

Gokyo Valley Alpine Conservation and Restoration
Field Assessment

Sagarmatha National Park

Buffer Zone



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Report Submitted

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Gokyo Valley Alpine Conservation and Restoration Field Assessment

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1. Introduction:

The Gokyo valley is uninhabited except for the summer transhumance grazing and is noted for its religious significance and sacred pilgrimage sites for centuries. The holy lake known as Gokyo Lake is located in Khumjung VDC-2 of Sagarmatha National Park and Buffer Zone to the north west of Everest. Surveys and reports of occasional trekkers and park people revealed that over the years the Gokyo valley has become a popular destination amongst trekkers seeking adventure, challenges and solitude at its best.

Nepal is a land of mountains, with over 150 towering peaks above 6000m. Some of the mountain regions such as the Everest and Annapurna have changed much during the past few decades. Nevertheless, there are still few areas such as the Gokyo valley, which have remained impervious than other popular destinations. Located in North West of Everest base camp and Imja valley, the Gokyo valley forms the core area of the Sagarmatha National Park and Buffer zone.

2. Objective:

The focus of this field assessment was to explore the ways to manage and protect the fragile alpine ecosystem while promoting community based tourism in the Gokyo valley of Sagarmatha National Park and Buffer Zone. This includes maximizing benefits to local communities whilst protecting the fragility of the area. It also includes involving various stakeholders to protect alpine ecosystem of the Gokyo valley in order to achieve long-term conservation and development objectives. Specific objectives of the field assessment include to:

1. Assess the current situation of fuel wood use by lodges along the Gokyo and Thame valley
2. Conduct series of discussion with communities and stakeholders and introduce Khumbu Alpine Conservation Project
3. Assess the resources of the Gokyo valley as an ecotourism destination for wilderness experience;
4. Assess current park policies and activities and their impact on the alpine ecosystem;
5. Assess the impact of local herders in the Gokyo valley and identify possible alternatives to minimize their impacts and;

6. Develop management guidelines to protect the alpine ecosystem and quality management of the sacred lake

3. Gokyo Valley Field Assessment

In the interests of conserving and sustaining high mountain ecosystems in Gokyo valley of Sagarmatha National Park and Buffer Zone, the local lodge operators along the Gokyo valley requested the chief warden of Sagarmatha National Park and Buffer Zone and the staff members of TMI to conduct a short visit to Gokyo valley to assess the current situation especially the juniper fuel wood use by lodge operators and make good recommendations to replicate the successful Khumbu Alpine Conservation and Restoration Project in Imja valley of Khumjung-7 of Sagarmatha National Park and Buffer Zone.

The assessment was conducted with a set of survey questionnaires along with brochures and posters from KACC. The assessment was carried out by presenting the success story of Khumbu Alpine Conservation Restoration project from Imja valley of Sagarmatha National Park and Buffer Zone followed by survey questionnaires developed on fuel wood use and the fuel sources used in the lodges.

TMI staffs involved in this field assessment program were Ang Rita Sherpa (Senior Program Manager) and Sushila Thing (Gender and Development Officer).

4. Introduction of “Community-based Conservation and Restoration of Mt. Everest Alpine Zone” in Imja valley of Khumjung VDC-7 of Sagarmatha National Park and Buffer Zone

TMI has implemented “Community-based Conservation and Restoration of Mt. Everest Alpine Zone” in the Imja valley with Khumbu Alpine Conservation Committee (KACC) in Dingboche of Khumjung-7 of Solu Khumbu District of Sagarmatha National Park and Buffer Zone. TMI has implemented this project in the interests of conserving and strengthening high mountain ecosystems throughout the Khumbu and other areas in Nepal with a goal of protecting and restoring the fragile alpine ecosystem of the SNPBZ-one of the two World Heritage Sites in Nepal-through the strengthening of local management and conservation capacities.

This project was officially launched in 2003 with financial support from American Alpine Club (AAC), National Geographic Society’s Conservation Trust, U.S. Agency for International Development, United Nations Development Program/ Small Grants Program, and private individuals and donors.

The project is implemented and directed by local Sherpa communities in partnership with government agencies, non-governmental organization (NGOs), international NGOs, donor agencies, and the trekking and climbing communities.

4.1 Successful implementation of “Community-based Conservation and Restoration of Mt. Everest Alpine Zone” in Khumbu region of Sagarmatha National Park and Buffer Zone

The Community based alpine conservation and restoration project in Dingboche-7 of Imja valley has resulted in unexpectedly high levels of success in conserving and restoring the depleted fragile alpine ecosystem of Khumbu region through the formation of Khumbu Alpine Conservation Committee (KACC) in partnership with government agencies, non-governmental organization (NGOs), International NGOs, donor agencies, and the trekking and climbing communities. During the project period, KACC successfully implemented changes in the management and protection of the upper Imja Khola valley alpine zones. Activities during the project period included:

Banning the harvesting of all shrub juniper resulting in 80,000 kg saved fuel wood use in one year; established a kerosene and stove depot as fuel alternative to shrub juniper for local people, hotel and lodge owners, and trekking groups; establishment of a porter rest house in Lobuche to provide shelter, warmth, and cooking facilities for porters dependent on local shrubs for fuel wood; construction of a 50 m x 50 m cattle-proof enclosure in Dingboche as a demonstration of hill slope and ecosystem restoration; establishment of a shrub juniper and medicinal plant nursery in Shomare at 4000 m, the first alpine nursery in Nepal; trained basic financial accounting and project management methods to KACC members and developed and established an Educational conservation signboards along the Mt Everest and Island Peak routes; and informational brochures, alpine posters, and educational posters were published to increase visitor awareness and as a fundraising tool.

4.2 Replication of successful “Community-based Conservation and Restoration of Mt. Everest Alpine Zone” in Gokyo valley, Khumjung VDC-2 of Sagarmatha National Park and Buffer Zone

Despite a remarkable initial success in conserving and restoring Mt. Everest Alpine Ecosystem by KACC in partnership with various stakeholders including Sagarmatha National Park and Buffer Zone, the conservation and restoration of the entire Khumbu alpine zone is clearly a long-term endeavor that will require long-term commitment and investment by the conservation, recreational, and international communities.

The purpose of replicating this successful Community-based Conservation and Restoration of Mt. Everest Alpine Zone in Gokyo and Thame valley is because of the ardent request that came from the residents of Gokyo and Thame valley to expand alpine ecosystem conservation and restoration activities and impacts throughout the SNP.

TMI is planning to focus on (a) developing a detailed ecological and socio economic assessment of the effect of tourism development, and over collection of medicinal plants and grazing pressure on the alpine ecosystem (b) developing clear mechanisms for ensuring that all alpine biodiversity protection mechanisms are integrated into local and National Park and Buffer Zone planning and management processes, and (c) ensuring that local people have a voice through which to impart their traditional natural, cultural, ecological, and economic knowledge in the design and implementation of the project.

TMI believes that the local participation in alpine management will lead to improved enforcement of locally initiated resource management which will reduce fuel wood use, allowing slow-growing high altitude grass/shrub lands and pastures to regenerate. The restoration of the alpine regions of Solu Khumbu will strengthen Nepal's already significant achievements as a leader in community-based natural resources management. In order to continue this exceptional progress, it is desirable to expand the project into the remaining two alpine valleys within the Sagarmatha National Park and Buffer Zone (Thame and Gokyo valleys). Rapid assessment of alpine disturbance conditions in the Gokyo and Thame valleys of Sagarmatha National Park and Buffer Zone has been conducted to expand this project further into Gokyo and Thame valleys.

5. TOURISM AND IMPACTS IN GOKYO VALLEY:

The rich natural and cultural heritage of Sagarmatha National Park and Buffer Zone makes Khumbu Region an attractive destination for international and domestic tourists. The main source of attraction to Khumbu region is to explore and observe the Sherpa culture.

The prime tourism attractions in the Gokyo valley are the mountains and peaks of various sizes. Sagarmatha National Park, despite the general decrease in the number of tourists in other parts of the country, has witnessed a growing number of tourists this year. The Gokyo valley attracts around one quarter of trekkers per year visiting the Everest region.

The scenic beauty of the Himalaya Peaks, clean environment, and panoramic view of Snow capped Himalayas, live glaciers, glacial lakes, unique Sherpa culture, religion, festivals and wonderful flora and fauna are continuous sources of inspiration for tourists to visit Sagarmatha National Park and Buffer Zone.

The popular Kalapathar in the Mt. Everest region and Gokyo valley and Gokyo RI are the main viewing areas of Mt. Everest (Sagarmatha). Therefore, the Sagarmatha National Park and Buffer Zone in the Khumbu region has become the most attractive tourist's destination in Nepal's mountain protected areas. Of the fourteen peaks above 8000m in the world, eight are located in Nepal and among them three in Khumbu region. They are Mount Everest the highest peak in the world containing 8848m; the other high peaks such as Lhotse, Cho Oyu and Ama Dablam can be seen from Gokyo RI without reaching to the base of Kalapathar and Everest Base Camp.

The most famous mountains in the world, the legendary Mount Everest is one of the main reasons people make the journey to Nepal. Home to the cheerful Sherpas, the Khumbu region boasts of some of the most extraordinary sceneries on earth. Unlike the famous route to Kalapathar and Island Peak, the Gokyo valleys is exceptional for sacred lake and ascend to Gokyo RI provides one a spectacular vantage point for Mount Everest. There are fewer trekkers here than on the route to Base Camp allowing you to enjoy the quiet of the mountains, its birds and wildlife. The view from Gokyo Peak (5200) is stunning.

The flow of tourism in Gokyo is increasing every year. The tourists are mainly trekking groups and not so much with mountaineering or adventure groups like in Mt. Everest route. While the number of visitors to the Gokyo valley is small compared to Everest Base Camp, their impact nevertheless is significant.

Tourism in the Gokyo valley no doubt has provided a range of opportunities to the local people in the form of employment and income. The economic benefits of tourism have much value largely for mountain areas like Gokyo valley. In fact, without tourism, some mountain communities would have either withered or out-migrated. Tourism provides opportunities for seasonal and permanent employment and generates handicraft industry. For example, total employment generated by mountain tourism in Nepal 19 is estimated to range from 536,935 to 1,115,345 man-days (Dr. Harka Gurung 1996). These have positive impact on the local as well as the macro economy.

But on the other hand, the increasing adverse impacts such as waste disposal; uncontrolled use of alpine juniper and other associated problems have been major concerns to those trying to sustain this fragile environment.

Since the implementation of Khumbu Alpine Conservation and Restoration Project in Imja valley of Sagarmatha National Park and Buffer Zone, TMI believes that addressing the alpine issues is the most desirable way to protect the wilderness quality of the Gokyo valley.

6, THREATS AND OPPORTUNITIES

The problem in the Gokyo valley is not only the tourists but also others associated with tourism, such as local herders, lodges and teashop operators. The herders use fragile valleys as temporary homes for three to four months of the year and some have started running lodges and teashops during the spring and autumn tourist seasons and thereby the numbers of lodges and teashops have increased significantly within ten to twelve years. One reason for this could be due to economic opportunity associated with tourism as poverty is pushing local farmers to expand into the wilderness area.

Livestock grazing combined with a high use of fuel wood by temporary lodges and teashops are rapidly changing alpine forests and pastures into scrublands of the Gokyo valley. This has also led to the fragmentation of wildlife habitats. Additionally, local herders also grow potatoes and vegetables during their stay, and are slowly opening new areas for cultivation.

Lodge and teashops operators encountered in the valley were interviewed regarding their movement in the area and type of fuel wood they use for cooking and heating especially for trekkers and their support staff. General assessment of tourism flow, the lodges and teashops conditions, the herders activities, the forest conditions, the fuel use policy were made during the assessment trip with particular focus on juniper's conditions and on future tourism management in the area.

The assessment was carried out based on the results and findings of the people reported and assumptions made from Imja valley of Everest region inside national park and buffer zone and some hamlets along the main trekking route in the Buffer Zone.

Several initiatives such as formation of Khumbu Alpine Conservation Council (KACC), the establishment of kerosene and stove depot, renovation and management of porter rest house, construction of metal bridge, construction of cattle proof enclosure, establishment of alpine nursery, development of environmental education materials, banning of juniper harvesting and promotion of alternative energy, office establishment with tourism information centre have all been commenced under the Khumbu Alpine Conservation and Restoration Project with support from various donors including UNDP/SGP.

Similarly, to maximize the involvement of local people in alpine conservation and restoration project, several meetings or workshops have been conducted and registered at Sagarmatha National Park and Buffer Zone council.

7. LOCAL AND NATIONAL LEVEL PROGRAM BENEFICIARIES

The project provides direct and indirect benefits from conserving and restoring the depleted fragile alpine ecosystem. It addresses real, rather than popular or perceived, threats based on the results of extensive research and field experience in the area. The direct beneficiaries include the local Sherpa people of the SNPBZ, who represent the primary participants and beneficiaries of all project phase activities.

Approximately 15,000-20,000 local residents, trekkers, porters, and lodge operators along this Gokyo and Thame valley via Renjo Pass will also directly benefit from this up coming programs. Likewise, the international conservation, development, and scientific communities will benefit from the new knowledge gained, and community-based alpine conservation models generated, as a result of project activities.

8. FINDINGS:

During this assessment trip to Gokyo, the team made some observation based on the current situation. The observations consists of fuel wood use, lodge construction, tourism flow, livestock management, and conservation initiatives:

8.1 FUEL WOOD USE:

As far as the fuel wood use is concerned in the lodges along the trekking route to Gokyo valley, we noticed that the fuel wood use in this valley exist as far as Dhole and the fire wood has been collected from Dhole forest inside National Park and Buffer Zone. According to the lodge operators from Dhole, the firewood they have collected during two official periods as per Sagarmatha National Park's rules and regulation will be exported to their permanent residents in Khumjung village. Ms Nima Phuti Sherpa, of Top Hill Lodge in Lhapharma says that the conditions in-terms of collecting fire wood has gone worse and more firewood has been collected ever since the Buffer Zone took the management responsibility which lack effective monitoring. The reason for that is there has been a clash between the park and buffer zone for the responsibility of managing the forest resources. Ms. Sherpa pointed out that the firewood was well controlled when the park was fully responsible as they had frequent staff moving for monitoring and there was strict control on firewood collection.

We have not noticed the lodges using firewood inside lodge beyond Dhole. The lodge operators and the porters use yak dung and kerosene as alternative fuel for cooking and heating due to plenty of yak dung available in the area. So there has been less destruction on firewood along this trail. Our observation also concluded that lodges uses juniper for incense purpose and not for firewood as there was scarcity of juniper at this altitude. Junipers were well protected by local themselves and the local people beyond Dhole are more conscious of juniper protection.

8.2 MEDICINAL AND AROMATIC PLANTS (MAPs):

Unlike other parts of Nepal especially in the eastern and western Nepal, the local people here in these valleys are not so familiar with MAPs. Some people reported that Yarcha Gumbu (*Cordyceps Sinensis* (berk)) is found in Luza and Lhapharma but not in large quantity. People here are busy with livestock rearing and tourism business and so are not involved in collecting valuable plant species for their own use and for trading purposes like in other places of Nepal. Thus, MAPs is fully conserved because there is no practice of collecting wild MAPs.

8.3 TOURISM FLOW:

As far as tourism is concerned, the flow of tourism in Gokyo is increasing every year. The tourists are mainly trekking groups and not so much with mountaineering or adventure groups like in Mt. Everest route.

8.4 REFUSE DISPOSAL

The obvious negative impact of tourism on mountain environment is pollution. The problem is accentuated by the inflow of large number of visitors during certain peak periods and at particular locations. Some people and visitors think that the littering is a dangerous to health but with the type of litter that is found in mountain trails is not dangerous to health as such but is visually intrusive. Littering with plastic, tin, and non-degradable materials have turned some popular trek routes as virtual 'garbage trail'. Solid waste is another pollution problem with a health hazard.

There is a refuse disposal along the route to Gokyo from Dhole to Gokyo. Sagarmatha Pollution Control Committee (SPCC) conducts clean up programs but according to local sources, the clean ups activities are done without any notification or information to the locals. Local people state that the problem of waste disposal will considerably decrease if SPCC staff train them on techniques to separate the disposal such as degradable from non-degradable and dispose them when possible.

Currently, a joint program between the lodges and SPCC is underway in managing the refuse disposal in Machhermo. According to locals, the lodge operators take turns to oversee the refuse pit and contribute some money to manage the refuse disposal along the trail. We saw local people digging pits next to the riverbank, which was not a very appropriate spot. We suggested that pits should be sited not near riverbanks or near cultural sites such as Mani wall, monument, temple and water spring. While in Gokyo, we also noticed trash left behind in and around the sacred lake.

8.5 SANITATION IN GOKYO VALLEY:

The toilets in this area are traditional pit toilets with compost that is later recycled as fertilizer. Some modern toilets with flushing were also noticed in some lodges in Machhermo and Gokyo. Overall, the lodges have been built with traditional method using or relying on compost rather than using flush toilets. According to local lodge operators, they are happy to have traditional toilet as tourists complain if they have built a modern toilet at that high altitude where there is lack of awareness on safety tank etc. Some lodges or resorts in Machhermo and Gokyo have built flush toilet inside the lodges and have no idea on how the safety tank works.

8.6 LIVESTOCK MANAGEMENT:

Livestock is an important component for the Sherpas of this valley. Majority of the households are involved in livestock raising Yaks, Naks, and Chauris in this valley. Unlike the Imja valley, livestock rearing is practiced as far as Gokyo and tourism has been categorized as secondary option. We have also counted number of traditional goths besides the newly constructed tourists lodges. The numbers of Goths from Dhole of Gokyo valley to Maralung of Thame valley were 73 in total. There seems to be a mixture of traditional Goths and also newly built trekking lodges in each settlement. People of this region are involved both in livestock rearing and tourism business.

8.7 CONSERVATION INITIATIVES IN GOKYO VALLEY

When asked whether or not there have been some conservation committee either formed by outside organizations or from their own initiative, the locals informed that they have formed small committee among lodge operators in order to manage the fuel wood use, improve sanitation and other means of activities to make the area clean and healthy for future generation.

Likewise, there has been one formed in Gokyo with support from Sagarmatha National Park and Buffer Zone, SPCC and WWF/Nepal. The purpose of the committee was to manage the sanitation in Gokyo and also to manage the sacred lake that is currently threatened due to unmanaged tourism and lack of proper disposal systems.

The World Wildlife Fund Nepal and Department of National Parks and Wildlife Conservation (DNPWC) have collaborative programs to develop a comprehensive data base on the high altitude lakes of the Himalayas of NEPAL that incorporate the view of the recent planning for the Sacred Himalayan Landscape (SHL), which is an initiative led by the Ministry of Forest and Soil Conservation and key partners.

In doing this, the WWF and Sagarmatha National Park and Buffer Zone have formed temporary conservation committee in Gokyo to manage the sacred lake of Gokyo. The committee was formed in Gokyo Lake and in collaboration of SPCC. According to chief Warden of SNP, very limited studies and research was carried out on high altitude mountain wetlands like Gokyo Lake.

At present, the conservation of the naturally and culturally significant sacred lake such as Gokyo, which has both biodiversity and cultural values, has become a serious concern due to mismanagement of the lake. This lake has both landscape and cultural values and is often visited by tourists, trekking agencies and their support staff while they trek to the Gokyo RI and also crossing newly opened high altitude pass known as Renjo Pass (5480m).

Gokyo Lake is situated at 4750m in elevation in the alpine reaches of the alpine zone. This lake has been used for religious rituals for generations. The indigenous Hindu, Buddhists and animist pilgrims who visit this site annually, conducting important religious ceremonies, considers it sacred lake as they have for hundreds of years.

Thousands of pilgrims flock to this sacred lake to bathe in the holy waters during the Janai Purnima Festival, which is sacred for Hindus and Buddhists alike. This festival occurs in mid August (Srawan in the Nepali Calendar). According to local residents from Gokyo village, approximately 1-2000 pilgrims visit Gokyo each year.

This alpine altitude sacred lake also contains many species, lying in the transitional zones. The lake is the home to many unique or rare species and assemblages of flora and faunal biodiversity, including migratory bird habitat, rare and endangered alpine species, medicinal and aromatic plants and a variety of mammal species.

Unlike most of the high altitude wetlands or the sacred lakes of Nepal, which have no nearby villages and are largely uninhabited, this lake is intensively used by local people and in some cases, by trekking agency staff and tourists as well. The problems that occur are intensive fuel wood use, grazing pressure and trampling of the grounds by the herds of livestock, waste mismanagement especially from the thousands of pilgrims who visit the sites for the two to three days of festivals every year.

8.8 VISITOR'S ACCOMMODATION

Accommodation facilities in the Gokyo valley are available to trekkers in the form of private lodging, teahouses or teashops, camping grounds and porter shelters, and a combination of these facilities. In this area, private lodges for free independent tourists (FITs) and an open area for organized camping groups are the most popular forms of accommodation. A combination of these modes of accommodation was the second best choice for either type of trekkers. According to local people in this area, as the number of FITs has been increasing, this area has experienced a boom in lodge construction in the last one to two decades. Although the number of lodges is not that many compared to Imja valley, it seemed a lot for a small valley like Gokyo as per local people's information. As shown in the trend line of building lodges along the trekking route in whole Khumbu, the lodge development grew dramatically in the 1980s when the Khumbu region had 83 operating lodges in 1991. According to the latest SNP Buffer Zone management plan (2002), there are now 450 hotels and lodges in the national park and buffer zone, 150 of which are in the buffer zone. According to Sanjay Nepal, Gokyo valley has least number of lodges in the Khumbu region.

The reason for building lodges have become an important part of the regional economy and, in spite of the rising costs of constructing one, are considered lucrative business. Local lodge operators have reported that a popular lodge can earn more than \$10,000 a year in net profits despite the need to buy supplies from outside and wages for non-local service staff. Likewise, investment in lodges is typically the result of savings from tourism work and low interest loans from friends and families.

We have noticed that majority of the lodge operators along this route were mainly female accompanied by seasonal helpers from outside Khumbu. Each lodge employ one to four non-family members as helpers and they are non-local Sherpas, Tamang or Rai men and women who hail from areas south of the Khumbu (Sherpa AR personnel 2007).

Table no 1. Sherpa lodges, 1973-1991¹

	1973	1978	1983	1986	1991
Gokyo route	0	2	7	10	17

8.9 MACHHERMO PORTER SHELTER & RESCUE POST

Machhermo porter shelter and rescue post has been established at 4410m that is ideally suited to serve porters and trekkers descending from the upper reaches of the valley and the passes leading into Renjo La 5600m and Cho La 5420m).

Namgyal Sherpa, a resident from Khumjung village approached some donors to support the construction of a porter shelter in Machhermo. This porter shelter was the combined effort of Community Action Nepal (CAN), IPPG, Sagarmatha National Park and Buffer Zone, and Khumbila Buffer Zone Committee (KBZC). In order to complete the porter shelter in Machhermo, following management has been occurred.

- The land will continue to belong to the National Park
- The buildings will belong to the KBZC
- The KBZC will arrange a roster of local lodge owners to manage the porter shelter
- IPPG will organize and run the rescue post
- KBZC and IPPG will consult each other on policy
- CAN is responsible for building the structure and coordinating with Namgyal and the KBZC via Ian Wall (CAN board member and IPPG-UK rep)
- IPPG is responsible for fitting the buildings

The porter shelter at Machhermo was established based on the following problems faced among the porters while trekking in the valley.

- Porters carrying heavy loads up and down the mountains, all day long in all sorts of weather

¹ The Everest route here refers to all lodges along the main trail from Namche to Gorakshap or Island Peak Base Camp. The Gokyo route here refers to all lodges above Namche and Khumjung en route to Gokyo in the upper Dudh Koshi valley. Table Source: Stanley F. Stevens 1996

- Lack of appropriate clothing and footwear- sometimes the porters are only equipped with flip-flops for footwear and a plastic bag as protection from the rain
- Lack of appropriate shelter
- Lack of appropriate food
- Lack of appropriate medical care
- Lack of insurance

Trekking porters are often from the lower valleys. The problems with trekking porters are not only in Khumbu but also in other parts of Nepal and even outside Nepal such as in Pakistan, India and Peru in South America. Although their life and conditions of their work is different from one country to another, they all share similar problems.

Apart from the above, life-threatening issues porters also face is lack of education on mountain safety, environmental issues and hygiene. They are often the meat in the sandwich of political upheavals and are usually discriminated against through race, social positioning or religious caste.

In lieu of all these problems, the over all objective of this porter shelter in Machhermo is to improve safety and health for porters working in the mountains for the trekking industry worldwide. This porter shelter works to eradicate avoidable illness, injury and death by raising awareness of the issues among travel companies, guides, trek leaders, and sirdars (porters and trekkers).

By establishing porter shelter in Machhermo, the project intends to work on the following activities:

- Educate trekkers on the issue of porter safety, through flyers, posters, photo exhibitions, video and media
- Lobby government departments
- Encourage travel agents and trekking companies to consider porter safety
- Assist with the provision of clothing and footwear for loan at the trail head through porter clothing banks
- Raise funds for and building porter shelters
- Help set up an emergency relief funds for injured porters or their dependents
- Run conferences for porters in Nepal
- Organize fundraisers through articles, lectures, documentaries, letter writing, talks, and donations
- Cooperate with other porter NGOs ²

8.10 IMPACT OF THE PORTER SHELTER IN MACHHERMO

Since the construction of the porter shelter in Machhermo, there has been a positive change as it is slowly becoming uncommon to see trekking porters not adequately equipped and sheltered. According to local residents of Machhermo and the proprietor of Namgyal Lodge in Machhermo, a trekker, and sirdars or group leaders now accompany most sick porters. The Government is starting to show interest in enforcing trekking porter legislation.

² Information derived from IPPG website and interview from local resident of Machhermo.

Likewise, the local organizations such as TAAN (Travel Agents Association of Nepal) and the NMA (Nepal Mountaineering Association) are beginning the process of using their prestige to push for necessary changes.

8.11 ENERGY USE IN THE GOKYO VALLEY

Along the Gokyo valley main trail, firewood and kerosene remains the main source of energy, particularly for cooking and heating. The firewood use and pile of firewood stock exists as far as Dhole, the first settlement along the route to Gokyo. Sagarmatha National Park and Buffer Zone regulation prohibits the use of firewood by trekkers and mountaineers in the Sagarmatha region.

Table no 1: Information about energy use and bed capacity at each lodge along the Gokyo valley

Villages	Altitude in (m)	No of lodges/Teash op	Total bed capacity	Firewood per year	Kerosene (litre per year)
Dhole	4040	5	82	300	48
Lhapharma		2	14	120	12
Luza	2,640	3	36		
Machhermo	4410	7	144	420	198
Phanka	4472	3			
Gokyo	4750	8	215	60	273
Lungden	???	3			
Maralung	???	4			
Dinging	???	3			
Total		37	491	900	531

Source: TMI September 2007

But trekking agencies reveal that despite this regulation, complete prohibition is not practiced. The average per capita consumption of fuel wood by trekkers

staying at local lodges is almost double (4.5 kg. per trekker per day) that of local people, and the average per capita fuel wood consumption of group trekker is even higher. Currently the lodge operators pay approximately Rs. 8-1000 rupees per day to collect firewood when the National Park permit opens.

It is the assumption based on what they are paying for per porter per day approximately Rs. 4-500 per load or bhari (one bhari = 40 kilos) (Sherpa AR et al 2003). The demand for firewood rises in proportion to the number of tourists in the Khumbu, at current ratios of fuel wood use per tourist, unchecked growth in tourist inflows, while providing financial benefits, will accelerate the ecological deterioration of the hill areas.

In the long term, over harvesting of alpine juniper and other slow-growing fuel wood species will threaten the ecological base of the area and will diminish the scenic value of the Park—the very reason that tourists come to Khumbu in the first place (Sherpa AR 2007).

8.12 ALTERNATIVE ENERGY TECHNOLOGIES

As a short term and long term measure, emphasis has been placed on low cost and user-friendly technologies to achieve sustainable resource conservation. Several generations of fuel saving technologies are being applied by lodge operators including back boiler or circulator water heating systems, improved stoves and solar energy systems. Almost all lodges along the trail to Gokyo have installed solar system that provides light system inside the lodge.

Unlike the lodges in Imja valley, very few lodges have installed back boilers and many have installed solar heaters and also micro hydro schemes with low wattage cooking and heating devices. If the lodges use these systems, it would reduce daily fuel wood use by 40%, lowering an average of 75 kg of fuel wood per day to 45 kg.

9. CONCLUSION and RECOMMENDATIONS

CONCLUSION

Over the years Gokyo valley in Sagarmatha National Park and Buffer Zone has become a popular destination for tourism especially trekkers seeking adventure and explore indigenous Sherpa culture, which they cannot find elsewhere in Nepal. Likewise the trekkers started to come to Gokyo to explore newly opened mountain passé such as Renjo pass (5480m).

There have been number of reasons why trekkers come to Gokyo. Majority of trekkers interviewed earlier or this time said that the view from Gokyo peak is much better in-terms of panoramic view where as they don't get same view from

A visitor from USA comments, "As a regular visitor to national parks in Nepal-but a first time visitor to Sagarmatha National Park in the Gokyo Valley, I was amazed at the variety of landscapes and cultural significance and the view from Gokyo Ri was amazing (Martin Gunn, 2002).

Kalapathar despite greater distance. The trekkers also said that the people of Gokyo valley are friendlier and provide greater hospitality than the lodges along the Everest Base and Island Peak route. In specific, the highlights of Gokyo valley consist of the following:

- Viewing the world's highest mountain in a short period
- Amazing view as and unique Sherpa culture
- Gokyo Lake and Gokyo Ri Excursion
- Sherpa society and village
- Scenic mountains flights
- Beautiful landscape
- A challenging walk and good sunrise and sunset view

The present number of trekkers to Khumbu is moderate despite the political instability. Nevertheless, there is a great potential in the increase in the numbers of visitors in the coming days.

We could not wait to go to this park and we are very glad that we have made it. We advised the park authorities not to expand the number of lodges and infrastructure inside the park, which would ruin the value of the wilderness" (Visitor comment, 2003).

Tourism has become quite an important business along the trekking route to Gokyo valley.

The recent survey shows that for the majority of the population, whose households are based on subsistence agriculture, trekking tourism has become an important economic factor especially where the resource is scarce, and where development opportunities are highly limited, it particularly offers the only hope for improving livelihood conditions.

The over all impacts from tourism in the area seems positive on local residents as tourism has provided a range of economic opportunities to the local people. In spite of some economic improvements, the increasing number of tourists in this valley has resulted in increased environmental degradation of these fragile mountain areas.

The primary impacts include the cutting of trees for firewood, an increasingly undesirable impact related to waste disposal, uncontrolled use of alpine vegetation and other associated problems, which makes this a major concern to those trying to protect this fragile environment. A survey of trekkers and lodge operators revealed that the Khumbu region has become more polluted and unclean. Increasing deforestation has also become more noticeable than in the earlier days since firewood is the major fuel source used by lodge operators and porters.

It is fair to state that the problems mentioned are not only the growth of tourists, but seasonal grazing, and pressure on alpine vegetation for fuel wood use. In order to achieve long-term management, Sagarmatha National Park must not forget to involve the local people from very beginning. It is now well tested and realized that nature conservation alone without considering local community's need has never been successful. This has been shown from past experiences of many protected areas within Nepal and worldwide.

As a result of increasing number of visitors in the Gokyo valley and the environmental effects thereof, some institutions have taken initiatives to tackle the problem related to tourism and environment. At present, there are some institutions that have been active in Khumbu region including Sagarmatha National Park and Buffer Zone, Sagarmatha Pollution Control Committee and Youth Groups and Clubs. TMI will also be involved in the coming days.

MAJOR RECOMMENDATION:

1. Most Himalayan destinations experience extreme high pressure of tourists during the autumn and spring seasons. Therefore, the need for regulating their volume by seasonally and geographically rises. The mechanism should include the absolute number permitted and differential rate for user charges.
2. Construction of hotels and lodges in mountainous areas without regard to their architectural suitability in one of the world's finest and unspoiled natural areas is not recommended. Likewise, local lodges along the main destinations are undergoing expansion and refurbishment without proper planning and minimum codes of conduct. To avoid further deterioration, there is an urgent need to have building codes and introduction of permit system for upcoming new establishments.
3. There is need for well designed and maintained campground along trekking routes, particularly in less developed areas; campgrounds must be sited with sensitivity to wildlife habitat needs and wilderness values.

4. Local participation in the planning and management of protected areas is important. It is expected that the recently introduced buffer zone management programme will be helpful in this regard. A community-based approach to tourism is essential in order to boost the local economy and ensure more equitable distribution of the profits derived from tourism.
5. There should be a regular monitoring system for tourist lodges and facilities; this system must be regularized as per Himalayan National Parks Rules and Regulations. *All* lodge operators should be given training in lodge management and related issues.
6. Lodge Management Committees or Tourism Management Committees are necessary to promote sound tourism management in the area. They can play a key role in promoting fuel-efficient technologies, proper waste management, fixing and improving menus based on geographical pricing systems, standardizing lodges, promoting improved sanitation and hygiene conditions, and building and maintaining trails.
- 7.** One of the primary aims of the park is to protect the forests and associated biota from excessive pressure from the fast growing tourism industries and local population. Since firewood is the only source of energy in the area, energy alternative are desperately needed for long-term solution for alternative fuel to save forests of the region. Therefore, micro hydro scheme is a must to substitute firewood use in this fragile alpine zone.
8. All tourist facilities including lodges and teashops should be equipped with clean toilets, which meet basic sanitary standards set by the Tourism Management Committee or Association. Toilet should be constructed away from water sources, but not more than 100 meters from lodge building so that users do not have to walk long distance at night. All tourists' facilities should have appropriate provision for garbage disposal. Garbage should not be discarded in water sources or along trails, but should be placed in disposal facilities provided at the lodges.
9. In order to manage the Gokyo Valley's fragile environment, it is essential to form a Conservation Committee that will oversee the tourism development and associated problems in the area. The committee will play a major role in protecting the natural and cultural resources of the Gokyo valley.
10. Basic facility for tourists is available along the route from Namche to Gokyo but after Gokyo, There is a need for some lodge or tea shop between the Renjo pass and Lungde
11. There is potential to develop sacred wet land management project at Gokyo valley because Gokyo and other beautiful lakes are one of the main tourist attractions in this route

APPENDIX ONE: DESCRIPTION OF THE SETTLEMENTS:

Dhole (4040m)

Dhole (4040m) is approximately 5 hours from Kenjungma or Khumjung Village. The trail passes through Mongla on the ridge top where there are four teashops and also private lodges. After a steep down from Mongla, Phortse Tanga is reached where there is one lodge and one small teashop. This is the fork trail between Phortse village and trail to Dhole. From this fork trail to Dhole, it is a gradual ascent up the valley passing through patches of birch and rhododendron forest where the elusive musk deer can sometimes be seen.

Machherma (4410m)

Machherma is a small settlement next to Luza. It is approximately two hours from Dhole. The trail goes along the alpine meadow with yaks and alpine highland birds and flowers with great view of Cho Oyu (8153m) in the North. This is only two hours from Dhole but it is wise to stop at Machherma for acclimatization. Machherma is the site of the most credible yeti incident in Khumbu - in 1974, one yeti reportedly attacked a Sherpa woman and killed 3 yaks.

Fanka (4,472 m)

Climb up the moraine on the far side of Machhermo village and then walk gently downhill to the village of **Fanka** [27° 54.85N 86° 42.93E 4,472 m (1 hour).

Fanka Hotel

Fanka View Hotel

Gokyo Lakes (4750m)

Gokyo is approximately three hours from Machhermo and is situated at 4750m. The trail passes through steep climbs up the Ngojumba Glacier, the largest glacier in Nepal, past small lakes to the tiny kharka (pasture) of Gokyo. This is the most beautiful place, and marks the first of the Gokyo Lakes, populated with its amazing high altitude ducks.

Gokyo RI (5333m)

The image of this region is associated with the soaring view of the most popular mountains view of Nepal like Mt. Cho-Oyo (8153m), Mt. Everest (8848m), Mt. Lhotse (8501m), Makalu (8463m) etc. that are clearly visible from Gokyo RI (5483m.) above Gokyo Lake.

APPENDIX TWO: FIELD ITINERARY FOR GOKYO ALPINE ASSESSMENT

Itinerary for Gokyo Alpine Assessment of Alpine Conservation				
September 2nd to 13th September 2007				
SN	Date	From	To	Remarks
1	2nd September	Kathmandu	Lukla	Meeting with Mera Peak Lodge operators
2	3rd September	Lukla	Lukla	Meeting with Mera Peak Lodge operators
3	4th September	Lukla	Monju	Travel/Interview
4	5th September	Monju	Khunde	Travel/Interview
5	6th September	Khunde	Dhole	Travel/Interview
6	7th September	Dhole	Machherma	Travel/Interview
7	8th September	Machherma	Gokyo	Travel/Interview
8	9th September	Gokyo	Lungden	Travel/Interview
9	10th September	Lungden	Namche	Travel/Interview
10	11th September	Namche	Namche	Travel
11	12th September	Namche	Lukla	Travel
12	13th September	Lukla	Kathmandu	Fly