

Indigenous forest management systems in the hills of Nepal

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The field work led to the conclusions that management efforts should be directed towards achieving stable forests and that the best basis of such efforts would be protective management by local users and their own institutions. However, outside support would be necessary if severely degraded forests like Sallepakha were to be brought to a state of stability.

Outside support would be largely the responsibility of the forestry authority of the country, but would need to be sensitive to the total needs of local people, and not limited to maximising tree growth; to be readily absorbed without becoming burdensome; and to be conceived in collaboration with local people and not imposed from above. The forestry profession would need to change from being part of the bureaucratic machine to being a technical arm supporting local institutions

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List of abbreviations

ANU Australian National University
DFO Divisional /District Forest Officer
HMG His Majesty's Government of Nepal
IHDP Integrated Hill Development Project
RRS Regmi Research Series
Rs Nepali rupees
SATA Swiss Association for Technical Assistance
SDC/N Swiss Development Cooperation, Nepal

1. INTRODUCTION

1.1 General

In the distant past, the hills of Nepal must have been covered with dense forest but what now remains is a small remnant (Bhandari, 1974). The pressures which led to this deforestation are still not entirely agreed upon but they were undoubtedly complex and of many types. Griffin *et al.* (1988) have summarised the evidence that deforestation had multiple causes and was largely accomplished, to the extent that it has occurred in the hill region, by early this century. Certainly there is little factual support for any belief that deforestation has proceeded rapidly in the hills in recent times (HMG, 1983). Forest degradation, however, is undoubtedly proceeding as demand for many products exceeds supply in conveniently located forests.

The Master Plan for the Forestry Sector (HMG, 1988) describes the heavy pressure on forests thus:

Heavy pressure is being exerted on the forests of Nepal by the increasing population. The people depend on them for fuelwood, as well as for construction timber and other forest products. They also use them for grazing and fodder collection to maintain a large number of livestock, which are essential for supplying manure for agricultural crops. As a result of this pressure, the forests have been reduced in area and depleted of trees. In turn, it has become increasingly difficult for the people to meet their basic needs for forest products. Pressure on the remaining forests is further intensified, creating a vicious cycle and aggravating the already serious problems of environmental deterioration and declining farm yields on the scarce agricultural land.

In response to the deteriorating forestry situation, HMG Nepal is moving increasingly towards transferring responsibility for the hill forests to their users, with the role of the Department of Forests becoming more that of an extension service and less that of an enforcement agency. If user-group forest management (probably better thought of as operational schemes under the responsibility of user groups) is to occur, then an understanding of the modes of management which have occurred historically may well be of value. It may be possible to build upon, or transform, existing or past practices rather than creating all anew.

In such context, foresters (particularly Nepalese) would be better equipped to deal with their future if they had a better understanding of their past (Leslie, 1987). A look into the historical development of forestry and the insights to be gained there from can be a substantial aid in understanding forest and environmental policy efforts in general (Niesslein, 1983). Not only can they

help in formulating future programmes but also in their absence it is impossible to establish a soundly based forest policy for a country or to produce an adequate appraisal of any assistance project (Mahat *et al.*, 1986). The situation, thus, suggests searching the historical record, as it alone provides the means of studying the processes of change and of testing policy proposals against the reality of practice (Dargavel, 1988). The intent of my research is to further elucidate the historical context of forestry in the Nepalese hills.

Although the historical record is crucial, there are major difficulties in tracing it, particularly in the context of the countries like Nepal. This is because much change occurred in Asia, Africa and Latin America before the regular keeping of written records commenced and because even during colonial times the records are often scanty or inaccurate (Mahat *et al.*, 1986).

Mahat (1985) pioneered research into the forest history of Nepal. His vision or general picture of Nepal is based on those aspects that have any bearing in the widest sense on forest. In this regard he has based himself on secondary sources of information. In "An economic history of Nepal, 1846-1901", Regmi (1988) dismissed the forestry of the hills by saying "transport facilities and proximity to the Indian market made the commercial exploitation of forests viable only in the Tarai." Studies based on primary sources have not so far been made. Furthermore, forest history is not yet seen in its own perspective.

Some studies (Arnold and Campbell, 1985; Campbell and Bhattarai, 1982; Campbell *et al.*, 1987) have encountered the systems for protecting the local forests. Molnar (1981) made a comprehensive attempt to analyse indigenous systems of forest management in terms of the features that made them successful. Fisher (1989), Fisher *et al.* (1989) and Gilmour and Fisher (1991) attempted to analyse some of the features of indigenous systems of common property forest management and their relevancy to forest management policy. They confined themselves, however, to very recent systems of forest management.

Thus, there are not enough studies made to conclude anything on the past systems of forest management. No efforts have been made to explore the origin and evolution of local practices of forest management, and to analyse their linkage with policy level decisions and guide-lines.

The aims of my research have been to:

- (a) Bring together as much documentary evidence as possible on the regulation and characteristics of forest use in historic times;
- (b) Undertake a partial analysis of documents within the limits of time available;

(c) Undertake three case studies of specific areas in the hills region, to illustrate the links between present-day situations and the historical background; and

(d) Consider briefly the implications of my findings for the current situation.

My thesis falls into two main parts. After this Introduction (chapter 1), there is a review (chapter 2) of the evidence concerning forest management in Nepal over the past two centuries, with emphasis on the period before 1957 (the year of the first development plan and the introduction of the first forestry legislation under the influence of international organisations). For chapter 2, the sources of information are mainly primary, such as legislation, petitions, and orders issued by different individuals and authorities. Then, there are three specific case studies (chapters 4, 5 and 6), and discussions (chapter 7), concerning areas where it is possible to link present-day situations to aspects of historical background. Methodology of the field work is described in chapter 3. Some suggestions for the future form a conclusion (chapter 8).

Glossaries for Nepalese words and terms and local names of botanic species used in the thesis are listed immediately after chapter 8. Photographs are presented in the respective chapters.

Appendices are presented immediately after the bibliographic references. Original documents, presented in most of these appendices, are often written in an archaic form of *Devanagari* script and this sometimes presents problems for translations. The documents of Appendix XVII come from the Regmi Research Series (RRS) and the translations are those of Regmi Research (Private) Limited. For the rest, I have made the translations myself. However, copies of the original documents relating to the Appendices I, II, V, VI and IX are also presented under the respective appendices.

Throughout the thesis most of the dates given are in Christian calendar. Wherever it is otherwise, it is indicated.

In the text, documents listed in Appendix XVII are indicated by 'D' followed by a number or numbers, e.g. D31 refers to document 31 of Appendix XVII.

1.2 Forest management in Nepal

Forest management, as now understood by the forestry profession, is a relatively new activity, scarcely extending beyond 100 years in most countries. In this sense it is highly quantitative, based on scientific and economic principles and with clearly defined goals. If the attempt is made to look back into the history of 'forestry' in a country, evidence of such forest management will inevitably be difficult to find except in recent times. However, even in

recent times forest management has been changing with time and situation. The following two cases show how one important aspect of forest management has evolved within a period of eight and half decades.

On the conflict between the local people and a director of the first professional forestry school in the United States (the New York State College of Forestry) regarding the implementation of a forest plan in 1903, Professor Schwappach of Eberswalde (the forestry school near Berlin) wrote (Duerr, 1975):

To us Europeans it is entirely unintelligible that a committee of laymen, who have never seen a managed forest, should be able to pronounce competent judgment regarding the procedures of professional men. This is the shady side of the much-praised democratic system!.

The European forestry heritage, then, was sharply focused upon trees, upon timber and included a belief that the answers to forest management questions, biological and engineering questions, were to be found in the forest itself (Duerr, 1975). People as individuals or as forest-associated groups were subordinated to the wider, economic aims of the forest policy.

On the other hand, (Griffin, 1988), with the perspective of work in forest management in a developing country over a decade writes:

The people are not so much part of a problem as part of a solution, as has been said before. ... People are the one indispensable part of the framework for any action. ... All the species trial plots and paired watershed catchments in the world will accomplish little unless peasants are not just taken into account but are an intrinsic part of the action.

Nepal is an extreme instance, in that forestry as an activity associated with a cadre of persons educated to professional standards has been a very recent development. It was only in the mid-1920s that a professional forester from the Imperial (Indian) Forest Service first came as an adviser to the government of Nepal. In 1941, Mr. E. A. Smythies was appointed as adviser and he assisted in establishing a Forest Department in 1942. The first Nepalese student attended the Indian Forest College at Dehradun, India in the 1940s. Since then the role of professional foresters in Nepal has steadily increased, but even now the concepts of scientific, quantitative forest management have not been implemented in Nepal.

The production of the First Five-year Development Plan by HMG Nepal in 1957 is the clearest evidence of the impact of international thought on Nepalese policy, and since that date Nepal has been increasingly influenced by world trends in economics and in development theory and practice. Before 1957,

Nepalese policy, and especially forest policy, was dominated by concerns and attitudes arising from within the country itself, and the years before 1957 therefore provide the best evidence of forest policy and management indigenous to Nepal.

However the word 'indigenous' is given such broad meaning these days (Fisher, 1989; Fisher, 1988; Fisher *et al.*, 1989; Gautam 1988b; Gautam, 1988c; Gilmour, 1990; Gilmour and Fisher, 1991; Griffin, 1988; Gurung, 1988, Rusten, 1989; Messerschmidt, 1990; Tamang, 1990) that its use without further explanation could lead to confusion. I take an indigenous system to mean one that has evolved within a country without inputs from other countries by way of imposition, inducement or extension. In particular it would have evolved in parallel with Western forestry. I thus categorised as indigenous the systems which evolved in Nepal during the time before Western interference arrived and I distinguish them from the systems now evolving as result of seminars, workshops, meetings, plantation activities, training, extension etc. The systems thus evolved indigenously are practices accepted from the past. I therefore argue that all the systems of the hills region, practised before 1957, are indigenous. Sometimes such practices were imposed from the centre, but I would still view them as indigenous provided they were responses to local (village or village group) requests or initiatives and were not significantly affected by foreign influences.

1.3 Chronology of Nepal's History

When considering the course of events related to forestry in Nepal it is convenient and helpful to adopt the chronological periods of the country's general history (James, 1981). The description of aspects of forest management in Nepal in chapter 2 is often in chronological sequence and it is therefore useful to describe briefly the historical periods involved.

1.3.1 Pre-unification

It is difficult to state exactly the year of unification of Nepal. Many authors (e.g. Regmi, 1972; Mahat *et al.*, 1986; Hobley, 1990) have set it as 1768-69, when the Gorkhali ruler, Prithvi Narayan Shah, subjugated the kingdom of Kathmandu in 1768 and moved his capital to Kathmandu in 1769, but the process of unification was still not complete even at the end of the 18th century. The shape and size of present-day Nepal was finalised only in 1857-58 (Kumar, 1967). The unification process actually got under way in 1744 (Regmi, 1972; Mahat, 1985; Mahat *et al.*, 1986), so the period before 1744 can be taken as pre-unification. In this early period, the territory of present-day Nepal was divided into many principalities. They were mainly grouped in three areas: Kathmandu valley, the western hills and the eastern hills. Makawanpur was the only kingdom in the Tarai; it lay to the south of Kathmandu and consisted of modern Bara, Parsa and Rautahat districts.

Kathmandu valley

The Kathmandu valley only was considered as Nepal before the conquest by the Gorkhali ruler in 1768 (Kumar, 1967). Though its earliest history is unknown, the Lichchhavi period (probably 3rd to 11th century) has been recognised as the beginning of the evolution of present civilization in Nepal (Rose and Scholz, 1980). The Malla dynasty followed the Lichchhavi dynasty in the 11th century. The Kathmandu valley was a single kingdom until 1457, when it was divided into three kingdoms, Kathmandu, Bhadgaun and Patan, by the three sons of Yaksha Malla (Kumar, 1967). Though there were occasional unifications and separations in succeeding times, there were three states at the time of annexation by the Gorkhali ruler in 1768.

The territory controlled by these three Kathmandu valley states appears to have extended between the Trishuli river in the west, the Tamakosi in the east, the Kuti pass in the north and the Mahabharat *lek* in the south, although there is some uncertainty about the eastern boundary.

Western hills

In the hills region in the west, i.e. between the Trishuli and Mahakali rivers, there were two sets of states known by their numbers as *chaubise* (group of twenty-four) and *baise* (group of twenty-two) (Kumar, 1967). These were based on two river catchments, the states in the Gandaki region being under the *chaubise* and those in the Karnali region under the *baise*. Only a few of these states had territories in the Tarai or the inner Tarai, in the present districts of Kapilbastu, Rupandehi, Nawalparasi, Banke, Bardiya, Kailali and Kanchanpur (Regmi, 1972).

Eastern hills

Chaubandi and Vijayapur were two kingdoms in the eastern hills (Regmi, 1972). The territory of Chaubandi kingdom included Okhaldhunga and Bhojpur in the hills and Saptari, Siraha, Dhanusha and Mahotari in the Tarai. Vijayapur consisted of the present hill districts of Dhankuta, Panchthar, Taplejung, Ilam, Terathum and Sankhuwasava, and of Morang, Sunsari and Jhapa in the Tarai.

1.3.2 Unification to pre-Rana period

This period covers the expansion and adjustment of the territory of Nepal. As the Gorkhali ruler became successful in attaining the unification in various stages, it will be appropriate to explain these.

1. At the time Prithvi Narayan Shah became the King of Gorkha in 1742 (Regmi, 1975; Stiller, 1968; Kumar, 1967), his territory was

between the Himalaya in the north, Seti river in the south, Marsyangdi in the west and Trishuli in the east.

2. After the Gorkhali conquest of the Kathmandu valley, the capital was moved to Kathmandu in 1769 and the territory of Nepal lay between the Marsyangdi in the west, the Tamakosi in the east, Tibet in the north and India in the south.

3. In 1775, when Prithvi Narayan Shah died, the kingdom of Nepal included the whole of the eastern Tarai (Morang, Sunsari, Jhapa, Saptari, Siraha, Sarlahi, Mahotari, Dhanusha, Bara, Parsa, and Rautahat), the eastern and central inner Tarai (Sindhuli, Udayapur, Chisapani, and Makawanpur), the Kathmandu valley, the eastern hills region up to the Tista river bordering Sikkim, and a small part of the western hills region (Nuwakot, Dhading, Gorkha, and Jajarkot) (Regmi, 1972).

4. Between the death of Prithvi Narayan Shah and the end of the 18th century, all the *baise* and *chaubise* states except Palpa were subjugated and the western boundary was extended beyond the Mahakali river (Kumar, 1967).

5. By 1803, the territory of Nepal extended from the border of Kashmir to the heart of Sikkim (Kumar, 1967). Palpa, the last of the independent *chaubise* states, was annexed in 1804 (*ibid.*).

6. The ambition of the Gorkhali rulers was not curtailed. When Bhimsen Thapa was appointed as *mukhtiyar* in 1806, he decided to conquer the rich and fertile plains to the south. Incursions took over several villages which were situated either in disputed territory or in the territory of British India (*ibid.*). This resulted in conflict and finally war between Nepal and British India in 1814.

7. The war ended with the treaty of Sugauli in 1816. After this, the territory of Nepal extended only from the Mechi river in the east to the Mahakali river in the west, including the Tarai. Some Tarai lands were lost under the treaty but later the far west Tarai districts of Banke, Bardiya, Kailali and Kanchanpur were returned to Nepal as a reward for the assistance given to the British during the Indian Mutiny of 1857-58 (Kumar, 1967; Regmi, 1988). These districts were known as *naya-muluk* till the end of the Rana period.

Thus the present boundaries of Nepal were established only in the middle of the 19th century, i.e. more than a century after the initiation of unification.

1.3.3 Early Rana period

The *kot* massacre occurred on 14 September 1846, enabling Jung Bahadur Rana to become Prime Minister of Nepal (Kumar, 1967), and initiating the Rana period of Nepalese history. This period was significant in the further unification of the country, in the sense of social and economical unification. The first legal code of the country was enacted within the first decade of this period.

The objectives of the first Rana Prime Minister were: firstly, to acquire real power by making the King politically ineffective; and secondly, if possible, to usurp the throne for himself (Kumar, 1967). Within a decade of becoming Prime Minister, Jung Bahadur was able to secure the title of *maharaja* and the King became a puppet of the Prime Minister. This is summed up by Sylvain Levi (Levi, 1908) in the following words:

In fact the King is only a sort of entity today, a nominal fiction, the only representative of the country recognised by the foreign powers. His red seal (*lalmohar*) is necessary to give an official value to diplomatic documents, but his action is void.

To secure his prime ministership from external force, Jung Bahadur attempted to improve relations with the British rulers of India. He paid a visit to Europe in 1850 with the formal object:

To see and bring back intelligence respecting the greatness and prosperity of the country, its capital, and perfection to which the social conditions have been raised there and arts and sciences have been made available to the comforts and convenience of life. (Regmi, 1988)

When the British had to face the Indian Mutiny in 1857, Jung Bahadur offered military assistance. After being successful in suppressing this rebellion, the British transferred the far western Tarai districts of Banke, Bardiya, Kailali and Kanchanpur back to Nepal in 1858. This stimulated Jung Bahadur to exploit the rich forest resources of these districts to accumulate revenue. Immediately the *amanat* system was introduced to manage the felling and export of timber (Regmi, 1988) from these areas. Only in the later stages was this system adopted in the eastern Tarai.

1.3.4 Late Rana period

This period starts with the beginning of the prime ministership of Chandra Shumshere Jung Bahadur Rana in 1901. The reason for breaking the Rana period into two is based on the administrative patterns. In contrast to the earlier period, the later Rana period was more people-oriented. Administrative changes were initiated through the timely amendment of laws and by-laws and

decentralisation is one of the prominent features. There were different forestry laws for the Tarai and the hills, and as most of the forests in the Kathmandu valley were under *birta* tenure, their management was also distinct from other areas.

1.3.5 Post-Rana to pre-*panchayat* period

This is the period between 1951, the year when Rana rule was overthrown by the democratic movement, and 1960, the year the *panchayat* system was introduced. From 1951, the government worked as caretaker to maintain law and order until a multi-party democratic government was formed after the election in 1959. The elected government was suspended by the King and a partyless *panchayat* system was introduced in 1960.

During this period not many changes were made to the arrangements in force at the end of the Rana period (Stiller and Yadav, 1979). The first development plan, for the period of 1957-62, was prepared and implemented. Some changes were made in the forestry sector, including the nationalisation of private forests.

1.3.6 *Panchayat* period

The *panchayat* system replaced the multi-party system in 1960. During the *panchayat* period, six periodic development plans were implemented. A substantial amount of foreign aid was provided through international, bilateral and multilateral agencies and Nepalese policy was strongly influenced by international pressures and events.

1.3.7 The dawn of democracy

After three decades of partyless *panchayat* system, the dawn of democracy arrived in the 1990, when the multi-party system was restored under a constitutional monarchy. Just before the general election held in May 1991, under the new constitution, 44 political parties were registered. However, only six of these parties could remain as national parties after the reviewing their position in general election, on the basis of the criteria fixed by constitution.

1.4 Geography of Nepal

As shown in the foregoing section, the various geographical regions have had rather different histories. It will, therefore be necessary and relevant to give a brief description of the geography of the country.

Geographical division of the Kingdom of Nepal is best based on topographical features. Accordingly, the country can be divided into two major topographical zones, the plains and the hills. The plains zone is located in the southern part

and can further be divided into the Tarai and the inner Tarai. Similarly the hills can be divided into the Chure, Mahabharat, middle hills and Himalaya according to their location from south to north. However, the Kathmandu valley in the middle hills has a distinct geography and history and so needs to be separated. Thus the resulting geographical regions of the country would be: Tarai, inner Tarai, Chure, Mahabharat, middle hills, Himalaya and Kathmandu valley.

The Tarai region is a long, narrow east-west strip extending right along the southern border except in Chitawan and Dang districts where the Chure touches the border. Its altitude ranges from 50 m to 200 m above mean sea level.

The inner Tarai is a series of WNW-ESE valleys between the Chure in the south and the Mahabharat in the north, with altitude up to 300 m. Udayapur in the east, Chitawan in the central part, and Dang and Surkhet in the mid-west are the valleys of significant size and importance in this region.

The Chure, the outermost foothills, runs east-west in a line roughly parallel to the Indian border. It is distinct only where the inner Tarai region is distinct. In other places it merges into the foothills of the Mahabharat. It thus separates the inner Tarai from the Tarai and its altitude goes up to 1,000 m.

The Mahabharat hills are to the north of the Chure and extend more or less continuously along the whole length of Nepal. These hills are very steep, and rise to over 3,000 m in places.

The middle hills region lies between the Mahabharat in the south and the Himalaya in the north and it is the most populated zone of the country. The history of Nepal mainly involves this region. The altitude varies from 500 m in the river valleys to over 2,000 m at the peaks. The Kathmandu valley, almost entirely surrounded by a ring of mountains is located at about 1,500 m in the central part of the middle hills.

The Himalaya form the northern boundary of the country, ranging from 2,000 m to 8,848 m in elevation. There are settlements in the river valleys throughout the Himalaya region.

1.5 Administrative Divisions of Nepal

At present Nepal is divided into 14 zones and 75 districts. A brief history of their origin is relevant to any study of the historical evidences relating to forestry, as the regulation of forestry is closely interwoven with the general administration of the various divisions of the country. The evolution of administrative divisions started only in the middle of the 19th century, when the shape of the present Nepal was finalized.

The Tarai was divided into eastern, western and far-western administrative districts. Chitawan was a separate administrative district and there were three other administrative units in this part of the country, based on fort-towns, or *gadhis*, on the main routes connecting the middle hills with the southern plains through the Mahabharat Mountains: Udayapur and Sindhuli in the eastern inner Tarai, and Chisapani in the central inner Tarai (Regmi, 1988). In 1898, the Tarai was divided into 12 districts. The *goswara*, the head office of the district government, which was established in 1879-80 in each Tarai district, was administered by a *subba* or a *hakim*, who after 1898 became known as *bada-hakim* (Kumar, 1967).

Administrative districts in the middle hills were determined on the basis of the defence strategy. Districts were created in the far eastern and western part much earlier than in the central part. Dailekh, Doti, Dadelhdhura, Jumla, Baitadi, Palpa, Pyuthan, Baglung, Gulmi and Salyan in the west, and Dhankuta and Ilam in the east, were each under the administrative control of a *gaunda* but there were no separate administrative units in other parts in the hills region. However, *jangi-pareth* stations were created to maintain law and order in different parts of the hills in 1879 (Kumar, 1967). The number of people involved in this force was about 13,000 in 1922 (Landon, 1928). It was not until the last year of the 19th century that Bir Shumshere divided the central part of the hills region, with the exception of the Kathmandu valley, into eight administrative districts as follows (Regmi, 1988) : East No.1 (Sindhupalchok), East No.2 (Dolakha), East No.3 (Okhaldhunga), and East No.4 (Bhojpur) in the region east of the Kathmandu valley up to the Arun river, and West No.1 (Nuwakot), West No.2 (Gorkha), West No. 3 (Bandipur) and West No.4 (Syangja). These district offices were known as *goswara* and functioned until their replacement by the administrative arrangements of the *panchayat* system in 1962. Kathmandu valley, before the new arrangements, comprised the three districts of Kathmandu, Bhaktapur and Lalitpur, each under a magistrate functioning under the general supervision of a commissioner for the whole of the valley (Regmi, 1978).

2. Historical Evidence Concerning Forestry In Nepal

2.1 Codes of Practice

2.1.1 Kinds of codes

As noted in section 1.1, it is unrealistic to look for evidence of forest management, as now understood, in past times in Nepal. Nonetheless, varied evidences of concern for the forest resource can be found extending back over centuries, and rules and exhortations concerning forest practices are numerous. These certainly do not amount to the management plans of Western forestry but are best viewed as codes of practice which, in many ways, guided the treatment and use of the forest resource, at least in nominated areas.

The codes of practice are essentially two originated in two main ways, termed respectively self-originated and imposed (Gautam, 1987). In the first, the initiation, definition and enforcement of the codes have been local, in the sense of pertaining either to a particular group of forest users or to a local group which would obtain some environmental benefit. The imposed codes have come from two sources. Firstly there are those imposed in response to local initiatives and requests; these are prevalent in the hills region. Secondly there are those originating from the exercise of central authority and imposed for local benefit, general benefit or the benefit of ruling elite. Until the mid-20th century, Nepal was a feudal society, and it is scarcely possible to distinguish between actions intended to provide benefits to the state as a whole and to a ruling elite. The elite formed a highly centralized government. What benefited the elite was the aim of that government and so of the state. Such centrally imposed codes are indigenous to the country unless they have foreign influences, but they can be viewed as imposed on local areas or people.

In principle, the codes identified can be categorised in terms of their origins, objectives, perceived benefits and beneficiaries, as depicted in Figure 2.1.

.1 A categorisation of codes of practice

2.1.2 Sources of evidence for the codes

The evidence concerning these codes is both diverse and fragmentary. The various types of evidence will now be described.

(a) Inscriptions

Inscriptions are the oldest records, and in Nepal they are divided into *shilapatra*, *tamrapatra* and *kasthapatra*. In the context of the present study, the oldest stone inscriptions were carved during the Lichchhavi era in the Kathmandu valley. These inscriptions were installed at specific sites where their messages could be read by the people concerned.

The system of placing red flags around the boundaries of protected forests during the early Rana period (see D83) can also be regarded as a modification of the installing of inscriptions at particular sites. Similarly, the practice devised by local people of installing *tharo* at the entry point to a forest can be seen as another stage evolved from inscription. This practice is still effective and is widely used in the hills region, to inform local people, most of whom are illiterate.

During the early Rana period, documents (e.g. D89) regarding forest protection mentioned '*kasthapatra*'. There is not sufficient reason to believe that the inscription was actually on wood; probably the term denoted a document relating to matters of wood and forests. However, document D83 mentions a *kasthapatra* installed along with red flags in the forest.

(b) Specific orders

Though specific orders were issued throughout recorded history, they only became fully institutionalised in the post-unification period. They were intensively used until the enactment of the legal code in 1854. Most of these orders were issued as *lalmohar* by the kings. However, a few were issued as *sanad*, *sawal* or *khadganisan* by the prime ministers in the later Rana period even after the enactment of legal codes. The *lalmohar* were often issued in response to petitions of local people, functionaries and local authorities but when the central elite needed forest products for themselves, orders were issued with that purpose only.

(c) Petitions

After unification, petitions often linked indigenous management to the central power, and many occurred when established practices faced challenges which could not be resolved locally.

(d) Royal directives

In addition to legal codes promulgated during different post-unification periods, royal directives have played a vital role in the general administration. These sometimes referred to the management of the natural resources. Of prime importance is the *dibya-upadesh* of Prithvi Narayan Shah (Stiller, 1968). The codes later developed were based on the contents of the *dibya-upadesh*.

(e) Evidence of *kipat*

It has been difficult to trace the origin of the *kipat* system in Nepal. *Kipat* is a system in which a specific area of land has communal ownership. Such ownership implies agreed membership and, probably, a code of practice, but written examples have not been found. Though this system existed prominently in the far eastern hills, it has been traced in some communities in districts adjoining the Kathmandu valley and Dailekh, a district in the far western hills. Attempts to abolish *kipat* as a legal category have been made since 1950 but are not yet fully successful. However, it is over-ruled by some legislation relating to the land and the forest.

(f) General regulations

The term 'regulation' has been used widely during the Rana period. Any arrangements made by the central authority were 'regulations'.

(g) Legal code

The evolution of a legal code in Nepalese history began with the code of the Shah dynasty at the time of Ram Shah (1606-33). The first legal code to cover all of present-day Nepal came only in 1854 (HMG, 1965). It was the first up-to-date treatise of law, it was made by a large body of councillors and it was intended to regulate almost all aspects of contemporary social life (Kumar, 1967). Individual chapters dealt with specific sectors. The chapter 'On cutting trees' of the code (HMG, 1965) dealt with all forestry matters. Whenever the legal code was found insufficient, amendments were made through regulations, *sanads* and *sawals*. Later, these were incorporated in the legal code. In this way the legal code of 1854 was amended in 1870, 1888, 1898, 1918, 1923, 1935 and 1948 (Tiwari, 1990) before it was replaced by a new *muluki-ain* in 1962 (HMG, 1962). However, the chapter 'On cutting trees' was repealed by the Forest Act in 1961 (HMG, 1961).

(h) *Sanad*

There is no evidence of a *sanad* before the enactment of the legal code in 1854. The *sanad* replaced the practice of issuing royal orders and was used for the first time in the forestry legislation in 1886, regarding the handing over of responsibility for forest protection to the local revenue functionaries (D101). After this period the *sanad* was frequently used in the authorisation of forest

protection activities. Later it was used in forest legislation, in the amendment of the legal code in 1918. All the *sanads* dealing with forestry matters were repealed by the Forest Act 1961. Other documents, *rukka*, *khadganisan*, *duichhape* etc. were also issued as part of *sanad*.

(i) *Sawal*

A *sawal* was an order /circular to the government officials in Rana times.

(j) Visitors' reports

After unification, and particularly when the British came to India, visitors sometimes entered Nepal for varied purposes. Many entered to study various resources and the potential for their exploitation. The following wrote reports mentioning the forestry situation in Nepal:

Kirkpatrick	1793
Military personnel	1814-16
Hamilton	1819
Honoraria Lawrence	1843-46
Oldfield	1850-63
Girdlestone	1876
Elles	1884

2.1.3 Usage in this thesis

For simplicity, the term 'order' will be used throughout this thesis to include inscriptions, specific orders, orders made in response to petitions, royal directives, general regulations, legal codes, *sanads* and *sawals*, unless it is necessary to be specific in any particular case.

2.2 Customary indigenous rights

It is likely that indigenous codes of practice have existed throughout the hills region for centuries, but documentation is inevitably rare in a country which was largely illiterate until recent times. Local communities would also have seen no need to commit codes to writing in most cases. Documentation of the existence of customary indigenous rights has mainly occurred when they have suffered attacks by those with customary rights themselves (D74), by outsiders (D51, 74), by unspecified parties (D27, 48, 54, 55, 64, 68, 70, 71), or by local authorities (D38). However, D58 is an outcome of the controversy that occurred between groups of local people occupying land under different tenure or

obligation. Similarly, D56 and 80 are the outcomes of injustices done by *chitaidar* and land-owners respectively in regulating customary rights. The documents D22 and of Appendix XIV are the codifications of existing customary practices. Only D45 reveals initiatives developed over any long period - in this case over the years 1834-47. Thus the written evidence can represent only a very small fraction of the indigenous codes that existed.

Evidence of the existence of customary rights relating to forest use can be found in documents Appendix XIV (this instituted the customary rights to grazing land, *panighat*, and recognised the rights of subsistence farmers in forests), D48, 51, 56, 64, 70, and 74. The documents D38, 56, 58 and 80 relate to pasture, and D27, 48, and 64 relate to soil and water conservation. Document D68 deals with forest plantations established by individuals on land under *kipat* tenure. Orders made in relation to the rights usually confirmed them although in one case (D80) they were abolished.

In some documents (D9, 22, 48, 54, 64, 70, 74) there are references to practices of 'former times'. It is tempting to assume that these refer to pre-existing indigenous practices but the content (except D54, 64 and 70) also allows that the practices may have been imposed in response to local requests.

Sometimes a need was seen to institute official regulation to enforce customary practices (D70) or to replace a lost order (D37). An official edict was obviously seen as important.

2.3 Early codes and some continuing emphases

2.3.1 Early codes

The earliest known occupants of the Kathmandu valley were cow herders, followed by the Mahisapal people who reared water buffalo (Tiwari, 1990). Thus the earliest main use of forests within the Kathmandu valley was probably for the provision of pasture and fodder. However the area around Pashupatinath was maintained for deer. Tiwari (1990) mentioned that King Bir Dev created the settlement of Lalitpur by clearing the Lalit forest in the late 3rd century, indicating that that part of Kathmandu valley was then forested. Elsewhere in the hills region, the settlements were created close to the forest, making it easy to rear water buffalo. Some were later shifted because of severe attacks by leopards and other wild animals (Rana and Bajracharya, 1972). In some places, such attacks were noticed even in the late 18th century (D2).

The Lichchhavi period has been described as the golden age of decentralised administration (Tiwari, 1990), because of the existence of local peoples' organisation such as *gosthi* and *panchali*. Each member had the same responsibility and authority in forestry matters. Inscriptions from the time of

Ganadev (about 340 A.D.) and Shiva Dev (middle of 5th century) speak of a law laying down the powers of village *panchayats* (Kumar, 1967). The taking of wood for making charcoal for subsistence purposes and for timber to build the houses of the local people was permitted. According to the Changunarayan inscription from the time of King Shiva Dev, up to 40 trees were allowed for building houses and for making charcoal for household purposes (Tiwari, 1990). The same inscription banned the use of forests for commercial purposes.

The inscription of Satungal village reveals that the local inhabitants were empowered to take action against those outsiders who entered forests to collect other than leaves. It also reinforced the system of allocating forest to the villages.

The regulations (D1) of King Mahendra Malla (1560-74) are dominated by the feeling that "If any subject remains hungry, penalty for the sin accruing on that day shall be borne by the *thakali* and *mane* of that *tol*". It was stated that as "for lamps, torches and wicks, go to the forests and use *devdaru*", which is concerned with the forest products to be obtained from green wood. Though it has not been possible to document fully other provisions of forest regulations of this time, forest products from dry parts of the trees were available without any restriction, as the afore-quoted order specifies the products from 'green trees'.

Queen Ganga, the wife of King Shiva Singh Malla, created a garden close to Budhanilkantha (a religious place located in the northern part in Kathmandu valley) in around 1585 and named it '*rani ban*' (Tiwari, 1990). She also expanded the Raj-rajewori forest (to the south of Pashupatinath temple located on the banks of the Bagmati river in Kathmandu valley).

From the early 18th century forest management practices were initiated in most of the forests of the Kathmandu valley by implementing regulations. The regulations emphasised consolidation of forest area, recognised the users, prescribed the terms and conditions for using forest produce, and set the penalties for defaulters. Management of forests of religious sites was given due emphasis by prohibiting the cutting of trees and the killing of jackals, monkeys and snakes. Lighting fires in the forests was taken as one of the serious offences (Tiwari, 1990).

Ram Shah (1606-36) introduced the first legal code (Appendix XIV) in the western hills region to regulate economic and social relations among his subjects, most of whom belonged to non-Hindu tribal communities (Regmi, 1972). This code had a tremendous impact upon surrounding areas and, according to one view, may have been an important factor in the subsequent expansion of Gorkha's dominions (Joshi and Rose, 1966).

Ram Shah's code has two major components which arise again in many later orders. The first relates to the maintenance of trees along paths so that travellers, especially porters, can relax in the shade. Later orders (D52, 65, 67) and the clauses of the legal code of 1854 have a similar emphasis, often including trees around resting places.

The second emphasises the maintenance of trees as an aspect of water management, in the belief that forest clearing leads in one way or another to loss of, or reduction in flow of, sources of water and to landslides. During the time of Prithvi Narayan Shah this belief was further supported on the ground that destruction of forest would lead to a decline in rainfall and undermine the productivity of the soil (Acharya, 1966). As the main emphasis in that period and later was to increase irrigated land, forests were accepted as a common significant factor in conserving water, land, irrigation canals, and ultimately, the productivity (D27, 36, 48, 50, 52, 62, 64, 65, 67).

The code of Ram Shah also recognised the need for grazing areas (*gauchar*), and the indispensability of forests for subsistence households. The code encourages increase in the area of agriculture land by reclaiming waste land, allowing the cultivator to keep the whole crop for three years after reclamation. The code does not specify reclamation of forest land. The other main type of land reclaimed in the hills region was *bagar*, or lands once cultivated but washed away by floods or landslides. As the code specifies the payment of an owner's share of the crop from the fourth year, it seems the land reclaimed was allocated land. The ninth code indicated that all land belonged to the king. So if the reclaimable land were other than allocated, the owner's share could have reverted to the king. But this was not the case. So the emphasis on reclamation of land must relate to the category mentioned before, i.e. *bagar*, rather than to forest. Regmi (Regmi, 1972) has, however, distinguished forest land from waste land on the basis of a document of 1793, indicating that forest was not included under the category of waste land.

Though in several parts of both the eastern and the western hills regions, a number of indigenous ethnic groups owned lands on a communal basis without any legal title under the *kipat* system, the *kiratis* of the eastern hills region were the biggest *kipat*-owning community in Nepal (Regmi, 1972). It is not known when this system was initiated, but it was certainly of long standing before unification. Prithvi Narayan Shah did not make any change in this traditional system of land management. Under the *kipat* system, the whole land, irrespective of its use, was owned by the community. Individuals who cultivated lands in their capacity as members of *kipat*-owning ethnic groups owed allegiance primarily to the community, not to the state (Regmi, 1972). Thus the whole land, including forests, was being managed for the benefit of the local community. This form of ownership persists in the local system of forest management by the Sherpa community of Khumbu region (Fürer-Haimendorf, 1964) and in the Jirel community of Jiri (Acharya, 1989; Acharya,

1990). The *kipat* system itself is evidence of local management for local benefits.

In the Tarai, the Mahotari, Rautahat, Bijayapur, and Makawanpur principalities were together known as South Limbuwan. The kings of these areas protected forest intensively, being afraid of invasion by neighbouring countries (Tiwari, 1990). Francis Hamilton, a member of the first British mission to Nepal in 1802-3, noted that the rulers of the principalities which controlled the Tarai region, before it was conquered by Gorkha, were so much afraid of their neighbours that they did not promote the cultivation of this low land (Hamilton, 1819). The purpose of forests here was thus to secure the terrain from foreign invasion.

2.3.2 Royal order emphases

The management norms established at the time of unification ceased in Kathmandu valley immediately after the capital was moved to Kathmandu and rather were directed towards managing for the interest of ruling elites (see sections 2.4, 2.5.1, 2.5.3 and 2.5.4). However, the royal orders D25, 36, 37, 62 emphasised management for local needs (mostly for conservation purposes). Furthermore, the orders D30, 33 and 63 banned the reclamation of forest land.

The hills forests were seen as sources of forest products for local needs, both individual needs (D50, 51, 53, 54, 57, 64, 65, 67, 70, 84) and communal needs (D22, 43, 44, 45, 47, 50, 51, 65, 67, 70, 71). Though most of these documents shown concern to conserve the local environment, sometimes forests were managed entirely for conservation of the local environment (D27, 36, 46, 52, 62, 66, 73). The system consisted of authorising a local person to regulate forest products under specified terms and conditions. The stability of the local forest was to be encouraged through protecting some specified species (D43, 47) or green trees (D52, 57). Only one royal order (D65) prohibited cutting of a particular species for nine years. None of these arrangements attracted any levies on such products.

Most of the orders issued between unification and 1842 relate to the forests west of Kathmandu and east of the Kali-Gandaki, i.e. east of Baglung. However one was found relating to pasture management in Salyan. Only in 1842 (D51), was this (practice of issuing orders) extended to the east of Kathmandu. By the middle of the 19th century, the practices laid down in such orders were applied between Baglung in the west and Okhaldhunga in the east. But one order regarding the management of an *Acacia catechu* plantation in Pallokirant (D68), shows that they may have extended up to the far eastern hills.

2.3.3 Legislative support

The first legal code of the country reinforced the practices laid down in previous orders with the provision of penalties for those who cut trees in areas where this was prohibited through royal or other orders, or in *guthi*, *birta*, *bekh*, *chhap* and other lands belonging to others. Thus it recognised the ownership of trees. Like the codes of practice established earlier, it continued to prohibit the cutting of trees along roadsides, water sources and irrigation channels even by the owner. In addition, it defined domestic and commercial use and provided different entitlements according to the tenure of the land.

Forest management principles were enforced not only through the forestry legislation but also through by other sections of the code. In this way, meadows and pasture lands were preserved from agricultural use by the section "On reclamation of waste lands" of the legal code 1854. The cultivation of forest land adjoining inhabited areas was strictly prohibited by the regulations. Such provisions ensured the supply of forest products, including pasture for the local people. In situations where the existing laws and by-laws were insufficient, orders were issued to validate the use of forests for local needs (D78, 80, 103, 110). Though forests were often part of the land granted under *birta* (D104), persons deputed to collect revenue from such land were not authorised to collect revenue out of the forest products but were instructed to promote reclamation and settlement (D115).

2.3.4 Institutionalisation

Document D89 attempted to involve local functionaries in the protection of forests. The reason for this change in policy is partly expressed in D83 by an officer as "It would not be possible to protect the forest merely through the orders of the government." Although *jangi-pareth* were stationed in different parts of the hills region, it was simply not possible to deploy army personnel for all the forests.

After devising this policy (as indicated in D89), it was first implemented in the Kathmandu valley (D100, 101) and was extended to some *birta* forests of Kabhrepalanchok (D101). However the practices adopted there (D101) were not the same as those initiated by early codes and royal orders (see foregoing sections).

The *ban-goswara* was established before the end of 19th century, as a central level authority to manage the forests of the hill region (Tiwari, 1990). Some forest check-posts were created to stop illegal activities in the forests and to stop smuggling of forest products (Appendix I). However, the system of authorising local functionaries was retained even in the forest of *birta* land (Appendix II).

In 1907, the government introduced a new arrangement for providing the timber required by local people for building houses and cattle-sheds. (This is

indicated in the *rukkas* relating to forests in various parts in the hills region). But after only four months of this arrangement a revolutionary policy was introduced to handover the management responsibility, including harvesting and utilisation of all forests, to the local people and functionaries. This was implemented first in the eastern hills (East Nos. 1, 2, 3 and 4 districts) and was extended to the western hills (West Nos. 1, 2, 3 and 4 districts) in 1910 and to the rest of the hills in 1913 (see Appendix XII).

This new policy has had a significant impact on the forestry of the hills. The name *sanad/sanadiya* given to many of the forests in the region is the result of this implementation. *Rukkas* for various forests in Dolakha district, and forests in Kaski (Adhikari, 1990) and Dadeldhura districts (Bhattarai, 1985) reveal the application of the policy throughout the hills region. Acharya (1990) has documented the linkages of this policy with the management of forestry in the Jirel community. Whereas Fürer-Haimendorf (1964) has documented the system of forest management applied by the Sherpa community, where he has noticed the evidence of its functioning since 1941. Several authors (Fisher, 1989; Acharya, 1990) have considered the Sherpa system to have evolved in isolation, and its linkages with the afore-mentioned policy needs to be further investigated.

Documents relating to this policy recognise the organisation shown in Table 2.1. The term *talukdar* has been used widely to denote any kind of local functionaries, so this organisation could apply to all forests in the hills region, irrespective of land tenure systems.

Table 2.1 Forestry organisation in the hills region in 1910

	Central	District	Village
Institution	Prime Minister <i>Muluki-adda</i> <i>Ban-goswara</i>	<i>Goswara</i> <i>Addas</i>	<i>Talukdar/Raiti</i>
Functions	Policy formulation	Judicial action against offenders	Execution

After implementation all over the hills region, the policy was incorporated in the legal code in 1918 through amendments under clause 5 (HMG, 1923). In a further amendment of the legal code in 1935 (HMG, 1935), this was put into clause 7, which states:

In case any person reports that he has raised a forest on a particular land under *raikar* or *jafati* tenure in consultation with the villagers, but that the forest has remained unprotected because of the absence of an official order, demands an official order granting him authority to raise a forest in specified areas other than those owned or cultivated by another person, and in case the inhabitants of the adjoining area are found to have expressed their consent in writing, a *banpala-sanad-rukka* granting the applicant authority to raise a forest on such land and mentioning the particulars contained in such document shall be issued.

This Clause was amended in 1948 (HMG, 1952) and finally read:

In case any person reports that he has raised a forest on a particular land under *raikar* or *jafati* tenure in consultation with the villagers, but that the forest has remained unprotected because of the absence of an official order, demands an official order granting him authority to raise a forest in specified areas other than those owned or cultivated by another person; or a *gaunda*, *goswara* or forestry authority felt the necessity of protection of any forests; and in case the inhabitants of the adjoining area are found to have expressed their (in majority) consent in writing, and the forest found to be protected, issue a *banpala-sanad-rukka* in the name of *chitaidar* instructing to consult *chitaidar* if any local *raiti-duniya* needs timber and vice versa i.e. *chitaidar* has to consult *duniya-raiti* whenever he needs timber.

This legislative amendment changed the paradigm of forest management to some extent, and in addition it expressed the intention of creating new forests in the hills. It recognised local initiative and the role of all community members in the management of forest resources in the hills region. Whereas previously only villager's action could initiate the issue of a *banpala-sanad* for the management of forests on *raikar* or *jafati* land, this amendment, while still retaining the previous arrangements, also allowed forestry offices, *gaundas* or *goswaras* to do so.

It was not the only formulation of policy but the forests were also given to villagers, and some of which were administered rationally (Robbe, 1954). The effects of this effort can still be observed in many parts of the hills region. Bhatta (1989) encountered the practice under this system in the forests he studied in Kaski district. Fisher *et al.* (1989) noted some similar history in case of two forests (Ganesthan and Maina-bisauni forests in Sindhupalchok district). Jackson (1990) recorded a *chitaidar* functioning until 1959 in a forest in Kabhrepalanchok district, indicating that this practice had a long history. Similarly Hobley (1990) has recorded an effort initiated in 1949 for the management of Salgari forest in Banskharka, Sindhupalchok, that reflects the linkage with this system.

The various stages of evolution of the policy of devolving the management responsibility to the local people are detailed in Appendix XII. The policy was first applied in the eastern hills, but it is not clear why this was so. There is not enough evidence why such initiations were made in the eastern hills. The evolution of the system has been directly linked with Brigadier Colonel Dal Bahadur Basnyat, who was the chief of the *ban-goswara* in the period from 1908 to 1914 when such arrangements were conceived and enacted. The role of the *ban-goswara* chief in introducing the new system certainly seems significant, and his background could help trace its origins. The following background is derived from the work of (Mahat, 1985) .

- He was from the eastern hills, originally from Dolakha and later shifting to Kabhrepalanchok, and so he had practical experience of the forestry situations and issues of the hills region.
- He was A.D.C. to Prime Minister Chandra Shumshere, so was influential in the administration.
- He was interested in protecting forest. Mahat writes:

Col. Dal Bahadur Basnet (Basnyat), however, protected the forest in his possession and allowed no clearing for agriculture. Its continued existence through the years appears to stem from a tradition of protection that he instituted, although many changes have occurred.

So on the one hand the chief of the *ban-goswara* was able to introduce a practical approach to the management of forest in the hills as against the approach taken in the preceding period, while on the other hand, the interest of the then Prime Minister to decentralise the administration (Anon., 1976) made it easy to enact such arrangements.

2.3.5 Harvesting and distributing system

The regulations concerning forest products for the local people recognised two categories of wood - firewood and timber. Timber for individual use and timber for communal use were placed in the same category. Firewood was required to come only from dead and fallen trees, whereas timber was to be collected in the following order of preference:

- dead, dried and fallen trees.
- over-mature trees
- mature trees.

But the extraction of wood had to be done in such a way that (i) forest would not be degraded, (ii) forest would not be opened unevenly, (iii) such extraction would serve as a thinning process, and (iv) trees were cut only in dense part of the forest. In no case were trees allowed to be cut from the forest along trails, *chautara*, sources of irrigation water, religious sites, *sandisarpan* or *panighat*.

The distribution system was simple. In the case of firewood, the joint decision of *talukdar* and *raiti* was enough. In the case of timber for building houses, sheds, inns and bridges, *raiti* had to get *talukdar's* approval and *vice versa*.

Smoothly functioning of any system requires checks and balances. Any people who infringed the arrangements were liable to punishment. Local people had to initiate the action, while district level authorities had the authority to deal with cases and punish offenders. However, a provision for the central authority to check forests every six months aimed at prompt action and effective protection of the forest.

2.3.6 Conclusion

Early codes of practice developed in the hills region and focusing on the management of specific forests were reinforced by royal orders in the post-unification period. While the legal code of 1854 recognised the norms established by earlier orders, the general principle of involving local functionaries was initiated in 1883 and was finally incorporated in the forest legislation in 1918. Throughout the evolution, the emphasis was on the management of forest resources to meet the local needs. The words '*sanad/sanadiya*' and '*chitaidar*' used in the history of forest management are the result of this evolution.

2.4. War and Forests

The varied role of forests in regard to the army and defence is a persistent theme throughout the two centuries under review.

Document D48 of 1838 states that 'some forests had been protected formerly for the supply of bows, quivers etc. to the government every year'. Indiscriminate felling had resulted in this supply ceasing so a royal order for the protection of these forests was issued.

Soon, however, warfare involved more than bows and arrows. Ore needed to be smelted for the production of metals, some for use in coinage but much for armaments and munitions. An armaments and munitions factory had been established in Kathmandu in 1793 and munitions factories existed in Pyuthan, Doti, Chainpur, Morang, Kumaon etc (Mahat, 1985). According to the royal order of March, 1800 (D20) to the *dithas* of all gunpowder factories in the Kathmandu valley, the daily production of gunpowder was one *muri*. The daily requirements of firewood, charcoal, and bark for this purpose are given as 200 *dharni*, 9 *dharni*, and 12 *dharni* respectively and these quantities were to be supplied throughout the year (D20). In the time of Rana Bahadur Shah an order was issued to cast one gun every day: this remained in force for about six weeks, after which three or four a month were founded (Cox, 1824). The fuelwood used in all these operations must have been very considerable (Mahat, 1985). Regmi (1978) has published the recorded *jangi-megjin-rakam* of about eighteen families living at Gagalgaun near Panauti in Kabhrepalanchok. Each was required to provide one *dharni* of charcoal daily (*ibid.*), the equivalent of at least 150 tonnes of fuelwood annually for the community. Similar orders (D18) were issued in March, 1800, to *dwares*, *naikes*, and *mahanes* of Dhulikhel in Kabhrepalanchok, and Thecho and Lele villages in Lalitpur to supply one *dharni* of charcoal daily to the munitions factory. The quantity is confirmed (D29) by the concessions granted on October 1812 to the inhabitants of Thecho. Firewood was also to be provided (D19). These practices were initiated, enforced (D64) and continued until at least 1889 (D79).

Other orders relating to war and defence are D10, 24, 29, 39, 59 and 75 issued in the period between 1797 and 1852. Mahat (1985) noted similar evidence relating to the ore smelting in the eastern hills region, and allocation of forests for making charcoal for the iron industry. These documents show that considerable quantities of forest products were being carried by porters over distances of at least 50 km (D75). However, the documents, the *istihar* (Appendix I) and D119, indicate attempts to convert these obligations into cash.

As a result of all these activities, the forests in and around the Kathmandu valley became so degraded that in 1815 a ban was imposed on land reclamation, clearing, slash-burning, manufacture of charcoal for purposes other than meeting the requirements of the munitions factory, and cutting timber in the forests areas in and around the Kathmandu valley and in part of Nuwakot, Sindhupalchok and Kabhrepalanchok districts (D30). Many of these arrangements were introduced, by the government during and after the 1814-

16 war with the East India Company in India, but similar orders were issued in 1822 (D33) and 1846 (D63).

Technological, administrative, and economic developments led to the obsolescence of several *rakam* functions and the expansion of several others. With the modernisation of the Nepali army, which made it almost wholly dependent on extraneous sources for supplies of arms and equipment, *rakam* labour used in the manufacture of gunpowder became unnecessary when machinery was introduced in gunpowder factories around 1888 (Regmi, 1978). The abolition of magazines in Salyan and Pyuthan around 1907 led to similar results (*ibid.*).

Forests themselves provided a defence wall against invasion from the south. Thus Hamilton (Hamilton, 1819), a member of the first British mission to Nepal in 1802-3 noted:

The chiefs of the principalities who controlled territory in the Tarai before the Gorkhali conquests made little effort to encourage cultivation, but encouraged extensive woods and contented themselves for the most part with the produce of forest in timber, elephants and pasture, because they were afraid of their neighbours.

The area referred to by Hamilton (1819) was the aggregation of principalities known collectively as South Limbuwan (Mahotari, Rautahat, Bijayapur and Makawanpur) lying in the central and eastern Tarai. Tiwari (1990) has also noted the use of forests as a defensive barrier, and implied that the same policy held throughout the Tarai.

From the beginning of the 19th century the forests of the Mahabharat region are mentioned only in connection with defence. It was considered crucial that the Mahabharat forests of the central region be protected in order to create a barrier against invasion of the Kathmandu valley. In this regard, a letter from a Superintendent of a Company to the Secretary to the government, Political Department of British India in December 1814 states (Cox, 1824):

Upon the whole, it appears to me that the Nepalese are desirous of making the access to their capital as difficult as possible to strangers, knowing their own weakness, and how little dependence is to be placed upon their undisciplined troops when put in competition with ours.

The same letter describes one of the strategies of defence as:

About a half *coss* [*kos*] from the summit of the Dunmunna hill [a place on the Sindhuli to Kathmandu route] is a chasm, described

as from thirty to forty feet in breadth, of immense depth, filled up partly by nature and partly by art, over which the road, six or eight feet broad, passes. This, however, in case of emergency, can be thrown down to a sufficient depth, so as to make it passable by a bridge only, for which there are plenty of materials at hand, *sauls* [*sal*] and firs. Should an enemy, however, effect a passage, on the summit is the aforesaid guard-house, which the natives call a *keella*; but is nothing more than a spot of ground which commands the road surrounded with *saul* timbers driven well into the ground, to which round stones of a large size are made fast with rattans. On the approach of an enemy the rattans are cut, and the stone rolling with increasing velocity down the path, clears all before it, and falls into the chasm with a tremendous crash.

The importance to defence of the region east of Narayani and west of Kamala, i.e. south of Kathmandu, was appreciated by an officer of the British Army on November 1814, who reported (*ibid.*):

It is asserted, and it may not be doubted, that the shortest distance from the Terraie [Tarai] to Catmandoo [Kathmandu] lies in the tract between Hetaunda [Hetauda] and Seendhoolee [Sindhuli]. The attack of the hills will probably, therefore, proceed through some points in that space. The same reason which invites the invasion through that line, may be supposed also to guide the enemy in his descent from the hills, whether to devastate the low lands or to infest the rear of the advancing troops. This view of the matter would naturally suggest, that the positions of the protecting force which is to remain below the hills, from Hetaunda to Seendholee, should be strong in proportion to the expected service.

In 1816, a *subedar* was ordered to remove settlements from an area south of the Mahabharat *lek* and north of the Chure hills, to close all tracks (D31) and to let this area revert to forests. Local people were asked to plant bamboo, cane and thorny bushes to render the tracks unusable. Subsequently, other orders were issued in 1817 (D32), 1824 (D34) and 1826 (D35) to remove such settlements to other areas and to develop forests. These orders were concerned with the central part of the Mahabharat *lek* except the general orders issued to check-posts in the Mahabharat region in 1826 (D35). The order issued to a check-post in Salyan in 1831 (D42) also extended the area of concern to the mid-west. A document of 1831 (D40) appears intended to impede invaders from the west as they approached the Kathmandu valley.

This same policy continued to be followed even after Jung Bahadur, the first Rana Prime Minister, established friendly and cordial relations with the British,

because the undercurrent of fear and suspicion was not completely eliminated. Oldfield (1880), the British Resident (1850-63), noted:

In Nipal [Nepal] the *dhuns* [inner Tarai, but here specifically the Chitawan valley] have been mostly allowed to fall into a state of jungle, and are consequently clothed with forests of *sal* and cotton trees, and are inhabited only by wild beasts. The Nipalese are averse to the "clearing" of these forests, as they look upon the malarious jungle at the foot of their hills as the safest and surest barrier against the advance of any army of invasion from the plains of Hindustan [India].

Similarly, Captain Orfeur Cavenagh, one of the British officers attached to Jung Bahadur's entourage during his 1850 visit to England, has realised (Cavenagh, 1884) that:

Despite all his public protestations of friendship (Jung Bahadur) retained considerable mistrust of Britain's ultimate intentions towards his country. This came out clearly when Jung explained to him after their return to India, his reasons for not wanting to build a road connecting Kathmandu with the plains. He said that he was sure Britain would one day take possession of Nepal and that if such a road were available for use by the invading force then its builder would go down in history as the author of his own country's destruction.

Not only did the Ranas not accept the construction of a road to Kathmandu, but they also made arrangements to close many of the tracks in the Mahabharat and Chure ranges, leaving only the essential ones open. Orders were also issued to allow all cultivated lands (irrespective of tenure or category) situated on the banks of the Rapti river in the Bhimphedi-Hetauda area to revert to waste land and to evacuate the settlements (D81).

Also a British naturalist wrote in 1880 that Nepal's rulers deliberately protected the malaria-infested forests of the Tarai and forbade human settlement in order to maintain the jungle barrier as a deterrent to British territorial designs (Mishra, 1990).

In contrast to the situation described above, there is no evidence of intention to preserve the forests of the southern ranges for defence purposes after the late Rana times. Legislation still prohibited any cultivation of land which had been banned by previous orders, but enforcement was not vigorous. Indeed, Mahat (1985) has provided evidence that settlement of the Mahabharat in Kabhrepalanchok began only very recently.

The importance of the availability of wood for the construction of channel embankments and dams led to many orders (D44, 45, 48, 64, 70, and 74). Sometimes these water-related orders seem not necessarily for general local benefits but to be aimed at the protection of 'army lands' (D44, 64, 70, 74), by which was probably meant land allocated to soldiers as *jagir* in lieu of wages. But it (practice of indicating army lands) was only to attract the early action on the petition, as all lands were allocated in one way or other by the government to its employees or to the nobility.

2.5. Forests and the Ruling Elites

As the ruling elites were scattered over all the regions of present-day Nepal during the period prior to unification, the effects of meeting their needs for forest products were hardly noticeable. In other words, pressure was well distributed throughout the country.

The ruling elites based in the Kathmandu valley after unification affected the forests mainly in four ways: the consumption of forest products by their households; the gaining of financial benefits through the sale of forest products; the establishment of areas which were effectively game preserves; and the construction of large buildings, particularly temples and palaces.

2.5.1 Forest products used by ruling elites.

In 1810, a previous order was confirmed (D28) that 26 households from four villages in Lalitpur should supply firewood to *dilasal-baithak* [possibly a portion of the palace]. Inhabitants of more than 23 villages were mobilised to transport timber in 1805 (D24). Sooner or later these obligations were institutionalised under *rakam* land tenure.

By 1882, the supply of timber from the inner Tarai towards the needs of the ruling elite was institutionalised (D88). An office, known as *lam-adda* had been established for cutting timber from the forests of Hetauda and transporting it to Kathmandu (D88). Another office, known as *chalani-adda* was working under the *lam-adda* to forward timber from Hetauda to Bhimphedi (*ibid.*). This timber was mostly used to construct palaces in Kathmandu (*ibid.*).

In the late Rana period, forest products for the elites were collected not from the Kathmandu valley but from the forests located on the other side of the ring of hills surrounding the valley (Appendix I, D119). This practice continued even after the Rana period; only in 1955 did the government decide in principle that all *rakams* should be abolished and converted into *raikar* (Regmi, 1978). But full implementation of this decision occurred only when forest products became available from the Tarai, i.e. after opening the road linkage between Kathmandu and the Tarai in the early 1960s.

It is clear that the forests of Kathmandu and adjoining districts were highly affected by the supply of forestry products to the ruling elites. The situation had deteriorated so much by the beginning of the 19th century that clearing for agricultural purposes was banned and the cutting of forest products was strictly prohibited except for munition purposes. The state of the forest resources of the valley even by 1844 was described by Honoria Lawrence (Lawrence and Woodiviss, 1980) as follows:

There is a large class of household slaves whose work is "hewing of wood and drawing of water". Every evening we meet troops of them returning from the neighbouring hills with burdens of faggots, men and women often singing and generally looking well fed and clothed. Water drawing is not so laborious an occupation here. The firewood grows some miles off but water runs by every man's door.

Fuel and grazing are the two great wants of the poor here...Where every inch is cultivated there is scarcely any grazing ground... The surrounding hills belong to certain chiefs who there cut the timber. Even were it public property, the labour of cutting and bringing it such a distance would make it inaccessible to the poor. Small branches, chaff, dried leaves, sugar-cane from which juice has been squeezed, straw and such like insufficient substances are the firing on which the poor people depend.

Indeed, timber was so scarce that every timber long enough for the beam of a house is brought from the Tarai.

2.5.2 Forest products for financial benefits

The ruling elites of Nepal benefited financially from forests (especially of the Tarai) by the sale (export) of forest products or through taxes on their sale.

Tiwari (1990) states that the Tarai forests were used even in Malla times to gain revenue through the export to India of products such as timber, wax, honey, birds and elephants. Prithvi Narayan Shah also was well aware of the possibilities of exports, which he expressed in one of his directives as "send our herbs to India and bring back money" (Stiller, 1968). Administrative regulations of 1793 (Regmi, 1972) attempted to centralise the trade carried on at a local level by providing of incentives to those who sold timber of *Shorea robusta* and *Acacia catechu* to the local *kathmahal* in Saptari and Mahotari districts. However Kirkpatrick's observation in 1793 describes the trade carried on in 1793 in the Tarai region as (Kirkpatrick, 1811) :

This forest skirts the Nepaul territories throughout their whole extent from Serinugar to the Teesta,... It is not, of course,

equally close or deep in every place; some parts having been more or less cleared away, especially those which are situated most favourably for the commerce of timber, or in the vicinity of flourishing towns....The part most resorted to by the wood dealers appears to be that which borders on the Boggah district, timber being transported from thence even to the distance of Calcutta.... The Nepal government levy, I believe, is very high, and consequently, in a commercial view at least, impolitic duties on this traffic.

An order of 1799 (D17) aimed at controlling the trade in wax (see also D77), and there is clear evidence of trade in timber between the Tarai and India by 1809 (Buchanan, 1828). In this period, the government benefited only through duties on the timber sold, but by 1811, a timber export regulation (Regmi, 1972) shows that the government was not only collecting duty but was actually involved in transporting and selling timber to Indian markets. By 1830, revenue was partially gained through a contract system (D41).

In the later half of the 19th century the Tarai forests made a significant contribution to revenue, increasing from Rs 50,900 in the year 1851-52 to Rs 679,600 in 1861-62 (Regmi, 1979) and about Rs 1,000,000 in 1884 (Elles, 1884). This might have been the time when the slogan 'Green forests are Nepal's wealth' was initiated. But in fact, it became the wealth of ruling elites. Regmi (1988) writes:

The third quarter of the nineteenth century witnessed a spectacular change in the nature of the export trade in timber and other forest products. That change was due to two main factors: the growing demand in northern India to meet the growing needs of urbanization and industrialization, and the development of a railway transport system in India. Jung Bahadur appears to have taken prompt advantage of these new opportunities and initiated a number of measures which set the tone of forest policy until around the mid-1860s.

To maximise revenue the *ijara* system was replaced by the *amanat* system in 1858 to operate *kathmahals* in the Tarai. The *kathmahal* had no authority to take any action. In all circumstances cases had to be forwarded to the central authority (D78, 85, 86, 93, 106 and 107). However, *kathmahals* of the *nayamuluk* were granted authority in April 1882, to finalise the sale of old timber stocks (D85). By the end of 1860, all *kathmahal* west of the Narayani river were managed under the *amanat* system and were headed by army officers (D111, 112). This system was expanded to the eastern Tarai in 1861, and soon there were 18 *kathmahals* functioning throughout the Tarai region (D114). All the *kathmahals* were managed under the central control of the *kathmahal-bandobast-adda*. The performance of *kathmahal* employees was based on the

amount of revenue collected (D82). Even the forests which were protected by certain orders previously were permitted to be felled later in order to increase the revenue (D92).

The other offices involved in the collection of revenue from forest products were *dariyabudi* and *khair adda*. The functions of these offices were to manage floated timber and *khair*. In the far west, these offices were managed by the *naya-muluk-rakam-goswara*, with the *naya-muluk-bandobast-adda* in Kathmandu. However, after 1896, when the government adopted the policy of permitting open exports of *khair* subject to the payment of duty, these offices were abolished and responsibility for collecting export duty and managing floated timber was given to the *kathmahals* (D108). The *kathmahal* operation during the middle of this period is explained in a letter from the British Resident in Nepal to the government of India in September 1876 (Girdlestone, 1876) as follows:

Under the system of monopoly now obtaining what happens is that the timber is collected at depots near the points at which the larger rivers leave Nepalese territory. These depots are in charge of government officials, *kathmahal* being as much a department of state as our own bureau of revenue, agriculture and commerce. The *Durbar* [palace] prefers to deal with as few persons as possible, because the fewer the holders of timber in British territory the higher the price that can realize, and therefore the higher the initial charge which the *Durbar* can impose on them.

The management of *jhora* forest was not under the responsibility of *kathmahals*. These forests were set aside for reclamation. In the eastern Tarai the management responsibility was given to the *goswara* (D102). A contract system was established in the west but was soon abolished and the *amanat* system was introduced (D109).

Forestry operations expanded as the market for forest products grew. When the demand for timber expanded in Darjeeling, a *kathmahal* was established in Ilam in the last decade of the 19th century (Tiwari, 1990), but it was abolished in 1897 (D110), and elsewhere in Tarai *kathmahals* were either amalgamated (D87) or abolished (D108, 113, 117).

During the 1880s, the Tarai forests in Janakpur and Sagarmatha zones were granted as *birta* to Rana families. *Kathmahal* and *mal* offices were involved in the sale of forest products from these forests (D91). Clause 4 of the chapter 'On felling trees' of the legal code enacted in 1854 had given authority for the sale of timber on the *birta* land. Enormous efforts were made to sell the timber during this period (D85, 86, 90, 91, 92, 96, 97, 98, 99, and 106). Though *birta* grants were banned by royal order (D49) this was not enforced in practice. On

the contrary even large forests totalling about 6,000 *bigha* were granted as *birta* to the Prime Minister (D122).

By the mid-1880s, two sets of district level offices were functioning under the *kathmahal-bandobast-adda*. The *kathmahal* dealt with the felling and export of timber, whereas *ban-janch-adda* had the overall responsibility for forest protection. Earlier, when there was only the *kathmahal*, there was no controlling system and excess timber was stocked in large quantities. It was to control this wastage that *ban-janch-addas* were established (D95). Though it has been mentioned that the *kathmahal-bandobast-adda* was working under the *madesh-bandobast-adda* (HMG, 1976), it is not likely, from the evidence in orders issued on December 1885 regarding the forest and wildlife conservation (D94 and 95), that this was so.

2.5.2.1 Classification of forests

Forests of the Tarai region were classified at the latest by 1886 (D116) as *jhora*, *sira* and protected. *Jhora* forests were those forests which were not valuable for timber purposes. The interest of the government was to clear such forests for conversion to agriculture and to sell the timber for whatever could be obtained. The responsibility for management of such areas was given to the *goswara* (D102) or, in some cases, to the *mal* office (D109). On the other hand, forests containing trees of high timber value were classified as *sira* forest. Reclamation of such forests was banned. Protected forests (see D84), were so classified because of their importance for wildlife. The *hatisar* service was created to patrol these forests regularly (D103). The three classifications of forests were descriptive, and forests were not delineated in the field. As a result, a forest had to be determined as *sira* or *jhora* on the basis of its species composition (D78 and 102).

2.5.2.2 System of felling

It is not yet possible to trace the system of felling before 1885. However, forests were assigned by contract to individuals on payment of duties (Buchanan, 1828; Dabral, 1973). After the establishment of *ban-janch-addas*, these offices had the responsibility of marking trees for felling. Only the trees so marked could be felled (D95, 98, 99), and even dry timber could not be cut without marking (D98). However this system of marking was applied only in the forests located to the south of Chure (D95).

At the beginning of the present century, sawmills were built in the Tarai as government enterprises to produce railway sleepers for the Indian railways (D116, 118). During the First World War, 200,000 broad-gauge sleepers were offered free of royalty charges to the British government (Collier, 1928).

As the activities of the *kathmahals* were expanded, more *ban-janch-addas* were opened (K.D., 1980). Furthermore, forest areas were opened for reclamation (*ibid.*). Collier (1928), the first forestry adviser to the government of Nepal, wrote:

If the merchants of the best type can be found to work this system it will prove successful and profitable, but the chief difficulty is to induce reliable and honest contractors to invest their capital in a country and under conditions of which they may have no experience or knowledge. It was with the object of creating this necessary confidence that the Government has recently enlisted for a short term of years the services of a British forest officer who, with some fifteen years of experience of the working of forests in India, may be able to induce the best class of Indian contractor to work in the far richer forests of Nepal.

The codes of practice throughout this long period dealt with little more than the regulation of felling and related financial arrangements. The first forest working plans were prepared and implemented to some extent in certain Tarai forests before the end of Rana period, just after the creation of the Forest Department in 1942. They originated from the efforts of Mr. E. A. Smythies, the British forester who came as an adviser to the government of Nepal in 1941. Bajracharya (1986) writes on the contribution of Smythies:

He introduced a system of working which paid emphasis for stand improvement. He prescribed separate marking rules and fixed exploitable sizes of the commercial species- *sal* [*Shorea robusta*], *asna* [*Terminalia tomentosa*], *sissoo* [*Dalbergia sissoo*], *karma* [*Adina cordifolia*]_etc. He gradually prepared working plans for the forests of Morang, Birgunj, Chitawan, Nawalpur [Nawalparasi], Banke, Bardiya, Kailali and Kanchanpur, and for some *birta* forests as well. Mr Smythies had also made some fire-lines to protect forests from fires. These plans were gradually implemented while Mr. Smythies was here.

Smythies's plan divided the Tarai forest into three circles and thirteen divisions. Each division was further divided into 2 or 3 ranges and each range into 5 or 8 beats.

Several others (Ratauri, Chaturvedi and Pal) from the Indian Forest Service were appointed as forestry advisers but all of them were engaged in structuring the organisation rather than forest management. The motive behind the organisation was to exploit the forests to the greatest possible degree. Mr. Ratauri, who replaced Mr. Smythies, did not hesitate to propose recruiting some retired Indian forest rangers as Divisional Forest Officers with the intent of maximising the revenue from the Tarai forests.

2.5.2.3 Forest legislation and adjustments

Forest legislation changed through amendments to the legal code of 1854 in 1918, 1923, 1935 and 1948 (Appendix XII). The amendment made in 1935 listed tree species protected from cutting without permission. The amendment of 1948 introduced some scientific norms into the forest legislation. However, these legislations were heavily used to centralise the revenue within ruling elites (conditions of using timber from *birta* forests in the legislation and in D122 represent the two situations).

The following quote from document D121 is an example of early legislation (1922) addressing, in part, the problem of differentiating, within a given class of products, those that arise in the hills from those that arise in the Tarai. ' In case it is proved that pine torches produced from the forests of the Tarai region are falsely represented as produced in the hills regions and offered for sale and purchase in the market, the appropriate forest office shall take necessary action'.

2.5.2.4 Conclusion

Throughout the period from unification to the fall of the Ranas, the management of the Tarai forest aimed at maximising the revenue, through a system of felling and export, with associated changes in organisation and in legislation. There is no convincing evidence that the forests in the hills were managed with the same objective as for Tarai forests. However the introduction of a monopoly on the export of medicinal herbs provided some revenue from the hills region to the governing elite.

2.5.3 Gardens, wildlife and hunting reserves.

When Shiva Singh Malla became King of Kantipur in 1585, his wife created the garden around Budhanilkantha which was named *Rani-ban*. The forest was later extended to other areas in the Kathmandu valley, even beyond to Nuwakot district; and by the middle of the 18th century similar forests had been developed at all the religious sites such as Swayambhu, Balaju, Gokarna, Changu and Bajrayogini (Tiwari, 1990). Killing jackals, monkeys, and snakes, illicit collection of any forest products including firewood, and lighting of fires were listed under the *panchamahapatak* and were forbidden (*ibid.*). Thus such offences were linked with the religious nature of places.

After unification, the practice of protecting forests in and around temples continued. Orders were issued to manage the forests of Machchhendranath (D25) in 1805, the forests owned by the temples of Nilvarahi and Mahalaxmi in the Bode area of Bhaktapur (D55) in 1843 and the forest around Harihar cave in Kaski (D69) in 1849. As in the previous period, these initiatives cannot be assumed to have been solely for the benefit of the ruling elites.

Wildlife was long prized by the governing elite as an economic resource, as food or as targets for hunting. Many orders therefore relate to wildlife and sometimes to areas which were virtually hunting preserves or wildlife reserves.

Early orders of 1798 (D13) and 1799 (D15) refer to the rhinoceros but it is not explained why 'there is a great need of rhinoceros' in Kathmandu.

Tarai forests afforded a source of profit to the government in the form of their numerous elephants. Between two and three hundred elephants were being caught annually from a single district of the Tarai in the 1890s (Kirkpatrick, 1811). In this regard, Hamilton (1819) has written:

The *raja* reserves to himself the sole right of catching the elephants, and annually procures a considerable number. They are sold on his account at 200 *mohurs* [*mohar*] or 86 *rupees*, for every cubit of their height, but five cubits of the royal measures are only six English feet. As few merchants are willing to give this price for elephants which have not been seasoned, the *raja* generally forces them on such persons as have claims on the court, who sell the elephants in the best manner they can.

Similar efforts were initiated in the Tarai by creating certain protected forests and issuing orders regulating their use (D84). These orders were enforced further in 1885 by further orders issued to the administrative heads of the Tarai regions through *madesh-bandobast-adda* (D94), and to the heads of the *kathmahals* and *ban-janch-adda* through *kathmahal-bandobast-adda* (D95).

In 1883, arrangements (D89) were made to give the responsibility for controlling use to local functionaries and the orders set out their functions, duties and privileges. These arrangements were extended in 1886 to some of the *birta* forests in the Kathmandu valley and adjoining areas (D100, 101). The motive behind these orders was to regulate game hunting. Though Mahat (1985) and Mahat *et al.* (1986) thought that these orders arose from a recognition of the critical situation of deforestation, this seems unlikely because if it were so the Prime Minister or government would not have confined the orders to the forests of their own *birta* land.

Similarly the regulations made in the name of Rangel *goswara* in 1886 (D102) and for the Tarai and inner Tarai in 1888 (D103) reveal that some of the forests in the Tarai and inner Tarai were protected under a system whereby game hunting required the permission of the ruling authority.

In the late Rana period, the system established in the previous period was institutionalised. The legal code was amended in 1923 to enhance the protection of trees and forests at religious sites and forests around Kathmandu valley which became the private property of Rana families. In addition,

conservation of musk deer was initiated, and the government employed some officials on the Nepal-Tibet border with an obligation to supply musk (D120).

2.5.4 Temple construction

Just two decades after the shift of the Gorkhali capital to Kathmandu, there began in 1796 an attack on the forests in and around the valley to construct the Jagannath temple in Kathmandu. Later a Shiva temple was constructed in 1845. These constructions involved many forestry products and many orders were issued. Among the forestry products listed were *sal* gum (D6, which was imported from India), *babiyo*, timber, and firewood to bake bricks.

Each household in 28 villages adjoining to the east and the west of the Kathmandu valley was ordered to supply one load of *babiyo* in July 1796 (D3).

In the next stage, firewood was collected by *jhara* labour of the people from the hills regions, excluding the Kathmandu valley (D4). Orders were made in October 1796 for people to come to Kathmandu with food for six months, and firewood cutting tools. Other inhabitants of some of the villages in the Kathmandu valley were ordered in May 1797 to supply 20 *dharni* of firewood (D11). However, in July 1798 the inhabitants of Thak and Theni (far away in the Kali Gandaki valley) were given the following options in this connection (D12).

- a. One person from each household shall provide *jhara* labour for the transportation of firewood, bringing food needed by him over a period of six months, or
- b. Purchase 8,000 loads of firewood and deliver them at Kathmandu, or
- c. Pay a sum of Rs 2,001 in *mohar* and *paisa* coins used in Kathmandu, or
- d. Pay a fine of Rs 10 from each household.'

From the way the population was mobilised, it seems that the harvest of a huge quantity of firewood was undertaken, probably to supply the large work-force involved.

The next forest product needed for the temple construction was timber. The supply of timber in small quantities was from adjoining areas (D5) but large quantities were transported from Hetauda in the nearest part of the inner Tarai (D7, 8, 61). Timber was also cut and transported from the forests of Nuwakot during the construction of the Jagannath temple (D11) and from Sindhupalchok district during the construction of the Shiva temple (D60).

2.6 Arrangements for the control of forest use

Post-unification orders concerning forests did not discriminate between various land tenures, i.e. *raikar*, *kipat*, *birta*, and *guthi*. The absolute right to use forest products was thus not vested in the land-holder, though *birta* owners were appointed as *chitaidars* with responsibility for regulating the use of forest products by those living nearby. In some cases, access rights were stated to differ from hamlet to hamlet.

In this early period, those made responsible for implementing orders can be grouped as:

- a. Local functionaries such as *amalidar*, *mijhar*, *amali*, *dware*, *ijaradar*, *umra*, *thari*, *mukhiya* and *gaurung* ;
- b. Land owners such as *talab* and *bitalab* holders, *mohoriyar*, *birta* , *chhap* , *guthi* or *kipat* owners;
- c. Ethnic communities such as Brahman, *guthiyar* and *khaniwara*;
- d. Elite groups such as *jethabudha*, *naike*, *bichari* and *tharghar*;
- e. *Chitaidar* (also known as *mahane* or *biset*) and
- f. Inhabitants such as petitioners and peasants.

In many cases, orders authorised members of the Brahman/Chhetri castes to be effective agents (D36, 37, 42, 44, 52, 53, 54, 56, 62, 64, 65, 70, 72, 73, 74) but two granted authority to Newars (D43, 55), one to Limbus (D68), one to Giri (D69) and one to Magars (D71). However, document D48 authorised Brahman/Chhetri and Magar jointly, and D72 authorised Brahman/Chhetri and Gurung jointly. Some of these documents (D56, 65) recognised the existence of members of other castes but authority was not given to them. Nonetheless, all four castes and thirty-six sub-castes had a responsibility imposed on them to supply forest products to the palace and ruling elite (D24).

The codes of practice were mostly motivated by the protective role of the forests. Conserving soil and water was known to be vital in productivity of the land. During the time of Prithvi Narayan Shah it was understood that destruction of forests would lead to a decline in rainfall and undermine the productivity of the soil (Acharya, 1966). The wider acceptance of this principle made it easy to get land-owners and tenants as guardian of the forests, and so this was commonly done (D36, 50, 53, 57, 62, 64, 65, 66, 68, 70, 72 73, and Appendix XII). Other specific arrangements were made in the following instances:

a. In 1805 the *chitaidars* of Machchhendranath temple were given the responsibility of managing forests in the *guthi* land of Machchhendranath (D25). They were paid out of the produce of the land belonging to the temple. *Bhardar*, *amalidar*, and revenue collectors were ordered not to create any trouble on lands belonging to the god. Thus revenue which otherwise would have gone to the central treasury, came to be spent on forest management.

b. In 1808 a *daroga* was appointed to supervise the forests in the Harmi area of Gorkha (D27).

c. Documents of 1815 (D30) show that forest guards were employed to protect the forests in and around the Kathmandu valley. There is no evidence from these documents to argue that the forest guards were paid from the central treasury, but a later document D89 suggests that they were military personnel and so would have been paid. So forest guards were not necessarily appointed from the local people.

d. In 1817 one *subedar* was deputed to protect the forests of the Mahabharat region (D31).

e. In 1827 four local households of Chhatyali village were appointed as forest guards and were granted *banpala* authority to protect the forests on *chhap* land in the Nala area of Kabhrepalanchok, and these households were exempted from paying rent on the land (Tiwari, 1990).

f. A forest in Kaski district had been reserved for the supply of timber to construct embankments along the Pardi canal. In 1834 a *chitaidar* was appointed to protect that forest. The *chitaidar* was paid five *muri* of paddy every year from rents on lands assigned for that purpose (D45).

g. In the forests of Nilvarahi and Mahalaxmi, a *chitaidar* complained that the forests could not be protected, as the *chitaidar* and *mahane* were placed under the obligation of working for the local *amal* and authorities (D55). As a result *chitaidars* were exempted, by an order issued in 1843, from all forms of unpaid labour obligations.

h. A document of 1843 (D56), relating to the forests in a village of Kabhrepalanchok, reveals that one of the forests was always protected by the officials of the *koṭ* (fort) .

i. An order (D62) relating to the forests of the Machchhegaon area in Lalitpur states: "appoint *mahanes* to protect the forest, water-spout and roadside shelter at Balagaun; do not impress unpaid labour from them for other purposes."

j. In 1847 the *chitaidar* of Sailung area forest in Dolakha was empowered to collect fines and penalties from people who acted in contravention of the regulations and to remit the income to the *sadar-dafdarkhana* in Kathmandu (D65).

k. When local functionaries were employed as forest guards in place of personnel deputed from the army, their functions, duties and privileges were defined, and they were authorised to share among themselves the income from the fines and penalties (D89).

2.7 The intent of orders

The aim of most orders was, to use modern terms, forest conservation attained by authorising certain people, or groups of people, to control utilisation in ways stated in the orders. The main emphasis was on growing 'green' trees, although some orders also related to growing other biomass such as tree leaves, fodder grass and thatching grass (*khar*). Usually there was no stated prohibition on the gathering of dead wood or other dead forest materials, although there is an exception to this (D101).

The aims of the orders which I have studied can be summarised as:

a. environmental protection (Appendix XIV, D25, 27, 31, 32, 34, 35, 36, 40, 42, 48, 50, 52, 57, 62, 64, 65, 66, 67, 69, 72, 73, 81 and 83). However the ultimate aim of documents D31, 32, 34, 35 and 42 was to avoid invasion from the south,

b. ensuring the continued availability of a specific forest product (Appendices II, XII and XIV, D9, 22, 30, 33, 38, 43, 44, 45, 47, 48, 50, 51, 53, 54, 56, 57, 58, 63, 64, 65, 67, 68, 70, 71, 74, 80, 89, 94, 95, 100, 101, 120 and 121),

c. regulating the obtaining of tree species of commercial value (D17, 41, 76, 77, 78, 82, 85, 86, 87, 90, 91, 92, 96, 97, 98, 99, 102, 103, 106, 107, 108, 109, 110, 111, 129, 113, 114, 116, 117, 118 and 121),

d. wildlife conservation or hunting (D13, 15, 69, 84, 94, 95, 101, 102, and 120). In addition, the documents D36, and Appendices II and XII also seem partly associated with this intent.

Generally, the intent of early orders was to prevent indiscriminate use of forests (Appendices II, XII and XIV; D9, 22, 25, 27, 30, 31, 32, 33, 34, 35, 36, 37, 40, 42, 43, 44, 45, 47, 48, 50, 51, 52, 53, 54, 55, 56, 57, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 78, 83, 84, 89, 94, 95, 100, 101, 102, 103, 105 and 121). Direct use by owners was permitted but sale of forest products was discouraged or forbidden (D78, 103, 121).

2.8 Conclusion

On the basis of all this historical evidence, it can be concluded that codes of practice varied in the four geographical regions in which the forests were located, as follows:

Forests in and around Kathmandu valley

Before unification these forests were managed with emphasis on local needs, but this was affected by the rising interest of ruling elites just after the capital was moved to Kathmandu. For the first century after that, the forests were used heavily for defence purposes, and later they became the property of the ruling elites. Almost all orders relating to these forests were imposed by the central authorities. In most cases paid watchers were involved in forest protection.

Forests of the Mahabharat region

Interest in the forests of the Mahabharat region developed only when relations with British India became tense, so they were preserved as a defence wall till the end of the last century.

Forests of the hills region

For the forests of the hills, the codes of practice were established as customary, indigenous codes and emphasised the local community. Whenever their effect was threatened these codes were safeguarded by royal orders, *sanads*, *sawals* and later by legislation. Though they were promulgated as specific orders in the beginning, the role of local institutions was enhanced in the late Rana period and most of the codes then developed out of local initiatives. Although imposed practices occurred in some instances, these were in response to petitions or other forms of local interest. The forests of the hills region were not used for financial benefit.

Forests of the Tarai region

Forests in the Tarai and inner Tarai were always exploited as sources of revenue for the ruling elites. The exploitation of these resources was carried out in a rather piecemeal manner until the beginning of the Rana period.

Utilisation was done intensively, by creating a department, since the early 1860s. The system aimed not at managing the forests properly but at increasing the revenue. The introduction of expertise of a professional forester was also to increase the revenue. Local needs were fulfilled by the left-overs from such commercial extraction.

Thus it is clear that codes of practice existed in Nepal long before the introduction of strong Western influences in the middle of the present century, and that they varied with geographical location. The chapters following this will deal with the forestry of the hills region, with emphasis on specific forests.

3. Forestry at the local level

I: the Methodology

3.1 Period of field work

Though my field work as an enrolled student of ANU was carried out only between November 1989 and February 1990, my field experience covers much more than this period. Evidence was gained over the period of more than a decade, during my work in Trishuli Forest Division (comprising Rasuwa, Nuwakot and Dhading districts), Gulmi District Forest Office (comprising Gulmi and Arghakhanchi districts) and Dolakha district as divisional/district forest officer.

The timing of my thesis field work was intended to fit the farmers' convenience. There is in fact hardly any leisure time for farmers throughout the year so the only option was to select the least busy season. The period selected was between the summer crop harvest and the main winter crop planting season. Though Chambers (1985) has claimed the selection of the post-harvest season for field work is the result of dry season bias, this is not true for forestry because this is the season when local people are most concerned with forestry matters. This is even demonstrated by the dates indicated in various documents collected in the field (Appendix I, II, VIII, X, XI, one of XII) and other documents (D45, 48, 50, 54, 62, 63, 64, 65, 66, 67, 72, 73, 74 and 78), whereas documents in Appendices III, IV, V, VI, VII, and some of XII indicate dates slightly later, but still prior to the rainy season.

3.2 Selection of sites for field work

I selected three sites for my field work- the Betini, Kamang and Sallepakha and Betini forests. Geographical locations of the study sites are given in Figure 3.1.

Selection of these sites was facilitated by my previous employment. While I was working in the hills districts in general and Dolakha in particular, I had encountered two classes of forests from the point of view of their management

- those which were managed and those which were not managed. Management systems were either locally developed or centrally imposed and here are categorised accordingly as self-originated and imposed (Gautam, 1987). Kamang forest was in the former category and the Sallepakha in the latter. This was attested by rangers at a workshop (Anon., 1988), and on this basis, I selected these two forests for study.

Figure 3.1 Map of Nepal with zones and study areas

I had known the Betini forest since 1979, when I was first posted to Trishuli Forest Division. During my tenure of office in that division, i.e. 1979 to 1983, I encountered many positive efforts to implement local management in this forest, but as a forest administrator I never had to deal with any cases related to Betini forest. Since then Betini forest always came to my mind as an example of indigenous, local or traditional management of forest so I decided to include this forest in my research. The purposes of including the Betini forest were two. Firstly it differed from the other two forests regarding accessibility. Secondly, by including the forest in my field study, I would have observations on the forest for a period of more than a decade.

I considered whether to include field work in an area where I had never worked as a forest officer, in case the local people would not speak openly or frankly to me as a forestry officer. Considering the short period available for my field work, however, the advantages of building on existing knowledge seemed to outweigh the disadvantages, allowing me to approach the depth gained by total immersion in an area (Chambers, 1983). If more time had been available, the inclusion of other field work areas would no doubt have been desirable.

3.3 Geographical size of field work

The users of the respective forests were the sources of information. The settlements of the users, eventually, became the areas of study, rather than wards or *panchayats*. This decision was biased on my own experience gained through working in the districts where I encountered many difficulties when using artificial boundaries based on a ward or a *panchayat*. The nature of difficulties which have arisen while working with the political unit is documented in Gautam (1987). In addition, political boundaries have been changing frequently to fulfil the interests of political groups, often leading to the break-up of indigenous institutions and/or organisations.

Nonetheless, the emphasis on the settlements of the users presented some difficulties. Users varied widely in the extent they used some particular forest. However, it was intended to include all the local people who used the forest for obtaining any sort of forest products. The main difficulties were faced in delineating the households of Pata and Purangaun as users of Kamang. Most of them use the Kamang forest for leaf litter so they were included as users.

Similarly it was also found that all the households, even of a single hamlet, cannot be grouped as users because precise use depends on the location and convenience of the household.

3.4 Methods of Information Collection

I gathered two types of information through a questionnaire and through discussion with local people. One was information regarding the patterns of use, which I obtained from all users. The other concerned the history of management, which I obtained from selected users. However, non-users were also sometimes found to be good sources of information regarding the forest management in the wider context.

3.4.1 Usage patterns

a) The questionnaire

Although the questionnaire was designed to collect mainly qualitative information, it included a small number of quantitative questions in the first part. No effort was made to get the information using standard units (e.g. kg, ha etc.), as it was understood that people use their own unit comfortably and confidently in giving information on landholding. The landholding unit the local people use is the closest to the reality so far as comparison between households is concerned. However, a conversion factor was derived on the basis of discussion with knowledgeable villagers (Rusten, 1989). Qualitative information was obtained from household heads, although other family members were involved in the discussion in some instances.

The questionnaire was originally prepared in Nepali and was later translated into English. The original Nepali questionnaire was used in the field. A discussion was held with local people to clarify the meaning and sense of some of the words or terms, as I was familiar with the situation where certain of the terms had different meanings in different regions or villages.

b) The sampling procedures

Respondents were not selected randomly or through formal stratification as done by Fox (1983) and Bhatta (1989), because such procedures would have been virtually impossible to implement, given the constraints of time, distance, topography and available manpower. Instead, the procedure focused on 'household to household visits'. The guide-lines for the various steps were the following:

- Visit every household within the settlement of users.

- Collect information if they themselves are available and willing to provide it.
- If no one is in the household, eliminate that household from the survey.
- If the time of the visit is not suitable for the people, make another time. If on the second visit no one is available, eliminate the household from the survey.
- If the people do not want to give their time do not insist, and eliminate the household from the survey.

The reasons for this procedure were:

- Respondents should not be compelled to answer. If they are compelled, they may not give the correct answer or they may try to finish the answer as soon as possible even if inaccurately.
- Even if they are happy to answer, they may not have the time.
- The purpose of the field work was to collect more, and more reliable, information but not to obtain complete coverage. The reliability of the information depended very much on the nature of the person and his understanding to the situation and the question.

3.4.2 Sketching the history of management

The history of management of the forests was gleaned from oral and documentary evidence. Though this section of my work was heavily influenced by information from the key informants, inferences from the study of usage patterns were very useful in supplementing and confirming information, and, in some cases, providing a basis for discussion with key informants. The multiple approaches process as defined by Chambers (1985) was therefore the basis of my method.

Plate 3.1 Discussion with people in Melung

Plate 3.2 Discussion with Mr Lalit Bahadur Karki

3.4.2.1 Selection of key informants

Key informants were selected on the basis of discussions with users during the study of usage patterns. The informants were selected on the basis of their interest in the matter, level of information available from them, their involvement in forestry matters etc. However, people from the following groups were considered especially valuable as key informants:

- Old people who were involved in any forestry activity in the past;
- Old people in general;
- Former local functionaries; and
- People currently involved in or affected by forestry activities (development, administration etc.).

Sometimes it was found that people other than the users were suggested as sources of historical information.

3.4.2.2 Approaches to information collection

The information from the key informants was collected through discussion. A questionnaire was developed as a check list in the beginning but was used only as reference during discussion. Answers on all the points in the questionnaire were not sought from each of the key informants, since it would have been impossible to get them. The emphasis varied with the nature of the role of the particular key informant in regard to the particular forest.

In addition to oral discussion (Plates 3.1, 3.2), it became possible to collect some documents relating to the forests and forestry of the areas. This is a sign of the development of a successful rapport with the local people, because unless people trust the interviewer the collection of such documents is not possible.

3.5 Organisation of Field Work

Two research assistants were involved during the field work. They were solely used to record the information on usage patterns. They were reliable, graduates (one in science and one in arts) and were well acquainted with hill farmers (Chambers, 1985), as they had grown up and been educated (up to high school level) in the rural area of Gorkha district in the hills region. However, being accompanied by a local person was found to be very helpful in overcoming suspicion (Fisher, 1986).

During the first five days in Bhusapheda, we all worked together in the same households. Afterwards, I was present for some or all of each interview and

gained more general information whilst the assistants concentrated on the more questionnaire data. However their discussions, in some instances, provided general information.

On average, each research assistant contacted three households every day. Morning was the best time for the villagers, and evening time was also used effectively. It was possible to arrange day-time meetings with some of the households.

My discussions with the key informants usually took place during the day, as the people selected were usually old, and worked at home or near, mostly making bamboo mats, splitting bamboo or working in the homestead (Plates 3.3., 3.4). However, I also had opportunities to discuss with some key informants while they were working in the field. It was possible to discuss with only one key informant in a day, although it was sometimes possible to include a short follow-up visit to another household on the same day.

Time in tea-shops, and in some other informal gatherings (Plate 3.5) was fully utilised in discussion. Discussions with the teachers and sometimes the students in the local school sometimes helped in cross checking the information given by the local people. Two full Wednesdays were spent in the *haṭ* (market) at Melung, which provided an opportunity to observe the products in the local market and to meet people in a group (Plate 3.6).

3.6 Study of the condition of the forests

The status of a forest was assessed by travelling in it and taking photographs. The status of forest use was assessed through observing conditions inside the forest, and people encountered in the forests and on approach paths. This also helped identify the forest products in use.

Plate 3.3 Mr Dhan Bahadur Tamang when I was talking to him

Plate 3.4 Mr Marta Singh when I was talking to him

Plate 3.5 Informal gathering in a Kami house in Pata.

Plate 3.6 Melung *haṭ* on 10.01.1990

However, by means of repeated walking and searching through the area from one extreme to another, a centralised replicate sampling (Mueller-Dombois and Ellenberg, 1974) was also used to select the samples. In this way, three distinct zones were identified in Sallepakha forest: areas close to hamlets, areas close to trails, and the remote areas. However, for the other two forests, there is no distinction as far as condition is concerned.

The following were the factors considered in assessing the condition of the forests.

(a) Structure

Structure of the forests was assessed on the basis of vertical cross-section. Mainly the observations were recorded as: top storey, middle storey, shrub and ground cover.

(b) Density

Density was measured only for trees taller than 2 m. The 'count-plot method', as described by Mueller-Dombois and Ellenberg, (1974), was used for counting trees per unit area. It was also done through measuring the distances between trees and calculating the mean. Numbers of stumps and evidence of uprooting were also noted.

(c) Crown cover

Crown coverage was recorded as the percentage of the canopy covered by tree crowns. The 'line intercept' method (Mueller-Dombois and Ellenberg, 1974; Metz, 1991) was followed. However this information was also used to state the broad classification of the crown cover.

(d) Regeneration status

Regeneration status was assessed on the evidence of seedlings or saplings (from seed or coppice) of height between 0.3 m and 2 m. The coppice shoots of trees above 2 m in height were considered as only branches of the trees, and not as regeneration.

(e) Lopping condition

This condition was simply assessed on the basis of presence or absence of lopped trees.

3.7 Expectations and Achievements of field work

In the beginning it was thought that there were about 600 households using the three forests and I expected to contact 50 per cent of these households. Field work showed the numbers to be greater, and at the same time the responses from the local people were encouraging. The households in the Kamang and Sallepakha were contacted as scheduled, but it was not possible to cover all the groups of users of Betini and only two of the three groups of users were studied there.

3.8 Use of information in the thesis

Information collected in the field is best used where it is actually needed in the thesis. Attempts have therefore been made to include the relevant information under the respective case studies. While reading the individual case studies, however, some information would seem irrelevant, but these are required and used in the discussions (chapter 7) of three case studies.

4. forestry at the local level

II: The Betini Forest

4.1 The Forest

4.1.1 Location

Betini forest lies in the southern part of Nuwakot district in Bagmati zone. Till recently the forest area was in both the Madanpur and Belkot village *panchayats*. After repeal of all tiers of the *panchayat* system early in 1990, it is now under the Madanpur and Belkot village development boards.

The Betini forest is in a single block of area approximately 200 ha forest physically located on the northern aspect of Kakani-Jhiltung hill. However, except in the south the forest is exposed to all aspects due to foldings of the block. The altitude of the forest ranges from Betini-dovan at 1000 m a.m.s.l. to Arukarka-*lek* 2100 m a.m.s.l. The slope varies from gentle in the lower part to precipitous in the upper part, but the majority of the forest area has a gentle slope.

The Betini forest is easily accessible from the all-weather Kathmandu-Trishuli road which passes through the middle of the area. It is equidistant from Bidur, the district headquarters, and Kathmandu. Although the road distance is about 35 km from Bidur, it is only a 3 hr walk along a short-cut trail.

The location map of Betini forests and its surroundings is presented in Figure 4.1.

4.1.2 General land-use pattern

A land-use survey was not made specifically for this study. It is not easy to define an appropriate sample area to assess land-use patterns, as the users might also be using land outside of that area in some instances. The pattern of land use is not only related to the settlement of the user but also to the total land used by him in the locality. So before studying the relationships between different land-use types, one needs to be clear as to the extent of the land held by the user in the locality. Because of the characteristics of landholding in

the hills of Nepal, it is not possible to delineate such in a block perfectly and conclude the relationships between different land-use types as established by Wyatt-Smith (1982). However to gain a general idea of the locality, a simple approach was selected, based on discussion with the users who were the only sources of reliable information.

Table 4.1 shows the land-use pattern in the locality and compares it with the national, regional and district patterns. Although the proportion of natural forest is slightly higher for this locality than for the district and lower than for the whole nation and the region, the proportion of agricultural land is more than double. Thus the same unit area of forest has to support more agricultural land here than in the rest of the district, if the figures are to be relied upon.

Table 4.1 Land-use pattern

Land-use types	Nepal 000 ha (%)	Mid- mountain 000 ha (%)	Central region 000 ha (%)	Nuwakot 000 ha (%)	Specific area ha (%)
Natural forest	5424 (37)	1762 (40)	1028 (37)	28 (24)	411 (28)
Plantation	69 (0)	30 (1)	29 (1)	0 (0)	0 (0)
Enriched forest	25 (0)	19 (0)	6 (0)	0 (0)	0 (0)
Degraded forest	706 (5)	404 (9)	238 (9)	21 (18)	115 (8)
Grassland	1745 (12)	278 (6)	138 (5)	4 (3)	0 (0)
Non-cult inclusion	998 (7)	667 (15)	239 (9)	21 (18)	0 (0)
Farmlands	3052 (21)	1223 (28)	818 (30)	39 (32)	956 (64)
Other land	2729 (19)	59 (1)	238 (9)	6 (5)	0 (0)
Total	14748 (100)	4442 (100)	2734 (100)	120 (100)	1482 (100)

.1 Betini forest and surroundings

4.1.3 General description of the forest

4.1.3.1 Composition of species

Castanopsis spp. (*C. tribuloides* and *C. indica*), *Schima wallichii* and *Myrica esculenta* are dominant among the tree species. *Alnus nepalensis*, *Syzygium cuminii*, *Mallotus philippinensis* and *Machilus odoratissima* are mixed in the top storey. *Maesa chisia* and *Mallotus philippinensis* constitute the second storey in most of the forest. *Mimosa himalayana*, *Clerodendron infortunatum*, *Woodfordia fruticosa* and *Zizyphus incurva* are among the shrubs available in the forest. The sloping ground is covered with grass. *Smilax menispermoides* and *Asparagus officinalis* are available in places. Among the climbers, *Eurya* spp., *Bauhinia vahlii* and *Dioscorea* spp. are noticeable.

4.1.3.2 Forest type

According to the land-use map prepared by HMG (1984), Betini forest is categorised as Hardwood Deciduous Mixed Broad-leaved with crown density above 70% and immature. The maturity class given here does not suit this type of forest, as the criteria which define the maturity classes seem based only on the timber-producing species.

According to the classification of Champion and Seth (1968), this forest falls within the category of northern subtropical broad-leaved hill forests, and the specific category of *Castanopsis-Schima* forests of eastern Himalayan subtropical wet hill forests.

The forest type is *Schima-Castanopsis* as described by Stainton (1972). Stainton (*ibid.*) concluded it was quite wrong to think of this type of forest as forming one continuous belt within the range of middle hills, which contains the zone of maximum cultivation. The present discontinuity may be explained, as this type of forest is present only in the moist patches of the zone on north and west slopes.

Mahat (1985) has noticed *Shorea robusta* in this type of forest but it was not found in the present case. However the other hills facing Betini forest have *Shorea robusta* at altitudes comparable to the lowest part of Betini. Stainton (*ibid.*) found *Shorea robusta* and also *Quercus incana*, *Q. lanuginosa* and *Pinus roxburghii* forests on the southern or eastern slopes in the drier conditions of this altitudinal zone in the east and central midlands of Nepal. This type should

be dealt with as a separate forest type, and should not be confused with *Schima-Castanopsis* forests.

4.1.3.3 Forest use and its effects

Betini forest has been used ever since the time of the earliest settlements around it. The present appearance of the forest reflects the effectiveness of the controlled-use system applied in the forest. Whatever other restrictions were imposed for the protection of the forest, the collection of dry twigs, leaves, fruits and grass has never been prohibited. This fact can be observed in the forest on any day of the year.

The canopy of the forest is fully covered. There is no evidence of concentrated use or degradation in the peripheral area. While a few stumps and wood chips were observed in the middle of the forest, the canopy has not been opened as a result, which indicates the use of a few suppressed trees

Notes to readers

This is an M. Sc. thesis.