

Student Papers in  
Parks, Recreation and Tourism  
Number 4

Sagarmatha  
National Park



Department of  
Parks, Recreation & Tourism

Lincoln University College  
Canterbury  
New Zealand



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By Bruce Jefferies  
and Lhakpa Sherpa

Edited by  
Robert Greenaway

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Canterbury

1989

STUDENT PAPERS IN PARKS, RECREATION  
AND TOURISM

PREFACE

The Department of Parks, Recreation and Tourism of Lincoln University College has offered students in their third year the opportunity of submitting a dissertation as part of the requirements of the Diploma in Parks and Recreation Management.

The completed dissertations are recognised as valuable information sources relating to parks, recreation and tourism practice, provision and resource management.

In recognition of their value, the Department has undertaken the task of editing and publishing several dissertations for wider use.

This particular paper has been drawn from the dissertations Considerations for management planning of Sagarmatha National Park by Lhakpa N. Sherpa (1979) and Sagarmatha National Park and Tourism by Bruce E. Jefferies (1987).

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SAGARMATHA NATIONAL PARK:  
MANAGEMENT CONSIDERATIONS

By Bruce E. Jeffries  
and  
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## ABSTRACT

Sagarmatha National Park, the most famous conservation area in Nepal, is situated within an area which has long been inhabited by the Sherpa people. By including these people's settlements within the confines of a national park, a unique set of management considerations has been created. The conservation programme established within the park must contend with the resource dependency of the traditional Sherpa lifestyle, tourism, the changes tourism is bringing to the Sherpa people, and the impacts these issues have upon the Sagarmatha environment.

This dissertation gives a broad overview of management needs for Sagarmatha National Park. It deals with the history of the park's establishment, the relationship of the Sherpa people with the land, their changing circumstances, the influences of tourism, the state of the natural park environment and the needs of an effective conservation programme. Of particular note are the considerations required to ensure the survival of a unique system of inhabitation by a native people while maintaining the state of environmental integrity necessary within a national park.

Through their close association with the park, Lhakpa Sherpa and Bruce Jefferies have been able to examine and describe these considerations, and formulate some suggestions which will help maintain the park's character. Lhakpa Sherpa comes from the Khumbu region and is currently working at Sagarmatha. Bruce Jefferies spent several years living in the park with his family as advisor to Nepal's National Park and Wildlife Conservation Office.

## 1.0 INTRODUCTION

### 1.1 THE ESTABLISHMENT OF NEPAL'S NATIONAL PARKS

Nepal had taken the first tentative steps towards nature conservation in the late 1950s, when His Majesty's Government was made aware of the nation's threatened wildlife by such eminent conservationists as the late E.P. Gee. Definite plans and programmes for conservation were formulated when His Majesty's Government sought the help of several international agencies, including the Food and Agricultural Organisation (FAO), World Wildlife Fund (WWF) and the Smithsonian. More recently, the Australian and New Zealand Governments have come forward with help in the establishment of national parks and wildlife reserves.

Nepal's first national park was established when His Late Majesty King Mahendra, a keen nature lover, bequeathed the Royal hunting ground at Chitwan to be turned into the Royal Chitwan National Park. To carry out His Late Majesty's wish to conserve nature and natural beauties, His Majesty King Birenda Bir Bikram Shah Deva passed the National Parks and Wildlife Conservation Act 2029 (1972). This facilitated the setting up of the National Parks and Wildlife Conservation Office of His Majesty's Department of Forests.

The National Parks and Wildlife Conservation Office is responsible for the development, administration and management of national parks and wildlife reserves throughout the Kingdom of Nepal, in cooperation with international conservation agencies.



## 1.2 THE DIFFICULTIES ASSOCIATED WITH THE ESTABLISHMENT OF PARKS AND RESERVES

The setting up of national parks and reserves in a developing nation, such as Nepal, requires much effort to overcome various social and economic constraints. There are four basic conditions which are essential for the effective creation of parks and reserves. They are:

- (1) A firm inclination toward conservation by the country's leaders,
- (2) A trend in public opinion which strongly supports conservation,
- (3) Sufficient funds to support a conservation programme,
- (4) The action of an administrative body to give effect to conservation objectives.

In Nepal, most of these conditions are, or could be, met. However, public support and acceptance of conservation programmes is still weak. Further constraints, some unique to Nepal, must also be considered. Some of the more pressing constraints are as follows.

### 1.21 Availability of suitable land resources

Some nations are more fortunate than others in this respect. Young countries such as New Zealand, with a small population and large tracts of virgin landscape have the greatest opportunity to establish national parks which are relatively unspoiled and natural. With proper management and ample finances, it is possible to protect these parks in their natural condition with minimal further deterioration as a result of human influence. Nepal, on the other hand, has a total population of more than twelve million spread over a total land area of 140,637 square kilometres. The population is concentrated and the demand for land is extremely high. Even the most hostile environments, such as the hot tropical

jungles of Terai and the frozen slopes of the Himalayas, are not without human settlements. Therefore, it is difficult to acquire land for the purposes of establishing national parks and reserves without encroaching on people's living space or influencing their way of life. The opportunity for preserving representative samples of undisturbed natural features is limited.

#### 1.22 Economic pressures

One of the main reasons for having national parks in Nepal is to promote international tourism to gain economic and monetary advantage. But "tourism can be in conflict with nature conservation, particularly when the presence of tourism and what it implies is detrimental to nature and natural resources" (Budowski 1977).

Since tourism is a major industry and an important source of foreign exchange, it is difficult and probably unwise not to derive economic advantage from it. The work of nature conservation and preservation itself requires large sums of money. However, unless tourism is strictly controlled and monitored, overdevelopment of the tourist industry may have negative side effects. These may be indirect, yet of great significance to social, cultural and environmental considerations.

#### 1.23 Population pressure

The national parks and reserves of Nepal contain a large number of people who are dependent upon natural resources for their survival. The influence of people on these areas, which may have been going on for centuries, is a current and future reality with which management must contend. Displacement of these populations may not be economically feasible or socially justifiable. Overseas examples of such actions have been highly unsuccessful.

In principle, the integration of the ways of life of the park inhabitants into the national park system seems to be a better alternative.

It is already recognised by His Majesty's Government that the traditional ways of life of the people, their cultivated landscapes and architecture are of high anthropological, scenic and aesthetic value. Unfortunately, the inclusion of human populations in national parks will pose considerable management and administrative difficulties. The ways of life of the people are subject to rapid change. Population growth places increasing demands on the natural resources of the park, creating conflicts between conservation and use. In this situation, application of simple resource management techniques are not sufficient, because people's needs have to be considered first.

#### 1.24 Lack of public interest

Poor nations tend to suffer difficulty in fostering a public conservation ethic. The majority of the population often consists of economically weak people with little interest in conservation of species or ecosystems. This view is also supported by Maslow's theory of human motivation, which describes people's requirements as being arranged in a hierarchy of needs. Unless the lower order physiological and safety needs are gratified, people will not have the drive to pursue higher needs. Our desire to have national parks and natural areas, our appreciation of their aesthetic and natural beauties, our desire to learn and know more about nature and natural ecosystems, falls within the sphere of the higher-level needs. Many people in Nepal show little support and interest in conservation, since they are busy trying to fulfil their survival needs. In order to gain their support and co-operation the park must contribute towards satisfying these lower-level needs, while encouraging practices which support the conservation mandate of the parks in which they live.

It is when immediate needs and long term conservation programmes come into conflict that the environment tends to suffer. This is exemplified by the closure of the India/Nepal border in 1989. Trading of kerosene, the staple cooking and heating fuel, has almost halted and forests which would have been otherwise protected are suffering wholesale destruction.

#### 1.25 Availability of finance

Availability of finance for national parks is a major problem, even in richer nations. To establish its national park and reserve systems, Nepal has been receiving generous financial and technical assistance through bilateral aid programmes. However, this is only the beginning. The main future responsibility of administering and maintaining these parks in perpetuity rests with the country itself. National parks and reserves may be delineated in the future, but without finance it is unlikely for these areas to be effectively maintained.

The costs associated with setting up and running conservation areas are immense. These costs may be calculated in monetary terms, unlike the benefits which are mostly intangible and often indirect. It is not easy to measure these benefits using dollars, since it is difficult to put a price on such benefits as public wellbeing, recreation, aesthetic values and the preservation of natural ecosystems. Getting allocation of sufficient funds for conservation is Nepal's most serious challenge.

Tourism may act as an important justification in obtaining funds for the establishment of national parks. However, the reliability of the tourist industry cannot be guaranteed.

Despite various constraints, the Nepalese Government is making rapid progress in developing its conservation systems. It reflects the considerable interest and dedication of His Majesty's Government in the preservation of the cultural and natural heritage of the world.

## 2.0 SAGARMATHA NATIONAL PARK

### 2.1 LOCATION

Sagarmatha National Park lies on the lap of the Himalayas in the northeastern region of Nepal, within the Solu-Khumba district of the Sagarmatha zone, ranging in altitude from 2800 metres at Monjo to 8848 metres at the peak of Sagarmatha (Mt Everest). Of 1228.8 square kilometres, the park encompasses an area previously known as Khumbu. The name Khumbu is often used as a synonym for Sagarmatha National Park, and shall be referred to as such within this text.

### 2.2 ACCESS

The park is only accessible by foot or air.

#### 2.21 Foot access

Sagarmatha National Park is surrounded by mountains which form a strong physical barrier to entry. Viable access points are limited to three main routes. The most important route on the southern border of the park runs through the lower Dudh Kosi Gorge which links Khumbu with the rest of Nepal. This route is heavily used by both human and animal traffic and is accessible all year round.

At Nangpa La, a 5791 metre high pass links Khumbu with the Tibetan Autonomous Region of the People's Republic of China. In the past this route was popularly used by Nepali and Tibetan traders. Its significance has declined in recent years due to major political changes in Tibet. This pass is still used by Sherpa traders for limited trading purposes, but access by foreign visitors is strictly prohibited. It remains closed during winter due to extreme snow and ice conditions.

Tashi Lapcha Pass in the west links Khumbu with its neighbouring Rolwaling Valley. This route is of only limited use to the local people but is frequently used by tourists. Due to snow, ice and falling debris it is not always accessible. Some mountaineering experience, good clothing and footwear are essential.

## 2.22 Air access

Air access into the area was first established at Lukla in 1964 when the Himalayan Trust built an airstrip for short take-off and landing aircraft. This strip is located in the lower Dudhi Kosi Valley about ten kilometres south of the southern boundary of the park at an altitude of 2800 metres.

A second airstrip of a similar type was built within the park at Shyonboche, at an altitude of 3760 metres in 1972 by a Japanese company. This served the Everest View Hotel.

## 2.3 TOPOGRAPHY

The physiography of Sagarmatha National Park is determined by the Himalayan Ranges, its glaciers and river valleys. It is enclosed to the north by the massifs of Sagarmatha and Cho Oyu, and to the east and west by lesser but still formidable ranges rising 6000 to 7000 metres, extending at roughly right angles to the main divide. Several major mountain peaks, including Sagarmatha, Lhotse, Ama Dablang and Khang Taiga, enclose the Khumbu Valley. This consists of three smaller river valleys: Dudh Kosi, Bhote Kosi and Imja Khola Valley, which all combine to form the Dudh Kosi River.

The upper valleys of Khumbu have U-shaped profiles as a result of glacial action, while the lower valleys are very steep sided and V-shaped in profile due to stream erosion.

## 2.31 Drainage systems

### Glaciers

There are glaciers of various sizes at the head of the valleys and sub-valleys of the Khumbu region. The most significant ones are the Khumbu, Lhotse, Imja, Ngozumba and Nangpa Glaciers. They are not very large due to low levels of precipitation and the absence of large névé basins which act as catchments for snow and ice. These glaciers are mainly nourished by summer avalanches from the steep mountain slopes.

Most Himalayan glaciers are in retreat. Their rate of movement varies considerably. Khumbu Glacier moves only about fifty metres per year, while some other Himalayan glaciers are known to move ten kilometres in two months (Hagen 1963).

### Rivers

The main river systems of Nepal (Koshi, Gandaki, Karnali and Mahakali) originated before the rise of the Himalayas. It is believed that the Himalayas rose so slowly that these rivers had no difficulty in continuing to flow through their original channels. The rise of the Himalayan chain and the eroding action of the rivers together developed deep transverse gorges. The deep gorge along the lower course of the Dudh Kosi is an example of this.

Because of their glacial origin, the summer and winter levels of the rivers do not vary greatly. A sudden rise in flow could, however, occur during the monsoon due to the bursting of the glacial lakes in the upper catchment area. This type of sudden flooding has caused severe devastation in the past.

#### 2.4 GEOLOGICAL HISTORY AND SOILS

It is generally accepted by geologists that the area which constitutes the Himalayas was once the bed of the Tethys Sea, which stretched along the southern edge of the Eurasian land mass. Following the break-up of the great southern continent, Gondwanaland, during the late Cretaceous period, the Indian tectonic plate moved northward toward Eurasia. During the Eocene, some sixty million years ago, collision between the two plates occurred. The result was crustal shortening and deformation of the continental lithosphere, which, in its final stages some ten to twenty million years ago, produced the Himalayas. Although the rate of convergence between the two continental plates was thereafter reduced, large-scale tectonic movement continues. In the past one and a half million years the Himalayas have risen at least 1371 metres (Hagen 1963).

Generally, the Himalayan soils are infertile. On steep slopes they are thin and poor, tending to be acidic. On cultivated areas, soils may be improved artificially by the addition of organic material.

#### 2.5 CLIMATE

The Khumbu Valley is encircled by the high Himalayan Ranges, which create unique climatic conditions. The climate may be described as something between that of the central hilly region of Nepal in the south and the arid Tibetan Plateau to the north, having cool wet summers and cold, dry and mostly sunny winters.

In summer, the principal mountain peaks to the south form a barrier which forces the warm moisture-bearing monsoon air to rise. In the process, most of its precipitation is discharged on the southern slopes of this range. The Khumbu Valley, therefore, receives less rainfall than valleys of the lower mountain region of Nepal. Some moisture-bearing air



gets into the Khumbu Valley through the Dudh Kosi Gorge and other low gaps along the ranges. This soon confronts the Sagarmatha and Cho Oyu massifs and drops all its moisture in the Khumbu Valley.

The Sagarmatha and Cho Oyu massifs also obstruct the passage of cold continental air from the north. Hence, while the Tibetan plateau on the north side of the range experiences arid conditions, the Khumbu Valley has lush vegetation.

Winter rain and snowfall in the Himalayan Ranges is caused by depressions advancing from the west, becoming progressively weaker as they move east. The effect of these depressions are not so obvious in the eastern Himalayas. As a result, the Khumbu Valley does not get heavy snow falls.

## 2.6 VEGETATION

The Himalayan vegetation is broadly classified into four groups, based mainly on altitude and rainfall: tropical, sub-tropical, temperate and alpine. The local variations in relief and climate cause considerable difference in the composition of the vegetation within each group. The vegetation of Sagarmatha National Park falls into the temperate and alpine categories.

The temperate forests extend from about 3040 metres to 3657 metres and contain conifers and broad-leaved temperate trees. The most significant temperate plant species are blue pine (Pinus excelsa), hemlock (Tsuga dumosa), oak (Quercus semicarpifolia) and bamboo species.

The alpine zone extends from 3650 metres to 4570 metres. The major forest trees in this zone are silver fir (Abies spectabilis), silver birch (Betula utilis), tree juniper (Juniperus recurva), Rhododendron species and shrub juniper (Juniperus wallicjiana).

## 2.7 WILDLIFE

There are only a few species of native mammals found in Sagarmatha National Park. Competition from domestic animals and loss of forest habitat may be responsible for their general low density within the Khumbu region. The larger mammals known to be found are: snow leopard (Panther uncia), black bear (Selenarctos thibetanus), red panda (Ailurus fulgens), wolf (Canis lupis), Himalayan tahr (Hemitragus jemlahicus), musk deer (Moschus moshiferus), blue sheep (Pseudois nayaur), goral (Nemorhaedus goral), langur (Prebytis entellus) and Himalayan mouse hare (Ochotona roylei).

Among these mammals, blue sheep and goral may have disappeared from the park. Musk deer and snow leopard are still found within the park, but are becoming rare. The tahr population has dropped over the past decade. Tahr and musk deer are illegally hunted for meat and musk pods. Because wolf prey on domestic animals, it is the only animal whose control is encouraged by the Sherpa people.

The Khumbu is relatively rich in birdlife. Birds are not harmed by the local people directly, but indirectly environmental degradation may be having an effect.

## 2.8 HUMAN POPULATION

The park has a total population of almost 3000 residents living in scattered villages along the glacial terraces and river valleys of the Dudh Kosi and its tributaries. The population consists mostly of Sherpa people plus a few Tibetan refugees and Nepalese who work for government offices.

## 2.81 Land ownership and use patterns

The land of the Khumbu region is mostly rugged and unproductive. The more fertile and stable flat areas along glacial and river terraces are used by the local people for residential and agricultural purposes. These areas are privately owned and are divided into individual fields by the use of stone walls.

There is no extensive system of zoning. The residential houses are built in association with agricultural land.

The fields are unsuitable for extensive cropping due to unfavourable climatic conditions and low soil fertility. They are used during the warmer seasons for growing crops and hay, and remain frozen during most of the winter. The main food crops grown in Khumbu are potatoes, buckwheat, barley and turnips.

The remaining unoccupied land consists of steep slopes, forested areas, alpine grassland, glaciers and other infertile surfaces. These areas are collectively used by the whole community for grazing and other communal purposes, such as the collection of soil, rock, firewood, grass and animal manure.

## 2.82 Domestic animals

The traditional Sherpa way of life is largely dependent on animals and animal products. Yak and nak (female yak), common cattle, sheep, goats and horses are the primary stock. Cross breeds are also produced by mating yak and nak with Tibetan dwarf cattle. Most Sherpa own livestock, but only a few are full time herders.

Livestock play a vital role in the local economy. They provide local communities with wool fibre, protein, and most importantly, manure for agriculture. Yaks and cross-breeds are also used for ploughing and transportation.

3.0 REASONS FOR THE ESTABLISHMENT OF  
SAGARMATHA NATIONAL PARK

1. As the highest point on the earth's surface, Mount Sagarmatha and its surrounds are of major significance, not only to Nepal, but to the whole world, and its status as a national park brings international prestige and support to the country.
2. The Khumbu region is already a significant tourist area and its importance does not show any signs of decline. The scenic and wilderness value, which are its major attractions, must be protected from further exploitation and ill-judged commercial development. This can only be safeguarded through positive management based on sound conservation principles.
3. The dwindling forests of Khumbu are not only of aesthetic value but are vital for the people of Khumbu as a source of fuel and building materials. The forests also play an important role in conservation of soil and water. They also harbour much of the wildlife.
4. As an ecological unit in the highest region of the world, the Dudh Kosi drainage system is of much scientific value and offers a unique research field to scientists throughout the world.
5. The area is of major religious and cultural significance in Nepal since it abounds in holy places, like Tengboche Monastery, and is also the homeland of the Sherpa, whose way of life is unique when compared with other high altitude dwellers.

#### 4.0 THE EVOLUTION AND DEVELOPMENT OF SAGARMATHA NATIONAL PARK

##### 4.1 MOUNT SAGARMATHA BECOMES A MAJOR TOURIST DESTINATION

Mount Sagarmatha is well known as Mount Everest, the highest mountain on earth. Its significance is enhanced by the grandeur of the Khumbu Valley with its flora and fauna and unique human culture.

Until 1950, Nepal was under the rule of the Rana Prime Ministers who adopted a policy of isolation. The country was closed to the outside world and Khumbu was rarely visited by foreign tourists.

After the 1950 political revolution, the last Rana Prime Minister was forced to yield and the King was restored to his position of authority in 1951. Nepal was finally open to foreigners.

Climbing expeditions to Mount Everest, previously led through Tibet, were now led through Nepal. The ascent of Everest attracted large numbers of climbers, explorers and trekkers to the Khumbu region. After several attempts by various expeditions through the Khumbu valley, the world's highest mountain was finally conquered by Sir Edmund Hillary and Tenzing Sherpa in 1953. Mount Everest, with its beautiful Khumbu valley and its inhabitants, became one of the main factors in making the country known to the rest of the world.

##### 4.2 ENVIRONMENTAL DEGRADATION IN THE KHUMBU VALLEY

Early visitors to the Khumbu Valley found majestic mountains rising from well-forested valleys, rich in wildlife and abounding in colourful plant communities. Much of the majesty has been lost despite the maintenance of many relatively conservative traditional land use systems.

The fragile mountain ecosystem gradually deteriorated under the pressure of increasing human and animal populations. This problem became severe with the sudden influx of Tibetan refugees and their grazing animals after the Chinese takeover of Tibet in 1959. The over-grazing of alpine grassland led to soil erosion and the death of much stock. Excessive use of forest for firewood led to the permanent loss of forest in some areas, and severe depletion in others. In recent years, the delicate Himalayan ecosystem was brought under further pressure by uncontrolled and rapidly increasing tourism and commercial development, with little respect for the environment.

The rapid rate of social and political change has also had some adverse effects upon Sherpa society. Some hold the view that there have been more changes in the Khumbu region in the last twenty five years than in the previous 250. Unless this massive rate of change is controlled through positive measures such occurrences as ecological disaster, irrational economic development, exploitation of resources, environmental pollution, social upheaval and cultural deterioration are all inevitable. This will not only endanger the ecology of the area, but also spoil one of the greatest tourist attractions of Nepal, causing serious economic and aesthetic loss to the country. Hence, to ensure conservation of resources and to increase the country's revenue from tourism, it became apparent that there was a need for national park status for the Khumbu region.

#### 4.3 STEPS TOWARD INITIATING THE PARK

In 1972, J.H. Blower, a wildlife conservation adviser to FAO, put forward an outline of a proposal with a comprehensive justification for the establishment of a national park in the Khumbu Valley. In May of 1973, a conservation committee was formed under the chairmanship of H.R.H. Prince Gyanendra. In the first committee meeting, the chairman directed H.R. Mishra (an ecologist) to make a field investigation of the possibilities of establishing a national park in the

Khumbu Valley. The points emphasized in the Royal directive were as follows:

1. Selection of the park boundary so as to ensure optimum protection of flora and fauna of the region; and to enclose Mount Sagarmatha (Everest) inside the park.
2. To investigate the tourist utility of the area.
3. To suggest the necessary development required within the framework of a nature conservation programme.
4. To estimate the cost required for staff and for development proposals.
5. To study the feasibility of involving local people in conservation programmes.

A report based on a field investigation carried out between May and June of 1973 was presented by Mishra. In the same year, H.R.H. Prince Gyanendra attended the World Congress of the World Wildlife Fund in Bonn. A decision in principle to set up a national park in the Khumbu region was subsequently made and His Majesty's Government of Nepal decided to approach the New Zealand Government to assist with its establishment. New Zealand's experience in mountain park management and Sir Edmund Hillary's continued association with the people of Khumbu were favourable factors which contributed towards obtaining the New Zealand Government's assistance.

#### 4.4 NEW ZEALAND CO-OPERATION

A three-person mission led by P.H.C. Lucas was sent to Nepal in May 1974 by the New Zealand Government to assess the proposal to establish Sagarmatha National Park and to make recommendations to the Nepalese Government. The party was also required to make recommendations to the New Zealand Ministry of Foreign Affairs as to the precise nature of any future New Zealand participation in the project (Lucas et al 1974).

In Nepal, the New Zealand mission, together with the ecologists Mishra and Bolton, made a group field inspection of the proposed national park area. Meetings and discussions were also held with the local people.

A report was prepared by the group and presented to the Minister of Forests, the Foreign Aid Division and the National Parks and Wildlife Conservation Office of His Majesty's Government. The recommendations made in the report were accepted. Co-operation between the New Zealand and Nepal Governments in the field of nature conservation, as recommended in the report presented by the New Zealand mission in association with Mishra and Bolton, had begun.

Nepalese national park personnel were sent to New Zealand to receive training in both administrative and practical aspects of park management under bilateral aid programmes. The New Zealand Government appointed G. Nicholls, formerly Supervisor of National Parks in New Zealand, as the first project manager. He left New Zealand in May 1975 on a two year assignment to assist the Nepal Government in establishing Sagarmatha National Park. The National Park and Wildlife Conservation Office of Nepal, with the consent of the Minister of Forests, appointed and dispatched two Assistant Wardens and other staff to Khumbu in the same year. A temporary office was established in Khumjung, which was later shifted permanently to Namche.



During 1976 and 1977 the Sagarmatha National Park Office of His Majesty's Government, together with the New Zealand project manager, completed most of the construction work on staff accommodation and the development of visitor facilities was initiated. The park was formally gazetted on the nineteenth of July 1976.

Gordon Nicholls returned to New Zealand in 1977 after the successful completion of his two year term. He was succeeded by Bruce Jefferies, followed by P. Croft in 1979. With the recommendation of P.H.C. Lucas, a member of the International Union for the Conservation of Nature (I.U.C.N.), the official procedure to designate Sagarmatha as a World Heritage Site was instigated.

#### 4.5 AIMS AND OBJECTIVES OF SAGARMATHA NATIONAL PARK

A suggested set of aims and objectives for the park are as follows:

1. To ensure the continued existence of the Sherpa people in the Khumbu region; to encourage their participation in conservation programmes; to prevent any further deterioration in the cultural and natural environments of the park through the application of proper management and conservation techniques, so Sagarmatha can be an example of an area where people are still living in harmony with their environment.
2. As far as possible to conserve native flora and fauna and natural and cultural landscapes of the park without depriving the pre-existing rights and privileges enjoyed by the park inhabitants.

3. To maintain a balanced relationship between conservation and tourism. Thus, while natural and cultural assets are conserved as far as possible in their original state, people can continue to derive physical, aesthetic, cultural, scientific and educational benefits from these assets, while the country draws economic benefit from increased visitor numbers.

4. To determine the human (locals and visitors) and domestic animal carrying capacity of the natural resources of the park, and maintain impacts within desirable limits.

## 5.0 TOURISM

### 5.1 THE HISTORY OF TOURISM IN KHUMBU

The Sherpa of Khumbu are no strangers to tourism. Early records indicate that in 1907 several men from the region first took on work as high altitude porters for climbing expeditions which set out from Darjeeling. During the 1920s the Sherpa became a world renowned figure in association with early British expeditions which came up through India and into Tibet to tackle Mount Everest from its northern side. Nepal was still completely closed to westerners at this time.

Transport into Tibet from Darjeeling did not provide large scale employment opportunities for Sherpa, as most of the expeditions' loads were ferried by pack animals. Of those who were employed, most were recruited in Darjeeling.

Consequently, many men migrated on a seasonal basis to that city, or in some cases settled permanently in the region in order to secure work. The 1933 British Everest expedition did, however, arrange to recruit Sherpa directly from Khumbu, and these rugged individuals met the expedition at the Rongbuk glacier base camp after hiking over mountains from Khumbu.

The King of Nepal allowed the first mountaineering expeditions to move through the kingdom in 1949, and two years later the first reconnaissance group reached Khumbu. Subsequently, Sherpa involvement in mountaineering changed considerably.

1952 saw two major Swiss expeditions to Everest. In the years following, at least one major expedition to this mountain and other Khumbu peaks occurred each year. At the same time the borders of Tibet were slowly closing and trading

opportunities for the Sherpa people became more difficult to negotiate. A relatively easy change to new employment situations was provided by large expeditions which required hundreds of porters to establish their base camps. Whole families took advantage of this temporary opportunity for cash income by involving any member of the family who was old or fit enough to carry a full load. Porterage at this time of year was not regarded as the low status occupation that it is today. The wages earned then were as much as seven times those paid to an agricultural day labourer or to porters carrying goods for traders over the passes to Tibet.

All of these changes led to a fundamental rearrangement of the Khumbu economy, and as a consequence, trading patterns were significantly altered. However, this early phase of tourism within the Khumbu region, consisting of one or two expeditions per year, did not alter dramatically the standard of living for most families. Agropastoralism and traditional trading continued to be the primary source of subsistence until well into the 1960s.

The establishment of tourism as the single most important contributor to the Khumbu economy came only in the 1970s. The first commercial treks were recorded in 1965. By 1976, a total of 13,891 individuals had been issued with trekking permits (Roberts 1985). Early trekking was normally organised through an agent who offered camping trips, using the same system as the mountaineering expeditions. Travellers toured in relative style, with porters and pack animals carrying all their baggage, including toilet and large mess tents. A cook and camp crew attended to the demanding tasks of camp life and provided services to the guests.

During the 1970s large scale promotion of adventure trekking, particularly in Nepal, was underway. Khumbu became one of the most popular destinations, and by the end of the 1970s over

4000 people per year were visiting the park. The total reached more than 5000 during the early 1980s, rising to a current total of approximately 6000 per year.

Although this number is small relative to tourist levels in mountain regions in New Zealand, the United States, or Europe, it is extremely substantial when compared to the population of Khumbu. It is even more significant considering that each tourist will have on average up to three people as porters, sirdar (trek organisers), kitchen boys or guides. The average stay is between twelve to fifteen days. These estimates reflect between 250,000 and 300,000 visitor days per year. In a high, fragile alpine environment, with long periods when tourism is not possible due to climatic conditions, this is a considerable number. The influence of the many pack animals which accompany most of the tours accentuates impacts upon tracks, overnight camping areas and grazing sites.

The arrival of trekking created many more jobs for the residents of Khumbu than mountaineering ever had. In addition, the work was safer, much more sociable and economically very attractive. Work opportunities as sirdar, guides, camp crews, cooks and porters were easy to obtain and by 1984 trekking employment had outstripped expedition work as a source of income. The job of a high altitude porter and guide, however, is still seen as a lucrative, albeit somewhat risky occupation. The fame of reaching some of the highest peaks in the world is one of the best ways of securing a highly paid position with a trekking agency as a sirdar or group leader. Once the position of sirdar has been reached, even more money can be made, as these individuals are in charge of hiring porters, arranging pack animals, selecting camp sites, purchasing kerosene and resupplying food stocks. All of these activities can be quickly turned into profit-making transactions, as it is normal for a sirdar to extract a commission for almost any sub-contracted service.

The trekking season generally lasts from October to May. This provides almost eight months of income, although most Sherpa count on four to six months per year; from October to December (post monsoon) and March to May (pre monsoon).

## 5.2 ASSOCIATED BUSINESS ENTERPRISES

The development of trekking has also created many new opportunities for peripheral business ventures. Mountaineering provided jobs, but apart from selling firewood (now banned under the Himalayan Park Regulations) and second-hand expedition clothing, very few opportunities for entrepreneurial activity were available. Much of the food and equipment was normally imported from overseas, pre-packed and transported directly from Kathmandu. Little was purchased within the Khumbu region itself.

In terms of environmental impacts, the only commercial commodity of any real significance both economically and ecologically was the firewood used at expedition base camps. It was customary for campfires to burn almost continuously for up to sixteen weeks. Expensive imported kerosene was reserved for high mountain camps.

Commencing with the Swiss in 1952 and continuing for more than two decades, crews of Sherpa were contracted exclusively to keep the base camp area supplied with firewood. The 1960s brought changes to the system and expedition woodcutters were replaced by a piece meal purchase system. This system continued well into the late 1970s. In 1979, it was estimated that the village of Pangboche (altitude 3985 metres, population 297) generated more than twelve lakh rupees (US \$18,000) in cash each year from the sale of firewood to expeditions and trekkers in the upper Khumbu Valley. All this wood was cut from park forests with little regard for species or site. The implementation of the Himalayan Park Regulations in early 1981 has certainly eased the pressure of expedition and organised trekking group consumption of firewood and

it is now a mandatory requirement that they be self-sufficient in fuel for themselves and their porters. The individual trekker who utilises local hotels and indirectly consumes the park's valuable natural resources is a problem that still needs to be addressed.

### 5.3 SHERPA HOTELS AND LODGES

The first Sherpa inns (or hotels) were established in Namche Bazar in the early 1970s, with the first shop having been established in the same village as early as 1967. These facilities have increased tremendously in number and standard, reflecting not only a growing willingness on the part of the Sherpa to invest in tourism, but also a shift in the style of trekking. A high percentage of visitors now rely on Sherpa hotels rather than the relatively expensive, but possibly environmentally sounder, facilities operated by commercial trekking companies.

The Sherpa of Khumbu, unlike other ethnic groups of Nepal, such as the Thakalis, did not have a tradition of operating lodges, tea shops or hotels. The first lodges were extremely primitive and invariably operated by families who recognised the opportunity for earning relatively easy cash from the increasing numbers of trekkers. The family would erect a sign outside their house, advertising that lodging was available. Trekkers were offered a very limited choice of food, a place to sleep (usually on the floor), and perhaps most importantly for the visitor, a chance to observe and interact with Sherpa family life. Only a few families spoke any English as the head male would normally be away on a mountaineering or trekking expedition.

This situation began to change relatively quickly and by 1975 several small hotels had been built specifically for trekkers, had provided beds and, in some cases, partitions within the traditional large, single, open room. Several

houses were completely remodelled to create a dormitory specifically for visitors. In 1977 the first shower for trekkers was installed in a Namche Bazar hotel, but during this period Sherpa hotels were normally little more than remodelled traditional style houses, or even unmodified yak herding huts.

The siting of lodges focused on the usual trekking circuit through the park, with the first major concentration of development at Namche Bazar (which retains its place as the hotel capital of Nepal), Tengboche Monastery, Periche and Lobuche. All of these places are conveniently located with regard to natural and cultural attractions, and also fit very neatly into the normal acclimatisation pattern with respect to altitude, as recommended by the Himalayan Rescue Association.

By 1986 the total number of Sherpa hotels in the Khumbu region had reached fifty eight. A significant part of this increase was an expansion of existing facilities and the opening of more hotels at traditional and well established sites. Namche Bazar, for example, is still a relatively small village in terms of total population, but in 1987 it supported fourteen hotels with three more fifteen minutes walk away in nearby Chorkem, adjacent to the Sagarmatha National Park Visitor Centre.

Change in other directions can also be observed with accommodation being developed at non-traditional intermediate sites along the trail towards Sagarmatha, spreading the impacts of waste disposal and firewood collecting. Accommodation has also opened in some side valleys, allowing access to the less frequented but extremely spectacular country of the upper Imja Khola Valley and the Dudh Koshi area.

In response to less organised trekking groups and 'hotel hoppers', Sherpa have developed a more sophisticated hotel



service. Tourists are no longer offered Sherpa food. Even in the most remote parts of the park it is common to find more easily prepared dishes on the menu, like pancakes, omelettes, fried rice, noodles and curry. This is supplemented by such expensive dishes as 'yak steak' (often buffalo carried in from lower valley areas), and in some lodges, particularly in Namche Bazar, tourists complete their day's trekking by sipping hot sweet coffee and devouring large slabs of chocolate cake or cinnamon rolls.

The sophistication of accommodation in Khumbu has continued to a point where some hotels now provide private rooms. Hotel keepers have realised that there is money to be made by providing services to a class of independent trekkers who willingly spend considerable amounts of money per day on food and accommodation with more comfort and privacy. Showers are now almost common, not only in lodges in Namche, but even in places such as Tengboche and Pheriche, which are either on the treeline or, in the case of Pheriche, well above.

The scale of building is also increasing. In 1983 a four storey hotel was built in Namche Bazar and a second four storey building was added almost next door. A trend for higher standards continued and the first 'upper storey' restaurant was constructed in 1982. Since then six other hotels in Namche Bazar have remodelled or constructed similar restaurants, and in 1986 this trend was transferred to Tengboche, with the construction there of the first multi-storey lodge and upper storey restaurant.

The evolution of Sherpa hotels in Khumbu is exceptional in that apart from one, all have been developed without government assistance. Almost all are operated by Khumbu or Solu Sherpa with close family ties in the region. The development of visitor accommodation in Khumbu over the last fifteen to twenty years has been nothing short of spectacular and is a conclusive example of the outstanding adaptability and enterprising nature of the Sherpa people. Almost no other

group in Nepal can match their inherent adaptability. In the last hundred years they have moved from agropastoralism and trading to high altitude porter work and guiding for expeditions, to commercial trekking organisation, and now to relatively sophisticated hotel operations. This is made all the more impressive when considering the altitude, climate and the difficulty of obtaining food supplies and building materials.

#### 5.4 MODERN TRADE

Trading patterns within Khumbu have changed dramatically. The establishment of the weekly 'hat bazaar', as well as being the major trading activity, is without doubt an event of significant social impact. There are now about twenty two shops within the Khumbu region and only two of these are not located in the village of Namche Bazar, although many of the hotels scattered through the park also provide basic shopping facilities. The range and variety of materials and goods to be found in Namche Bazar is staggering. Stocks generally consist of a variety of Nepalese or Indian canned goods, sweets, chewing gum, alcohol, biscuits, etc. Most of the goods are flown to Lukla and portered to Namche Bazar, while some are trucked to Jiri, about eight days' walk to the south, and carried from there.

These supplies are augmented by surplus expedition foodstuffs and equipment. At any time of the year it is possible to locate in the shops at Namche Bazar anything from French pâté to Italian cheeses, or American high altitude rations and locally made clothing. Trekking and mountaineering equipment and religious ornaments are also offered for sale, normally for tourist consumption. Locally manufactured woollen goods, especially hats and mittens, are finding increasingly receptive tourist markets, resulting in a sharp increase in the price and availability of wool for the production of more traditional items.

## 5.5 ANIMALS FOR TRANSPORTATION

A further dramatic illustration of the economic expansion of the Khumbu region, as a result of tourism, has been the substantial change in the type of livestock kept exclusively for transporting tourist supplies and equipment. Until the late 1960s and early 1970s, yaks were without doubt the most popular pack animals. Progressive cross breeding to produce the zopkio (male) and zhum (female) by breeding naks with bulls from the low and middle hills has produced a very valuable and versatile animal. Zopkio were not usually kept to full maturity and were traded ultimately to Tibet by Namche traders who had initially bought them from Solu stock raisers. This animal has since become the principle means of carrying expedition and trekking loads from Lukla towards the Sagarmatha base camp. With relation to the Khumbu economy, it remains a valuable and extremely profitable trade commodity.

In the past, the hiring of Sherpa as porters to transport luggage from Lukla into the heads of Khumbu valleys was a relatively easy task. Khumbu Sherpa will now negotiate with tourists to carry loads, not as porters but as drivers of from three to seven zopkios, each carrying the equivalent of two porter loads.

The profits from tourism have been diverted by many Sherpa to the purchase of livestock. Seventy percent of the sirdar families in Namche Bazar now own zopkios, however in 1963 there were only four adult zopkios in the entire village. This shift in animal populations is a particularly significant factor for park management, as it has occurred in a village which was the last major settlement to be established and is the one with the smallest area available for pasture or grazing. This has caused severe over-grazing in the local area and created conflict with neighbouring Sherpa villages who have become hostile to the trespass of Namche Bazar animals.

## 5.6 ENVIRONMENTAL IMPACTS

It has not been the increasing number of visitors to the Khumbu region per se that has contributed to environmental degradation in Sagarmatha National Park: it is more the pronounced changes in the character of tourism. However, both these factors have placed direct pressure on the natural resources of the park. Increased consumption of fuel wood and construction timber, and more animals and grazing pressures are some of the more obvious factors, but more subtle and influential impacts have been changing resource use patterns. Many of these are a direct result of the growing affluence of the Sherpa people.

### 5.61 Rubbish and sanitation

During the 1960s and early 1970s environmental commentators coined the phrase 'the Mount Everest garbage trail'. Littering is not currently as significant as it was at that time, although the situation is far from perfect. Impressions gained in 1987 show that there is a much more conscious approach to the problem by sirdar, some hotel owners and certainly amongst visitors. The most serious concentrations of litter are still in the expedition dumps, particularly those on the Khumbu glacier at the sites of past base camps and areas adjacent to villages and hotels, especially Loboche, Pheriche, Namche Bazar and Gorak Shep.

In spite of the implementation of various codes and regulations, such as the National Parks Act and the Himalayan National Park Regulations, few expeditions bother to clean up their garbage after the base camp has been evacuated, and very little or no garbage is packed out when an expedition leaves the area. Dumps of cans, plastics and excess food supplies are all left behind and one observer in 1984 noted, "When I had an opportunity to tour the base camp area it was possible to review the history of recent mountaineering on Sagarmatha by inspecting the dumps which each expedition left behind."

Other areas in urgent need for clean up operations and garbage management are the regularly used overnight camping sites and villages, such as Namche Bazar, Tengboche Monastery, the spring around Lobuche and the lake edge at Gokyo. In the winter of 1984 the Nepal Police Association organised a clean up expedition to the Everest region and recorded that in excess of sixteen tons of garbage was removed from the Everest base camp alone. This was consolidated in an open dump at Gorak Shep - the small lake at the side of the Khumbu glacier about three hour's walk below the normal base camp site. The efforts of this expedition to clean up an important tourist area and to make visitors aware of the litter problem created in many ways a more significant aesthetic problem than the garbage itself. By painting red signs advertising the 'clean-up expedition' on granite boulders from Jorsalle to Mount Everest, they generated more complaints from tourists than there had ever been about the initial problem.

The garbage generated over almost forty years of tourism in the park is certainly an aesthetic affront to both tourists and the national park image. It does not, however, have the same ecological impact or present the same hazard that the lack of sanitary and toilet facilities does. Large numbers of tourists congregating in such areas as Tengboche, Pheriche, Lobuche, Gokyo and Gorak Shep are all adversely affecting the quality of water supplies and creating a hazardous situation in terms of the spread of disease. Tests conducted in springs as high as 5,200 metres in March 1978 indicated concentrations of more than three organisms per 100 millilitres of water, which is three times the level recommended by the U.S. Public Health Service for drinking water.

5.62            The forests

The indisputable influence that tourism has had in aggravating deforestation in Sagarmatha National Park was probably the greatest single influence in the overall rationale for establishing the park.

A major problem in terms of firewood consumption is that the tourist demand for wood is not spread evenly through the park, but is almost exclusively confined to the narrow corridor of the tourist route from Lukla to the Everest base camp. As facilities and hotels develop in the side valleys of the park, demand will spread.

Controls on organised trekking groups have been implemented since 1980. These initial measures, which completely banned the use of firewood by mountaineering expeditions and trekking groups, was an effective first step. This step has, however, been largely compromised by the shift in trekker use patterns and it is now necessary to look at ways to control firewood use by hotels, as this is now the impact of most concern. It accentuates the problem, as fuel wood for tourist demand is concentrated around the forests which provide wood for Namche Bazar, Tengboche, Pheriche, Khunde, Khumbjung, Lobuche and Gokyo. In the latter location the high altitude scrub juniper is being heavily exploited. This species has a poor recovery rate and annual growth is almost negligible.

It is interesting to note that although far more trekkers come to Sagarmatha now than they did in 1975, very few actually sleep in tents. The comparatively inhospitable conditions found in a mess tent, which was once regarded as the height of luxury when compared with the smokey, poorly lit and ventilated Sherpa house, are now being discarded for the comparative comfort and warmth of restaurants, particularly in places such as Namche Bazar. Firewood use by a hotel is often four to six times more than that required by

a family living in a similar house, and the expanding practice of offering tourists hot showers (at approximately ten rupees (NZ \$1.00) for three minutes of hot water) is increasing the demand for wood still further.

### 5.63        Grazing lands

Large areas of the park are used for grazing and winter fodder collection. Grazing lands are generally confined to open areas in the high valleys up to 4,500 metres depending upon aspect and vegetation condition. Grazing is still based on the traditional principle of transhumance: the use of winter and summer grazing ranges. Herds of yak, nak and crossbreeds of zopkio and zhum are moved to high altitude pastures for the spring and monsoon months and return to lower altitude settlements for the autumn and winter. Extra fodder collected during the growth seasons supplements winter feeds. This practice of grazing has led to the development of summer and winter settlements. Major winter settlements include Namche Bazar, Thami, Khunde, Khumbjung, Phortse and Tengboche, while the summer settlements are spread out over the main valleys. It is the summer settlements that are now important links in the pattern of tourist use.

Since the late 1950s the total number of large animals within the park has remained more or less constant. However, the number of yaks and naks has declined in consequence of an increase in the number of cross bred zopkio and zhum. This change, a direct result of tourism, has implications for grazing pressure. Cross breeds are able to descend to lower altitudes with little susceptibility to the lung diseases which beset yak and nak, and so increase impact on lower altitude pastures.

To soften these impacts, the Hillary Commission, a Canadian non-profit organisation formed to support the work of the Himalayan Trust and Sir Edmund Hillary, moved to purchase

sheep and goats from locals and remove them from the park. These species were having an extremely negative effect upon the already fragile and overgrazed areas adjacent to major villages.

Products from Sherpa cattle herds in the form of dried cheese, curd and cottage cheese are important supplements to the normal diet of potatoes and buckwheat. Once again, as tourist and mountaineering demands increase, animals that were not traditionally kept for meat are now being slaughtered, by non-buddhists, and supplied to expeditions and a considerable number of hotels.

Another impact which is emerging as a potentially serious resource conflict is the competition for limited grazing areas between domestic cattle and other indigenous ungulates, such as tahr. The impacts of grazing and increases in domestic cattle are in many instances directly linked to tourism and may be a more serious park management problem than the more heavily focused upon and researched forest degradation of the Khumbu region.

#### 5.7 SOCIOECONOMIC AND CULTURAL IMPLICATIONS

Many significant internal and external factors have contributed to cultural change. These include the introduction of a national political system, establishment of a resource management agency (Department of National Parks and Wildlife Conservation), continued development of the Nepalese education system, increasingly better communication, the popularity of radios and enhanced opportunities for entire families to visit Kathmandu.

There is no question that the Sherpa have been heavily influenced by tourists visiting their homeland. Stereos, cameras and other gifts in the form of cash or goods from visitors are now almost a normal part of Khumbu life. However, current trends among young Sherpa for disco music,



modern polyester clothes and, in some cases, exposure to drugs and other aspects of western culture, can be directly traced to visits to the capital city, rather than an adoption of activities from the tourists within Khumbu. Complex questions, such as the effects of tourism on local inflation, the social implications of the long absence of the majority of village men, the commercialisation of art, radical changes in agropastoral practices, and shifts in the traditional quality of life, are surely direct influences of sustained exposure to tourists.

The major indication of socioeconomic change is the increasing degree of wealth dispersed amongst various groups in the Khumbu region. Khumbu is arguably one of the most affluent regions along the entire Himalayan chain. This is a result of tourism, and the effect is an upward spiral in material wealth. More money generates an ability to buy more rice, construct more and bigger houses, and occasionally to support religious activities. It also provides the means to purchase more livestock with which to carry more loads for tourists, or the opportunity to construct a new hotel.

It must be stressed that the impacts have not been all negative, as some researchers would like to suggest. Trading opportunities, once the most important source of the Sherpa's income, were severely inhibited by the closure of the Tibetan border in 1959. Without the gradual development of a viable tourist trade, residents would have been faced with some very serious choices in terms of their long term survival. Increased wealth has enabled many families to continue living in Khumbu when they may have been forced to emigrate to lower altitudes in an effort to find enough land to support themselves.

Many ambitious young Sherpa, who, in response to economic decline would have been the first to leave the area, have been able to earn enough money from tourism to maintain a family base in Khumbu. There are of course many instances

where forward thinking young Sherpa live full time in Kathmandu, running successful trekking agencies, as well as other forms of business associated with tourism. For instance, several Khumbu Sherpa are employed by the Department for National Parks and Wildlife Conservation, and at least one occupies a position as an aircraft captain with the Royal Nepal Airlines Corporation.

Important village festivals still attract Sherpa of all ages back to their traditional family villages. It is fortunate that the trekking seasons do not coincide with these occasions. The Dumji and Losar festivals are still regarded as particularly significant events which draw families together for up to ten days each year.

An example of the effect of Khumbu's affluence, compared with adjacent regions in Nepal, is the influence it has on regional labour and trading patterns. The Sherpa's ready access to cash and the ability of Khumbu to support high market prices keeps a long distance trading network operating. Rice transported from the Arun Valley, more than a week's walk to the south and east, by-passes large villages on the way simply because it is possible to sell the rice for cash, rather than exchanging it for other goods.

The number of other ethnic groups that can be found in most major Khumbu villages represents another social change brought about by tourism. In the late 1960s and early 1970s it was almost unheard of for a Sherpa family to have a Tamang, Rai or Solu Sherpa as a servant. Namche Bazar is now liberally sprinkled with such workers, and there are increasing numbers of servants from outside the Khumbu region in the villages of Khumbjung and Khunde. In return for their services, which usually include the carrying of water and wood, helping with cooking and preparing agricultural land, they get a place to sleep, regular food and a small monthly salary. The daily pay for such work is well under the fifteen to twenty rupees that a Sherpa would expect to make for

working in the fields or forests, but for young Solu or Tamang workers the conditions in Khumbu provide them with an opportunity to earn cash. This would otherwise be virtually impossible in many other areas of Nepal as tourism is almost nonexistent and land fragmentation and tenant farming common.

There is possibly a misconception that all people share equally in the relative affluence of Khumbu. This is very far from the truth. There is considerable difference in the benefits tourism affords individuals. Although in some villages a proportion of the residents get richer, all others share much more modestly in this new wealth. In the three major villages of the Namche Bazar, Khunde and Khumbjung, one can find higher standards of living than in any of the other villages of the region. This relates to the number of families involved in tourism, the degree of involvement they share and the village's location. Namche Bazar families, who have traditionally occupied the main link in the trading routes between the lower and middle hills of Nepal through to Tibet, now take positive advantage of their location, as the village occupies a key spot on the main trekking route to the Everest base camp. Financial opportunities developed in Namche Bazar have enabled some families to open further hotels along the route to the base camp in such places as Lobuche and Tengboche.

In complete contrast, the villages of Khunde and Khumbjung can boast only a single Sherpa hotel. The families from these villages, however, have been most active in converting many of their traditional herding huts on the high routes to the Gokyo Lakes and Everest base camp into simple lodges. Again, these are located at key locations for trekkers, and also provide their owners with direct access to the sirdar and expedition leaders, who are willing to negotiate the sale of excess food and equipment at the completion of a successful climb. Air-freighting food and equipment out of the country is both time consuming and expensive, and although prices normally paid for excess expedition supplies appear

ludicrously low, sale of these commodities is an expedient way for expedition leaders to dispose of unwanted supplies.

It appears inevitable that the regional differentiation of economic wealth is likely to deepen, and has already reached a level of inequality which definitely surpasses the differences between villages established during the early trading era. Prior to 1960 Namche was noted as one of the wealthiest villages in the area and this is where most of the big traders resided. There were many poor families in Namche as well, but the contrasts between that village and others within the area were definitely not as pronounced as they are now. The repercussions of this economic differentiation within Sherpa society remain to be seen, but is conceivable that economic power and influence will affect political directions and also influence the future focus for the expenditure of money for development.

## 6.0 LAND USE AND ZONING

### 6.1 HISTORICAL BACKGROUND OF LAND USE IN KHUMBU

Human settlement began in the Khumbu region with the arrival of the ancestors of the Sherpa people about 400 years ago. The early settlers were pastoral people with a semi-nomadic way of life. The ancient Sherpa practised a system of seasonal migration and shifted from place to place with their livestock, seeking better climate and fodder conditions. Their property consisted of what they could carry and drive in front of them, and no ownership of fixed property existed. Their impact upon the environment was probably minimal, as both human and stock populations remained well within the carrying capacity of the land. The migratory habits of the population also helped to disperse pressure on resources over a wide area.

With the use of more intensive agricultural crops, like potato and buckwheat, people began to occupy fields and build houses for shelter and storage of agricultural products. The ownership of fixed assets led to the adoption of a more sedentary way of life. The people began to practice both pastoral and cropping cultures. Thus, two land use types emerged in Khumbu.

The practice of agriculture and the adoption of a fixed residence had both social and environmental implications. The availability of surplus food improved living conditions and increased local populations. Forested land was cleared for agricultural use and trees were cut for the construction of houses and shelters. The assembly of human and animal populations around the major villages placed localised pressure on the surrounding areas.

## 6.2 THE NEED FOR LAND USE CONTROL

Cropping and pastoral practices have been the two dominant land use types in the Khumbu region for several centuries. Initially, land and forest resources were abundant. A low population density, the absence of modern technology and other natural and cultural factors, prevented the rapid exploitation of resources. The land was treated as a commons: open for free occupation and exploitation, with no competition for private ownership. Cultivation of land was a means of deriving economic benefit, but the demand for land for cultivation was low due to the unproductive nature of the environment and the people's limited agricultural abilities. There were no conflicts associated with different land uses, and as a result, the need for land use zoning and control measures did not arise.

This situation has changed in recent years. The increase in local populations has placed additional demands on land use. Areas previously regarded as unsuitable are cultivated with little regard for the natural limitations of the land. Tourist developments have introduced commercial interests which have placed considerable pressure on previously unoccupied areas. The need for timber for the construction of tourist facilities and firewood has hastened deforestation. Further pressure has been added by the occupation of land by government and private organisations for various purposes.

Realising the increasing demand and potential commercial values of land, people are attempting to occupy communal land as if under private ownership. Unless this trend is checked through effective planning and control, the remaining open spaces of Khumbu, vital for grazing, recreation, collecting and wildlife protection, will be in danger of serious depletion.

It is important that the concepts of land classification and zoning are introduced to protect different areas of land for different uses. Classification and zoning should be carried out according to the inherent qualities and desirable uses of the land. Each type of classification should have separate management policies constructed by qualified planners in consultation with park managers and representatives of the local people. The policy documents must be flexible so they may be reviewed and checked for necessary modifications to meet the needs of changing circumstances.

To meet the needs of local people, to allow for the demands of tourists, and to provide recognition and protection of features which satisfy the criteria of a national park, Sagarmatha National Park could be zoned under the following six different land use types:

1. Human settlement zone
2. Agricultural zone
3. Pastoral zone
4. Natural landscape areas
5. Special areas
6. Wilderness zone

### 6.3 LAND USE ZONES AND POLICY RECOMMENDATIONS

#### 6.31 Human settlement zone

This is an area primarily set aside for residential purposes. All the permanent villages within the park boundary should be included in this zone.

#### Recommendations

1. All the existing major Sherpa villages which are used as permanent bases by the locals must be designated as human settlement zones.
2. These zones should be primarily administered by local government (village Panchayat).
3. A set of village planning regulations must be produced and implemented. These regulations should aim for the elimination of bad land use practices, protection of the environment, improved health and sanitation, the prevention of undesirable development and overcrowding and the reduction of land use conflicts.
4. Open spaces should be provided in appropriate locations within the village to provide for community use, ie: sports, social gatherings and other community activities.
5. When determining the boundary of a human settlement zone, sufficient buffer should be allowed for expansion and extension of the village.

#### 6.32 Agricultural zone

Agricultural zones are stable areas of arable land suitable for the production of crops. All the summer and winter settlement areas of Khumbu which have significant agricultural value should be included within this classification.



### Recommendations

1. Agricultural zones must be retained primarily for production of crops for human and animal consumption.
2. Agricultural development should be encouraged, but dense housing and development not related to agriculture should be discouraged.
3. Grazing animals should be excluded from this zone during the cropping season if they are damaging crops or are incompatible with the rotational grazing system.

#### 6.33 Pastoral zone

Pastoral zones are areas of land reserved for the purpose of grazing. These zones should not include forests, agricultural lands or residential housing.

### Recommendations

1. All pastoral areas should be free of private ownership, and the national park should maintain control over them.
2. Permanent occupation of land within this zone should not be permitted. However, temporary habitation associated with pastoralism should be allowed.
3. Prospecting and mining should not be permitted unless part of the traditional rights of the local inhabitants.

#### 6.34 Natural landscape areas

This zones includes areas to be maintained predominantly in their natural state. Local people may obtain their livelihood through means that do not involve extensive cultivation or other major modification of vegetation and wildlife.

### Recommendations

1. The major forest stands of Khumbu must be protected under this designation for the purpose of conservation, aesthetics and sustained production of plant material essential for agricultural and domestic use (dead wood and leaves, for example).
2. Needs of the park inhabitants should be recognised and the existing collecting rights should be protected. Periodical bans on collection and limitation on quantity taken could be imposed if necessary.
3. Grazing may be restricted in this zone if it is detrimental to the natural features. However, limited grazing may need to be introduced periodically to minimise the fire risk.
4. Lighting fires, trapping, killing and removal of any native wildlife species and cutting green trees should not be permitted without the permission of the National Park Office.

### 6.35 Special areas

Any area possessing rare native plants or animals, or significant biological, geological, archeological and historic features which require strict protection and management should be classified as a special area.

### Recommendation

The degree of protection and development required on a special area will depend on the nature of the feature to be protected.

6.36 Wilderness area

An area whose character is the result of an interplay of purely natural processes, large enough and so situated as to be unaffected, except in minor ways, by processes which occur in non-wilderness areas around it.

Recommendations

1. The areas occupied by mountains and glaciers on the upper regions of Khumbu are natural and unaffected by human activities. They should be designated as wilderness areas.
2. Grazing and collecting should not be allowed if it reduces wilderness qualities.
3. Access should be by foot only and the development of facilities should be restricted.

## 7.0 RESOURCE MANAGEMENT

### 7.1 THE IMPORTANCE OF NATURE CONSERVATION IN THE KHUMBU REGION

Khumbu has been inhabited and utilized by the Sherpa people for less than 500 years. As their rate of exploitation exceeded nature's capacity to heal itself, Sagarmatha's plant life began to suffer. Unless this trend is checked, forest resources will soon disappear and the consequences are not difficult to guess. Wildlife is already effected by loss of habitat. Soil has been damaged by loss of vegetation. Agricultural and pastoral land will suffer a reduction in productivity. Consequently, inhabitants will have to either abandon areas in search of alternative places where necessary resources are available, or find a source of importation to support their lifestyle.

If we are to avoid this tragic course, conservation measures must be introduced into the Khumbu region without delay. Conservation is the only means which ensures the sustained existence of sufficient resources for human benefit.

### 7.2 THE RESPONSIBILITY OF THE SHERPA PEOPLE TO SUPPORT CONSERVATION

Conservation, here, is defined as the rational use of the earth's resources to achieve the highest quality of living for people. Natural resources are not only important for raising standards of living and improving the quality of life, they are essential for the survival of all life. Accordingly, the Sherpa people have a major responsibility for conservation of the natural resources of the Khumbu region, for their own benefit and the benefit of future generations. However, the rate of resource consumption cannot be altered greatly since many Sherpa already lead a

way of life close to subsistence. Application of major restrictions on the pattern of resource use would affect their standard of living, unless alternatives are provided.

### 7.3 PROTECTION OF NATIVE FLORA AND FAUNA

#### Justification

1. The existence of the native inhabitants of the Khumbu region depend upon the native vegetation. Wood for fuel timber for housing, organic manure for agriculture, and fodder for domestic animals are derived from forests and grasslands. The trees and shrubs are also used for religious and cultural purposes. The forests of Khumbu have been severely depleted over the last several decades as exploitation has exceeded natural regeneration. No effort has been made to replant trees. With much of the original forest cover having been destroyed, what is remaining must be conserved to allow regeneration.
2. The Khumbu Valley is admired by many visitors, not only for its panoramic mountains and human culture, but also for its colourful alpine vegetation. Khumbu is known as the home of the rhododendrons. If the native vegetation is not protected, the Khumbu region will lose one of its major attractions.
3. The loss of vegetation in the northern Himalayan region has caused severe flooding problems in the plain lands of Terai. This has resulted in the loss of valuable agricultural and forestry lands, and even human life. As a result, national and local government, community organisations and individuals have the responsibility to prevent these disasters through protection of vegetation on the upper slopes.

4. The flora of the Khumbu Valley with its associated vertebrate and invertebrate fauna is not well researched and documented. It offers a wide scope for both amateur and professional scientists to carry out ecological studies and research programmes on high altitude ecosystems.

5. The wildlife of the Khumbu region is of aesthetic, educational and cultural significance, and contains potential economic value. Unfortunately, it is disappearing rapidly due to habitat destruction and other human interference. Its protection would not be possible without conservation of forest habitats.

#### Recommendations

1. Sagarmatha National Park has already placed restrictions on the use of firewood by tourists. This is a significant step towards nature conservation in Khumbu, and will be appreciated by the local people and environmentally conscious visitors. To achieve the purpose of this regulation, it must be accompanied by an effective implementation programme.

2. The sale and purchase of firewood in the market should be controlled. The purchase of firewood through door-to-door sales leads to a lack of awareness of the over-exploitation of the forests. Only by restricting sales and encouraging individuals to collect their own fuel, can the waste be reduced.

3. The cutting of green trees depletes the forest. It should be discouraged unless allowed by park bylaws as part of the traditional rights of the people.

4. The traditional Sherpa forest and grassland conservation practices should be strengthened and brought back to into practice, with some modifications to suit changing needs.

Public involvement and motivation are always a better means of bringing success to conservation programmes than is enforcement of rigid regulations.

5. The needs of the people should be given priority and public representatives should be consulted when making decisions regarding conservation activities which may affect the people.

6. The forest of Khumbu has been effected to such an extent that more protection of the remaining stands will not fulfil the potential present and future demands for forest products. A reforestation programme should be implemented both inside and outside the park boundary.

7. With protection, the wildlife population could increase beyond a desirable level. Control programmes should be carried out when it is necessary to maintain the health of the species, the environment, and to safeguard public health and safety.

8. Alternative forms of energy (wind generation, methane gas, solar energy and hydroelectricity) could be used to save native forest. However, it would be justified only if the social and environmental impact is low and production cost is minimal.

9. Accidental fires should be prevented to avoid the destruction of natural vegetation and wildlife. Natural fire and prescribed burning are encouraged in some national parks around the world to prevent the heavy accumulation of plant litter on the forest floor. This prevents the natural vegetation composition from changing and also decreases the risk of serious hot accidental fires. This is not a major consideration within Sagarmatha National Park as dry leaves and wood are collected for domestic and agricultural use.

#### 7.4 PROTECTION OF NATURAL AND CULTURAL LANDSCAPES

The natural and cultural landscape of the Khumbu region is the result of the interaction between people and the environment over several centuries. The landscape developed in the absence of modern scientific and technological forces and is still primitive in character, with unique cultural, scenic and historical value. It is worthy of protection.

Because of its human and animal population, Sagarmatha is not a park of natural wilderness with a minimum of human influence. The conservation of the existing natural and cultural landscape must be contended with.

The concept of including modified landscapes within a national park system has been achieved with success. The British national parks, for example, include private farmlands, modified pastures and villages.

#### Recommendation

Strong planning and protection should encourage good farming techniques while safeguarding the scenic and natural features of the landscape. Land should be kept, as far as possible, within its present ownership and productive uses. Only land needed for special reserves, or public recreation access, should be acquired, preferably not through compulsion or if it results in the displacement of people.

#### 7.5 TIMBER HARVESTING

Timber is an extremely scarce resource in the Khumbu region due to the apparent lack of millable forest trees and the expenses and difficulties associated with importing timber. This scarcity has coincided with an increasing demand, placed by an increasing population, greater affluence and recent pressures for tourist developments and paraphernalia.



Timber harvesting needs to be carefully controlled and managed in order to cater for present and future demand.

Normally, timber harvesting would not be permitted within a national park. Sagarmatha should be an exception to this norm since the local inhabitants are dependent on the park's forest resources. However, to maintain a sustained yield of the present forest resources, it is essential to have some degree of restriction and control on the rate of harvest.

#### Recommendations

1. Timber harvesting rights within the national park boundary should be held exclusively by local inhabitants.
2. A permit, indicating the volume of timber to be obtained, the locality, species, harvesting period and other essential details, must be obtained from the Sagarmatha National Park's office before timber may be harvested within the park boundary.
3. A timber harvesting permit would be issued only if the timber is required for personal use. The commercial use of harvested timber should be prohibited, unless it is obtained from outside the park boundary or comes from production forests.
4. Timber yield should be improved through management of the existing forested areas and reforestation with timber trees.

## 7.6 EXOTIC PLANTS AND ANIMALS

There are numerous examples from around the world of accidental or deliberate introduction of exotic plants and animal species. Many of these had disastrous consequences, even though often carried out with the best of intentions.

The biological interactions and ecological processes associated with introduced flora and fauna are so complicated that it is difficult to say that these problems will not occur in Nepal's national parks.

### Recommendations

1. The introduction of any plant or animal species which are foreign to the area should be carried out with caution.
2. Exotic plants and animals may not be introduced to wilderness areas, since wilderness quality depends upon its purity.
3. Exotic plant and animal species may not be introduced into any pastoral zone, natural landscape area and special area if the introduction of these organisms threatens the existence of native species or spoils the natural and cultural integrity of the area.
4. Introduction and ownership of introduced plants and animals which have social, economic and or aesthetic importance to the local people should be allowed within the human settlement and agricultural zones.
5. Measures should be introduced to control harmful animals, such as wild cats and dogs which prey on small birds and mammals.

## 7.7 MINING

Mining and prospecting can constitute one of the worst forms of exploitation of national park resources. Most park authorities are obliged to oppose mining activities to achieve the goals of conservation. However, areas within some national parks of Britain, the United States and Finland are set aside by enclosing a human settlement area for protection of human culture and cultural landscapes. The local people are encouraged to maintain their traditional lifestyles with the exclusion of technological exploitation and the provision of economic incentives and special privileges.

Sagarmatha National Park has been established for the protection of culture as well as nature. It seems desirable that local inhabitants should be allowed to carry out mining operations in their traditional ways. However, since the maintenance of human culture is not possible without natural resources, resource protection should be equally emphasised.

### Recommendations

1. Large-scale commercial mining and prospecting for mineral resources within the park should be strictly prohibited.
2. People who are lawfully residing within the park boundary should be permitted to mine minerals, remove soil, extract sand, gravel and rock, as it is essential for the support of their way of life.
3. Where a lawful right to mine exists, both the miners and authorities who grant permission to mine should do all that they can to minimize environmental and visual impacts. Landscape restoration and maintenance of disturbed sites should be the responsibility of the miner, and as such should be done to the satisfaction of the authority. All provisos should be stipulated in the permit issued.

7.8 COLLECTING

Recommendations

1. The collection of natural objects should not be allowed in wilderness zones. This will preserve the wilderness character, and enhance the wilderness experience.
  
2. In other zones, the needs of the people should be recognised and rights of collection should be granted. Excessive collection should be discouraged if it threatens to endanger the resource. Restrictions can be placed on quantity, rate and frequency of collection to prevent excessive exploitation and to protect essential park values, while allowing for social needs.
  
3. The non-residents of the park should not be allowed to collect scarce natural resources unless authorised by an appropriate authority.

## 8.0 PEOPLE MANAGEMENT

For a national park programme to be successful, it requires a combination of public interest and support, coupled with sound management and planning. In the case of Sagarmatha National Park, public association is not limited to recreational, educational, conservation or economic use only. The Khumbu Valley is a home for almost 3000 people, besides being a recreational ground for thousands of visitors per year. Conservation will not be possible without some realisation of the basic needs of those users. For the proper management of a park, managers must understand these needs, the users' attitudes, motivations and behaviour.

### 8.1 CHANGES IN THE SHERPA COMMUNITY

The need for conservation in the Khumbu region has long been recognised by local people. One has only to look into the traditional forest, cropland and pasture management practices to realise that the Sherpa people were long aware of the mounting environmental problems of the Khumbu region. This awareness gave birth to various conservation traditions which have been greatly distorted in recent years due to the advent of various changes over a short period. The changes are as follows.

#### 8.11 Political changes

The sense of responsibility of the Sherpa people towards their environment has its roots in Buddhism. The influence of this religion on the Sherpa community has been decreasing since the Chinese takeover of Tibet, which led to the loss of religious contact. The invasion also caused a massive exodus of Tibetan refugees and their animals into the Khumbu Valley. This disrupted the local conservation tradition and resulted in the destruction of forests and grasslands. Trade between Tibet and Nepal, a major support for the Sherpa economy,

was affected. The loss of trading relations caused major economic hardship in the Sherpa community which placed more demands on the local resource. The closure of the India/Nepal border in 1989 will accentuate this.

#### 8.12 Tourism

Growing tourism and mountaineering activities in the Khumbu region have direct and indirect impacts on the local environment. The direct impacts are overuse of forests and littering. The indirect impacts are caused by induced changes in the Sherpa way of life. The improved standard of living and growing affluence is putting more demands upon the natural resources. Undesirable traits such as dishonesty, violence and crime are becoming more apparent due to a breakdown of social unity.

#### 8.13 Administration and control

In the past the Khumbu region was a politically isolated area not influenced by central government control. The Sherpa of Khumbu developed their own system of maintaining social and environmental stability. Law and order was maintained by the Pembu (village chief), the Nawa (forest and cropland guard) and the Chorumpa (a person nominated to control crowds in community gatherings). The power and functions of these personnel were lost when the government posted administrators and police forces to keep law and order in Khumbu during the 1960s. The change brought many improvements in the Sherpa community, but not in the field of conservation. The police failed to support the local conservation practices which led to the exploitation of forests.

#### 8.14 Education

The Sherpa children began to receive formal education in 1961, when Sir Edmund Hillary assisted in the building of schools in various villages at the request of the local

people. The effect of education on the society was generally beneficial. The Sherpa people learnt to speak the Nepali language, which enabled them to develop a better understanding of people from other ethnic backgrounds. Knowledge of the English language made it more easy to communicate with tourists. With improved education, people became more independent. Their job opportunities are greater and, most importantly, education has helped the Sherpa people cope with the modern changes.

## 8.2 RECOMMENDATIONS FOR LIAISON WITH PARK INHABITANTS

### 8.21 Public relations and participation

The support and involvement of park inhabitants seems to be essential for the success of park programmes. The National Park Office should seek participation by the people in major decision making processes.

Good public relations are the key to success of any programme. The park manager must convince the people, both in words and in action, that the establishment of a national park is in their best interest.

Local people must not be removed or displaced. The people who have been living in the park, and who own property, should be able to continue to do so. Removal of people from Sagarmatha National Park or their displacement within its boundary may have destructive social and economic consequences. Such an action would cause loss of public support and interest in conservation programmes in the country. It may also lead to a loss of Nepal's international reputation since the action would contradict the underlying philosophy of national parks.

### 8.22 Immigration policy

Due to the fragile nature of the mountain environment, the total number of permanent residents which the Khumbu region can support without environmental damage is limited. The growth of the local population seems to be slow due to low fertility and high mortality. In fact, it seems to be a trend that the population of Khumbu has been decreasing from the beginning of 1970. This may have been due to the emigration of the younger Sherpa and the Tibetan refugees. The emigration of Sherpa may, however, be temporary. The number of semi-permanent immigrants settling in the Khumbu region over the past decade has been substantial, consisting mainly of government employees, casual job seekers and people with commercial interests in the area. The number of these temporary immigrants could be expected to rise with increasing government involvement and tourist activities.

Because of the mobile nature and simple lifestyle of most Sherpa people, Sagarmatha National Park can accommodate the existing population without undue pressure on the environment. However, any great increase in the present population would not be desirable, since the resources are limited. There is therefore a need for an immigration control policy.

A desirable population size must be determined with reference to the carrying capacity of the land, and policy measures should be introduced to achieve the desired level. Policy should encourage family planning and monitoring of the immigration and emigration imbalance.

### 8.23 Conservation education

In the past the Sherpa people maintained their conservation practices through strong social and religious taboos. With recent changes, social unity is breaking down and people's faith in religion is decreasing. This in turn is



causing deterioration of age-old conservation traditions. There is an urgent need for conservation education to replace the declining faith in religion with a real understanding of conservation principles. Conservation education programmes should be carried out throughout communities in the Khumbu region, with special emphasis on incorporating it within the school curriculum. The National Park Office needs to appoint an expert to work in the field of conservation education and interpretation.

#### 8.24                    Priorities in jobs and incentives to locals

The migration of people from the hills to Terai and into the cities is putting pressure on the agricultural and forestry land of Terai and causing problems of overcrowding and adjustment in the cities. In the light of these problems, it will be in the interest of the whole nation to encourage the mountain people to remain in their homeland. This is a process which could be achieved through the provision of jobs and incentives in the mountain region. The establishment of national parks and the staffing of them with local people will be one way of achieving this. The provision of an alternative source of income will not only reduce the pressure on park resources, but also foster involvement and support by park inhabitants in the park programme. Local people should be given first priority when considering applications for park jobs.

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