

Tibet: The Third Pole & the Himalayas

- *Tenzin Norbu*

Overview

The world has one roof. It is the Tibetan Plateau, defined simply by Tibetans as the land surrounded by mountains, or the land of snows. Situated at the heart of Asia, Tibet is ringed by fourteen high mountain ranges; the whole plateau is uplifted to an average height of 4500 meters. This vast plateau stretches for almost 3,000 kilometers from west to east and 1,500 kilometers from south to north. The glacier-fed rivers originating from these peaks and the subsequent recharge from the underground aquifer makes up Tibet the largest river run-off from any single location in the world. Despite its cold environment and intricately complex natural systems, the Tibetan people have occupied this plateau for thousands of years. They have created a cultural landscape based on the principles of simplicity and non-violence that are in harmony with the environment. It is in fact one of the most environmentally strategic and sensitive regions in the world and quite often referred to as 'The Third Pole' and 'The Water Tower of Asia'. These synonyms reflect the significance of its snow capped mountains, the river systems and its alpine grasslands. Since time immemorial, the plateau holds the Hindu Kush Himalayan Ice Sheet, considered as the largest ice mass outside the two poles. Tibet also acts as the fountain-head for many rivers that flow into Asia (*India, Inner Mongolia, Nepal, Bhutan, Bangladesh, China, Pakistan, Thailand, Laos, Burma, Cambodia and Vietnam*) creating a vast river basin area of more than 6 million sq. kilometers. During the last few decades, due to climate warming and human actions, the natural systems of this unique landscape are silently degrading away and threatening the survival of millions who rely on its natural ecosystem services.

Rilung Tsatsig: The Mountain Valley Decree

Tibetans have always lived with nature, seeking to learn and understand its nuances and rhythms. Buddhism, which was introduced to Tibet in the second or third century, has played an important role in this respect. A general taboo against exploiting the environment was a direct result of Buddhist knowledge and belief about the inter – relationship between all plants, animals, as well as the non-living elements of nature such as sunshine sky, mountains, valleys, lakes and rivers. The close relationship between religion and nature meant that the simple yet effective principles which maintained balance in the natural world became a part of life. After ages of living like this, it is in fact difficult for a Tibetan to differentiate between the practice of religion and concern for the environment.

Looking back in time, in the Horse Water Year of 1642 His Holiness the Great Fifth Dalai Lama (Ngawang Lobsang Gyatso, the spiritual and political leader of Tibet) issued a royal decree in the tenth lunar month to protect the animals and the environment. This royal decree was widely known as Rilung Tsatsig or the 'Mountain Valley Decree'. In the absence of the Dalai Lama, this decree was issued by the regent.

One such decree issued by the Regent Tagdra in 1940 reads, ‘for this Iron-Dragon year, the Tibetan Government has decreed that in each and every village and town in Tibet, on 8th, 15th, 30th day of each lunar month and on the 4th, 6th, and 22nd day of the 9th lunar month and the 25th day of the 10th lunar month, nobody is allowed to kill domestic animal for the purpose of selling it or for personal consumption.¹

Hundreds of copies of this decree were drafted by the clerks in the private office of His Holiness and were then distributed to various regions and villages in the whole of Tibet from to be read out by the district head or the magistrate to the people in order to promote peace and prosperity, to remind the words of Lord Buddha and to retrain them from committing sinful acts. It also reiterates the legal rule and also regarded by the locals as a blessing from His Holiness.²

On special occasions and on the advice from the state oracle (Nechung) a special Tsatsig would also be issued. For instance, Regent Tagdra issued a special Tsatsig in the seventh month of 1944 (wood monkey year). In short the decree reads, ‘except for the predatory animals such as wolves, all the other animals, aquatic, boreal, or amphibians as long as they are endowed with the gift of life must be protected and should not be harmed. Clear directions were also given for the implementation of the Tsatsig to all the governors and the local officials.³

Similar Tsatsig or decree were also issued from the local high priest or lamas, this tradition is prevalent throughout Tibet, these Tsatsigs were considered the most effective ways to preserve the religion, life, happiness and health for all the sentient beings.

In some western parts of Tibet, in Ngari region, periodic or territorial decree or Kabdhus Tsatsig was issued and the local authorities should employ some rangers or guards to protect the animals from hunters and poachers. For example, decree issued during the spring season of the third and fourth lunar month that coincides with the birthing period of Tibetan antelope and the migration of fish. In some cases, the local authorities should employ special corps during the mating season of the wild ducks, their duties were to protect the eggs till the young hatchlings could swim freely with their mothers.⁴

From all these above accounts, one could clearly make out that these decrees or Tsatsigs had a deep connection and reverence towards Buddhist philosophy of nature conservation and protection. These decrees were not only considered as a direct command but also referred to as a blessing from the Dalai Lama or the high priest. Rebecca Redwood French, mentioned in her

¹ *Tibet: Environment and Development Issues (1992): Wildlife Conservation Decree Issued by Tagdra Rinpoche the Regent of Tibet in 1944.* DIIR CTA, Dharamshala 1992.

² Rebecca Redwood French, ‘The Golden Yoke – The legal cosmology of Buddhist Tibet’, Snow Lion Publications, Ithaca, New York, ISBN 1-55939-171-5 (1995)

³ T.P Atisha, ‘The Tibetan Approach to Ecology’ Paper presented at the Ecological Conference on Tibet, San Francisco, 27 October, 1990.

⁴ Tsering Choephel and Tsephel, ‘Environment conditions in Ngari prefecture of Tibet,’ DIIR Publication, (2003)- Tibetan version

book, 'The Golden Yoke- The legal cosmology of Buddhist Tibet' how this royal decree looks and the reaction of the local Tibetans, she writes..

*'The decrees that were issued from His Holiness private office bear the full name of His Holiness the Thirteenth Dalai Lama, the Tibetan year and date. The decree was always written on the finest paper, unrolled to almost a yard in width and two yards in length. The writing was exquisite; even those who could not read would marvel at the elegant shapes of the finest government duktsa script. At the top was a large red seal of the Dalai Lama's Office; it was followed by exactly forty five lines of even script, all perfectly spaced. The villagers went up to receive the blessing of the even larger red seal of His Holiness at the bottom, which was placed near his many-worded full name.'*⁵

Evidence of the successful implementation of this approach can be found in the records of various western travelers, explorers and naturalist who visited Tibet before the Chinese invasion. They mentioned about various bird festivals and also certain areas being designated as bird sanctuaries for migrating birds, specific shrines were named in protecting the birds, for instance, Yarlung⁶ Jha-sa Lhakang (meaning 'the resting-place-of-birds temple'). Yet another temple was at the north shore of the lake Namtso known as the Jha-do gompa, or "bird confluence monastery". According to Jamyang Norbu,

*'Jha-sa Temple in Yarlung, Reting monastery, and the Jha-do monastery by Namtso Lake form an almost straight line on the migration path of birds flying to the Changtang from Mon, or the Arunachal Pradesh area. So it is conceivable that these festivals were a way of aiding and supporting these exhausted migrating birds on the way to their breeding grounds in the north, and also of making the local public aware of this important event'.*⁷

Since the occupation of Tibet, the Chinese government has not only restricted the practice of traditional Buddhist tradition involved in environmental preservation but also embarked upon unsustainable development schemes in many parts of Tibet, adversely impacting most of its river systems, biodiversity and the pristine landscape that benefits the entire Himalayan nations and beyond.

The Himal Parivar

Those mountains that attract the snow extend beyond the political boundaries of today's Tibet, which, in China's definition, covers less than half the Plateau. To the north and east of "Tibet Autonomous Region" (TAR) are the historic Tibetan provinces of Amdo and Kham, today fragmented into China's Qinghai, Gansu, Sichuan and Yunnan. To the south of TAR are the Himalayan communities of Arunachal, Kashmir and Sikkim in India, Bhutan and upland Nepal. Taken together, they constitute a Tibetanised world, a coherent cultural, religious and linguistic

⁵ Source: Rebecca Redwood French, 'The Golden Yoke – The legal cosmology of Buddhist Tibet', Snow Lion Publications, Ithaca, New York, ISBN 1-55939-171-5 (1995)

⁶ Since it was situated on the banks of the Yarlung Tsang-po, hence the name 'Yarlung'.

⁷ Jamyang Norbu, 'HIGH SANCTUARY, WILDLIFE AND NATURE CONSERVANCY IN OLD TIBET', December 6th, 2009, <http://www.jamyangnorbu.com/blog/2009/12/06/high-sanctuary/>

bloc with deep ties and connections over many centuries. This Himal parivar long predates the interventions of great powers –the British Raj, China and modern India. As a trans-Himalayan cultural family, it will outlive the ridgeline mapping imposed on the region by imperial powers. In no way is this claim to a “greater Tibet” or for political change to existing boundaries. It remains a cultural reality that the Himalayas, for those living in them, are not at all an absolute barrier, but a porous life way that has long brought down from the plateau water, wool, salt, pilgrims, lamas and religion; while carrying up from the lowlands and through the mountains cotton, pilgrims, modernity and the clouds of the monsoon. This rich history of two-way traffic, of goods and ideas, commodities and mind training instruction, brought the Himalayan peoples closer together, overcoming all hardships of a steep terrain.

The peoples of the Himalayas know how extraordinary their land is. Their orientation was to the north, to Lhasa and the great sources of the Buddhist teachings that made mountain life meaningful. The hill tribes of the Himalayas looked north to Tibet, to trade, to go on pilgrimage, to seek a teacher for the village, to rebuild a monastery, to find an artist to repaint murals, to seek authentic connections to a lineage of mediators.⁸

The Water Tower of Asia: Himalayan Rivers

Tibetan rivers are distinguished by their high silt loads resulting from the largely desert landscape from which they originate. The five major rivers are Machu (Yellow River), Driчу (Yangtse), Zachu (Mekong), Gyalmo Ngulchu (Salween) and Yarlung Tsangpo (Brahmaputra). Rivers originating from Tibet flows to more than ten countries and play a vital role in all the spheres of life form and socioeconomic of each country. These rivers enable Tibet to become the Water Tower of Asia.

From the western part of Tibet, four rivers originate around Mt. Kailash, also known as the Gang Rinpoche, the Holy Mountain. From the east of Mt. Kailash through the most densely populated region of Tibet, The Yarlung Tsangpo (Brahmaputra River) irrigates most of the agricultural land in the historical Yarlung valley of Tibet (hence the name Yarlung, and Tsangpo meaning river in Tibetan). Then it passes through Shigatse City and, flowing south of Lhasa, it drains the Kyichu River. The river then flows through the once forested Kongpo region before turning abruptly near Mt. Namchak Barwa to the south, cutting straight through the Himalayan divide to flow into India as Brahmaputra and then to Bangladesh. The Senge Khabab or Indus River originates from the north of Kailash. It then flows west into India (Ladakh and Kashmir) and continues to become Pakistan’s principal river. The Langchen Khabab (River Sutlej) begins from the west of Mt. Kailash, crossing the Himalayas into Himachal Pradesh in northwest India, passing through the Punjab region before joining the Indus in Pakistan. The Macha Khabab (Karnali) originates from the southern part of Mt. Kailash, crossing the Himalayas into western Nepal and then into India where it becomes one of the major tributary of the River Ganges⁹.

⁸ *This section was inspired through a personal communication with Gabriel Laffite (a Tibetologist)*

⁹ *Tibet 2000, ‘Environment and Development Issues’ Environment and Development Desk, DIIR, CTA, 2000*

Melting Himalayas and the state of its rivers

It is now feared that the Himalayan glaciers are rapidly retreating because of climate change. Since the mid-1970s, the average air temperature rose by 1°C in the Himalayan region, i.e. almost twice as fast as the global average warming of 0.6 °C reported by the IPCC, this trend being most pronounced at high altitude sites. And almost 67% of the glaciers in the Himalayan and Tianshan mountain ranges have retreated in the past decade – by as much as 30 m per year for the Gangotri glacier.¹⁰

According to Jane Qiu (2008)¹¹, 82 percent of the Tibetan Glaciers in the Himalayas have already retreated in the past half century. In the past 40 years, Tibet's glaciers have shrunk by 6,600 sq km (as of year 2006). It is estimated that they are currently melting at a rate of 7 percent per year. A separate study by a NASA scientist (2010) revealed that 20 percent of these glaciers have retreated in the past 40 years and if the current trend continues, more than 60 percent of the existing glaciers could be gone in the next 40 years. Glaciers in the Indian Himalayas are losing one metre of ice every year and the main contributor towards this melting is from the black carbon - resulting from forest fires and burning of agricultural waste. It was also reported that the loss in mass of glaciers in Indian Himalayas has significantly gone up 1998 onwards.¹² It was also reported that the fastest retreating glacier in the Himalayas is the Imja Glacier.

The International Centre for Integrated Mountain Development (ICIMOD) has revealed alarming details on the sustainability of the Himalayan glaciers. According to their findings, the current trend of melting glaciers suggests that the Ganges, Indus, Brahmaputra and other rivers across the northern India plains could most likely become seasonal rivers in the near future. Increased temperature has accelerated glacial shrinkage and has accelerated the degradation of permafrost regions further reducing the river flow. Himalayan glaciers in the eastern Nepal near the Dudh Koshi region are retreating at rates ranging from 10 to 60 m per annum, and many glaciers smaller than 0.2 km² have already disappeared.

Glacier melting leads to the formation of glacial lakes. The banks of such lakes are made of moraines (accumulated earth and stones deposited by the glacier) that may collapse when the lakes fill up – leading to sudden and violent flooding in the downstream valleys. Any flood of this sort can have disastrous consequences for the population and biodiversity of the entire region downstream of the lakes. The formation of glacial lakes as a result of the rapid melting of glaciers on the higher reaches of the mountain ranges continues to pose a serious threat to downstream countries, especially Nepal and Bhutan.

¹⁰ UNESCO World Heritage Centre, 'Case Studies on Climate Change and World Heritage', (2007) CLT/WHC/07/30.

¹¹ Jane Qiu, China; *The third pole: Climate change is coming fast and furious to the Tibetan plateau*, nature news, Published online July 23, (2008).

¹² Dinesh C Sharma, 'Himalayan scare from melting ice', <http://www.dailymail.co.uk/indiahome/article-2133382/Himalayan-scare-melting-ice.html#ixzz1srOfh8Fr>

A study recorded about more than 1,600 glacial lakes in Nepal, of which about a half dozen are considered very dangerous. In the Bhote Koshi¹³/Sun Koshi basin alone, 139 glacial lakes and nine lakes have been identified as potentially dangerous. Twenty-four GLOF events have been reported so far out of which ten occurred in the Tibetan catchments of river. The 1981 GLOF event that swept away 41 houses, two highway bridges, and many water mills has cost Nepal a loss of USD 750,000. Recent research in time series analysis indicated that the number, area, and ice reserves of glaciers in this basin are declining leading to increase in the number of glacial lakes. The study even warns the likelihood of other GLOFs in the near future with double the magnitude experienced in 1981, affecting nearly 900 households as they are living within the GLOF hazard zone or their properties are within the hazard zone.¹⁴

In 2002, the Greenpeace reported in its briefing that, the proglacial (Imja Lake) lake was born in the 1960s and continues to grow, filling the area left as the glacier front retreats, currently at the rate of nearly 10 metres per year.¹⁵ Other scientists from Nepal's reported that the Imja lake is growing by just under 50 meters per year and is in danger of bursting its banks – a 31 meter-high dam of rocks and stones – and flooding nearby villages and trekking routes. They predicted that more than 7,500 people would be affected by the floods, including tourists hiking along the popular Everest Base Camp route. It was also mentioned that the ethnic community residing in Nepal's western province (Halji village) is threatened by a glacial lake on the mountain overlooking their village.¹⁶ Such outbursts can kill, and they almost always invariably destroy infrastructure and land, burying fields in several metres of rubble.

Similarly, the formation of various glacial lakes such as Raphstreng Lake, Thorthormi Lake and Luggye Lake in Bhutan are all clear indication of the rising temperature on the Himalayan ranges (Fig1).

¹³ *Bhote Koshi is a transboundary river originating on the southern slopes of the Himalayas in the Tibet and flowing through Nepal.*

¹⁴ *ICIMOD 'Case Studies on Flash Flood Risk Management in the Himalayas In support of specific flash flood policies' (2013). ISBN 978 92 9115 270 4.*

¹⁵ *Greenpeace briefing (2002)*

http://www.greenpeace.org/international/PageFiles/24845/glacier_media.pdf

¹⁶ *BBC news report, 'Himalaya village caught between culture and nature', 24 August 2011, Navin Singh Khadia. <http://www.bbc.co.uk/news/science-environment-14620091>*

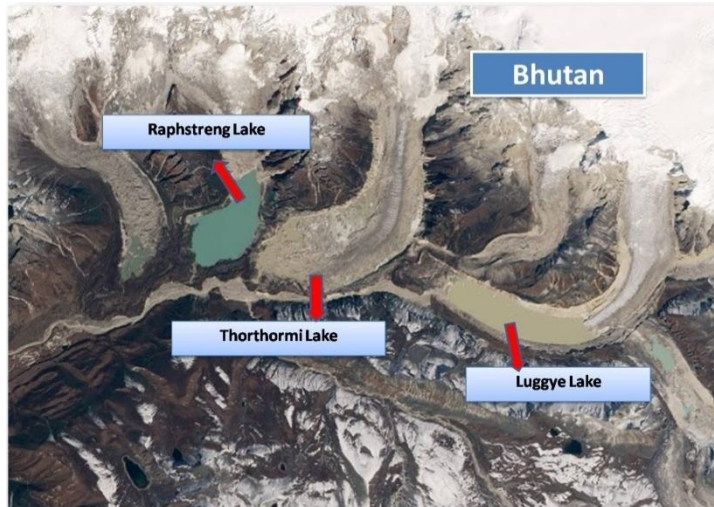


Fig1. Glacial lakes in Bhutan; Source: Y. Penjor

Glacial lake was also reported at the snout of South Lhonak glacier at the height of 7000 meters in Sikkim, the study further revealed that this lake was bounded only by loose soil and debris and could cause havoc downstream if it ruptures.¹⁷ Such climate of fear and change in the weather patterns are also affecting the daily lives of the local residents and the native species.

Unpredictability of South Asian Summer Monsoon

The seasonal monsoon wind shift and weather associated with the heating and cooling of the Tibetan Plateau is believed to be the strongest such monsoon on earth.

The Plateau's seasonal heating during summer and spring plays a principal role in determining the large-scale air circulation in summer. Heating over the Tibetan Plateau tends to generate a surface cyclonic circulation and upper-atmosphere anti-cyclonic circulation which results in the appearance of a large air motion in the eastern side of the Plateau. As long ago as 1884, an English meteorologist working in India had the inspired idea that the snows of Tibet and the Indian monsoon are causally connected. Henry Francis Blanford¹⁸ also suggested that the less it snows in winter in Tibet, the earlier the snowmelt, and the earlier the monsoon.¹⁹ In other words, the Tibetan Plateau acts as a heat pump in the summer drawing in the moisture rich water vapors from the Bay of Bengal.²⁰

¹⁷ *Huge glacial lake atop Himalayas poses danger in Sikkim*, http://www.dnaindia.com/scitech/report_huge-glacial-lake-atop-himalayas-poses-danger-in-sikkim_1798401-all

¹⁸ *In the pages of Proceedings of the Royal Society, in London, proposed that the greater the snow cover in the land of snows, the later the Indian monsoon wets the parched earth on India.*

¹⁹ *Henry F. Blanford; On the Connexion of the Himalaya Snowfall with Dry Winds and Seasons of Drought in India; Proceedings of the Royal Society of London, Vol. 37 (1884), pp. 3-22.*

²⁰ *During summer, the Tibetan Plateau acts as an elevated heat source driving the Asian monsoon, with sensible and latent heat fluxes domination over the eastern and western Plateau respectively. The*

Many researchers have identified that the rate at which the Tibetan Plateau is heated and the thickness of summer snow on the plateau determines the timing and the intensity of the Indian monsoon. In a recent report published by ICIMOD (2013),²¹ on flash flood risk and management in the Himalayas, they have mentioned that these flashfloods and other natural hazards are triggered by the intense seasonal precipitation in the central and eastern Himalayas during the summer monsoon (June–September) and in the western Himalayas during winter.

In future, any change or erratic behavior in the weather system especially the Himalayan region could be very devastating. For instance the series cloud bursts event that occurred in Pakistan and in India at Leh, Ladakh, on August 5, 2010.^{22, 23}

Damming Himalayan Rivers

The greatest threat to any river ecosystem is undoubtedly the manipulation of its natural flow to meet our demands. We do either by damming or diverting its flow.

*'More than 60% of the world's 227 largest rivers have been fragmented by infrastructures such as dams and diversions. Rivers are turned on and off instead of flowing by natural rhythms. Many rivers are thus but shadows of their former selves and the blue lines on the map are often tokens of faded glories' - UNESCO-IHP*²⁴

In her written Testimony before the U.S.-China Economic and Security Review Commission on 26 January, 2012, Dr. Elizabeth Economy mentioned that 'Several of Asia's longest and most important rivers begin in the Himalayas and the Tibetan Plateau, and China is a central player in many of the controversies surrounding shared water resources in Central, South, and Southeast Asia. China develops plans for its upstream reserves that will have dramatic impacts on the lower reaches. China is one of only three countries, along with Burundi and Turkey, not to sign onto the 1997 United Nations Convention on the Law of Non-Navigational Uses of International Watercourses. It rejects the idea of national integrity, which asserts that states have the right not

differential heating between land and sea intensifies the pressure gradient between the south Asian landmass and the Indian Ocean leading to the flow of air and moisture from the sea.

²¹ ICIMOD 'Case Studies on Flash Flood Risk Management in the Himalayas In support of specific flash flood policies' (2013). ISBN 978 92 9115 270 4.

²² CLOUDBURST IN LADAKH – WORST FLOOD IN THE HISTORY OF LADAKH-HELP SEND RELIEF DIRECTLY TO LADAKH, <http://www.honorpanchenlama.org/imported-20100407235507/2010/8/10/cloudburst-in-ladakh-worst-flood-in-the-history-of-ladakh-he.html>

²³ Pakistan Cloudburst Smashes 100-Year Record, <http://www.accuweather.com/en/weather-blogs/andrews/pakistan-cloudburst-smashes-100year-record/72410>

²⁴ *Water, Cultural Diversity, and Global Environmental Change, Emerging Trends and Sustainable Futures?*(UNESCO-IHP, 2012); http://www.unesco.org/new/en/media-services/single-view/news/now_available_online_water_cultural_diversity_and_global_environmental_change_emerging_trends_sustainable_futures/

to be adversely affected in their development potential by activities of the upstream riparian countries.²⁵

According to South China Morning Post²⁶, on the 23 of January 2013, the state council has released an energy-sector blue print for 2011-2015 in which they have decided to construct at least 54 hydro power stations with total capacity of 120 GW on the upper reaches of Yangtze, Mekong and Salween. It clearly disregards the geological risks, global biodiversity, resettlement and impacts on downstream communities. This plan also includes the reopening of previously shelved damming projects on Salween River due to environmental concerns.

Kenneth Pomeranz mentioned in one of her article that even by excluding China, hydropower potential for the remaining Himalayan countries (Pakistan, India, Bhutan and Nepal) is a 192,000 megawatts with almost half of it in India. She further writes, 'Current models predict that this will happen much faster in the western than the eastern Himalayas; the situation for Pakistan and northwest India is thus particularly grim, with an initial windfall period of increased flows to be followed by a devastating loss of water in the already declining Indus, Sutlej and other rivers'.²⁷

The Chinese dam building frenzy could be easily observed from their record in the past fifty years. According to the World Commission on Dams, China had only 22 large dams in 1949 and by 2000 the number had increased to 22,000 dams.²⁸

The mainstream Yarlung Tsangpo and its major tributaries in Tibet (Kyichu, Nyangchu, Tongchu, Nyang Trib Chu, Drakchu, Wolga Chu, Chllong Chu, Yiwong Chu, Parlung Chu) is becoming increasingly interrupted by medium sized dams in Tibet and may one day host the biggest dam in the world. If this scheme were implemented it would impede the downstream flow of the primary resources -water and alluvial sediment, that India and Bangladesh depend on. While the construction of 510 megawatt project is already underway, two new additional dams (Bayu and Daigu) are being planned along the mainstream of Yarlung Tsangpo and no clear information is available as to how and when they will initiate these projects along with those that are already being planned. Hong Lei, the foreign ministry was quick to clarify on a press briefing that *'The Chinese side always takes a responsible attitude towards the exploitation of cross border rivers and every new project will be planned and reasoned in a scientific way - before being started'*²⁹.

²⁵ Dr. Elizabeth Economy, Testimony before the U.S.-China Economic and Security Review Commission, January 26, 2012, "China's Global Quest for Resources and Implications for the United States", http://www.uscc.gov/sites/default/files/1.26.12economy_testimony.pdf

²⁶ South China Morning Post, 'Ban lifted on controversial Nu River dam projects' January, 2013 <http://www.scmp.com/news/china/article/1135463/ban-lifted-controversial-nu-river-dam-projects>

²⁷ Kenneth Pomeranz, 'The Great Himalayan Watershed: Water Shortages, Mega-Projects and Environmental Politics in China, India, and Southeast Asia', <http://japanfocus.org/-kenneth-pomeranz/3195>

²⁸ Karnali is the major tributary that flows from Tibet that forms river Ganga.

²⁹ Beth Walker, 'China gives green-light to new era of mega-dams' <http://www.chinadialogue.net/blog/5678-China-gives-green-light-to-new-era-of-mega-dams/en>

Loh Su Hsing has mentioned in JakartaGlobe (2011) that, “China has dammed every major river on the Tibetan Plateau - including the Mekong, the Salween, the Brahmaputra, the Yangtze, the Yellow, the Indus, the Sutlej, the Shweli³⁰ and the Karnali. China has unveiled plans to dam the rivers that still remain free flowing, such as the Arun³¹ and the Subansiri³²”.

The World Wide Fund (WWF) for nature named the Indus River as one of the world’s ten rivers at risk. The Indus which was already facing an acute shortage of water in its flow due to climate change suffered more obstruction after Beijing built a dam on the river at Gar in Ngari (Ch: Ali) without informing India and Pakistan.

Not only are these rivers subjected to hydropower projects but also these free flowing rivers lures the major extractive industries from distant mainland. Now, with a strong policy backing from Beijing (mining sector designated as one of Beijing’s “Four Pillar” industries in Central Tibet), these rivers will face more pollution from toxic wastes. If these pollutions are not addressed immediately, it could be too late when these toxic spills wander beyond the boundaries of administrative jurisdiction causing social unease.

Dam safety and Social Impacts

In China, dam safety has always been treated as a sensitive subject. Now, incidents at a number of dams and reservoirs have cast doubt on the quality of these projects, but they are rarely reported to the general public.³³

In 2012, a study conducted by the Probe International, mentioned that more than 90 percent of dams that are built, under construction or proposed for the rivers that flow from Tibet are located in zones of very high or moderate seismic hazards. In a simpler way, one can just overlay the UN seismic hazard zone map and the locations of these dams in Tibet to realize and understand the imminent threat posed by these dams.

By just overlaying the UN seismic hazard zone map and the locations of these dams on the western rivers of Tibet clearly sends an inevitable signal that those living in the shadow of these dams are at the mercy of nature (Fig 2).

³⁰*Shweli River is a river in Myanmar (Burma). It forms part of the boundary between Burma and China.*

³¹*Arun flows from Tibet as Bhumchu to Nepal and India.*

³²*Subansiri River is a tributary of the Brahmaputra River flowing from Tibet to the Indian states of Assam and Arunachal Pradesh.*

³³ *Lu Zongshu and ShenNianzu, Dams gone wrong: Is danger lurking in China's dams?, August 24, 2011, <http://journal.probeinternational.org/2011/08/24/dams-gone-wrong-is-danger-lurking-in-china%E2%80%99s-dams/>*

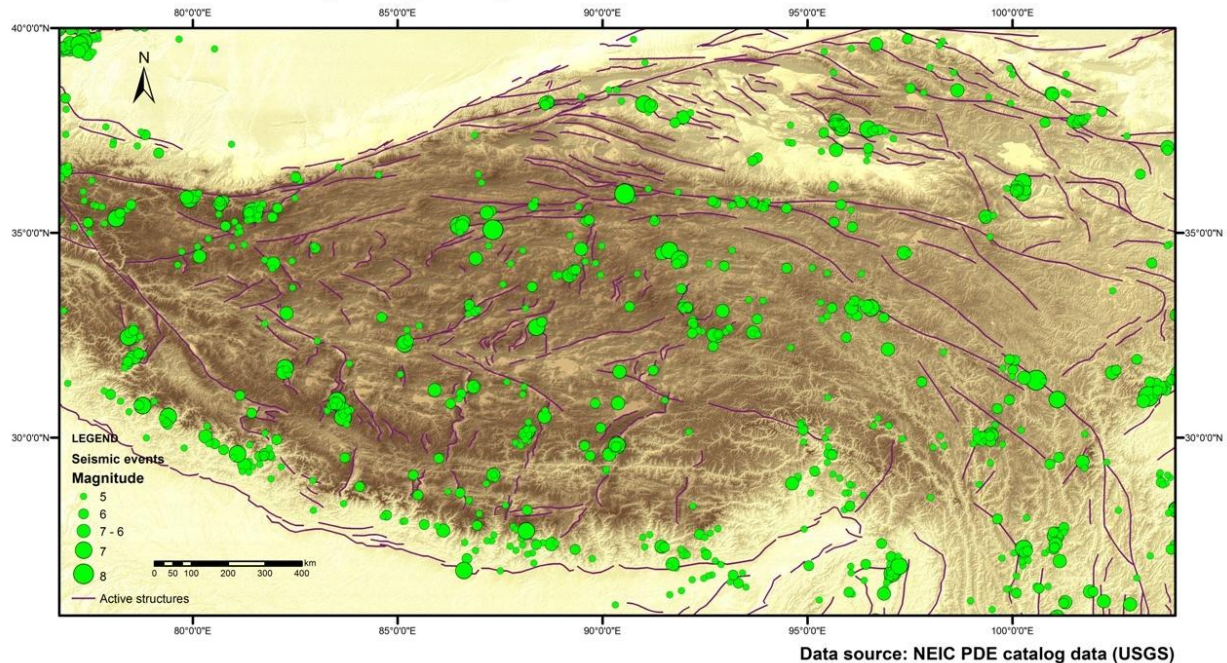


Fig 2 Seismic events (>5 magnitude) between 1973 to 2012 on the Tibetan Plateau, Map© EDD/ DIIR

According to a recent report published by UNESCO-IHP (2012) it reads, ‘Water shapes culture and culture shapes water and it is crucial for the flourishing of cultures..].’ Managing and securing the water resource in Tibet could be the biggest and most important challenge for the new Chinese leaders. Downstream users of water originating in Tibet should establish a regional forum to create policies on transboundary issues that effectively safeguard access and quality of water, at a time of accelerating glacier melt and damming activities.

According to recent report released on Himalayan Glaciers, the combined river basin of Indus, Ganga/ Brahmaputra benefits/ supports more than 744 million people living within the contiguous arc from Afghanistan to Bangladesh (Fig 3). The use of water in the agricultural sector has increased over the past few decades. It is estimated as per 2000 data that the irrigation area for Indus (15 MHA), Ganga/ Brahmaputra basin (29 MHA) - million hectares and will continue to increase further.³⁴

³⁴ *Himalayan Glaciers: Climate Change, Water Resources, and Water Security* Committee on Himalayan Glaciers, Hydrology, Climate Change, and Implications for Water Security; Board on Atmospheric Studies and Climate; Division on Earth and Life Studies; National Research Council
http://www.nap.edu/catalog.php?record_id=13449



Fig3. Fraction of the land equipped for irrigation in the HKH region. Irrigation is widespread in both the Indus and Ganges/Brahmaputra basins. A relatively large amount of irrigated water consumption in the Indus basin is for cotton production. In the Brahmaputra basin, by comparison, irrigation water use is dominated by rice production, while in the Ganges basin, irrigated water is used primarily for wheat production.

Source: National Academy of Science (2012) <http://www.nasonline.org/>

Climate warming impacts on Daily lives & culture

On the high alpine pastures of Tibet, climate warming has not only resulted to various landscape changes but also resulted to the final eviction of nomads from their ancestral pastures. The current Chinese policy of settling the nomads in low land permanent settlements are based on the overgrazing of pastures by their livestock. In reality, it could be the climate warming is slowly heating up the surface and slowly degrading the permafrost soil that in turn could affect the vegetation mat leading to the decertification of grasslands. These nomads are termed as 'ecological migrants' and are involuntarily settled permanently in concrete blocks. This forceful sedentarization has led to abandon or sell their livestock which are their only security or investments. The pastoral lifestyle on the Tibetan plateau has evolved over thousands of years of careful studying and knowing the climate extremes.

According to D. Miller, The area used by nomads includes the high-elevation regions of Bhutan, Nepal and India in the south and extends north across the Tibetan Plateau to the Kunlun and Qilian Mountains in northern Tibet, Qinghai and Gansu Provinces of China. In the east, it begins

in the highlands of western Sichuan Province and extends west to the boundary of the Tibetan Autonomous Region of China, also extending into the Ladakh region of northwestern India (Fig4).³⁵

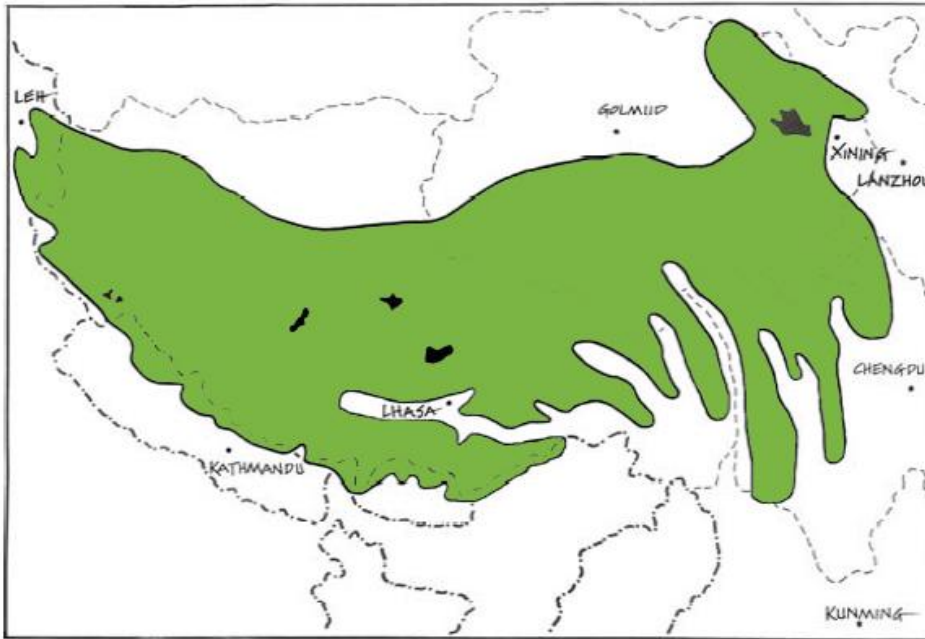


Fig4. The pastoral nomadic area of Tibet, Source: D. J Miller

In the hilly areas of Nepal and Bhutan, beekeeping is an important component of mountain farming systems and a source of income, nutrition, and medicine for mountain communities. In addition to direct income from bee products such as honey and beeswax, honeybees also support agricultural production and biodiversity through pollination services, thus contributing to the livelihoods of poor mountain communities. Challenges arising from climate change are affecting bee populations and the flowering of crops and other plants that provide nectar and pollen for colony development and honey production.³⁶

Recommendations

The Tibetan Plateau is the land bridge connecting South Asia with East Asia. The very survival of almost 1.3 billion people depends on the water resources originating from the Tibetan Plateau. The impact on Tibet's landscape and its natural resources due to climate warming and human intervention will threaten not only the future food security of many nations but also their development.

³⁵ Daniel J. Miller, 'The World of Tibetan Nomads',
<http://www.case.edu/affil/tibet/documents/TheWorldofTibetanNomadsSept14.pdf>

³⁶ ICIMOD, 'Indigenous Honeybees In Mountain Farming Systems',
<http://chimalaya.org/2012/05/18/indigenous-honeybees-in-mountain-farming-systems/>

A healthy ³⁷ Tibetan Plateau would not only benefit the entire Asian continent but also it helps in promoting peace and harmony within the region, especially between two major emerging super powers (India and China).

Downstream users of water originating in Tibet should establish a regional forum to create policies on transboundary issues that effectively safeguard access and quality of water, at a time of accelerating glacier melt. A special priority for such a regional forum should be long term planning for the time when the current enhanced flows due to glacier melt will greatly diminish, once the un-recharged glaciers are exhausted.

³⁷ *In this context 'Healthy' refers to an environment where nature and the spiritual sanctity of the landscape along with the local knowledge is respected for its purity and life sustaining potentials as has been for many centuries.*