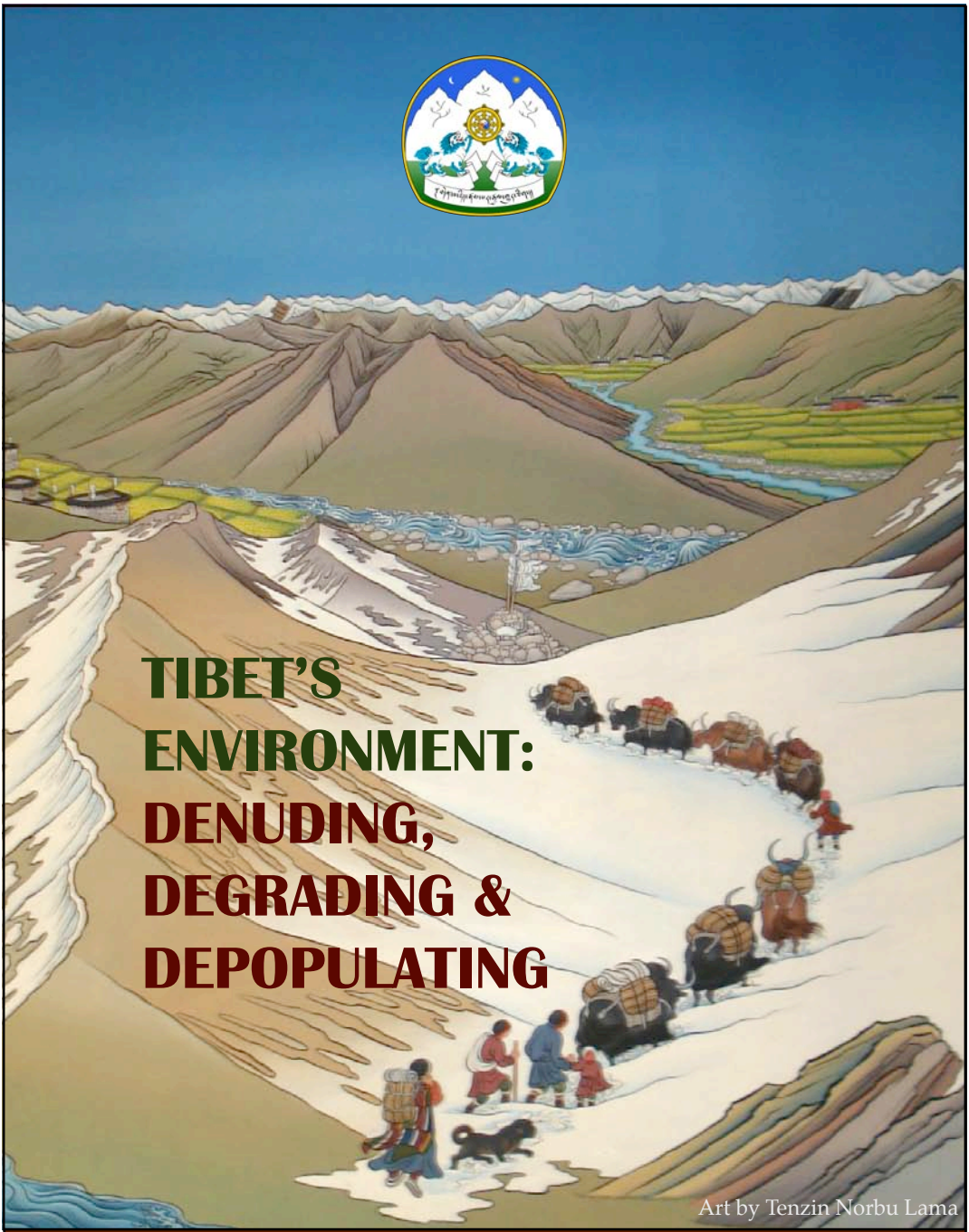


TIBET'S ENVIRONMENT: DENUDING, DEGRADING & DEPOPULATING

Art by Tenzin Norbu Lama

Environment and Development Desk
DEPARTMENT OF INFORMATION & INTERNATIONAL RELATIONS
CENTRAL TIBETAN ADMINISTRATION
(2011)

A. Tibet and Climate Change: What's the underlying story?

Why Tibet matters? Several scientists have realized the importance and Tibet's role in the planetary climate. However, the six million Tibetans are silenced and forbidden to form their own organizations, people think Tibet is small and unimportant on a global scale. Actually, it is an immense upland, with an area of ~2.5 million sq. km and averaging over 4500 meters in elevation. It is not just the largest and highest area in the world today (also referred to as 'the roof of the world'); it may be the largest and highest in all geologic history. It is also close to 2% of the land surface of the planet.

Scientists are increasingly calling the Tibet the planetary 'Third Pole', because it is home to around 46,000 glaciers, storing more freshwater than any other region except the North and South poles. These scientists also know that Tibet is warming at least twice as fast as the rest of the world resulting in more extreme and unpredictable weather across Asia. Tibet's glaciers will be gone within decades. These glaciers feed the rivers that are the lifeblood of Asia, providing water for more than one billion people in ten nations downstream of Tibet.

Global warming is not only causing extreme weather conditions and particularly affecting extreme elevation regions of the world. On the one hand, global warming could cause the submergence of low-lying islands and coastal lands, while on the other hand its effect on the Tibetan Plateau is higher than any part of the world. Tibet is virtually an island in the sky so vast it deeply affects wind circulation, draws the Asian monsoons deep inland, affecting even storm tracks of the north Pacific and Atlantic Oceans.

The Alpine grasslands of the Tibetan Plateau play an important role, like the rainforest of Amazon, in absorbing Carbon dioxide and acting as a Carbon sink. Over one-third (37%) of the Plateau's grassland Soil Organic Carbon is stored in its permafrost regions. The release of the carbon contained within the Plateau's grasslands (positive feedback) could also accelerate global warming. Like the vast Amazon rainforest, it is on the brink of being turned into a desert, which could in turn have catastrophic consequences on the world's climate.

As the climate change on Tibet's fragile mountain ecosystem continues or even accelerates, their effects will resonate far beyond the plateau, changing the water supply for billions of people and altering the atmospheric circulation over half the planet. More than ever before, the need to save the Tibetan Plateau from ecological devastation is urgent because it is not a question of the survival of Tibetans, but also half of the humanity.

The following sections addresses the major impacts of climate change on the Tibetan Plateau and its people especially the nomads. The prevailing global warming and the land use changes over the Plateau are leading to a series of interconnected environmental concerns including:

- **Meltdown of glaciers**
- **Degradation of permafrost layers**
- **Changes in the river hydrology**
- **Drying up of wetlands and shrinking of lakes**
- **Degradation of grasslands and displacement of Tibetan nomads**
- **Resource extraction and deforestation**
- **Human-induced factors**

B. Tibetan Plateau and Climate Change: An Overview

Today, climate change and its impact is a grave concern to the entire world and one that can no longer be ignored. Such a change is not an inexorable force of nature but in fact, has known human causes and available solutions to restore climatic stability.

After Arctic and Antarctic, the Tibetan Plateau is Earth's largest store of ice and a hotspot of climate change. Due to its unique geographical location and high altitude, Tibetan Plateau faces rapid changes in its weather patterns and ecosystems in more extreme ways than other parts of the world. The Plateau has been warming three times as fast as the global average and its glaciers are shrinking more rapidly than anywhere else.

Despite its cold environment, for thousands of years the Tibetan people inhabited this plateau and created cultural landscapes based on the principles of simplicity and non-violence, in harmony with the environment.

The significance of the Tibetan Plateau is clearly evident from different names being used by scientists such as, 'The Third Pole', 'The Water Tower of Asia', 'The Roof of the World' and 'The Barometer of Asia'.

With an average elevation of 4,500 meters, the Plateau contains over 46,000 glaciers covering an area of 105,000 sq. km, and is the highest, largest, and coldest plateau on Earth. It is surrounded by the mighty Himalayas in the south, Kunlun Mountains in the north, and Hindu Kush and Pamir ranges in the west.

The glaciers, snow capped mountains, permafrost soils and alpine wetlands of the Tibetan Plateau hold a large reserve of carbon. If not managed properly they could become a source of greenhouse gases

The rivers originating from Tibet have been the lifeblood of Asian civilization as ancient societies have developed their lifestyles around these great rivers. Today almost half of the world's population is dependent on the water coming from Tibet. As a result Plateau's impact is not only regional, but also global.

The plateau plays an important role in generating and regulating the Asian monsoon. It heats quickly in spring and summer, diverting the jet stream, establishing a steep pressure gradient that draws monsoon clouds deep inland into the heart of Eurasia.

The Tibetan Plateau is a unique biodiversity zone with over 100,000 high altitude plant species, 12,000 species of vascular plants, 532 species of birds, 126 identified minerals etc.

The prevailing global warming and the land use changes over the Tibetan Plateau are leading to a series of interconnected environmental concerns like meltdown of glaciers, degradation of permafrost layers, changes in the river hydrology, drying up of wetlands, shrinking of lakes, degradation of grasslands and displacement of Tibetan pastoral nomads.

This multi-faceted environmental degradation further enhances warming process and adversely affect the Plateau's climate, its neighbors and the world at large.

C. Glacial Meltdown and Glacial Lake Outburst Floods

The Tibetan Plateau holds the Hindu-Kush Himalayan Ice Sheet, considered the largest ice mass outside the two poles. Hence scientists and geologists are increasingly using the name 'Third Pole' to pronounce the global significance of Tibet's environment.

According to the Inter-governmental Panel on Climate Change (IPCC), glaciers in the Tibetan Plateau are receding fast, which will result in massive flooding followed by severe drought. Some reports suggest that Tibet's glaciers have shrunk by 6,600 sq. km in the past 40 years and 82% of the glaciers have already retreated in the past 50 years. Furthermore, a major concern is the lack of any net accumulation of snow since 1950 over these mountains.

The scale of glacial melting can be viewed at Rongbuk Glacier, the northern slope of Mt. Everest (*Tib: Jhomolangma*). Between 1966 and 1997, the glacier receded by up to 270m in the middle, 170m at its eastern side, and 230m at its far-east side. Similarly, the Zepu glacier of southeast Tibet has thinned by more than 100m in the last three decades alone.

Mountain glaciers are experiencing less accumulation of snow and higher rates of melting. Without these glaciers the flow of rivers would become seasonal, leaving the livelihoods of hundreds of millions of people affected by the extreme weather conditions.

Furthermore, melting of glaciers and the permafrost in recent years have destabilized hillsides and resulted in landslides. A massive landslide in Tibet blocked Pareechu, a tributary of the Sutlej in Tibet. In the year 2000 and 20005 this unstable rock-fall dam burst caused heavy destruction of livelihood, infrastructure, and socio-economic assets in Kinnaur and Shimla districts in Himachal Pradesh, India.

Due to the rapidly melting glaciers, there has been a rapid increase in the numbers of glacial lakes in the Himalayan regions resulting in Glacial Lake Outburst Floods (GLOF) particularly in Nepal, India and Bhutan. According to the International Centre for Integrated Mountain Development (ICIMOD), there are 8790 glacial lakes within a selected areas of Hindu-Kush Himalaya and more than 200 potentially dangerous Glacial lakes, where rock walls created by retreating glaciers may suddenly collapse.

The scale of glacial melting on the west Rongbuk Glacier between 1921 and 2008. (Courtesy: RGS & David Breashears/GlacialWorks)

D. Degradation of Frozen Earth Layers and Release of Green House Gases

The presence or absence of the permafrost layer necessitates major variations in the soil's physical structure mainly its moisture and nutrient content. The permafrost covers approximately 1.3 to 1.6 million sq. km. These covers have thickness ranging from 1 to 130 m, depending on such local characteristics as slope and exposure, altitude, geological structure, soils, and soil water content. The alpine permafrost on the Plateau stores about 12,300 million tons of Carbon. Significant amount of methane gas are also trapped in the permafrost, preventing its release into the atmosphere. The alpine permafrost on the Plateau are characterized by warm permafrost and rich ground ice, as a result they are sensitive to climate change and are particularly vulnerable to rising temperature.

Tibet serves as a major carbon sink with around 37% (12,300 million tons of Carbon) of the its grassland Soil Organic Carbon (SOC) stored in the alpine permafrost of the Tibetan Plateau. Their degradation would lead to a huge amount of carbon entering the atmosphere, intensifying global warming. Recent studies have shown that glacial melting and thawing of permafrost on the Plateau will lead to a large-scale release of green-house gases into the atmosphere and could bring further changes in the already warming global climate.

With a significant measured increase in the mean cold season average temperature, the permafrost layers and seasonally frozen grounds are slowly degrading leading to increased microbial decomposition of previously frozen organic carbons. The degradation of permafrost, besides disturbing the carbon balance over the plateau, will also lead to the lowering of the water table, loss of soil moisture content, drying of wetland, extinction of native plant species and desertification.

If the current trend of melting permafrost and loss of wetlands continue then the carbon deposits and methane would be released in the air and it can speed up the Global Climate Change. The loss of carbon deposits will also degrade the grasslands directly hurting the biodiversity on the Tibetan Plateau.

In addition, since the wetlands and permafrost work as sponges controlling the amount of water running into the rivers, there could be flash floods and ultimately water crisis in the most populous regions of the world.

Thaw slumps caused by permafrost degradation. (courtesy: Niu Fujun)

E. Impact on River Hydrology and Sustenance of Lower Riparian Countries

Snow peaks and glaciers enable Tibet to be the source of major rivers that flow into Asia and meet its water demand. Rivers such as *Machu* (Yellow), *Drichu* (Yangtze), *Zachu* (Mekong), *Gyalmo Nyulchu* (Salween), *Yarlung Tsangpo* (Brahmaputra), *Macha Khabab* (Karnali), *Langchen Khabab* (Sutlej), *Sengey Khabab* (Indus), *Bhumchu* (Arun) and *Lhodrak Sharchu* (Manas) have their sources in the Tibetan Plateau.

According to some estimate, approximately 1.3 billion people in Asia are directly dependent on the watersheds of these major rivers. For instance, *YarlungTsangpo* originates from the glaciers of Mt. Kailash range in Tibet and drains an area of 651,335 sq. km connecting Tibet (50.5%), India (33.6%), Bangladesh (8.1%) and Bhutan (7.8%). Beyond the populations residing in the watersheds of these rivers are the additional hundreds of millions who depend on monsoon rains drawn inland by the Tibetan Plateau.

Unfortunately, the flow regimes of the rivers in Tibet are changing due to climate change and human interventions. In 2007, the WWF (World Wide Fund For Nature) identified that four out of the world's top ten rivers, which are at greatest risk (from six important threats including dams and infrastructure, excessive water extraction, climate change, invasive species, over-fishing, and pollution), originate from the Tibetan Plateau. This includes *Sengye Khabab* affected by climate change, *Drichu* confronting a pollution crisis, *Gyalmo Ngyulchu* threatened by dam construction and *Zachu* threatened by overfishing.

According to the World Commission on Dams, the Chinese government increased the number of large dams from 22 in 1950 to 22,000 in 2000. Although the plans to divert water from the *Drichu* and *Yarlung Tsangpo* rivers to the fast-drying *Machu* River will improve its flow through the most populated areas of China, it will deprive water to the millions of people in the lower riparian (downstream) regions.

List of major rivers originating from Tibet and its watershed regions in the lower riparian.

Tibetan Name	Common Name	Watershed Regions/ Countries	Outflow
Machu	Yellow River	Tibet, China, Inner Mongolia	Yellow Sea
Drichu	Yangtze	Tibet and China	East China Sea
Zachu	Mekong	China, Vietnam, Laos, Cambodia, Thailand	South China Sea
Gyalmo Ngulchu	Salween	Tibet, China, Myanmar, Thailand	Andaman Sea
Yarlung Tsangpo	Brahmaputra	Tibet, India, Bangladesh	Bay of Bengal
Macha Khabab	Karnali	Tibet, Nepal, India	Bay of Bengal
Langchen Khabab	Sutlej	Tibet, India, Pakistan	Arabian Sea
Senge Khabab	Indus	Tibet, India, Pakistan	Arabian Sea
Bhumchu	Arun	Tibet, Nepal, India	Bay of Bengal
Lhodrak Sherchu	Manas	Tibet, Bhutan, India, Bangladesh	Bay of Bengal

F. Grassland Degradation and Removal of Tibetan Nomads

Tibet's rangeland with an average altitude of 4500 meters, covers approximately 70% of Tibet's total area. The Alpine grassland at high altitude occupies over 60% of the total rangeland in Tibet.

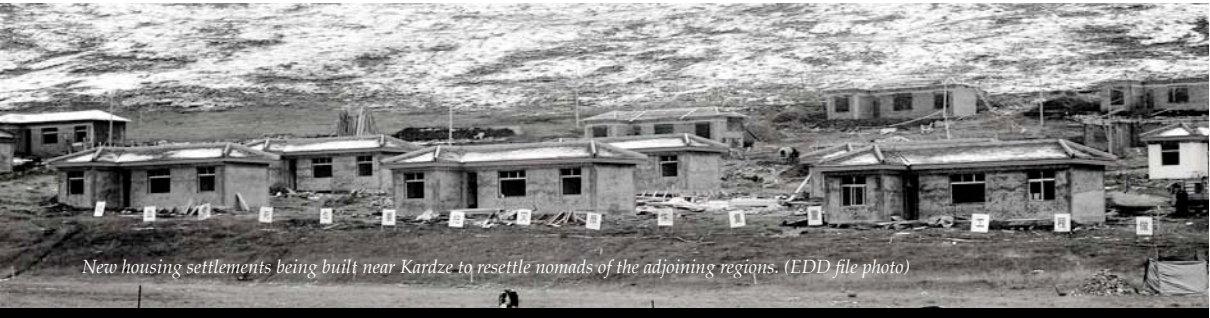
Pastoralism on the Tibetan Plateau is an adaptation to a cold environment at elevations above the limit of cultivation. Consequently, pastoral nomads of Tibet have maintained a unique pastoral culture for more than 8000 years. Tibet's grasslands represent one of the last remaining agro-pastoral regions in the world. The pasturelands are made habitable through the co-existence of the Tibetan people and their yaks. According to recent archaeological fieldwork, the Tibetan Plateau has been used extensively by pastoral nomads, who developed deep understanding of grassland dynamics and veterinary knowledge for close to 9,000 years.

According to one UNDP report (2007), Tibet's grasslands are turning into desert at the rate of 2,330 sq. km per year. Apart from the natural climate warming and its feedback, various anthropogenic (human-induced) factors are also responsible for accelerating the process of grassland degradation.

China's introduction of different grassland policies over the years have threatened the sustainability of this fragile environmental balance. The overall plan during the periods of 'Collectivization and Household Responsibility' was to maximize the agricultural production from the grasslands. During that era, almost 20 million hectares of grassland in Tibet and Inner Mongolia were converted to croplands. Tibetan Plateau's alpine grasslands has been plowed and exposed to hazardous chemical fertilizers causing severe degradation of grasslands.

However, Chinese government has been accusing nomads, making them scapegoats for causing the grassland degradation and is planning to forcibly resettle all nomads in permanent structures by 2020, in order to protect their precious water tower! Chinese government's implementation of the policy to settle Tibetan nomads has led to increasing poverty, environmental degradation and social breakdown. Tibetan nomads, in reality, are the expert custodians of the alpine pastures and their mobile lifestyle prevents the grasslands from overgrazing. Recent researchers have also indicated that managed grazing on these grasslands could actually help to restore the degraded grasslands, and maintain a wider biodiversity of indigenous species of grasses, forbs and medicinally useful plants.

Therefore, far from being 'selfish', 'stupid' or 'ignorant' of the consequences of grazing, as China supposes, Tibetan nomads has actually been the natural resource managers over millennia. If at all, the implementation of the current grassland law is necessary to protect the grasslands or the Chinese water tower, why the nomads are excluded and their past experiences are not valued? They could play a key role in rehabilitating the degraded pastures.



New housing settlements being built near Kardze to resettle nomads of the adjoining regions. (EDD file photo)

G. Contraction of Wetlands and Drying Up of Lakes

Wetlands, often referred to as earth's kidney, has played a vital role in sustaining ecosystems that serves millions of lives. They act as an enormous sponge slowly releasing water into rivers all round year.

The fresh water wetlands on the Tibetan Plateau are distributed in an area of around 1,33,000 sq. km. With their wealth of stored carbon, these wetlands provide a potential sink for the atmospheric carbon. It was also observed that the role of wetland as a carbon sink was closely related with the water table and the amount of precipitation.

The warming climate has resulted in the drying-up of thousands of lakes across the Tibetan Plateau. Most of them are considered sacred. These lakes have no outlet and depend entirely on local streams and underground sources to maintain their water level. Already a large number of lakes have disappeared due to warming climate and human activities in the past few decades. This is now accelerating.

The subsequent release of Carbon dioxide, Methane and Nitrogen dioxide from these contracting wetlands further adds up to the yearly GHGs emission. Total Carbon dioxide emission from the Tibetan Plateau wetlands due to prolonged permafrost thawing season is estimated to be around 10 million tons, which is roughly equivalent to Carbon dioxide emitted by 10 million average automobiles in China for two months. The wetlands of *Lhalu* on the northwest edge of Lhasa, with its total area of 6.2 sq. km could absorb 78,800 tons of Carbon and produce 57,300 tons of oxygen annually.

The contraction in the wetlands due to climate change led to reduced flows of the *Drichu* (Yangtze) and *Machu* (Yellow) rivers. The warming climate has resulted in the drying-up of thousands of lakes across the Tibetan Plateau over thousands of years.

According to Chinese Academy of Sciences, the wetlands on the Tibetan Plateau have shrunk more than 10% overall in the past 40 years, with biggest shrinkage occurring at the source of the *Drichu* (Yangtze) and *Machu* (Yellow).

The surface area of lake *Nam-Tso* has decreased by 38.58 sq. km from 1970 to 1988 at a rate of 2.14 Sq. km per year. Similarly, the water level of *Tso-Ngonpo* has reportedly lowered by 3.62 meters and its water surface shrank by 342 sq. km between 1959 and 2005. The decline in the lake level of *Tso-Ngonpo* has led to many environmental problems in this watershed such as grassland degradation, deterioration of water quality, wind erosion and expansion of sandy land.

H. Resource Extraction and Deforestation

Tibet's elevation has produced a unique, resource-rich geology. The unchecked mining operations in Tibet have been a major cause for environmental degradation since 1960s. Extraction of mineral ores and natural resources (chromium, salt, copper, silver, coal, gold, lithium, lead, zinc, asbestos, oil, gas, magnesium, potash and uranium) has been vigorously carried out by the Chinese government to fuel its growing economy and to lessen its dependence on costly imports. Chinese Geological Survey in 2007 estimated that the Tibetan Plateau holds about 30-40 million tons of copper reserves, 40 million tons of zinc, and several billion tons of iron. Copper deposits included the Yulong copper find in the Tibetan Autonomous Region (TAR) which has a proven reserve of more than 7.8 million tons, making it the second largest copper mine in Asia.

The mining operations are carried out without any consent, involvement and, in some case, even the knowledge of the local Tibetans. This is a violation of their fundamental right to determine how their economic resources are utilized. The Chinese government has also been actively promoting resource extraction opportunities in Tibet to foreign firms who have both the capital and expertise needed to mine in Tibet's inaccessible and often hostile environment.

The opening of the Gormo-Lhasa Railway has allowed China to extract Tibet's resources more efficiently and at the faster rate. The railway has been deliberately routed through areas with rich mineral deposits, which confirms the suspicion that one of China's prime objectives for the railway is to transport vast quantities of Tibet's enormous mineral wealth out of Tibet, denying Tibetans any opportunity to benefit from it.

Mining poses devastating social, economic and ecological consequences for the local Tibetan communities. Mine operations have an irreversibly destructive impact on environment, especially gold and copper mining, which use toxic chemicals usually cyanide or arsenic in the processing stage. Of particular concern is danger of water contamination from the waste discarded at mine sites, as most of the proposed mines are in close proximity to Tibet's main river systems, including the Yarlung Tsangpo.

Increased mining activities further reduce vegetation cover and thus increase the danger for severe landslides, massive soil erosion and loss of wildlife habitat. Mine operations destroy grazing lands, negatively impacting the livelihood of local residents located near mining sites. The heavy influx of Han Chinese migrant workers has also started to cause disastrous effect on the region and lead to potential conflicts with Tibetan residents. Over the past two years, they has been several protest made by the local residents against the mining companies all across the three traditional provinces of Tibet.

China refers to Tibet as its "Western Treasure House". At the time of China's invasion in 1950, the Plateau was rich in timber resources, but decades of logging has resulted in large-scale deforestation and half of Tibet's forest-stock have been exported to China, leaving the region highly prone to erosion. It was only after the disastrous floods of the middle and lower Yangtze River in 1998, that China realized the consequences of stripping Tibet's forests. Even now logging does continue but at a smaller scale.

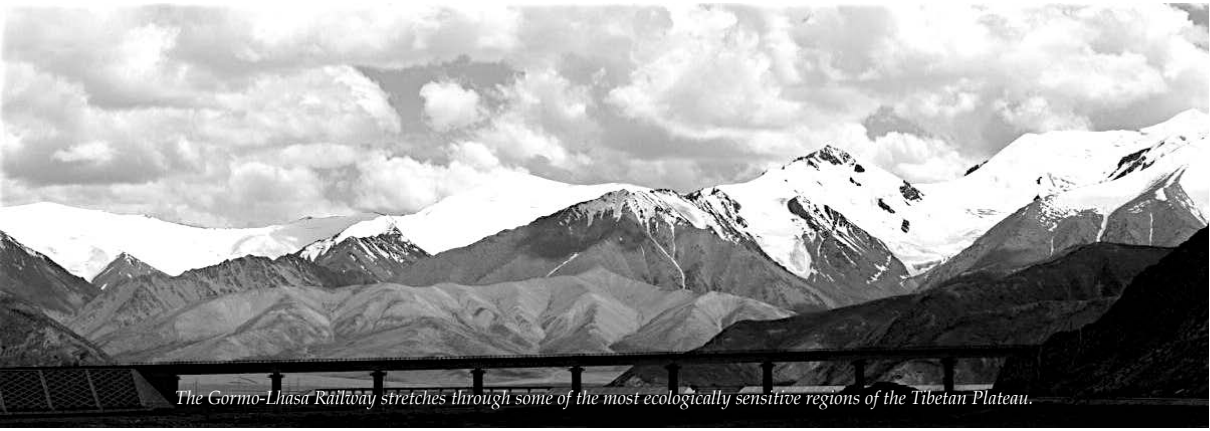
I. Anthropogenic (Human-Induced) Factors

Various anthropogenic factors on the Tibetan Plateau are also responsible for speeding up the environmental degradation and its associated problems. One of the major causes has been the Chinese government's policy to bring changes in land use, in particular, conversion of grassland into cropland to maximize agricultural production.

The construction of Siling-Lhasa Highway (SLH) (Ch: Qinghai-Tibet Highway) in 1959 led to severe degradation of the permafrost soil and the vegetation along the highway and adjoining areas. The damaged vegetative mat led to the loss of organic matter and carbon in the soil, and the melting of the warm permafrost layer under the topsoil. The degradation of the permafrost was further aggravated during the road width expansion and reconstruction of SLH between 1973 and 1984. Recent researchers have also indicated that the permafrost degradation on the Tibetan Plateau are mainly attributed to human interventions or the surface disturbances over the past several decades, while the global warming has played a secondary role in speeding up the degradation.

China has been constructing a series of dams on Tibet's major rivers, disregarding the implications on Tibet's fragile ecology. These dams have proved controversial as they involve massive relocation of people and their homes, and the environmental impact of altering landscape and ecosystems. Besides these immediate environmental and social problems, there are other issues that will threaten the dams and the peoples living in its shadow. Most of the Tibetan Plateau is an active seismic zone, where earthquakes are frequent and often severe. The weight of water stored in the dam has been found scientifically to be sufficient to trigger seismic events.

Furthermore, other human-induced factors that contributes to the environmental degradation in the Tibetan Plateau includes infrastructural development such as new townships for displaced nomads and railroad tracks, reclamation of communal land and pastures to allow commercial development, large-scale illegal harvesting of wild medicinal herbs on grasslands, and elimination of indigenous predators causing growth of pest species etc.



The Gormo-Lhasa Railway stretches through some of the most ecologically sensitive regions of the Tibetan Plateau.

J. QUOTES ABOUT TIBET'S ENVIRONMENT

"These days the environment- the source of life for all beings in the world including Tibet, the Land of Snows- is undergoing extensive degeneration. At this time it is extremely important that every human being, according to his or her ability, consistently puts effort into ensuring the conservation and protection of this planet's environment and its inhabitants."

-His Holiness the XIV Dalai Lama, the spiritual leader of Tibet

"Our understanding of global climate change would be incomplete without taking into consideration what's happening to the Tibetan plateau."

-Veerabhadran Ramanathan, an atmospheric scientist at the Scripps Institution of Oceanography in La Jolla, California.

"[…] While there is little doubt about the extent of the land degradation problem, the Special Rapporteur would note that herders should not, as a result of the measures adopted under the tuimu huancao ('removing animals to grow grass') policy, be put in a situation where they have no other options than to sell their herd and resettle."

-Olivier De Schutter, the UN Special Rapporteur on the Right to Food, Preliminary observations and conclusions: Mission to the People's Republic of China from Dec. 15 to 23, 2010

"The Dalai Lama argued that the political agenda should be sidelined for five to ten years and the international community should shift its focus to climate change on the Tibetan plateau. Melting glaciers, deforestation, and increasingly polluted water from mining projects were problems that cannot wait."

-Timothy Roemer, the US Ambassador to India stated in his cable to Washington about his meeting with His Holiness the Dalai Lama.

"The highest and largest plateau on earth. It shelters a wide array of unique species, including the Tibetan antelope, Tibetan gazelle, wild yak, blue sheep, snow leopard, brown bear, Bengal tiger and black-necked crane. The Tibetan Plateau is also the source of almost all of Asia's major rivers: the Yellow River, the Yangtze, the Mekong, the Salween, the Indus, and the Yarlung Tsangpo, which downstream becomes the Brahmaputra. Because of its high elevation (ave. elev. 4000m), the ecosystem here is extremely fragile. Once damaged, it is extremely difficult to reverse."

-Ling Lin, Director of Tibetan Plateau Programme, World Wide Fund for Nature.

"Temperatures are rising four times faster than elsewhere in China, and the Tibetan glaciers are retreating at a higher speed than in any other part of the world. In the short term, this will cause lakes to expand and bring floods and mudflows. In the long run, the glaciers are vital lifelines for Asian rivers, including the Indus and the Ganges. Once they vanish, water supplies in those regions will be in peril."

-Qin Dahe, the former head of the China Meteorological Administration

K. Did You Know?

- Tibetan Plateau or The Third Pole which contains more than 46,000 glaciers covering an area of 105,000 sq. km is the most glaciated region on earth.
- Around 1.3 billion people in Asia thrive on the watershed of the rivers originating from the Tibetan Plateau.
- United Nations has warned that Tibet's glaciers could disappear within the next 100 years.
- The Tibetan Plateau plays a pivotal role in generating and regulating Asian monsoon.
- The melting of Tibetan glaciers had led to the formation of 8,790 identified glacial lakes, and 204 of these are considered potentially dangerous and may lead to lake outburst and floods.
- The air temperature on the Tibetan Plateau is predicted to increase by 2.2°-2.6° C by 2030, which in turn will melt the region's glaciers and permafrost at an accelerating rate.
- According to WWF, four of the world's top ten rivers, which are at the greatest risk (from dams and infrastructure, excessive water extraction, climate change, invasive species, over-fishing, and pollution) originates from the Tibetan Plateau.
- According to one UNDP report (2007), Tibet's grasslands are turning into desert at the rate of 2,330 sq. km per year.
- Tibetan pastoral nomads are the best stewards of the grasslands and China's current grassland policy completely disregards their traditional knowledge and compels them to settle permanently without their livestock.

Mt. Kailash in Western Tibet © Ray Kreisel

L. About Environment and Development Desk (EDD)

Established in March 1990 by the Department of Information and International Relations (DIIR), EDD was earlier known as Environment Desk. In addition to monitoring and reporting environmental situation inside Tibet, it is active in environmental education projects in exile Tibetan communities.

Over the years, EDD has begun to focus more on environment and development issues inside Tibet.

EDD's spheres of activities are mainly focused on Tibet, our chief goals are:

I. To monitor and research on environment and development issues inside Tibet
II. To disseminate information and carry out selective advocacy on promoting sustainable development inside Tibet
III. To create awareness on environmental issues in the exile Tibetan community.

CONTACT:

Environment & Development Desk
Department of Information & International Relations
Central Tibetan Administration
Dharamshala 176215
Himachal Pradesh, INDIA

Tel: +91-1892-222457, 222510
Fax: +91-1892-224957
E-mail: edd@tibet.net

For more information visit www.tibet.net