal to maintain a proper office.
- PN: How much would a household earn on average for the season?
- TG: I remember Aum Makhum during a BBS interview say that she earned over Nu. 1,00,000 a season. Our contact farmers ask us to bring food provisions, and we take them free of transportation costs. Matsutake is the main source of cash income for the people. The BDFC also provides micro-credit to the people, and the people repay the credit with the matsutake revenue. The BDFC people say that the recovery is best during the matsutake season.
- PN: Why have the exporters number fallen?
- TG: Simply because there is no market, no demand, and the price is not attractive for the Bhutanese exporters. When the demand was at its height, we were paying as high as Nu.1020 per kilogram of matsutake. It still then was a good business.
- PN: What is your annual turn over from matsutake business?
- TG: In the peak years, I guess between US \$ 50,000 and 60,000. It has declined in the last few years. Last year, it was between \$ 14,000 to 15,000.

Transcripts

Appendix 3: Case Study Three – *Piper pedicellatum*

15.03.04 Interview with BB Chettri, Divisional Forest Officer, Zhemgang Forest Division –

BB: *Mr. BB Chettri*

PN: *Mr. Phuntsho Namgyel*

PN: What was the forest policy in the past on NTFPs?

BB: There was a competition in the past amongst the government departments to generate the most revenue. The forest was the most important economic sector then. The Department of Forests used to be the top earner, and of course, we are taken over by the Power Department and others. Therefore, timber was the primary concern of the DoF, and therefore there was no particular attention given to the management and development of NTFPs. The DoF would just auction out the forest areas, be Bhutanese or Indians, for the NTFPs. It was open to all bidders.

PN: What were the NTFPs that are auctioned out?

BB: Pipla, Ritamajatu (Rubia?), Chirata, Brooms, Bamboos and Cane. Forest records should still be available in the forest divisions in the south. We did not bother about the sustainability of the NTFPs. The winning bidders paid the villagers to collect the products. The villagers were not allowed to sell directly in the market.

Sometime later, the sale of NTFPs was banned, and this information is available in the 'manual of forest orders', published during Dasho Dorji Tenzin's time.

PN: What could be the reason behind the ban on the sale of NTFPs?

BB: I guess it was because of forest degradation. Some species may have been at the verge of extinction. The quality and production have gone down. We don't know exactly. But, directly or indirectly, we are losing the revenue because the people are still collecting and selling the NTFPs. The DoF's enforcement capacity has been limited.

PN: Which period are you referring to?

BB: 1975 to 1985. I can correctly remember the ban on the clear felling. It was in 1978.

PN: What was the harvesting system?

BB: Harvesting was by the private contractors. If you see a good forest area, demarcate it, prepare a coupe and marking list, and just auction it.

PN: When did the impression that the contractors do not care about the forests come about?

BB: All our senior forest officers were from India, and in India, there was a bad impression about clear felling and the use of private contractors...

The DoF have no economic perspective with regard to the forest resources. We have only the stick for the people. We never give authority to people. We only say to people you can do this and you cannot do that. It is important that economic incentives motivate the farmers to have long-term interests in the surrounding natural resources. It is not only ginger and maize that can give the farmers money. There are many forest products, which can bring money to the people.

15.03.04 Interview with Tshewang Dorji, ex- pipla contractor

TD: *Tshewang Dorji*

TD: Mr. Tshewang Dorji, Ex-Councillor (People's Representative in the National Assembly).

TD: Pipla business was not allowed until 1994. In the water bird year, there was a Royal Command that allowed the people of Zhemgang, Sarpang, Samdrup Jongkhar and Pema Gatsel to do pipla business.

PN: How many years were you in the pipla business?

TD: I did pipla business for only two years some time after the Royal Command. A kilogram of dried pipla used to cost in the village Nu. 25. In the first year, I took 5 to 6 tons of pipla and sold in Gelephu at Nu. 130/kg. In the following year, the pipla price in the village went up to Nu. 50/kg but I got only Nu. 90/kg in Gelephu. There was no proper system of auction. We could not make

sense of things between FCB and Indian buyers. Now the pipla price has dropped, and pipla have not been picking pipla for the last two years.

PN: Do pipla picking cause an environmental problem?

TD: There is no environmental problem. People only pick the berries, and pipla regenerates and grows abundantly in the forests.

PN: Is a local management system for pipla possible?

TD: Yes, very much. We only have to hand over the responsibility to the local geog administration with clear guidelines. Within the government guideline framework, they will develop their own system of control and sustainable management of the resources. The important thing in the pipla management is fixing the picking time. At the moment, people collect early, and pick the immature berries. The immature berries constitute less weight and are poor quality, as they don't dry well. They develop white patches. The berries are ready for picking only in the month of ninth Bhutanese month (October). The matured berries bear more weight and dry very well.

16.03.04 Interview with Mr. Dorji, shopkeeper at Dakpai

DI: *Dorji.*

PN: Please can you tell me something about pipla?

DI: There is no price for pipla in the last two years. The highest price I remember which pipla got at the FCB auction yard in Gelephu was Nu. 100/kg. I don't think pipla price crossed the Nu. 100 mark. When the price was Nu. 100/kg, we were paying the farmers Nu. 50/kg.

PN: What is the auction system in Gelephu?

DI: We first make contacts with the Indian businessmen in Gelephu, and negotiate the price. We keep the pipla consignments in the *godown* of the Indian businessmen, and in the following day, they help us to take the consignments in their *threla* to the FCB Auction Yard. In my opinion, the bidding is only for namesake only. The Indian businessmen form a syndicate. At the most, there would be four Indians bidding in the auction. They raise the price by 25 to 50 *chetruns*. The bidding takes place so quickly, and before we are able to make sense of the things, the bidding is over. The auction serves the Indian businessmen an important purpose, which is that it certifies the purchase as legal, and it facilitates the transport of it in India. When the prices were good, the Indian businessmen in Gelephu would wait at the bus terminal for people with pipla. The pipla then would be taken straight to their *godowns*.

PN: How can the government intervene in the pipla marketing?

DI: I can only think of the government buying from the people and selling directly to India. One year our Indigenous Hospital bought all of the pipla from the people. After that, they stopped coming. They did not pay us any higher. It was better for us to sell to the Indian businessmen. Their prices were better. I did pipla business for only one year. When the villagers when buying from my shop had difficulty paying in cash, I had accepted pipla as a form of payment. I paid the villagers Nu. 50/kg, and when I took the consignments to Gelephu, I got only Nu.61/kg. It was not a profitable business taking into account of transportation. After the first year pipla business I stopped accepting pipla as a form of payment. Farmers now directly take their pipla to Gelephu.

PN: What are the processing requirements for pipla?

DI: After we bring pipla home from the forests, we have to immerse it in a pot of boiling water for a few minutes. After that we dry pipla in the sun. The boiling water treatment is very important because the pipla dries faster and maintains the black dark colour. If we dry pipla straightway, they don't dry uniformly and they develop white patches. They don't get good prices. Some of our farmers adulterate the pipla with berries of another species, which bear elongated berries. The Indian businessmen are very particular with the adulteration practices, and they check the consignments for it when buying. There are three types of pipla in the forests. The first the real pipla, the shrub and round berries. The second is shrub but elongate berries. It is the pseudo pipla. The third is a climber, and round berries. The price for berries from the real pipla and climber are same. However, it is difficult to collect the berries from the climber pipla. From the Forest Department, we need to obtain a transit permit. The transit permit is important for the transportation of pipla and to enter the auction in Gelephu.

- PN: Which villages engage in heavy pipla collection?
 DI: Nangkhor and Bardo Geogs.
 PN: Could pipla picking affect the resource base?
 DI: No, I don't think so. They are plenty. We did not see farmers pick in the last season. When the price was good I also picked pipla. People then used to prohibit outsiders from picking in their local areas. Now, they don't.
 PN: What do you think pipla is used for in India?
 DI: We don't know. When we ask the Indian businessmen, they say that it is used in the formulation of Indian medicine.
 PN: Is pipla cultivation possible?
 DI: It should be possible but what is the purpose. If the farmers cultivate it, they have to grow in large scale. Where is the land? Moreover, it grows abundantly in the wild.

16.03.04 Interview with Mr. Tshogpa, Goling Village

Goling Village has a total of 48 households. The village is a primary pipla production area.

- TA: *Mr. (?), Tshogpa (>40). He is the village representative in the Geog Yargye Tshogchung (GYT).*
 KY: *Mrs. Kinley Yangzom (39), Tshogpa's wife*
 LN: *Mrs. Lhaden (70), Kinley Yangzom's mother*

- PN: Please tell us about pipla business in the village?
 TA: Since last year, we have not seen traders come to the village. I have about 20 *dreys* of pipla in stock.
 PN: Is the pipla picking opportunistic or dedicated?
 TA: It is a dedicated collection. One cannot collect much pipla with the opportunistic picking.
 KY: In the winter, the days are short and we return home in darkness.
 TA: With the support from the Dzongkhag, we are initiating a management system i.e. no collecting before the date agreed upon.
 LN: In the beginning, what I can remember, one *drey* of pipla fetched only Nu.5.
 PN: How many traders come to the village?
 TA: Only one or two. They bring with them clothes and cash.
 PN: Why do people not take directly to Gelephu?
 TA: Forestry people do not allow taking pipla without a permit, and for villagers, it can be a lot of work to obtain the permit.

17.03.04 Group Interview with women collectors at Tshogpa's house, Goling

- WG: *Women Group*
 KY: *Mrs. Kinley Yangzom (39)*
 LN: *Mrs. Lhaden (70)*
 CW: *Mrs. Chitem Wangmo (30)*
 ET: *Mrs. Eden Tshomo (26)*

- PN: Do you sell to the FCB auction in Gelephu?
 WG: The FCB is in Gelephu. We have only small quantities, and it does not make sense to take pipla all the way to Gelephu. And also when we take the pipla to Gelephu, we land up selling up to the Indian businessmen. It is so much convenient to sell them, and then wait the next day to take to the FCB. When we are in Gelephu, we go from one Indian businessman to another to find out their prices, and we sell our pipla to the highest price we get from them.

PN: Do you have your own village pipla picking sites?
 WG: Yes, we have our own picking sites.
 PN: Then do you protect your picking sites from other pickers?
 WG: No, it is open to all. We pick from wherever we like. We go over to Talipa's area. Their village is way up the mountain, and we are closer to their pipla areas than them. But, they don't say anything when we pick from their areas.
 PN: How long does it take to reach the picking sites?
 WG: At the most, one and half hours.
 PN: How many types of pipla are there?
 WG: There are three types; climber type, pseudo pipla and real pipla. We don't collect the climber type and the pseudo type. They have no market value.
 PN: What do you do after you bring pipla home?
 WG: After we reach home, we weigh to find out how much we have picked for the day. Then we immerse them in boiling waters for a few minutes, and we dry them in the sun.

Interview with an old couple (over 65 years). Only three members in the house i.e. Old man, Old woman and a young boy (18) – 17.03.04

PN: Do you pick pipla?
 Old Man: Yes, a little.
 PN: Why do you pick pipla?
 Old Man: We need cash for everything, for example paying taxes and buying food provisions. We have no other source of cash income.

17.03.04 Interview with Dechen Wangdi, Ex-Chimi

DW: Dechen Wangdi

PN: What do you say about the pipla in the Nangkhor Geog?
 DW: It is the main source of cash income in the geog; otherwise the villagers have no other economic opportunities. It contributes greatly to the welfare of the people. It is abundantly available and renewable. The cattle do not eat it. There is no problem in its regeneration. It has no storage problem. Each household will have a few kgs of pipla in stock. I myself have 10-15 kgs of it, and I am waiting for a good price. One year we got Nu. 100/kg. Before the Royal Command, the pipla trading was illegal. The Royal Command was issued sometime in 1995.
 PN: When did the pipla trading start?
 DW: About 20 years ago.
 PN: In what ways could the government intervene to improve the pipla marketing?
 DW: The government could look for alternative markets. In the Gelephu FCB, we are at the mercy of the Indian businessmen, and we do not get good prices.

17.03.04 Interview with an old lady (> 60) with a broken wrist

Old Lady: I broke my wrist a few months ago, and it is still not all right. It gives me a lot of pain, and I cannot pick and lift things. I have no choice but to do the household chores because I have only a young daughter, who has to do the running around and attend to the village labour (woola) services. She is today working at building the community school. She has three small children. We have no time and labour to go to pick pipla. I feel sad when I see the neighbours go into the forests. Life is difficult for me. I wish I did not break my hand. My poor daughter is really worn out from the heavy burden of village life. I feel so sad for her.

17.03.04 Women Group Interview, Goling Village

TL: Mrs. Tashi Lhamo (26)
DP: Mrs. Dorji Pemo (35)
GL: Mrs. Gyem Lham (20)
KY: Mrs. Karma Yangzom (35)
CW: Mrs. Chitem Wangmo (30)
KY: Kinley Yangzom (39)
LN: Mrs. Lhaden (70)

PN: How much money do you make from the sale of pipla?
WG: We have not had traders come to our village for some years now. Generally one or two of them come.
PN: Why do people pick pipla?
WG: We have no other source of cash income, and we need cash to buy food provisions, pay taxes and bear expenses for school children. We therefore pick pipla to make some cash. In the past we used to rear pigs, and now we don't after our Lama told us not to rear pigs. When we don't have money, we feel helpless, and suffer from confidence. People don't look favourably upon people with no money.
PN: How much do a person earn from the sale of pipla?
CW: Last year I earned Nu. 1330. I took the pipla to Gelephu and sold to the Indian businessman.
PN: Why didn't you take it to the FCB?
CW: I didn't want to take the trouble of taking it to the FCB.
PN: What was the amount of your pipla?
CW: 21 brays (61 kgs i.e. 1 bray = 3 kgs).
PN: When is pipla ready for picking?
WG: The best time for picking is the ninth Bhutanese month. We only pick pipla for two months.
PN: Who collects more, men or women?
WG: Mostly the women collect pipla.
PN: Why is this?
WG: Men do not bother about small household needs. It is only us women who have to worry about everything concerning household food provisions and expenses. Pipla allows us to make some money.
PN: When picking pipla, do you need to break the plants?
WG: No, not at all. Pipla plants are thick bushes, and it is easier to pick berries from the live plants than from cut plants.
PN: Who keeps the pipla money?
WG: We women only. Of course we spend the money for the household expenses.
PN: What could the government do to intervene in the pipla marketing?
WG: It would be very beneficial to us poor people if the government paid a higher price for pipla, and established trading points in the villages. It is impossible and inconvenient for us to transport pipla by road to Gelephu, and our pipla amounts are small. And with the traders in the villages, we don't get good prices.

Women Group Interview at Tshogpa's house – Sobling Village

UD: *Mr. Ugyen Dorji (33), Tshogpa*
KW: *Mr. Kinley Wangdi (50), porter*
KZ: *Mrs. Kinley Zangmo (20)*
DP: *Mrs. Dorji Pema (30)*
DW: *Mrs. Dechen Wangmo (17)*
LN: *Mrs. Lhaden (44)*
UO: *Mrs. Ugeyenmo (44)*
RP: *Mrs. Rinchen Pema (52)*

TP: *Mr. Tshering Phuntsho, District Forest Extension Officer*

TP: Did you pick pipla in the last season?

WG: Very little. We heard that there was no price and no buyers. No traders also came to the village for the last two to three years. However, all of us would a few kgs of pipla in stock at home.

PN: What was the price system in the past?

WG: In the beginning it was Nu. 35/kg, then Nu. 45...In one year we even got Nu.100/kg.

PN: Where are your collection sites?

WG: We collect from everywhere. They are generally from the nearby forest areas. When the price is attractive, we leave behind the household works to pick pipla, even small children join their parents.

PN: Who takes the more responsibility in picking pipla, men or women?

WG: It's women mostly who pick pipla.

PN: What could be the reason for the women to be picking pipla more?

WG: Women are fast pickers. Men are clumsy. Men do the heavy works such as collecting firewood, and portering services. And also we women are more concerned about the household needs whereas men are generally insensitive and indifferent. We need to order our men to do things.

PN: Do men get angry when women are out the whole day picking?

WG: (Laughing...) Sometimes. They say that the children are crying at home.

PN: How much would a person collect pipla in a day?

WG: If we collect from early in the morning to evening, we could get anything from 6 to 10 brays (fresh weight).

PN: How much fresh weight equals to 1 kg of dried weight?

WG: If the berries are matured, two brays of fresh pipla will equal 1 kg of dried pipla i.e. a ratio of 2:1.

PN: When do the pipla mature?

WG: They mature in the ninth Bhutanese month (October). The immature berries bear less weight, and they develop white patches when dried. So when the traders come, we sell the immature berries in brays, and the matured berries by weight. One bray of matured berries will equal to 3 kilograms, and immature berries will equal to 1 kilogram only.

PN: So you women are very smart?

WG: (Laughing...) What to do? It is such a hard work and hard labour. We have to endure the leech bites, and worry about encountering snakes. Now, we are initiating an agreement in the village that no one will collect immature berries. There will be a declaration on the starting and ending dates.

PN: What is the distance to the pipla collection sites?

WG: The furthest we may go is half an hour to one hour. The pipla is abundantly available in the nearby forest areas of our village.

PN: When did people start picking pipla for the first time?

WG: We do not remember. It was long ago people were picking pipla. Perhaps 15 to 20 years.

PN: Were there restrictions on trading of pipla by the forestry people?

WG: There were no forestry people in the beginning. In the later years, when forestry people started coming on visits, they put restrictions on the trading of pipla. They apprehended people carrying pipla and fined them. We don't know which year but it was the time of one forester Sangay. He came to our village, and asked us questions to whom we sold pipla.

PN: Do forestry people still put restriction on the pipla picking?

WG: Now, they don't, but two years ago, they said that we cannot sell pipla to the traders who come to the village, and that we have to take to the Gelephu FCB to sell.

TP: There is a miscommunication here. The issue here, as I see it, is with regard to the formulation of the management plan for pipla. We only suggested to the people of the benefits of collective action than doing things individually.

PN: What do you say about the abundance of pipla in the past and now?

WG: We don't see any difference. They are the same, except the land slips in the forest areas do wash away pipla. Pipla crop year alternates between bumper production and normal production.

- PN: We learnt that pickers cut pipla plants. What do you say about it?
- WG: We don't remember or seeing people break the pipla plants. In fact, it is easier to pick berries from the live plants than from the cut plants. Pipla plants are thick and bushy shrubs. The breaking of plants could be isolated and rare cases by children. They may be breaking the branches as they walk back home to pick a few extra berries.
- PN: What would be the highest amount earned by a household?
- WG: It is difficult to say because we barter pipla with clothes, and repay the advances taken from the traders with pipla.
- TP: When does the lean season begin?
- WG: The Bhutanese months of 2, 3, 4, 5 and 6.
- TP: Does your agricultural produce not see you through the year?
- WG: Our agricultural produces are not enough, and they cannot see us through the year.

18.03.04 Village Meeting at Ngakhar Village

- VM: *Village Meeting*
- TP: *Mr. Tshering Phuntsho, District Forest Extension Officer, Zhemgang*
- TP: Did you pick pipla last year?
- VM: We did not pick pipla last year. First we were told by the forestry people to wait for an order when to pick, and secondly, the price was reported to be not good.
- TP: Who picks pipla mostly, men or women?
- VM: It's mostly women, but men also pick pipla.
- TP: What is the reason for the women to be picking mostly?
- VM: Women are fast pickers. All the women, young and old go to pick pipla, except of course very old women.
- TP: Who is more concerned about the household needs, men or women?
- VM: Equal. It's same. Men do the outside works and women inside. Incomes are all pooled together.
- TP: But, who would know more about the household needs?
- VM: Of course, the women know more about the household needs. Men do not bother much about what is available and available in the house e.g. food provisions. We women therefore have to worry more about the household matters than men do. That is why for the purpose of earning small cash, we pick pipla. We have no regular source of cash in the village.
- TP: Why do you need money?
- VM: Everyone asks for money. Our stomach asks for money. The government asks for money in the form of taxes.
- TP: Is your agricultural production enough to support your family?
- VM: It depends upon the individual households. For instance, it is our first Bhutanese month, and some households have already started borrowing grains from the neighbours or buying it from the shops. The lean season continues until the 6th Bhutanese month. And there are some households who will have excess food grains.

18.03.04 Village Meeting at Tsaidang

- VM: We have not picked pipla for the last two years, as the price is very low. The low price is not motivating us. In the past, it used to be an important source of cash income.
- TP: Who picks pipla mostly, men or women?
- VM: It's women. Men do not know how to pick well. Women are fast pickers. However, if the price of pipla is attractive enough, men will also rush to pick it. The price is a very important factor. We are deeply disappointed by the current low prices.
- TP: Who cares about the household matter, men or women?
- VM: It's women. Women cook and manage the households.
- TP: What amount/rate for pipla you will say is attractive?

VM: OverNu.70/kg.

Interview with Mr. KB Gurung, Driver

KB: I picked pipla as a young boy in the early 1970s in Kalikhola. My family were very poor. We did not have land. So we did not have choice but to pick pipla. Pipla provided us an opportunity to earn cash, and its price then was attractive. We used to get Nu. 16 for a kilogram of pipla, much higher than the day's wage, which was Nu.6. Every one in the village would pick pipla.

PN: Was there a restriction on selling pipla by the forestry people?

KB: There wasn't. We used to take pipla to the Kalikhola market, and there, there would be many Indian businessmen waiting to buy pipla from us.

PN: What did people do with the money?

KB: People were poor, and did not have enough to eat, so they bought rice and other food provisions with the money.