



KHUMBU ALPINE CONSERVATION AND RESTORATION PROJECT 2004-2008

Sagarmatha National Park
and Buffer Zone
Solukhumbu, Nepal



By
ANG RITA SHERPA

And
Bheem Raj Rai
**THE MOUNTAIN
INSTITUTE (TMI)**



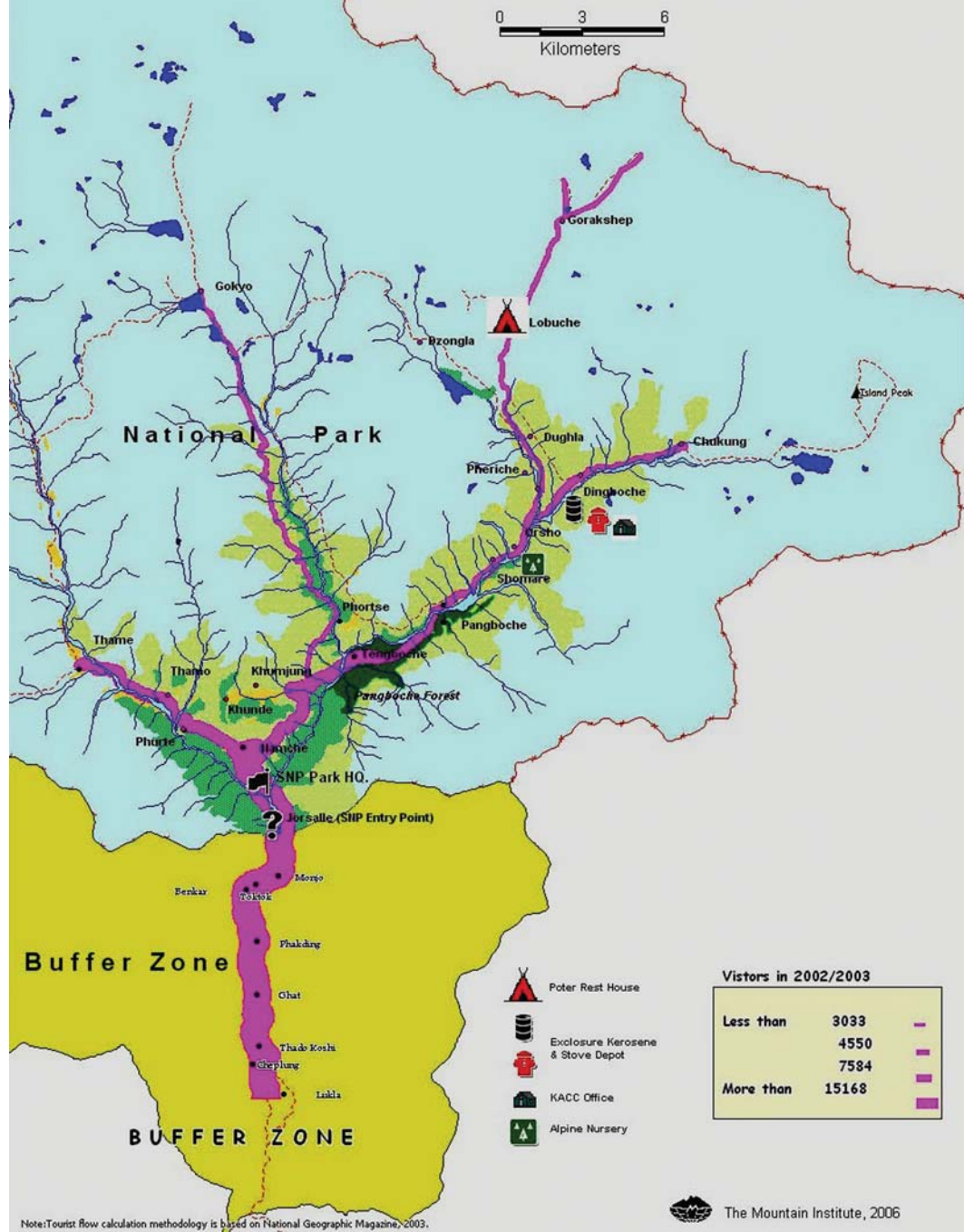
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Khumbu Alpine Conservation & Restoration Project
Khumjung-7, Dingboche, Solukhumbu
(Sagarmatha National Park and Buffer Zone)



ABBREVIATIONS

AAC	American Alpine Club
GMC	Gompa Management Committee
HT	Himalayan Trust
INGO	International Non-Governmental Organization
NGO	Non-Governmental Organization
KACC	Khumbu Alpine Conservation Council
MACG	Mera Alpine Conservation Group
NMA	Nepal Mountaineering Association
PYC	Pangboche Youth Club
SNPBZ	Sagarmatha National Park and Buffer Zone
SGP	Small Grant Programme
SPCC	Sagarmatha Pollution Control Committee
TAAN	Trekking Agents Association of Nepal
TMI	The Mountain Institute
UNDP	United Nations Development Programme

ACKNOWLEDGMENTS

We would like to express our sincere gratitude to The Mountain Institute (TMI) for asking us to publish this booklet. We hope this booklet will provide useful information for designing new community-based alpine conservation and restoration projects that improve the livelihoods of people living in the alpine zones of Nepal.

This project would not have been possible without the financial and technical support of TMI and generous grants from the American Alpine Club, the National Geographic Society, the United States Agency for International Development, the Argosy Foundation, UNDP/SGP, private donors, and local communities.

We greatly appreciated the constant support and feedback provided by the following individuals: Dr. Alton Byers, director of TMI's Research and Education; Brian J. Peniston, Director of The Mountain Institute, Asian Regional Office; Dambar Thapa, Senior Programme Coordinator; Purusottam Bhattarai, Regional Finance Officer; Bhala Kaji Kulung, Programme and Finance Officer; Sushila Thing, Gender Development Officer; Chiranjibi Dahal, NGO Partnership Officer; Karma Bhutia, NTFP Officer; Tsedar Bhutia, Monitoring and Planning Officer; Sara Subba, Program Development Officer and Ramesh Shrestha, GIS specialist. We are very grateful to all the people who gave us their time, despite their busy schedules, and shared their experiences and knowledge of issues and opportunities related to alpine ecosystems.

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Since this project lies within Sagarmatha National Park and Buffer Zone, Khumbu, Nepal, our deepest thanks go to the Mr. Tulsi Sharma; chief warden, Assistant Warden Mr. Birendra Kadel of Sagarmatha National Park and Buffer Zone and the scout stationed at Debuche post for their continued support of this project.

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Last but not least, we pay our heartfelt thanks to all inhabitants of the Imja valley for their lively and active participation in the community-based alpine conservation and restoration programs. Their participation and their enthusiasm, despite their busy work schedules, made the programs important and most valuable, without their constant support, it would not have been possible for us to publish this booklet.

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EXECUTIVE SUMMARY

Alpine zones, or the area between the upper treeline and permanent snowline, are distributed globally and are among the most biodiverse habitats in the world per unit area. Alpine zones are important as highland water catchments for lowlands, as sources of natural products (e.g., edible and medicinal plants), as pastureland for animal husbandry, and as attractions for the ecotourism trade (trekking and mountaineering).

However, experts also warn that these ecosystems are especially vulnerable to incompatible land use and global climate change. Unfortunately, the need to protect alpine ecosystems worldwide and in Nepal has been largely neglected by the international conservation community. Hence, alpine ecosystems in the Khumbu region of Nepal are becoming increasingly threatened by unsustainable uses, such as unregulated tourism, burning, overgrazing by livestock, uncontrolled lodge construction, and the accelerated harvesting of slow-growing shrubs for fuel wood. Especially during the last 20 years, the removal of soil-binding shrubs from the fragile and thin alpine soils has contributed not only to dramatic increases in soil erosion, but also to accelerated landscape denudation that local people refer to as “growing glacial moraines.” Only recently have the relatively unknown, but accelerating, problems of alpine degradation received some level of international attention as a result of TMI’s ongoing research and conservation efforts.

In 2004, The Mountain Institute (TMI) launched a project entitled “Community-based Alpine Conservation and Restoration of Mt. Everest Alpine Zone” with the goal of protecting and restoring the fragile alpine ecosystems of Sagarmatha National Park and Buffer Zone (SNPBZ). As part of the project, the region’s first local NGO, the Khumbu Alpine Conservation Council (KACC), was formed with financial and technical support from TMI and the United Nation Development Programme (UNDP)’s Small Grant Programme (SGP). KACC works to conserve and restore fragile alpine ecosystems by strengthening local management and conservation capacities. It has implemented this project in partnership with local Sherpa communities, government agencies, non-government organizations (NGOs), international NGOs, donor agencies, and the trekking and climbing communities.

1. INTRODUCTION

Sagarmatha National Park and Buffer Zone (SNPBZ), Nepal's second most-visited national park, is of global cultural and environmental importance. The Park is one of the world's premier mountain tourism regions, containing four of the world's mountain peaks over 8000m, including Mt. Everest (known in Nepalese as Sagarmatha). Approximately 25,000 tourists visit each year, drawn by the spectacular beauty of the varied terrain, including glaciers, alpine meadows, and mountain lakes nestled among the high Himalayas. The Park is also home to approximately 4,000 Sherpa people, who have lived in the area for over four centuries. They have developed a harmonious relationship with the harsh but seasonally fertile environment and continue to use traditional planting methods and indigenous natural resource management techniques.

However, SNPBZ has witnessed a dramatic increase in the number of visitors that has placed stresses on both the physical resources and the cultural and social fabric of the region. Increased tourism in the region has helped boost the local economy and standard of living with better health care, education and infrastructure, but it has also threatened the relationship between local people and the mountain environment embodied in traditional cultural practices and has contributed to the degradation of the region's fragile ecology, including alpine ecosystems above 4000m, as never before.

Like other alpine zones throughout the world, the Everest Alpine zone is important for its biodiversity and as a source of resources used by local people. Specifically, experts have identified the Everest alpine zone as habitat for many rare and endangered plants and animals, such as the famous snow leopard and the important Tibetan medicinal plant, the snow lotus. Likewise, the Everest alpine zone serves as a highland water catchment for lowland communities, as a source of economically valuable natural products that provide income for local people (e.g., edible and medicinal plants), as pastureland for animal husbandry, and as an attraction for the ecotourism trade (trekking and mountaineering). However, experts warn that these ecosystems are especially vulnerable to incompatible land uses associated with the tourism trade and to global climate change. Unfortunately, the international conservation community has comparatively neglected alpine environments, despite the fact that they have long been recognized for their fragility.

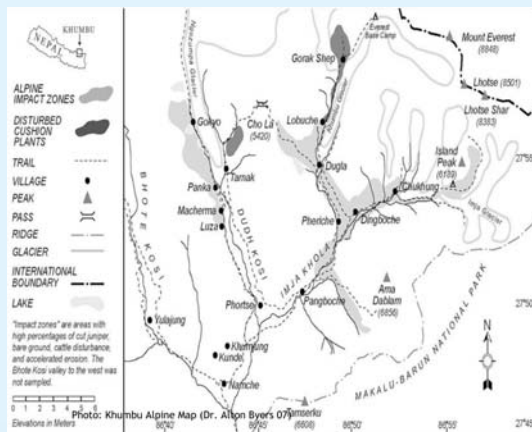
2. THE PROJECT

Only recently have the problems of alpine degradation in the Everest area received some level of attention. After years of scientific research and consultation with local Sherpa people, The Mountain Institute (TMI) launched the “Community-based Alpine Conservation and Restoration of Mt. Everest Alpine Zone” project in 2004. As part of the project, the region’s first local NGO, the Khumbu Alpine Conservation Council (KACC), was established in May 2004 with financial and technical support from TMI and the United Nation Development Programme (UNDP)’s Small Grant Programme (SGP).

KACC works to conserve and restore fragile alpine ecosystems by strengthening local management and conservation capacities.

It has implemented this project in partnership with local Sherpa communities, government agencies, non-government organizations (NGOs), international NGOs, donor agencies, and the trekking and climbing communities.

3. THE PROJECT LOCATION



Map courtesy of Alton Byers.

The community-based alpine conservation and restoration project is located in Khumjung-7 of Solukhumbu district in the upper Imja Khola watershed of the Sagarmatha (Mt. Everest) National Park and Buffer Zone, Khumbu, Nepal. The project area includes seven temporary settlements such as Shomare, Pheriche, Dingboche, Chhukung, Dughla, Lobuche and Gorakshep.

4. PROJECT ACCOMPLISHMENTS

4.1 Juniper Harvesting

Many older people in the villages have said the Khumbu's oldest and slowest growing juniper forest is in danger of being destroyed because the trees are being cut down for firewood and timber.

In response, KACC convinced local communities throughout the project area to ban the harvesting of all shrub juniper and alpine plants (e.g., *Arenaria* sp.) for fuel wood, agricultural purposes, and incense throughout the Imja Khola valley, saving approximately 80,000 kg of wood during one year alone. The juniper plant is important for restoring fragile alpine ecosystems and preventing soil erosion.

4.2 Bridge Maintenance

Foot trails and bridges are critical in the region because they are the only means of travel for visitors, local residents, and porters. KACC works to improve and maintain trails and bridges in order to minimize safety and environmental hazards and to promote tourism.



Bridge before maintenance



Bridge after maintenance

4.3 Kerosene Depot Establishment

In popular trekking and mountaineering destinations throughout Nepal, increased tourism has been directly correlated with fuel wood consumption. In the Khumbu region, trekkers, mountaineers, support staff, and local lodges used alpine juniper as a source of fuel for cooking and heating. A 2003 article in *The Geographical Journal* described the problem thusly:



Kerosene depot at Dingboche

"The destruction of alpine juniper continues across a large area. Shrubs are cut at ground level, and sometimes their roots are grubbed up for firewood. The long-term impact on alpine ecology is a serious concern given the extremely slow growth rate of these shrubs. Past juniper harvesting by expeditions and trekking groups, together with continued cutting by alpine inns and seasonal herders, has significantly diminished ground cover not only on the approach to Mt Everest between Pheriche and Lobuche but also near Dingboche and Chhukung in the upper Imja Khola valley and in some areas of the Dudh Koshi valley."



Kerosene transportation

To reduce pressure on alpine vegetation, KACC established kerosene depot in Dingboche that provides alternative energy for local people, lodge owners, and trekking groups. The depot is also a potential source of operational support for KACC.

4.4 Alpine Nursery Establishment

KACC established an alpine nursery with a capacity for 7,000 juniper seedlings and medicinal plants at 4,000 m in Shomare, on the way to Mt. Everest base camp – the first of its kind in Nepal. The nursery was designed in consultation with Himalayan Trust forestry staff and Sagarmatha National Park.



Alpine Nursery in Shomare

4.5 Environmental Education Materials Development and Distribution

To increase awareness about the importance and fragility of alpine ecosystems, KACC developed educational programs, curricula, posters, and annual brochures for local schools, visitors and lodge owners.



Signboards

4.6 Signboard Construction

In order to increase awareness about the importance of juniper and other alpine shrubs in SNPBZ and to reduce the use of these plants as fuel for cooking and heating, several informational signboards have been erected along the Everest and Island Peak trekking routes.

Signboards include information on KACC's kerosene and stove depot in Dingboche, as well as a price schedule.

4.7 KACC registration under Sagarmatha National Park and Buffer Zone

KACC has been formally registered under Sagarmatha National Park and Buffer Zone as a functional group. With this registration, KACC can legally operate and implement programs in close coordination and partnership with the Sagarmatha National Park and Buffer Zone Management Committee (SNP/BZMC).



KACC members at SNP



50x50m cattle proof enclosure

4.8 Cattle-proof Exclosure Construction

The region's first alpine cattle-proof exclosure (50x50m) was constructed above the village of Dingboche as a demonstration of ecosystem restoration.

This demonstration was modeled after the successful forestation exclosure above Namche Bazar.

4.9 Porter Rest House Renovation

Porters in the Khumbu often have trouble finding sleeping accommodations; trekking groups rarely provide them with a tent, and some porters interviewed by the field visit team said that none of the high-altitude lodges provide shelter for them if they carry loads for any organized trekking group, whether the group stays in tents or teahouses.



Porter Rest house in Lobuche

This claim was borne out by field visit team observations: in Chhukung, several porters whose organized trekking group slept inside were observed sleeping in a rock cave. Under these conditions, porters are often forced to cut live alpine juniper to cook and to keep warm. In order to provide a comfortable and safe place for porters to stay while trekking in the Mt. Everest region, a porter rest house at Lobuche was renovated. This rest house provides shelter, blankets, and cooking facilities to porters. Thus, porters are no longer forced to burn fragile alpine shrubs for warmth and cooking or to sleep in caves in Lobuche.

4.10 Small Enterprise Development Training

In order to provide income opportunities for farmers and herders who do not make income from tourism and to conserve shrubs that control soil erosion, KACC conducted a three-day training on making juice from a shrub known as seabuckthorn (*Hippophae rhamnoides*) that grows by the rivers near Dingboche and Pheriche.



Seabuckthorn Juice Production



Monitoring of Juniper harvesting

4.11 Juniper Monitoring

In order to enforce and assess the impact of anti-juniper harvesting policies, KACC and park staff regularly patrols the project areas.

4.12 KACC Visitor Information Center Establishment

KACC has established a visitor information center and office at Dingboche to facilitate regular meetings, workshops and distribution of information to visitors. The office provides services to local residents, porters, guides, trekkers and mountaineers.



KACC Visitor Information Centre

4.13 Drinking Water Supply

KACC completed an approximately 1,400 m aqueduct in Chhukung to help improve local health and sanitation by providing safe drinking water for local people, trekkers and porters. In return, the communities made a commitment to conserve fragile alpine juniper.



Water supply in Chhukung

4.14 Designation of Porter Cooking Facilities

In order to reduce fire risk and pollution, KACC and SNP made a plan to designate cooking areas for porters. KACC built open shelters in two locations (Debuche and Shomare) as specially designated cooking areas. Porters were interviewed regarding these cooking shelters and their ideas and inputs were incorporated into the project implementation.



Porters cooking meal along the trail

5. LONG-TERM BENEFITS

The project has helped to strengthen local resource management systems and the capacities of local people in the Everest region to protect and restore their fragile alpine ecosystems. Likewise, it has contributed to the development of a model for alpine conservation that can be applied throughout the world.

Local participation in alpine management has proven to lead to improved enforcement of locally initiated resource management plans, reducing fuel wood use and allowing slow-growing high altitude forests and pastures to regenerate. The restoration of the alpine regions of Solukhumbu will further Nepal's already significant achievements as a leader in community-based natural resources management.

New developments and unexpected difficulties/problems during the implementation of the project include:

- (a) Difficulties gathering financial support, especially for alpine areas.
- (b) Delays in work due to unexpected difficulties like cancellation of flights because of bad weather (e.g. KACC staff waited for a flight for three days in a row with materials for the nursery).
- (c) Lack of adequate information on alpine issues led to communities' initial lack of willingness to participate in the program.

6. LESSONS LEARNED

Since its inception in May of 2004, the Everest Alpine Conservation and Restoration Project has been widely recognized as a pioneering project that has achieved maximum conservation results using relatively minor amounts of funding. Several conclusions, insights, and lessons learned are discussed below.

The KACC is a very new NGO and its continued strengthening will be critical to its sustainability and long-term success. The priority areas identified by KACC members for future training include (a) non-profit management, (b) accounting and record keeping, (c) proposal and report writing, (d) fundraising, and (e) natural resource management.

(b) Because most KACC members are deeply involved in the tourist trade for up to seven months of the year, KACC found it necessary to recruit one full time social mobiliser for project continuity, financial tracking, implementation, monitoring, and KACC meeting coordination. In particular, regular monitoring ensured the smooth functioning of each enterprise.

(c) The porters' rest house, a KACC-driven initiative, initially came under a certain degree of criticism by Kathmandu-based conservationists who maintained that porter lodges are not the answer to contemporary porter problems in the Khumbu, and that trekking agencies must assume full responsibility for their shelter, fuel, warmth, and safety.

We fully agree with this position; however, it should also be acknowledged that in the interim the rest house has provided several thousand porters per season with warm sleeping and cooking accommodations. These porters would otherwise have been forced to sleep in caves while burning fragile alpine shrubs for warmth.

Secondly, all porters continue to express their great appreciation for the facility on a regular basis. The rest house has clearly been an excellent short-term solution to a chronic problem in Nepal, i.e., the inhumane treatment of porters.

Overall, the project has been a great success in terms of conservation impact per unit of financial input. It has also resulted in the development of a model of project design and implementation that can be summarized as follows:

7. PROJECT REPLICATION

The conservation and restoration of the entire Everest alpine zone is clearly a long-term endeavor that will require long-term commitment and investment from the national and international conservation and recreational communities. It is necessary to continue building upon KACC's and the project's successes in conserving and restoring Everest area ecosystems.

While continuing implementing conservation and restoration programs in the Imja Khola, the project also focused on the development of (1) detailed ecological and socioeconomic assessments of the effects of climate change, tourism development, over-collection of medicinal and aromatic plants, and grazing

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pressure on the biodiversity within the Gokyo and Thami valley watersheds, (2) clear mechanisms for ensuring that all alpine biodiversity protection mechanisms are integrated into local and National Park and Buffer Zone planning and management processes,

(3) strategies that ensure that local people have a voice through which to use their traditional natural, cultural, ecological, and economic knowledge in the design and implementation of the project, and (4) capacity building methods that ensure the growth, development, and strengthening of the KACC and related community-based organizations in perpetuity. These important components of the project should be considered for replication in future projects.

Local participation in alpine management will also lead to improved enforcement of locally initiated resource management, which will reduce fuel wood use, allowing slow-growing high altitude grasslands, shrub lands and pastures to regenerate. The restoration of the alpine regions of Solukhumbu will further Nepal's already significant achievements as a leader in community-based natural resources management.

7.1 Mera Peak Field Reconnaissance



Constructing new building inside the National Park Area



Tourism inside Mera Pea Area

In May 2007, The Mountain Institute and representatives from the Department of National Parks and Wildlife Conservation (DNPWC) conducted a detailed field reconnaissance of the region in order to obtain an understanding of current conditions in the upper Inkhu Khola of the Mera Peak region. The fundamental questions addressed by the team include:

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- What have been the environmental and social impacts of increased adventure tourism within the Mera Peak region during the past 10 years?
- What changes in sub-alpine and alpine ground cover have occurred since 1995? What key factors (political, climatic, social/economic) have been involved, how are their impacts spatially distributed, when did they occur, and how are they changing?
- How do these impacts either support or challenge the conventional development hypothesis that improved land stewardship is directly related to increased income generation through tourism?
- What preventative, restorative, and management solutions might be feasible to address the reportedly growing impacts upon the upper Inkhu Khola alpine and sub-alpine ecosystems?

In order to answer the above-mentioned questions, TMI's Senior Program Coordinator, Dambar Thapa and MBNPBZ's Senior Scout, Commanding Rai conducted interviews and participatory meetings with local residents.

In spite of the heavy environmental damage inflicted upon the sub-alpine and alpine ecosystems of the Mera Peak region during the past 12 years, the study showed that an unprecedented opportunity to reverse these trends, restore these ecosystems, and improve the livelihoods of local people exists through the use of partnerships and community-based approaches. TMI has begun programs in the region to replicate KACC's successes in the Imja Khola region.

7.2 Mera Alpine Conservation Workshop

In September 2007, the residents of the Inkhu and Hongu Valleys of the Mera Peak region requested TMI to replicate its alpine conservation and restoration program in the Mera peak region. As per their request,

The Mountain Institute, in collaboration with the Chief Warden of Makalu-Barun National Park and Buffer Zone, Mr. Yoba Raj Regmi, conducted a two-day workshop in Lukla as a follow-up to a May 2007 meeting with lodge operators. This workshop addressed issues like illegal lodge construction, forest destruction, shrub juniper and dwarf rhododendron harvesting, the need for better land stewardship and the possibility of forming a conservation committee inside the area.

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Information Dissemination in the Park area



Meeting among User committee, Park warden and TMI's staff

With financial and technical support from TMI and Makalu-Barun National Park and Buffer Zone, MACG has identified and begun to implement the following conservation activities that will begin the process of reversing contemporary environmental degradation:

- All harvesting of green wood and shrubs for cooking and heating has been banned, and trekking groups are requested to use kerosene or gas as a substitute.
- All bottles (beer, coke and fanta) are now banned in the region.
- The ban on poaching wildlife is enforced.
- Construction of new lodges or teashops without formal approval from the Park and the MACG is banned.
- Training is provided on the sustainable collection of medicinal and aromatic plants (MAPs).
- Littering at lodges or campsites has been banned and enforced.

7.3 Gokyo and Thame Valley Field Reconnaissance

The temporary residents of Gokyo valley of SNP requested that TMI and SNPBZ conduct a reconnaissance visit to assess the current situation, especially with respect to juniper use as fuel wood by lodge operators, and to make



Gorky Lake and Surrounding Village

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recommendations to replicate the successes of the Khumbu Alpine Conservation and Restoration Project in Imja valley. At their request, TMI conducted an assessment of the alpine conditions in the Gokyo Valley and discovered that processes similar to those found in the upper Imja Khola Valley are occurring.



Information collection about alpine issues

The assessment was carried out by presenting the success stories of the Khumbu Alpine Conservation Restoration Project in the Imja Valley, followed by the distribution of survey questionnaires focused on fuel wood use and the fuel sources used in the lodges. The TMI staffs involved in this field assessment program were Ang Rita Sherpa (Senior Program Manager) and Sushila Thing (Gender and Development Officer).



Briefing about the alpine values

7.4 FINDINGS:

Over the years, Gokyo Valley has become a popular destination for tourism, especially for trekkers seeking adventure and to explore indigenous Sherpa culture. Tourism has become the most important source of income in the Khumbu and Gokyo Valley.

The reconnaissance survey shows that tourism has had a positive economic impact in the area, providing a range of economic opportunities in the tourism business for local people whose households are based on subsistence agriculture in a region where resources are scarce and development opportunities are highly limited.

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However, in spite of some economic improvements, the increasing number of tourists in the Valley has resulted in increased environmental degradation, threatening the area's fragile mountain ecosystems. The primary environmental impacts include the cutting of trees for firewood, unmanaged waste disposal, uncontrolled use of alpine vegetation and other associated problems. It is important to recognize that the area's environmental threats are not only due to the growth of tourists, but also to seasonal grazing and pressure on alpine vegetation for personal fuel wood use.

In order to achieve long-term management, the residents of Gokyo Valley have requested SNPBZ and TMI to replicate the successful community-based alpine conservation and restoration project from Imja Valley in Gokyo Valley.

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9. APPENDIX ONE: Institutions Involved in the Area

- The Mountain Institute (TMI)
- Sagarmatha National Park (SNP)
- SNP Buffer Zone Council
- Himalayan Trust (HT):
- Sagarmatha Pollution Control Committee (SPCC):
- Pangboche Youth Club (PYC):
- Nepal Mountaineering Association (NMA):



The Mountain Institute

The Mountain Institute

The Mountain Institute (TMI) is the only organization in the world developed exclusively to addressing the unique needs of conservation and equitable development in mountain communities throughout the world. We measure ourselves by the impact we have in three areas:

1. Conserving high priority mountain eco-systems,
2. Increasing environmentally and culturally sustainable livelihoods for mountain communities,
3. Promoting support for mountain cultures and issues through advocacy, education and outreach.

The Mountain Institute's Mission and Vision

To ensure the sustainable future of the world's mountains and people, The Mountain Institute's mission is to "Conserve mountain environments", "Improve mountain livelihoods", and "Support mountain cultures."

The Mountain Institute's vision is to contribute to a world where mountain and mountain people are valued and understood as integral and important to all the world's ecosystems and to the human populations that live within them; and where thriving mountain communities prosper in ecologically rich mountain environment.

For further information, please contact:

TMI, Himal Program
Asian Regional Office
P.O.Box 2785
Baluwatar, Kathmandu, Nepal
Tel: +977-1-4419356/4414237
Fax: +977-1-4410073
Email: tmiregional@wlink.com.np

The Mountain Institute
1707 L St., NW, Suite 1030
Washington, DC 20036
Tel.: 001-202-452-1636
Fax: 001-202-452-1635
Website: www.mountain.org