

## Report from Nepal,

### *"Global Warming and Glacier Physiognomy"*

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Ang Tshering Sherpa, President  
Nepal Mountaineering Association

## **The threats of glacier lakes and Glacial Lake Outburst Flooding**

**Nepal is the canary in the mine shaft.**

**Nepal is the world's early warning system**

**The predictions of the effects of global warming are happening NOW in Nepal.**



An unforgiving mountain whose icy slopes are enough to frighten the most hardened mountaineer.

We think of Everest as massive, solid, unchanging, strong and lofty and unable to be hurt.

The Truth is, few people know that the home of Mother Sagarmatha is one of the most endangered places on earth.

Nepal's climate ranges from tropical lowlands a few meters above sea level, to the highest point on earth.

Less immediately noticeable at lower altitudes, the urgency is in the high Himalaya, now emerging as one of the world's most vulnerable and quickly disintegrating areas due to man made climate change.

### ***Nepal is a land of extremes.***



From almost sea level, to the highest point on Earth, Nepal includes virtually every climate, temperature and terrain in the world.

## **We all know Glaciers are found in mountains.**

And glaciers in Nepal are melting at an astonishing rate.

There are over 3000 glaciers in the high Himalaya and in the last 40 years, almost as many glacial lakes have formed;

**that's almost 3000 new lakes!.**

These glacial lakes can burst out of their walls at any time

Ü if there is an avalanche,

Ü landslide, heavy snowfall,

Ü earthquake,

Ü or even simply accelerated ice melt.

## **The people of Nepal are threatened by Global Warming.**

When the glacial lakes become warmer, and the ice dams break, they will wash away everything below.

Ü bridges,

Ü buildings,

Ü mountain paths,

Ü hydro power plants,

Ü forests,

Ü livestock,

Ü wildlife,

Ü and tragically people.



Bridges gone by floods (2007)

## The challenge to Slow-down climate change must be addressed by analysing our society, our environment and our economy.

The issues of Society, Environment and Economy are exaggerated in our small country because just like the range of climate differences,

Nepalese SOCIETY consists of over 90 ethnic groups all with their own languages, customs and traditions.



### Mountain Culture & Society

The fabric of Nepalese Society is held together by the balance between the people's respect for their society and cultures, their relationship with the environment and their participation in the economy.

When these flash floods occur, also known as GLOFs (Glacial Lake Outburst Flooding) the fabric of Nepalese SOCIETY is ripped apart.

## The ENVIRONMENT of Nepal is also threatened by climate change:

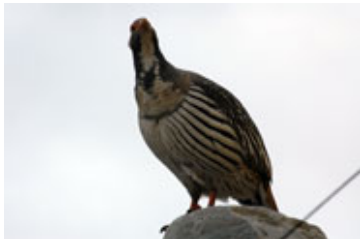
Some of the world's most fragile eco systems lie downhill from these huge glacial lakes.

When these Glacial Lakes burst through, the mountain farmer's topsoil will be washed away, leaving only a rocky infertile land.

The wild and domestic animals will be washed away.

The valley Forests will be washed away.

It will take many years for the environment to recover.



## The ECONOMY of Nepal is based mostly on tourism, and it too, is threatened by global warming and the growing number of glacial lakes.

Everything that generations of Nepalese have invested in our ECONOMY and built in Nepal will be washed away by GLOFs that result from a warming climate.

The tourism ECONOMY will be seriously damaged, not only in destructive physical terms, but also in tourist confidence for many years.



Reduction of grazing land, due to accelerating rate of melting of the glacier path



**Unlike the Tsunami in 2005**, the loss of lives and infrastructure in the mountain environment of Nepal will be very difficult to revive and rebuild.

On the ocean, boats can bring supplies and help to disaster areas, but in the mountains, transportation logistics and local economies are very fragile, and take years, sometimes decades to recover.

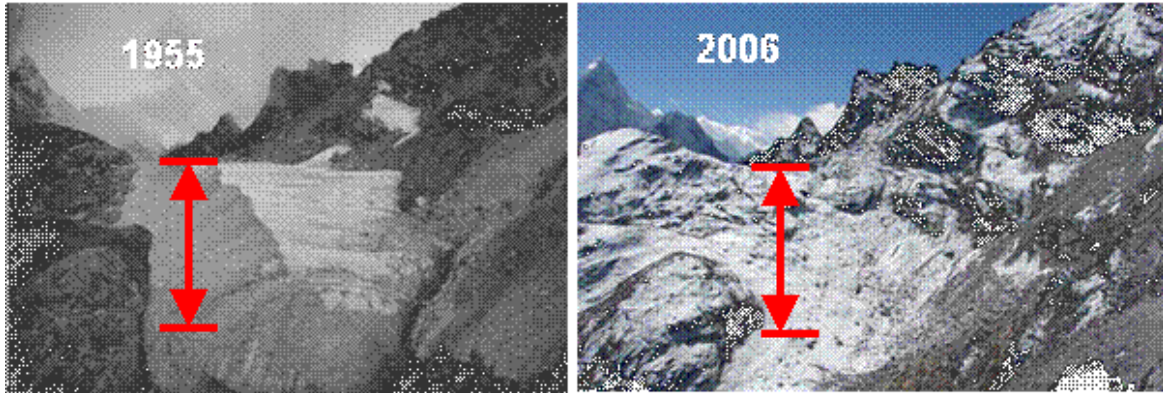
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## EXAMPLES OF EXTREME CLIMATE CHANGE IN NEPAL

Glaciers are "Rivers Frozen in Time",  
... and time is running out for Nepal's glaciers... Here are a few examples.

## Glaciers and Glacial Lakes in the Himalayas



## Glacial Lakes in the Himalayas

Nepal's glaciers are melting and retreating at an unprecedented rate, leaving in their place the highest and most unstable lakes in the world.

These lakes are already at threateningly high levels and the danger of them bursting through their brittle rock and ice dams loom ever closer with each warm day and every unfrozen drop.

It's not like it hasn't happened before: such disasters have occurred, but not with such magnitude and potential frequency.

### (Dig Tsho)

In 1985 one such lake, named Dig Tsho in Khumbu Region burst its natural dam and brought drowning deaths and destruction to the Himalaya valley dwellers in its brutal path.

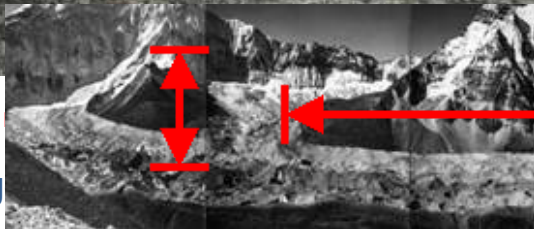
Nothing was granted mercy as it washed away houses, villages,, bridges, hydropower plants, livestock and innocent lives.

The avalanche of water caused an estimated 5 million dollars of damage.

In a developing country like Nepal, 5 million dollars equates to nearly 8,000 years income for the average Nepalese. A devastation to the spirit and progress of people



Due to GLOF, a small glacier



...ed away all the infrastructure below.

Today there is an even bigger

Imja Tsho, on the lap of mount Everest, is nearly 5 times as big as Dig Tsho and is nearing a critical GLOF stage, near to bursting.

Compounding the potential... upstream of Nepal's tou...



## Imja Tso glacial lake formation 2006

### (Vertical Tsunami)

When Lake Imja Tsho decides to burst, it will be a vertical Tsunami, tearing

ü villages,

ü mountain lodges,

ü bridges,

ü mountain paths,

ü hydro electric plants,

ü precious farmland,

ü world heritage woodlands,

ü animal habitats,

ü wildlife,

ü livestock

and most importantly innocent lives - from the slopes leading to Mt. Everest.

The **avalanche of water** will wash away what generations of Sherpas having been building since many generations..

- Everything we have ever invested in –
- Our blood
- Our sweat;
- and our dreams will be washed away in one short thundering moment.

**Only our souls will remain.**

Although primarily concerned with inconvenient local weather changes, the problems the people of Nepal face are truly global in scale.

In spite of our local knowledge and expertise, our impact on the global community is largely unrecognized.

And yet, the poorest will pay for global warming with everything they have.

**(Carbon creeping into the atmosphere)**

These people of the Khumbu, the Sherpa, bravely do whatever they can to combat this threat, but this new enemy has been relentlessly creeping into the atmosphere, raising temperatures almost imperceptibly, and unfortunately, even the legendary superhuman strength of the Sherpa is no match for an accelerating dripping tap and melting dam.

We need to work together to save them because saving them means saving ourselves.

**(SOLUTIONS)**

Let's join hands...

Since 1922, Sherpa people have been helping the world climb Everest.

But, now we need to work together to overcome the next great challenge;

Global warming,

Climate change

and the melting of our glaciers.

In Nepal, we are doing everything we can to reduce the threat of global warming.

Unfortunately, we can't battle this on our own.

This is a global challenge. Now, we need YOUR help.

## How can we solve these problems together?

### Lake Drainage

Bringing the level of the lake down will mean that the stresses on the lake walls are reduced.

In the case of a sudden stress event like an avalanche or rock fall, the lake will not burst out of its dam.

One of our colleagues has suggested that perhaps Lake drainage could be coupled with hydro power generation providing an opportunity for many, where once there was only a problem for all.

### Creating channel diversions

### Relocating people

Relocation of houses, buildings and population above the flood zone.

### Installing early warning systems

Early warning systems give people vital time to evacuate the area of destruction.

### Creating emergency response capability

### Education and awareness campaigns

### Strengthening health services.

## We need the help of the international community

- ü Engineers

- ü Expertise,

- ü Technology

- ü Machinery

- ü Capital

- ü Raise awareness

Please Keep sending your tourists, because responsibly spent tourist dollars help the community and the locally based conservation organisations.

Sherpa having been helping people to reach the top of the world since 1922, now its time that we worked together

We also promised to provide you with an opportunity for a life-changing and climate-saving experience...

...In 2008, we're organising the first Everest Eco-Expedition to help environmentally-minded participants, trekkers, journalists and supporters understand first-hand how climate change and glacial melting is affecting Sagarmatha's / Chomolungma's / Everest's fragile home.

We'll take the Sustainability Symbol and Eco-Expedition participants to the highest platform in the world; where everyone around the planet can SEE!

...and we hope that our actions and YOUR actions will Inspire anyone who Aspires to achieve greatness in the world, to look, think and understand how they can be part of the solution.



"The glacial lakes are like this rock, held back by a thin ice wall - at any moment, the balance could be upset, and damage the people, property and environment below..."

***So Let's THINK Sustainably, work together and ACT now!***

**You are most welcome to come to Nepal to see the future, and learn how together, we can change the world.**

Namaste  
Thank-you!

Ang Tshering Sherpa

President  
Nepal Mountaineering Association

[angtshering@asian-trekking.com](mailto:angtshering@asian-trekking.com)  
[www.asian-trekking.com](http://www.asian-trekking.com)