

NEPAL

**CONSERVATION IN KHUMBU:
THE PROPOSED
Mt. EVEREST NATIONAL PARK
(A PRELIMINARY REPORT)**

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Mt. EVEREST NATIONAL PARK
(A Preliminary Report)**

Hemanta R. Mishra
Kathmandu
1973

(Note:- Confidential report for Official use only.)

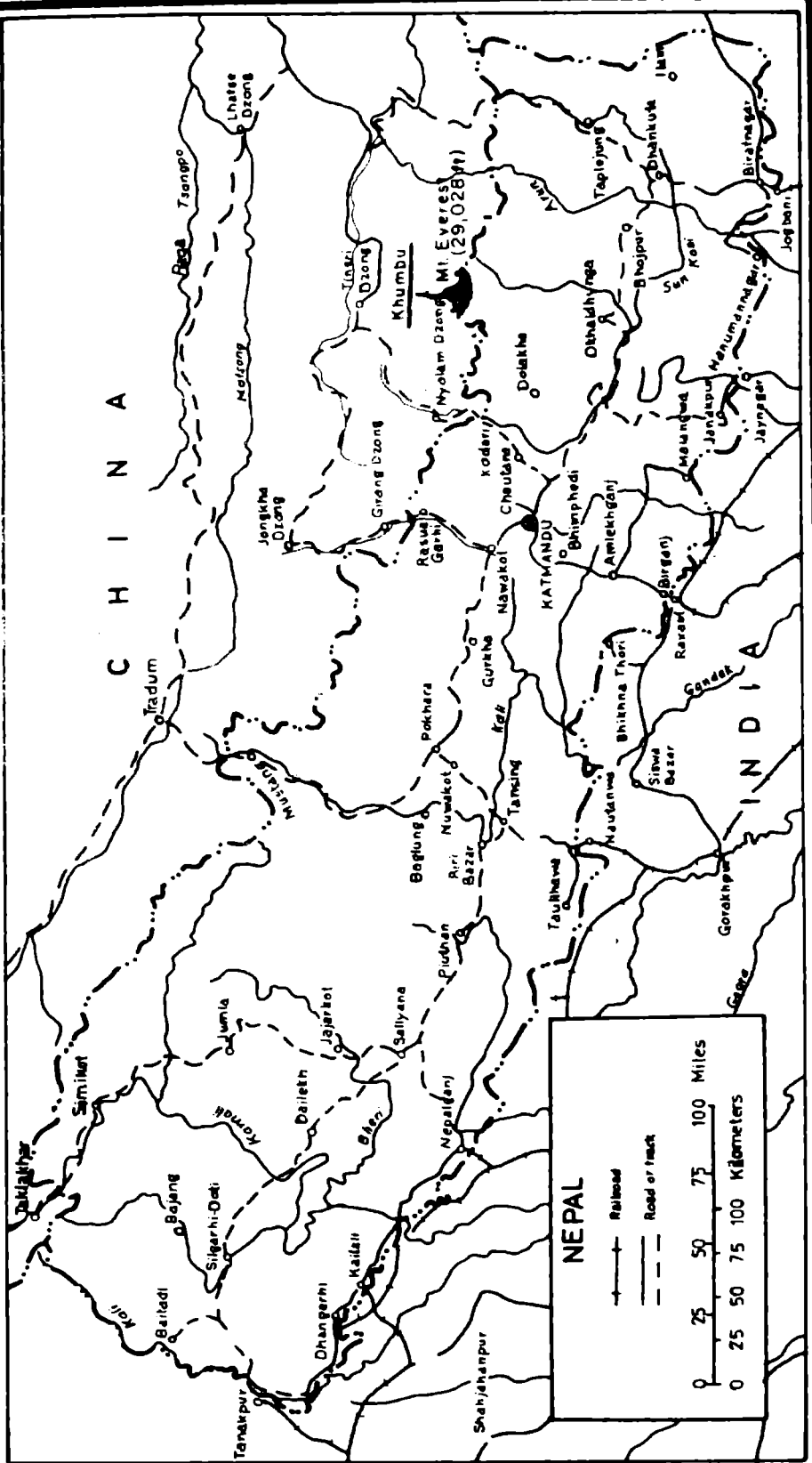
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Summary

1. Mt. Everest (Mt. Sagarmatha) remains unique as the highest mountain in the world and is of significance not only to Nepal but to the whole world.
2. Conservation in the Everest (Sagarmatha) region is urgent as the Natural areas in the region are under constant human pressures.
3. A National Park (480 sq. miles, 1228.8 sq. km) integrating panoramic mountains, well-forested valleys harbouring diverse Himalayan flora and fauna, and the exotic Sherpa culture; is proposed in the upper Khumbu region.
4. Within sound ecological principles, the following development activities are suggested for the protection of natural resources:
 - a. Tourism development under the control of the National Park to insure against visual, cultural and Nature pollution. Improvement of Syangboche airstrip and construction of trekkers' houses are suggested.
 - b. Electrification as an alternative source of fuel.
 - c. Forest management to retain a sustenance supply of timber much needed by the local people for building materials.
 - d. Water supply and agricultural development to reduce the dependence of the Sherpas on natural land.
 - e. Forming a committee responsible for co-ordination between the National Park authorities and the people of Khumbu.
5. The total cost of the project is estimated to be Nepali Rs. 10,425,500 (US \$ 1,042,550 approx).

Outline of Project Proposals

The project is phased according to priority as listed below:--

Phase	Item	Cost		
		Nep. Rs.	U.S.\$ (Approx)	
1st year	1st	Survey & Demarcation	10000	1000
	2nd	Staff allocation	323500	32350
	3rd	Construction of Office/Staff quarter	510000	51000
	4th	Radio Communication	92000	9200
2nd year	5th	Forest Management:--		
		a) Preparation of plans	---	---
		b) Implementation of plan	185000	18500
	6th	Formulation of Bye-Laws and gazettment of the national park	---	---
3rd year	7th	Construction of tourist houses:--		
		a) 1st five	750000	75000
		b) 2nd five	500000	50000
	8th	Water supply	500000	50000
	9th	Electrification	2555000	255500
	10th	Airport improvement	5000000	500000
TOTAL			10425500	1042550

Note:--

1. Forest management plans will be prepared by existing staff.
2. Plans for agricultural development will be carried out as and when experts and staffs are available.
3. Formulation of Bye-Laws will be done by existing staff.
4. Cost for airport improvement *excluding metalling of run-way* amounts to Rs. 500,000 (approx) only.

Preface

In Baisakh (May 1973) 2030, a committee was formed under the chairmanship of His Royal Highness Prince Gyanendra. On the very first meeting held on the 18th of Baisakh 2030 (May 1973), I was directed by H.R.H. Prince Gyanendra to make an investigative field study on the possibilities of establishing a National Park in Khumbu.

The main points stressed in the directive are as follows:—

- a) Selection of the park boundary to ensure optimum protection of the flora and fauna of the region; and enclosing Mt. Everest (Mt. Sagarmatha) inside the park.
- (b) To investigate on the touristic utility of the area.
- (c) To suggest necessary development works required within the framework of nature conservation programme.
- (d) To estimate the costs required for staff and for development works.
- (e) To study the feasibility of involving local people in conservation works.
- (f) To make a report on any other things that are of interest to the well being of the National Park.

This report is based on the field investigation carried out between Baishak-Ashadh 2030 (May/June 1973) by J. Fox, American Peace Corps Volunteer and by me.

The assistance rendered by J. Fox was found to be very valuable, and I am very grateful for his help.

I also wish to acknowledge my indebtedness to T. Mihiyara, S. Mihiyara of Hotel Everest View and Tek Chandra Pokhrel for providing me with recent information on the problems of tourism in Khumbu, to the Pradhan Pancha of Khumjung, the High Lama of Thyangboche, to the Inspector of Police, Namche Bazar (who also helped in compilation of tourism statistics) and to the other Sherpas of Khumbu for their information of local problems.

Captain G. J. Furer of the United Nations provided me with the most recent map of Khumbu, and the bulk of the literature cited and also helped in German translation (papers of the Thyssen Foundation) and I am grateful for his help. I am indebted for the guidance and help from T.B. Raymajhi, Secretary of Forest, H.M.G., R.B. Thapa, E.J.B. Rana, B.B. Basnet, B.N. Upreti, B.P. Upadhyaya and U.B. Shrestha of the Forest Department H.M.G., S.E. Pellback (F. A. O. Country Representative), J. Blower, F. Poppelton, of the U.N.; James Foster of the Arun Valley Expedition;

the Doctor of Kunde Hospital (for his help during my sickness); and last but not least to S. Raiena-
litd who arranged for getting me airlifted from Lukla when my physical condition made it necessary.

While I acknowledge the assistance of the above people on reaching the conclusions outlined
subsequently, any error of fact, or interpretation of facts, is my own.

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Mt. Sagarmatha (Mt. Everest) From Khumjung.

A. Introduction

1. Background:

Since it was discovered in 1852 (Dyrenfurth 1963), Mt. Everest remains unique as the highest mountain on earth. Since then a special status has been given to it both as the highest peak in the world and by virtue of its unique geographical location in the grandeur of the Khumbu valley. The valley harbours some diverse Himalayan flora and fauna and within it dwell the famous Sherpa mountaineers.

Prior to 1950, the southern side of the Everest region in the Khumbu valley remained a mystery, since all expeditions were made only through the northern side in Tibet. After several unsuccessful attempts through Tibet before 1950 and through Nepal in 1950, 1951 and 1952, Everest was finally climbed in 1953 by Tenzing Norkay and Edmund Hillary. The ascent of Everest triggered a large influx of mountaineers, scientific explorers, tourists and the like, with the result that an isolated region in the then unknown Nepal became one of the main factors in making the country known to the outside world.

The early visitors to the Khumbu valley found majestic mountains rising from well-forested valleys rich in wildlife and abounding in colourful plant communities. However, much of these have been lost as a result of continual encroachments by human beings and animals. This has been mainly due to un-controlled grazing combined with excessive felling which has further led to the rapid degradation of land quality. Now, it has become urgent to protect this area for both economic and ecological reasons. Blower (1972) stressed that the conservation of this natural environment is all the more crucial since its destruction would result in disastrous erosion leading to an enormous economic and aesthetic loss to the country. Hence, to insure conservation and to increase the country's revenue from tourism, a national park should be established in the Khumbu region. The reasons advanced by Blower (1971) for the establishment of a National Park in Khumbu are strongly endorsed by this writer. They are as follows:-

1. As the highest point of Earth's surface, Mt. Everest and its surroundings are of major significance not only to Nepal but to the whole world, and its status as a National Park would bring international prestige and support to the country.
2. Khumbu is already an important tourist area and its importance does not show any signs of decline. The scenic and wilderness values 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 depleting forests of Khumbu are not only of aesthetic value but are vital for the people of Khumbu as a source of fuel and building material. They also play an important role in conservation of soil and water and harbour much of the wildlife.
4. As an ecological unit in the highest region of the world, the Dudh Koshi drainage is of much scientific value and offers unique research fields to scientists throughout the world.
5. The area is of major religious and cultural significance in Nepal since it abounds in holy places like the Thyangboche and also is the homeland of the Sherpas whose way of life is unique, compared to other high altitude dwellers.

Thus Mt. Everest and its surrounding land seem to be best utilized by the creation of a National Park with its consequent control and conservation scheme.

II. Proposed Boundary of the National Park :

Though rich in bird life, wild animal population in Khumbu is relatively poor, and there seems to be little potential for establishing a national park based on viewing of big animals by tourists (as in Chitwan). But wildlife (mainly birds) can form an important part of a more extended scheme of the National Park based on panoramic mountains, well-forested valleys, sacred monasteries and the Sherpa way of life, with Everest forming an integral and commanding part of the Park. Hence for reasons outlined above (I) a unit enclosing about 480 sq. miles of the upper catchment of the Dudh Kosi is suggested to be given the legal status of a National Park.

This unit is enclosed on all sides by natural physical features (i. e. ridges) and is only accessible by ground from the southern side through the Lukla-Namche trail or from Thame in the north. It also forms a compact ecological, cultural and management unit.

The proposed boundary of the park is as follows (see attached map):

- South: From Pigherago Shar peak in an easterly direction along the ridge to Ten Kangpoche peak, to Kongde Ri peak thence along the ridge to Dudh Koshi river on the Lukla-Namche trail which then climbs to Transerku peak to Kang Taiga peak and to Mingbo La following the ridge.
- East: From Mingbo La in a north-easterly direction to Ambhu Labtsa to Cho Polu peak, thence along the ridge to Nepal/China (Tibet) border.
- North: Along the Nepal/China border in a westerly direction to Lotse Shar peak to Mt. Everest peak to Pumori peak to Gyachung Kang peak to Cho Oyu peak and to Nangpa La.
- West: Ridge following Nangpa La in a southerly direction (along the Nepal/China border) to Menlung La to Tangi Ragi peak, to Trashhi Labtsa and to Pigherago Shar, the point of origin.

III. Villages inside the proposed National Park :

The proposed boundary encloses several villages with a population of more than 100 people.

It has proved to be difficult to learn the exact number of inhabitants in these villages, since the Sherpas are very mobile and often a family dwell in different places at different times of the year. Quite a few maintain summer settlement and winter settlement. Often, one finds several deserted houses (even small villages) without any human activities. The Sherpa way of life and the high mountainous terrain of the country makes it difficult to obtain exact population figures. Generally the number of houses in a village is known, and the average size of each household in Khumbu is 7 persons (Bodenmann 1971). Table (A.1) shows village sizes inside the proposed park based on the number of households.

Table A. 1

VILLAGE SIZE AND POPULATION

<u>Name of Village</u>	<u>Number of Households</u>	<u>Inhabitants</u>	<u>Remarks</u>
Namche Bazar	106	742	1. Does not include several new constructions of this new year.
Khumjung	103	756	2. Does not include temporary residents.
Kunde	66	452	3. Pangpoche and Dingpoche have the same population since Dingpoche is the summer settlement of the inhabitants of Pangpoche.
Pangpoche	60	420	
Dingpoche	80		
Phorse	57	399	
Others (including monasteries)	50 (approx)	350	
Total	527	3119	

In addition to these, there are walled fields, cattle sheds and other private land holdings, whose records are not available.

It is neither feasible nor desirable to remove these villages in view of socio-economic and cultural reasons. Neither will their exclusion from the National Park by shifting the proposed boundary help in implementing a conservation programme in the region, since they are situated in the vicinity of forest lands where conservation is most important. (These forests provide the basic needs of fuel and building material to the Sherpas, and at present they have no alternative).

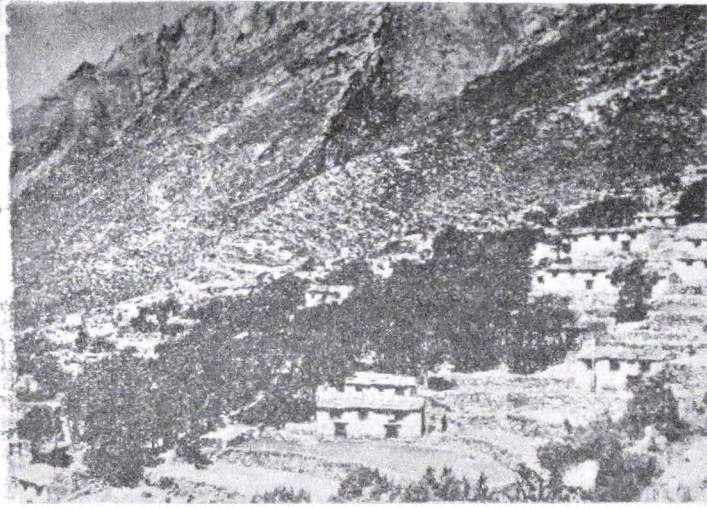
The appreciation and conservation of nature by local people can make little progress unless their basic requirements (particularly in harsh climatic conditions) are provided. Thus conservation activities in Khumbu must integrate the forestry and agricultural requirements of the Sherpas. This probably is best achieved by "excising" the villages inside the National Park (as in some of the Uganda National Parks), when the Bye-laws and regulations of Mt. Everest National Park are formulated, and they should be allowed to retain certain traditional rights. Though this implies that the Sherpas should be allowed to collect fuel wood and maintain some of their grazing rights, it is stressed

this should be done only on the principle of sustenance supply and within sound ecological principles. It seems that this can be best done by devising a rotational scheme of forest and grazing management. Suggestions as how to "excise" villages need to be sought from experts of the WWF and the IUCN.

No records on land holdings were available and it is not possible to determine how much of private land falls within the proposed boundary of the National Park. This record is necessary for finalization of park boundary, and for "excising" the villages falling inside the park. The rapid increase in tourism has also resulted in the apparent construction of new "hotels", "tea houses", and the like in several places. It was not possible to find out whether these activities are undertaken in private land or on public property. Thus a detailed survey map of the area is necessary. Based on this, all villages and private land holdings need to be demarcated by permanent posts; and to check unaesthetic development, any new construction or settlement should be subjected to the approval of HMG authorities.

Survey work takes considerable time, so it is recommended that the Land Survey Department (Napi) of the Ministry of Agriculture be asked to undertake this work from the beginning of this dry season. They should carry out land survey works in collaboration with the Chief District Officer, Solukhumbu, and the Forest Department, HMG. In the end, the survey team should produce a detailed map on private land holdings.

The cost for demarcation works is approximated to be Rs. 10,000.



(Barren Hillside Behind Namche Bazar)

Photo: Naylor

B. The Area

I. Background:

The proposed park boundary encloses 480 square miles (1228.8 sq. km.) of the upper catchment of Dudh Koshi. This area is situated in North Eastern region of Nepal in the Solu-Khumbu District of Sagarmatha Zone.

As compared to other regions in Nepal, considerable amount of studies has been carried out in Khumbu. Some relevant ones are by Bista (1957) and Furer-Haimendorf (1964) on the socio-economic pattern of the Sherpas; by Hagen (1961) on geology of the Khumbu region; by Naylor (1970) and Stainton (1972) on the forest; by Donner (1968) on agriculture practices; by Bodenmann (1971) on power resources and by Swan (1961) on the ecology of the region.

More recently, the Fritz Thyssen Foundation of Germany (which also has a unit in Kathmandu) has carried out detailed studies on the ecology of the region and have produced several publications in German. Their findings are foreseen to be of considerable value for the future planning and management of National Parks. They need to be translated from German into English or Nepali.

Available literature should be consulted for details omitted in this report.

II. Methods of Study:

This report is based on 37 man days of field studies in Khumbu (20 man days by this writer and J. Fox, and the rest by J. Fox only). The principal methods used are as follows:

1. Traverse by foot over the area to get an insight of the region (see attached map).
2. Discussion with local villagers, temporary residents, and concerned authorities yielded valuable information on human problems of the region.
3. A literature survey of available publications and HMG files revealed much of the information which could not be collected during the short period of field studies.

III. Vegetation within the proposed Park boundaries:

A comprehensive description of the natural vegetation in Khumbu is given by Voutier (re-quoted from Bhatt 1964), Stainton (1972) and Naylor (1970). The Fritz Thyssen Foundation has

also published several papers (in German) on the vegetation of that region. The Japanese also have carried out a few botanical studies. Most of these findings are published.

A brief description of the main forest types within the proposed boundary of the park is as follows:

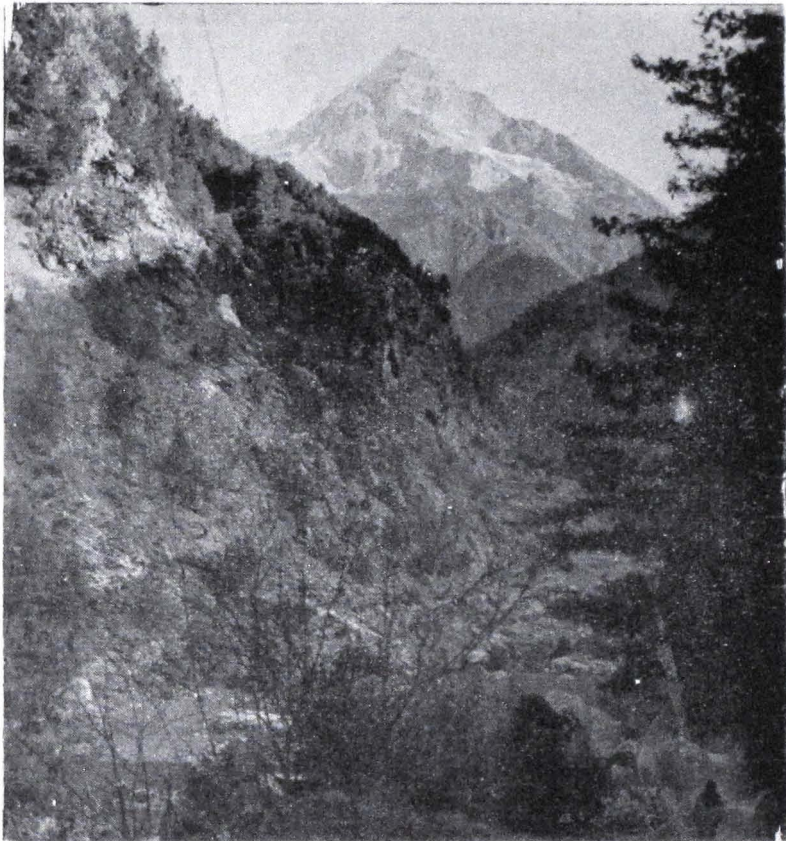
- A. Blue pine wood- (*Pinus excelsa*) is found mostly between 2800 m. (9100 ft.) to 3300 m. (10,800 ft.) in the deep valleys of Bhote Kosi, Imja Khola and Dudh Kosi. The blue pine there is probably of secondary growth due to cutting, grazing and fire. Timber is used for building materials.
- B. Fir and Fir--Juniper woods (*Abies spectabilis*; *Juniperus recurva*) are found mostly between 3200--3900 m. (10,500-12,800 ft.) in the area just above pines on the slope of Imja Khola, Dudh Koshi and Bhote Kosi. Open areas in this type are often invaded by *Rhododendron arboreum* and other shrubby species.
- C. Birch--Rhododendron woods (*Betula utilis*, *Rhododendron campanulatum* and *R. campylocarpum*)--are found mostly between 3600-4200 m. (11,800-13,800 ft.) along the upslope of Fir-Juniper type and tend to extend furthest on the northern slope. *Rhododendron campanulatum* usually continues a bit further up than the other two species.
- D. Juniper-- Rhododendron scrub (*Juniperus wallichiana*, *Rhododendron anthopogon*, *R. lepidotum*) is seen between 4000--4700m. (13,100--15,400 ft.): continues up the valleys as conditions become drier. It is the dominant vegetation near the highest settlements. The Juniper is extensively used for fuel along with Rhododendron (and yak dung). In this area *Myricaria rosea*, *Hippophae tibetana* and *Salix* species are found along river sides. The rhododendrons along with other scrubs continue above; and the highest limit reached by rhododendron (*Rhododendron nivale*) is about 5,200m. (17,000 ft.). In this region some of the alpine herbs were in bloom and form an important part of the vegetation. The species composition and their relative density seemed to be largely determined by grazing of domestic cattle.
- E. Above this (D), small scrubby plant communities were found (often in rock crevices) to continue upward up to an altitude of about 6000 m. (20,000 ft.), beyond which it was rare.

IV. The fauna:

1. Mammals:-

Caughley and Mishra (1968) outlined the following peculiarities that are basic to understand the fauna of the Himalayan region of Nepal:

- a. The Himalayan Zone separates the regions occupied by the Oriental fauna (India and South-East Asia) and the Palaearctic fauna (Eurasia, excluding S. E. Asia), but neither contributes many species to the fauna of the Himalayan Zone.
- b. Endemic Himalayan fauna have not developed since the Himalayas are geologically young and have not evolved a fauna of its own.
- c. The number of mammalian species in central Nepal Himalayas is lower than to its East and West.



A Well Forested Valley Along the Trail in Upper Khumbu.

- d. The low density of mammalian population in the Himalayan region of Nepal can be traced directly to the activities of man in changing the forest habitat. Thus the mammalian population in Khumbu was found to be very low. The following table (Table B.1) shows some of the large mammals known to be found in the Khumbu region.

Table B. 1

COMMON WILD MAMMALS OF KHUMBU

<u>Common Name</u>	<u>Scientific Name</u>
Snow leopard	<i>Panthera uncia</i>
Black bear	<i>Selenarctos thibetanus</i>
Red panda	<i>Ailurus fulgens</i>
Wolf	<i>Canis lupus</i>
Weasels and Marten	<i>Mustela spp. and Martes spp.</i>
Himalayan Mouse Hare (Pikka)	<i>Ochotona roylei</i>
Himalayan thar	<i>Hemitragus jemlahicus</i>
Blue sheep	<i>Pseudois nayaur</i>
Goral	<i>Nemorhaedus goral</i>
Serow	<i>Capricornis sp.</i>
Musk deer	<i>Moschus moschiferus</i>
Langur	<i>Prebytis entellus</i>

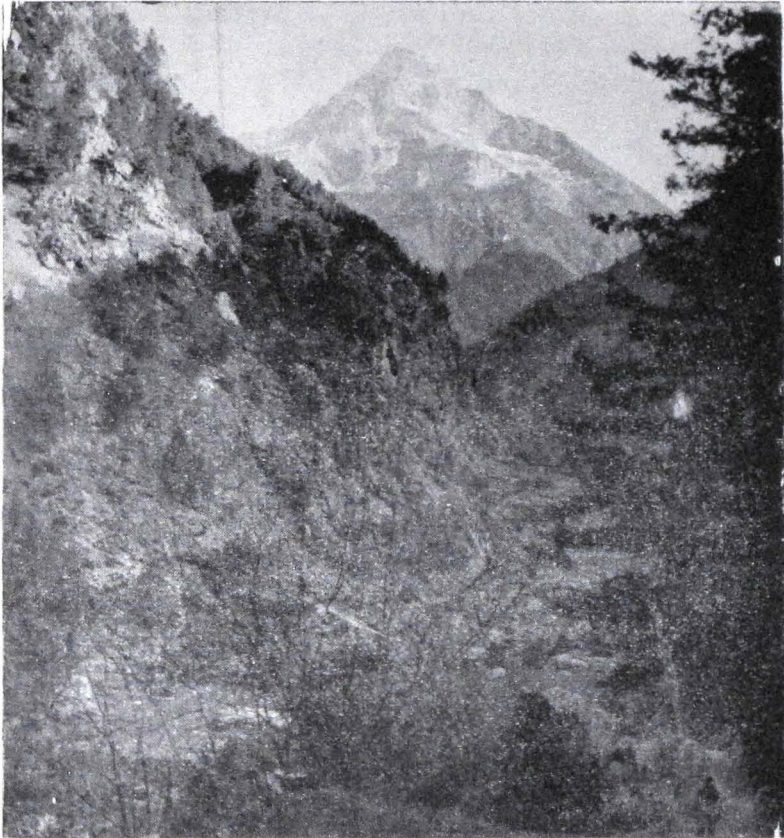
2. Birds:-

Khumbu is relatively rich in bird population. The following list gives the common birds of Khumbu, which were sighted during this study. (Bird list prepared by J. Fox).

List of birds sighted in Khumbu (May June):

- Snow partridge *Lerwa lerwa*
- Danphe pheasant *Lophophorus impejanus*
- Blood pheasant *Ithaginis cruentus*
- Ruddy Sheldrake *Tadorna ferruginea*
- White-capped redstart *Chaimarrornis leucocephalus*
- Himalayan dipper *Cinclus pallasi*
- Himalayan ruby-throat *Calliope pectoralis*
- White winged grosbeak *Perissospiza sp.*
- Black-crested tit *Lophophanes rufonuchalis*
- Golden bush robin *Erithacus chrysaeus*
- Red-flanked bush robin *Ianthia cyanura*
- Snow pigeon *Columba leuconota*
- Rose finch *Carpodacus erythrinis*

Tickells Willow warbler *Phylloscopus affinis*
Tufted pochard *Aythya fuligula*
Rufous breasted accentor *Prunella strophiata*
Jungle crow *Corvus macrorhynchos*
Red billed chough *Pyrrhocorax pyrrhocorax*
Yellow billed chough *Pyrrhocorax graculus*
Woodcock *Scolopax rusticola*
Kestrel *Falco tinnunculus*
Lammergeier *Gypaetus barbatus*
Hodgson's Pied wagtail *Motacilla alba*
Eastern grey wagtail *Motacilla cinerea*
Whistling thrush *Myiophoneus caeruleus*
White throated laughing thrush *Garrulax albogularis*



A Well Forested Valley Along the Trail in Upper Khumbu.

C. Tourism

I. Background:

Tourism (including mountaineering) is one of the main sources of Sherpa income. Despite their geographical isolation, the competence and reliability of the Sherpas provide them a better standard of living than people of other comparable regions.

The number of foreign tourists has increased from 20 in 1964 to 3,200 in 1972/73.

TABLE (C. 1) shows the number of tourists that have visited Khumbu in the last few years, and TABLE (C. 2) shows the number (and percentage) of visitors from different countries that have visited Khumbu in year 1972/73 (2029/2030 Nepali F. Y.).

Table C. 1
FOREIGN VISITORS IN KHUMBU

<u>Year</u>	<u>Period</u>	<u>Number of foreign visitors</u>
1964—1969/70	6 years	1020
1970/71	1 year	558
1971/72	1 year	895
1972/73	1 year	3200

Table C. 2

NUMBER OF VISITORS FROM DIFFERENT COUNTRIES IN YEAR 1972/73

<u>Country</u>	<u>No. of visitors</u>	<u>Percentage of total</u>
E. E. C. (Countries)	651	20.4
U. S. A.	549	17.2
Japan	489	15.3
Europe other than E. E. C. countries	131	4.1
Australia / New Zealand	120	3.7
Canada	56	1.7
Asia other than Japan	13	0.4
Africa	8	0.2
Country unspecified †	1183	37.0
<u>Total</u>	<u>3200</u>	<u>100 %</u>

† Note: Country unspecified includes visitors with U. N. passports, Indian nationals and others who did not register or pass-through the Namche Police Post.

The Trans-Himalayan Tour (a sisterly organization of the Hotel Everest View) estimate that 10,000 foreign tourist will visit Khumbu in the next four years. Thus tourism is foreseen to remain a dominant factor of the economy of the Khumbu region.

However, touristic trade in Khumbu at present is far from being organized (with probable exception of Everest View Hotel) and pays little or no respect to the existing natural environment. Negative effect of un-organized tourism has resulted in several unwanted establishments along the Everest trail. These new developments at present are uncontrolled. If this trend is allowed to continue, it will result in the creation of a number of unaesthetic commercial establishments motivated with the quick buck attitude.

Further uncontrolled and unorganized tourism has resulted in ugly garbage dump and litter in the region of the highest mountain of the world. The garbage problem is more apparent in Thyangboche, Periche, Lobuche and Gorakshep, which has an unusual collection of "Exotic and imported" litter. A quick sampling of garbage dump in these areas can provide an excellent idea on different nationalities that have visited Khumbu and is also a source of learning (as one environment-conscious traveller cynically stated) the food habits of the affluent people from all over the world.

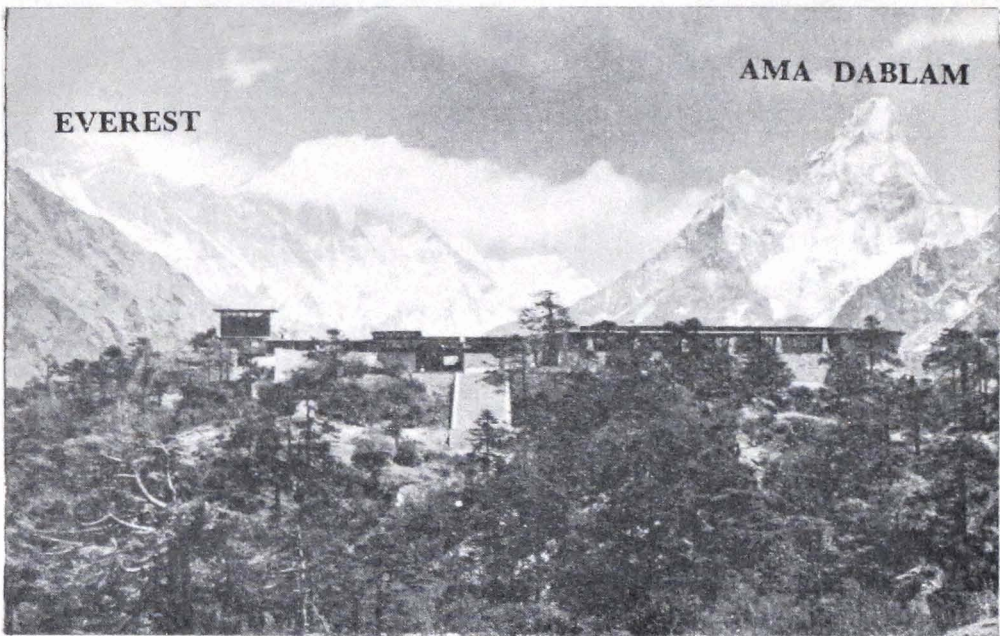
The demand for fire wood has also increased with the increase in tourism. Expeditions and "group" travellers deplete a considerable amount of timber for cooking or for "bon fires" to fulfil the demands of tourists, and the needs of their porters. Though touristic development in Khumbu has enough economic justification, it must insure that touristic utility does not exceed the carrying capacity of nature.

The 12th Technical meeting of the IUCN (1971) (in which this writer participated) stressed that un-balanced touristic trade based on more economic argument results in visual, cultural and nature pollution. This latter retards economic and social development of the country by defeating its own objective. Thus it becomes necessary to regulate tourism in Khumbu under the control of the National Park and it should aim at preserving the natural environment.

II. The Everest View Hotel:

The newly constructed Everest View Hotel (a joint Nepalese - Japanese venture in private sector) near Khumjung provides comfortable living for vistors whose monetary resources fall within the upper income brackets. So far they have taken 650 guests and from the beginning of next year are expecting about 85% occupancy (Shozo Mihyara: personal communication 1973). At present they employ 22 Sherpas paying a salary of about Rs. 30,000 per annum. The hotel has 12 double rooms. Despite the sudden increase in number of tourists in Khumbu, the Everest View Hotel does not seem to desire to expand to more than another 12 rooms. They stress that they are aware of the ecological problems because of sudden increase of tourists. Any further commercial development will defeat the very purpose of the establishment of Everest View Hotel (Source of this information: Takashi Miyhara, Director Hotel Everest View; and "Conservation in Everest", Memorandum of Trans--Himalayan Tours (1973)).

Assuming that Everest View Hotel desires a complete harmony between Nature and their touristic trade, it is best integrated into the concept of a National Park as a park concession.



EVEREST

AMA DABLAM

Mt. Sagarmatha And Mt. Ama Dablam, With Hotel Everest View

III. Trekkers' Accommodations:

Even though Everest View Hotel can absorb some of the rich tourists, the bulk of trekkers in that area seek shelter at random, since Khumbu lacks any proper accommodation facility. Some dwell in local Sherpa houses and some live in tents, and their activities are mainly concentrated along the Lukla-Everest base-camp trail. Their un-controlled activity and lack of proper shelter are mainly responsible for unstable pricing of local commodities, mushrooming of new unplanned construction and the overall nature pollution.

Thus it is necessary to provide proper trekkers' housing facilities in the region. These houses need not be very elaborate and should be within the means of an average trekker. The following specification is suggested:

- 1 Men's dormitory, 15 bunks
- 1 Women's dormitory, 5 bunks
- 2 Rooms with 3 bunks each
- 1 Kitchen-cum-dining room
- 1 Storeroom
- 1 Staff room
- 2 Wash-room

Estimated cost of each of these houses using local materials is about Rs. 150,000. This cost includes furnishing and could be scaled up or down depending mainly on how elaborate a construction is necessary and subject to an architect's evaluation at site.

Five such buildings will be required immediately in the vicinity of Namche-Everest base-camp trail (the most popular route of travel at present). Another five with lesser capacity and each costing about Rs. 100,000, will be required in other areas.

The following table (Table C. 3) and attached map shows the suggested location of proposed houses and is listed according to priority.

Table C. 3
SUGGESTED LOCATION OF REST HOUSE

Serial No.	Location (nearest village)	Capacity	Cost Rs.	Remarks
1.	Periche	26 lodgers	150,000	1. Timber required to be extracted from outside the boundary of the proposed park.
2.	Lobuche	26 lodgers	150,000	
3.	Thyangboche	26 lodgers	150,000	
4.	Khumjung	26 lodgers	150,000	2. All houses to be constructed in Nepali (Sherpa) type design and in complete harmony with the local surroundings.
5.	Taog	26 lodgers	150,000	
6.	Gorakshep	12 lodgers	100,000	
7.	Thame	12 lodgers	100,000	
8.	Gokyo	12 lodgers	100,000	
9.	Lhabarma	12 lodgers	100,000	
10.	Phorse	12 lodgers	100,000	
Total cost			1250,000	

IV. Radio Communication:

The tourist houses should be connected by radio communication to assist in proper management of the Park and also help in rescue operation. Last year 7 people died and several got acute altitude sickness since timely communication leading to necessary actions was not possible.

10 portable radio communication sets will be required in each trekker's house and one long distance (SSB) communication set in Khumbu (at park head quarters) and one in Kathmandu. (At the Head Office of the National Park and Wildlife Conservation section).

The cost of these radio sets similar to the ones in use by the Nepal Police is as follows:—

VHF portable radio telephone 10 set each at Rs. 6750. Fixed SSB sets and accessories 2 sets, each at Rs. 12,500. Total cost for all 12 sets is Rs. 92,500 (approx).

The above costs are based on the price list of Pye Company of U.K.

V. Garbage disposal:

The visitors to Khumbu should be informed (by notices, vouchers, sign boards) not to litter along the trail but to carry their litter and dispose of it at garbage pits. Such pits need to be dug near touristic settlements. For proper maintenance of garbage pits and to keep the area clean from litter, it is proposed that a garbage disposal team consisting of 5 men be assigned in the near future.

Later this unit should be intensified and garbage bins need to be installed at regular spacing along the tourist trail.

VI. Entrance fee for foreign tourist:

To help maintain the National Park in its natural environment (which provides aesthetic pleasure to tourists) it is suggested that all foreign visitors be charged a Park entrance fee of 10 U.S. dollar (Rs. 100 N.C.). This is a feeble amount compared to the total amount a visitor has to spend in getting there and seems to be within the means of any average foreign traveller. Entry to park should be allowed through Taog (along the Lukla--Namche trail) and through Syangboche air strip.

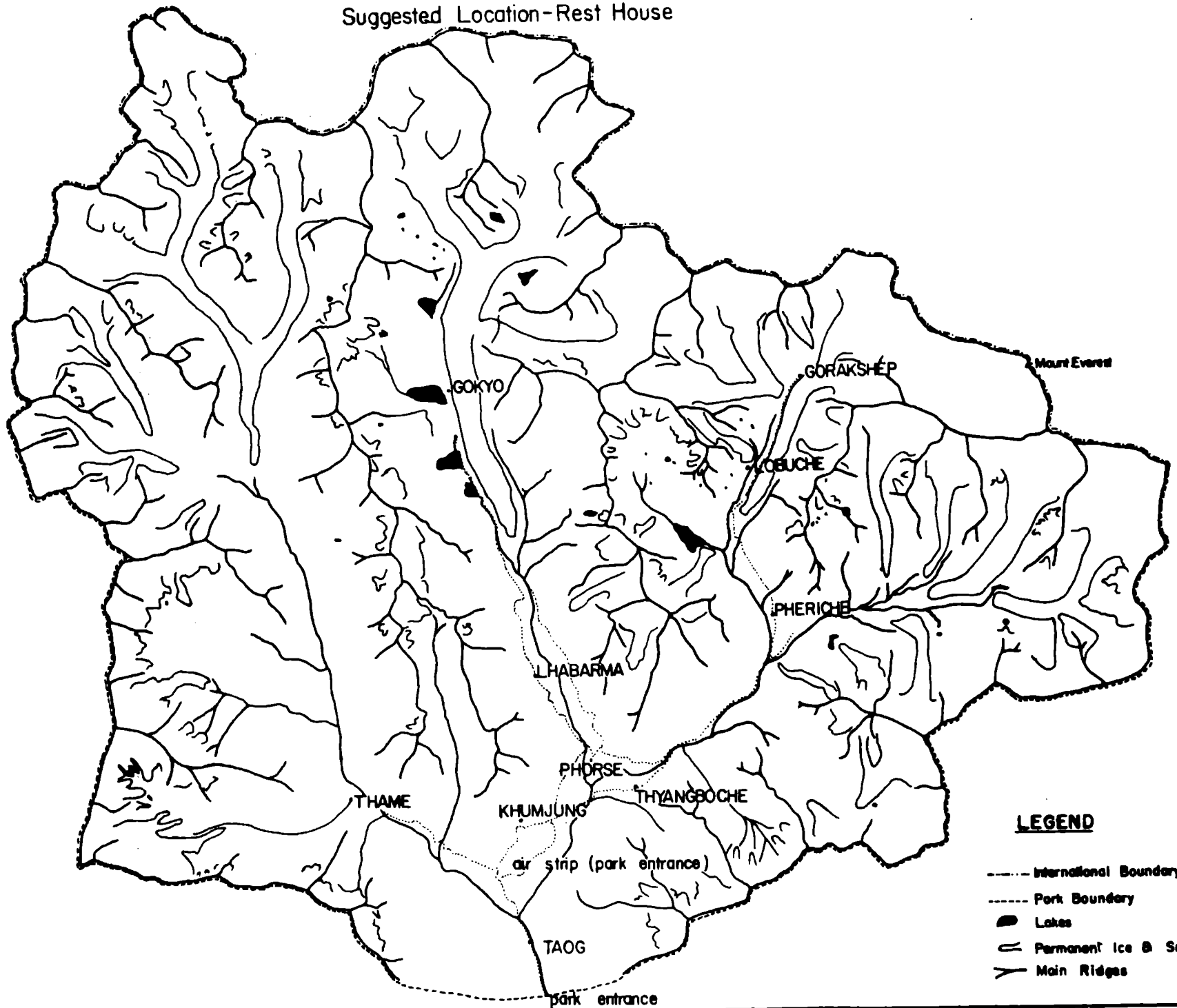
VII. Restriction on tourists to consume local fire-wood:

At the prevailing price of Rs. 15-25 for a man load of firewood; hauling fuel wood to travelers (and expeditions) at the expense of natural forest land has become quick way of making money for some of the local people. This practice needs to be restricted. One way of doing so is to encourage all trekkers (including mountaineering expeditions) to carry kerosene cookers and the like, to fulfil their own requirements and to provide cooking fuel for their porters. This seems to be best done by establishing fair price shops by the National Trading Corporation in Khumbu.

VIII. Improvement of Syangboche air strip:

The newly constructed air strip at Syangboche is only suitable for Pilatus-porter aeroplanes. It needs proper surfacing and some improvement since that air strip will serve as the main gate to the Everest region and will also be the centre of communications of the region. Its further improvement leading to regular scheduled flights seems necessary. The cost for improvements so as to accommodate Twin-otter planes (of the Royal Nepal Airlines) and to metal the runway amounts to about Rs. 5,000,000 (approx). If the runway is not metalled the cost for improvement of the air strip goes down to Rs. 500,000 only (approx).

Suggested Location - Rest House



Mount Everest

GOKYO

GORAKSHÉP

LOBUCHÉ

IPHERICHE

LHABARMA

PHORSE

THAME

KHUMJUNG

THYANGBOCHE

TAOG

air strip (park entrance)

park entrance

LEGEND

--- International Boundary

.... Park Boundary

● Lakes

∩ Permanent Ice & Snow

Y Main Ridges

IX. Electrification for an alternative source of fuel:

The harsh climatic condition, topography and isolation make the Sherpas depend much upon forest for heating and cooking fuel. At present each household needs at least a human load of fuel-wood per day. Naylor (1970) estimated that the requirements of fuel-wood of Kunde and Khumjung alone amount to 11,150 Cu. ft. per annum. In view of the demands of Namche, Thame, Thyangboche, Phorse (the large villages inside the proposed National Park) plus the demands for fuel from Everest View Hotel, Trekkers huts, and Kunde Hospital, gross over-cutting becomes unavoidable unless an alternative is sought. Electricity could provide such an alternative.

Bodenmann (1971) has carried out preliminary studies on establishing Hydro Electric Micro Plant in Khumbu and found it to be feasible. The estimated cost based on his findings for construction of micro hydro electric plant in the Khumbu area is as follows:—

A. Plant materials and Buildings	Rs. 5,25,000.00
B. Civil works	Rs. 7,00,000.00
C. Pen stock	Rs. 4,00,000.00
D. Transmission	Rs. 2,65,000.00
E. Distribution	Rs. 2,65,000.00
F. Miscellaneous (including transportation cost)	Rs. 4,00,000.00
	<hr/>
Total	Rs. 25,55,000.00

This cost was estimated by an engineer of the Electric Corporation Nepal for generating a total of 240 KW of power and is subject to detail studies at site. This cost was based on Bodenmann's (1971) findings and on cost of Dhankuta Power Plant Project.

At present each household consumes about Rs. 4.60/ per day worth of fuel for fire and lights (Bodenmann 1971) and power purchase seems to be within the means of the majority of Sherpas. The micro-hydro electric plant besides being economically and technically feasible is justifiable as an indirect measure to protect the natural forest from being consumed. This could also help the standard of living of the local communities.

X. Water Supply:

Small water supply units exist in Khumjung-Kunde area, Thyangboche and Phorse. The sources of water are known to be generally frozen during December-February and villagers have to travel considerable distance for water to fulfil their needs and the needs of their cattle. The Syangboche-Everest View area lacks any water supply throughout the year and this area encompasses one school, one hospital, a government experimental farm, Shyanboche air-strip establishment and Hotel Everest View. At present water is carried from Namche Bazar to this area on human backs.

To meet the needs of an estimated 10,000 tourists (in the next four years) and to fulfil the needs of the present establishments, an improved water supply system needs to be established. The proposed rest houses also need proper water supply. Details on required water supply scheme have yet to be worked out. A rough estimate of installing water supply to suffice the present needs is approximated to be Rs. 500,000.

D. Involvement Of Local People

I. Background:

As His Royal Highness Prince Gyanendra emphasized, nature conservation in Nepal can make little progress unless the local community is involved in conservation schemes.

Initially, this can be best done by providing jobs through conservation activities and launching an educational scheme to make people aware of their environment.

Pending detail studies on this subject, the following are suggested as an initial step to involve the local people within the framework of the National Park:-

1. The Sherpas of Khumbu should be given the first priority of jobs at the National Park and its development activities.
2. To do so, certain relaxation on the existing H. M. G. staff recruiting system is necessary.
3. Considering the harsh climatic condition and isolation, the people of Khumbu lead a hard life much dependent on the available Natural resources. Certain development activities in the National Park (as given in this report) seem necessary. This would provide employment and also reduce the pressures exerted by the local people on Nature. Further, it helps to improve the Sherpa's standard of living and also make him aware of the Government conservation activities; provided these activities are formulated within the framework of the National Park.

II. Formulation of a committee:

To avoid confrontation between human demands and conservation requirements, a "guidance" committee needs to be formed. This committee should be empowered to make the final decisions on major aspects of the National park in case conflict of interest arises.

The following personnel are suggested to constitute such a committee:—

- 1) Hon. Member Rastriya Panchayat, Solo Khumbu District.
- 2) Representative of the Department of Tourism, H. M. G.
- 3) Representative of the National Parks and Wildlife Conservation Section H. M. G.
- 4) Representative of the Remote Area Development Board .

To assist the "guidance" committee, a sub-committee consisting of local representatives may also be formed. The following personnel should constitute such sub-committee:—

- 1) Representative of the Chief District Officer, Solo Khumbu

- 2) Warden, Mt. Everest National Park, Solo Khumbu
- 3) High Lama, Thyangboche, Solo Khumbu
- 4) Pradhan Pancha, Namche, Khumjung, Phorse
- 5) District Chairman, Solo Khumbu
- 6) Chief Police Officer, Solo Khumbu

E. Forestry Management

I. Background:

In the past, it was considered a sinful act for a Sherpa to fell a green tree. Since trees provided the Sherpas one of their basic needs of survival i.e. fuel, they had grown to respect forest, and wasteful usage of timber was prohibited by the community. Each village had its own wardens to see that wasteful cutting of trees was avoided.

In recent years, the decline of the old Sherpa tradition led to the decline of forest resources in Khumbu. This was further accelerated by the increase in human and cattle population. At present, the forests of Khumbu are under heavy pressure. They are cut for firewood and timber, lopped for fodder, and even blazed to make torches (splinters of conifers are used to produce light by the Sherpas when travelling during the night). Thus any management ensuring the continued existence of the forest is lacking.

II. Management proposals:

Naylor (1970) carried out detail studies on forestry in Khumbu. He urged that forest management is entirely a matter of policing, and recommends the system of "control by area".

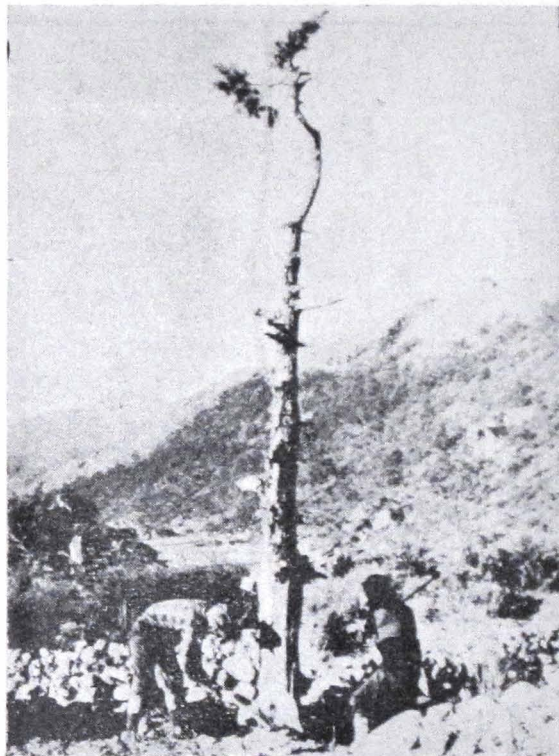
This is best done by dividing the whole forest area near each village into a number of working units. Timber required by villagers should be obtained from one unit (coupe) per year, in rotation. Naylor (1970) suggests a 60 year rotation: thus 60 units (coupes) need to be constituted with each unit workable every 60 year. Timber from each unit should be removed only on a selective basis.

The apparent lack of regeneration in most of the places reveals that forests in Khumbu are retrograding. Grazing is the main factor regarding regeneration and so the forest land must be protected against grazing. It is recommended that parts of the forest near every village be enclosed by cattle-proof fence till regeneration is complete. Naylor (1970) reckons that it will take at least 20 years for seedlings and saplings to be physically strong to resist cattle.

Since barbed wire fencing is not feasible (because of transportation problem and cost), stone wall (locally available) fence and strict policing by the Park guards are suggested as measures against grazing.

III. Reforestation:

Certain parts of the area were well forested in the last few years but now are completely devoid of trees (e. g. Syangboche area / Namche area). Forest in these areas needs to be restored by planting indigenous species to fulfil future human requirements, and to ensure soil conservation.



Tree being felled after several years of topping.

Photo: Naylor.

As a start, the Australian Aid Reforestation adviser to H. M. G., and one counterpart of his should be requested to make field studies on reforestation schemes in Khumbu. The best period to do so seems to be the beginning of this dry season. Based on their findings, one Asst. Warden and 3 Foresters of the National Park should be made responsible for reforestation work.

IV. Cost:

Table (E. 1) shows the estimated cost for forest management. It is emphasized the below-quoted figures are only an approximate indication of cost for the first year.

Table E. 1
FOREST MANAGEMENT COSTS

<u>Item</u>	<u>Cost (Rs.)</u>
Forest nursery	50,000
Fencing (using stone walls)	60,000
Pitting	30,000
Planting	20,000
Others	25,000
Total	<u>1,85,000</u>

F. Agriculture

Background:

The agricultural practices in Khumbu, particularly animal husbandry, are largely dependent on forest resources. Trees are lopped for fodder, leaves, chiefly rhododendron, are swept for animal bedding and forest land is used as grazing ground. There is also an apparent expansion of cultivation by clearing forest and scrub land. The farmers there do not only possess land near the villages, but also own plots at lower and higher altitude. Shifting agriculture seems to be of regular occurrence. In no way is Sherpa farming easy in climatically inhospitable Khumbu both for him and on the natural resources. Any improvement in agriculture practices that could make Sherpa farming less dependent on forest land consumption should be in the interest of the National Park.

Within the limited scope of this study, detail investigation on agriculture could not be undertaken, though it is stressed that the Sherpas seemed eager for any improvement.

Pellback (1973: Personal Communication) informed that under the U.N./F. A. O./H. M. G. agreement a high altitude farming project is being undertaken in Nepal in 1974. A Japanese farmer (presently under the employment of Hotel Everest View) has started a small farm in Chumo (near Taog) to make a trial on vegetable farming in Khumbu.

Information as to how to integrate agriculture within the concept of the nature conservation has to be sought from experts, particularly the ones from U.N./F. A. O./H. M. G. project.



Cattle sheds inside the boundary of the proposed National Park

Photo: Naylor.

G. Staff

Staff:

About 57 staff members will be required for the establishment and functioning of the National Park.

Table (G. 1) shows the details on the required staff: --

Table G. 1
PROPOSED STAFF AND THEIR SALARY

<u>Title</u>	<u>Class</u>	<u>Number required</u>	<u>Monthly Salary (Rs.)</u>	<u>Monthly allown.(Rs.)</u>
Warden	Gaz/C.III (tech)	1	570	285
Asst. Warden (Ranger)	Non. Gaz I (tech)	2	650	325
Dept. Ranger (Foresters)	Non. Gaz II	3	426	213
Khardar	Non. Gaz II	1	195	98
Mukhiya (Gate-Keeper)	Non. Gaz III	2	270	135
Bahidar (Store Keeper)	Non. Gaz IV	1	115	58
Subedar		2	442	60
Havaldar		10	1161	173
Guards (Protection)		30	3045	457
Guards (Garbage Disposal Unit)		5	508	254
Total		57	7382	2058

The Total Cost per annum for staff is as follows: --

Salary p. a.	Rs. 88,584.00
Extra Allowance	Rs. 24,696.00
Food/clothing Allowance	Rs. 200,220.00
Travel Allowance	<u>Rs. 10,000.00</u>
Total	Rs. 323,500.00

Note:—1. This cost does not include the salary of experts or other specialized personnel that will be required.

2. Cost is based on the present H. M. G. regulations.

II.Housing facilities for the staffs:

Khumbu is climatically in-hospitable. The staff in the National Park should be provided with well-equipped living and working quarters. The following is tentatively suggested.

Park Office (H. Q.)	Rs. 1,00,000
Warden quarter	Rs. 50,000
12 junior staff quarters at Rs. 30,000 each	<u>Rs. 3,60,000</u>
Total	Rs. 5,10,000



Kongde Peak

H. Conclusion

The establishment of a national park in the Everest region seems appropriate to maintain a balance between nature and tourism. Such a national park could provide a source of national income and is foreseen to bring international support.

References

- Bhatt, D. D. (1964) — — — — — — — — — — “Plant collection in Nepal” *Modrono* Vol. 7 (5) 145-152.
- Bista, D. B. (1967) — — — — — — — — — — “People of Nepal” H. M. G. Dept. of Publicity, Kathmandu.
- Blower, J. H. (1971) — — — — — — — — — — “Proposed National Park in Khumbu” Memo from the F. A. O. Wildlife conservation adviser to the Secretary of Forest, H. M. G. Forest Department File No. 219-2/ Khumbu.
- Blower, J. H. (1972) — — — — — — — — — — “Establishment of Khumbu National Park” Nepal, Outline project proposal”. File No. 219-2/ Khumbu. H.M.G. Dept. of Forest.
- Bodenmann, H. J. (1971) — — — — — — — — — — “Khumbu Hydro-electric Micro plant. Preliminary report”. Balaju Yantra Sala, Kathmandu.
- Caughley, G. J. and Mishra, H. R. (1968) — — — — — — — — — — “Wildlife and Recreation” Trisuli Watershed Project Report, Kathmandu.
- Donner, Dr. Wolf (1968) — — — — — — — — — — “Chances for high altitude agriculture in Nepal.” F. A. O. Project Report, Kathmandu.
- Dyrenfurth, Gunter-Oskar;
Hagen, T. and Furer-Haiemndorf C. Von — — — — — — — — — — “Mount Everest. Formation, Population and Exploration of the region.” Oxford Univ. Press.
- Furer-Haiemndorf C. Von (1964) — — — — — — — — — — “The Sherpas of Nepal.” Oxford Univ. Press.
- IUCN (1972) — — — — — — — — — — “Proceedings of the eleventh general assembly of the International Union for conservation of Nature and Natural resources”. IUCN Switzerland.

- Miyhara, S. (1973) --- --- --- --- --- --- --- --- Personal Communication; The Manager of Hotel Everest View.
- Miyhara, T. (1973) --- --- --- --- --- --- --- --- Personal Communication; The Director of Hotel Everest View.
- Naylor, R. (1970) --- --- --- --- --- --- --- --- "Colombo Plan assignment in Nepal." New Zealand Forest Service.
- Pellback, S. E. (1973) --- --- --- --- --- --- --- --- Personal Communication; The F. A. O. Country Representative.
- Stainton, J. D. A. (1972) --- --- --- --- --- --- --- --- "Forests of Nepal." John Murray, London.
- Swan, L. W. (1961) --- --- --- --- --- --- --- --- "Ecology of the High Himalayas." Scientific American 205 (4) 68-78.
- Memorandum of the Trans-Himalayan Tour (1973) --- --- --- --- --- --- --- --- "Conservation in the Everest Region." Kathmandu.
- Voutier, S. (1969) --- --- --- --- --- --- --- --- Cited from Bhatt (1964).