

CHINA'S TRAIN, TIBET'S TRAGEDY



Environment and Development Desk
Department of Information and International Relations
Central Tibetan Administration
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Cover design : The train (a symbol of the new economic development of China) is coming out of an old Tibetan icon which shows the penetration of a new communist/capitalist empire into a world where tradition is strong. While the Tibetan religion, culture and tradition and overall way of life is being stifled, its presence is still powerfully embedded in the hearts of Tibetan people and of those individuals who acknowledge and share the urgency of time and situation.

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Note on geographical terms

The geographic terms used in this report including the names of the cities, grasslands and rivers are in Tibetan. For the reader's convenience, the Chinese names have been provided alongside the Tibetan ones. 'Tibet' in this report refers to historical Tibet that includes U-Tsang, Kham and Amdo and correlated with the plateau now known as the Qinghai-Tibetan Plateau. In the PRC's view and usage, Tibet refers only to that half of historical Tibet now within the Tibet Autonomous Region. "TAR"- Tibet Autonomous Region is the area created by the People's Republic of China (PRC) out of the historical Tibetan province of U-Tsang and a small portion of western Kham in 1965. The reason the title appears in quotation marks in this report is to denote the rejection by the Tibetans of this PRC-demarcation of Tibet, particularly with the misnomer "Autonomous".

"TAR" covers the area of Tibet west of the Yangtze River (Tib: Driчу), including parts of Kham, although it is often referred to now as 'Central Tibet'. The rest of Amdo and Kham have been incorporated into Chinese provinces, and where Tibetan communities are said to have 'compact inhabitancy' in these provinces, they were designated as Tibetan Autonomous Prefectures and Tibetan Autonomous Counties. As a result, the Chinese authorities designate most of Qinghai and parts of Gansu, Sichuan and Yunnan Provinces as 'Tibetan'.

In case of the railroad, most popularly referred to as the Gormo-Lhasa railroad, we have used the Tibetan names for those provinces it runs through. The 1,956 kms railroad is referred to as the Siling-Lhasa railroad throughout this report. The 1,956 kms railroad is comprised of Siling to Gormo railroad, which was first completed in 1984 and Gormo to Lhasa railroad, completed in 2006. Siling and Gormo (Ch:Golmud) are both cities in Amdo, northeast Tibet, and where we are exclusively talking of the 1,142 kms Gormo-Lhasa, we have stated it clearly in the research. Any inconvenience generated thereof is regretted.

Gormo-Lhasa Railroad: A Perspective

With the advent of the railroad from Beijing to Lhasa, and therefore a closer and more profound link between China and the formerly sheltered Tibetan Plateau, it has become imperative for the Central Tibetan Administration (CTA) to examine the impacts of the railroad on Tibet's sensitive environment, on its vulnerable culture and people, and the cultural survival thereafter. Given Tibet's history, its remoteness, and its cultural heritage, the railroad has also served as an important tool in understanding the ethnic tensions between the Tibetans and the non-T Tibetans in Tibet, whether the tensions arise because of economic, political or



Gormo-Lhasa Railway Route (Photo Source: Tibet.cn)

religious reasons. In such a light, CTA has felt an obligation to analyze and compile these various articles, reports and journals into a brief comprehensive report of the effects of the railway on the Plateau and its people.

Although CTA is not against infrastructure development on the Plateau, and encourages the betterment of its people and culture through promotion of better vocational schools, educational facilities, economic growth and development projects, it is concerned about the Chinese policies or lack thereof about the population flow which has resulted in the economic and social marginalization of the Tibetans. The increasing number of Chinese migrants to Tibet and especially the capital Lhasa after the arrival of the first train almost two years ago has had a dramatic effect on the lives of the millions of Tibetans in Tibet. Further, reports of educational disparities between the Chinese and the Tibetans, which deem the Tibetans incapable of competing in the burgeoning job markets of Lhasa, raise several questions about the kind of development the PRC is promoting in Tibet. Despite promises of better schools and educational facilities, rural Tibetans remain one of the most illiterate groups in Tibet. Also, increasing policies on nomad resettlement have made many Tibetans dependant on traditional forms of life- style, unable to make a living in the urban areas and depend on meager state subsidies to raise their families. Alongside these, the rising concerns of environmental degradation on the Plateau, because of mining and other developmental projects, have become an issue of chief concern to many environmental protection agencies and human rights advocacy groups.

This brief report on the Gormo-Lhasa railroad (the second extension to the already existing Siling-Gormo railroad), therefore, is an attempt to evaluate the claims made by the PRC and its critics concerning the environmental, social and cultural effects of the railroad on the Tibetans and their land. The report relies heavily on secondary data provided by individuals, researchers, scholars, Tibet support groups and Chinese media as well. Since the PRC's policies on research in Tibet is heavily subsidized by the state or in other cases not permitted at all, many Tibet support groups and CTA cannot help but question China's opacity concerning Tibetan people, their culture and environment. For us to have better communication with the Chinese government and to encourage and trust their development motifs and concerns, it is

important that they create transparency in the way they implement development and social policies in Tibet. Otherwise, it is hard to develop and assess impartially the many infrastructure development projects that the PRC implement in the region.

Environment and Development Desk (EDD) at CTA, feel that it is important for the reader to treat this report as only a foundation for further research on the railroad's effect on the Plateau. We hope that this report will encourage many others to investigate the environmental and cultural disparities in Tibet, especially concerning infrastructure developments. We have made every effort to create a well-researched and unbiased report that will help others concerned with the Tibetan issue undertake serious research driven studies on the Tibetan plateau. Yet our inability to conduct this research ourselves may have left many questions unanswered, for which we encourage the readers to undertake their own study. In this short investigation into the railroad's impact on the Tibetan plateau we have found that for many of its chief concerns including its direct and indirect impact on Tibet's environment, its culture and people, some more time is needed for observation and examination of claims made by the PRC and their critics. We hope that this report will trigger such investigations in the future.

The Maiden Journey of “China’s Engineering Marvel”

*Tibet’s mystique, its very identity, was its remoteness. It was the great thing Tibet stood to lose to the Chinese. And to the Chinese, the geographic separation, and how it sustained Tibet’s political separation too, was an embarrassing reminder of the limitations of the nation’s progress.*¹

On July 1 2006, the 1,142 kms (710 miles) Gormo-Lhasa railroad (Ch: Golmud-Lhasa),² the last leg of China’s \$4.2 billion railway to Tibet,³ officially opened a year ahead of schedule. Over a hundred thousand workers, supplied with oxygen, had worked on the tracks for five years to see the railroad completed. Many of the skilled laborers involved in the construction had been Chinese immigrants.⁴

With the completion of the first part of the railway from Siling to Gormo in 1984, work on the new Gormo-Lhasa leg began in 2001, under China’s “Western Development Strategy,” and embodied the most pervasive Chinese effort to connect the hitherto sheltered Tibetan capital, Lhasa, with China.⁵ Today, the full length of the Siling-Lhasa railway, incorporating the two legs spanning Siling to Gormo and Gormo to Lhasa, travels a distance of 1,956 kms.

The railroad, which traverses stretches of unstable permafrost and harsh mountain roads, also reaches the highest altitude of any railroad in the world at more than 16,000 feet (5,072m) above sea level, at least 200m higher than the Peruvian railway in the Andes, the former record-holder.⁶ The Tanggula Mountain at 5,072 meters above sea level, considered by local Tibetans as “insurmountable [,] even by eagles,”⁷ is now the location of the Tanggula Railway Station, the highest railway station in the world. Referred to as “the loftiest railstopover,” the station is operated and monitored by satellite.⁸

The Siling-Lhasa railroad also has other record holders such as the

Fenghuoshan Tunnel, which is the world's most elevated tunnel on frozen earth at 4,905 meters and Kunlun Mountain Tunnel, the world's longest plateau tunnel running 1,686 meters.⁹ The design of the last bridge over the Kyichu River has been inspired by the silk scarves that Tibetans use to greet high monks, deities and officials.

Every day, a total of eight passenger trains and two cargo trains run in both directions on the Siling-Lhasa rail tracks.¹⁰ During the journey to and from Lhasa, the railway passes through “thirty kilometers of tunnels and 286 bridges”¹¹ to avoid contact with a layer of ice that melts and refreezes almost daily according to the seasons, and also to avoid contact with the unstable permafrost that lies a meter or more below the earth's surface.¹² Of the 1,956kms of track that form the railway, 960kms lie at an altitude of over 4,000 meters above sea level, and 550kms are built on



Passing through high terrains (Photo source: Wang)

continuous permafrost. Perhaps more importantly, of the track lengths laid over permafrost, 190kms are considered “unstable” and 100kms, “most unstable”.¹³ Pipes fitted with cooling elements and driven into the earth's crust have been used to stabilize track embankments on permafrost.

In the first run of the Siling-Lhasa railroad, a direct Beijing-to-Lhasa luxury train was

unveiled to coincide with the 85th anniversary of the founding of the Chinese Communist Party (CCP).¹⁴ Described variously as the ‘Sky Train’, ‘the line of unity’ and the ‘line of wealth,’¹⁵ the first train left Beijing to make the 48-hour journey to Lhasa, amidst much grandeur and celebration.

In a televised address, President Hu Jintao, who was present during the opening ceremony, alongside top Communist Party cadres, state news media, and 40 foreign journalists handpicked by the officials to ride the first deluxe run,¹⁶ called the completion of the railroad “a magnificent feat”.¹⁷ Hailed as an “engineering marvel,” the Chinese already see the railroad as an example of China’s greatness in the new century and proof of its claim to be a “technological superpower”.¹⁸

The completion of the railroad, however, would not have been possible without US General Electric’s diesel engines, which have the capacity to maintain an average speed of 100kph, even at altitudes of 4,000 meters, where the thin air can have an halving effect; and Canada’s Bombardier which fulfilled a US \$280 million contract to build carriages with the capacity to withstand the journey through Tibet’s frozen mountains, some with deluxe sleeping compartments equipped with showers, glass-walled sides for panoramic views, entertainment centers and gourmet dining areas, and toilets with sewage and waste-treatment systems.¹⁹

The train carriages to be used on the Siling-Lhasa railroad have also been fitted with carefully regulated oxygen levels with spare supplies to combat the thin air.²⁰ Each seat is equipped with an oxygen mask. In addition, double-layer glass covered with anti-ultraviolet radiation film is used to keep out the sun’s glare.²¹ Abrahm Lustgarten, a freelance writer who has conducted studies on the impact of the railroad, writes, “Their windows, which do not open, are double paned with pressure valves to keep them from cracking under intense barometric change. Each seat, bed, and table has an oxygen hose to assist passengers in breathing the thin air. And the electrical and communications systems—both the ones inside the cars and the external wireless ones built by Nortel—are redundant”.²²

The first train reached thus “a large red structure, flanked by two smaller white wings, that echoes the architecture of the Potala Palace, (the seventh-century marvel that sits atop a large rock

outcropping above Lhasa and was home to the Dalai Lamas,)" the final station in the Tibetan capital city, Lhasa, after a two-day journey. It reached the Tanggula Pass at 5,072m on July 3, from where it began its descent to Lhasa. Although the train, supplied by Canada's Bombardier Inc., was outfitted with artificial oxygen, similar to that used in airplanes, to prevent altitude sickness, some passengers were still affected.²³ A Chinese tourist reportedly told Reuter's news agency, "now we've reached the top, I feel sick and nauseous and have headaches." At the Tanggula crossing, passengers were forced to lie down and attach oxygen tubes to their noses.²⁴

Just three weeks after its launch, the Southern section of the Gormo-Lhasa railroad was also fitted with an earthquake warning system. Although Chinese experts had claimed that the rail line was quake resistant as it crossed the seismic belt at right angles, thereby minimizing any damage future tremors might cause to the tracks, Peng Fengshan, head of the Tibet Autonomous Regional Seismological Bureau, admitted that earthquake monitoring on the plateau railway was crucial due to Tibet's entering a seismologically active period which would last until 2014.²⁵

Soon after the railroad was launched, the railway ministry spokesman, Wang Yongping, in a rare admission was quoted as saying that there have already been surface cracks developing in the railroad's concrete structures while its permafrost foundation is sinking and cracking in some sections.²⁶

Despite the large investment and heavy preparation to combat the plateau's harsh environment, there are still fears about the railroad's sustainability. Built on one of the world's most unstable icy roads, foreign engineers involved in the project had already predicted during its first run that the railroad will require heavy maintenance expenditures and will be hard to operate for more than a decade without an extensive overhaul.²⁷ Abrahm Lustgarten, author of the book *China's Great Train*, interviewed Nortel's vice president of International Operations, Mr. Scott Wickware, who noted that "Should a car break down in one of those [big] storms, [Tibet witnesses frequently], a mechanic could be as far as three days' drive away. 'Out there, you lose something and it could take days to replace it'".²⁸

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Note: Abraham Lustgarten is a contributing writer for Fortune magazine and the recipient of a MacArthur Foundation grant for international reporting. His articles have appeared in Esquire, The New York Times, Outside, Sports Illustrated, National Geographic Adventure, Salon, and many other publications, and in 2003 he was awarded the Horgan Prize for excellence in science reporting. He splits his time between New York City and Oregon. In May 2008, he published a book *China's Great Train: Beijing's Drive West and the Campaign to Remake Tibet* after years of studying the railroad connecting China to Lhasa. The book provides "A vivid account of China's unstoppable quest to build a railway into Tibet, and its obsession to transform its land and its people."

2. Gormo, Chinese Golmud, is the third largest city in the Tibetan plateau after Siling, (Chinese: Xining) and Lhasa. Gormo is strategically located in the central-south part of the Tsaidam basin, which is now also known as China's 'treasure house' of the west due to the huge abundance of natural gas and oil found there along with the PRC's largest reserves of lithium, magnesium, potassium and sodium. To its north is the Qarham Salt lake, the biggest inland salt lake in the world. Along with the 1,142 kms Gormo-Lhasa section of the railroad that was completed in 2006, Gormo-Lhasa highway, which runs a length of 1,050 kms is part of the 1,930 kms Siling-Lhasa (Ch: Qinghai-Tibet) highway connecting Siling and Lhasa.

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China-Tibet Railway History

In *Tools of Empire: Means of National Salvation* Robert Lee writes about China's resistance to colonial railway programs. Fearing that railroads connecting Chinese villages and towns would have a negative impact on Chinese cultural values, destroy employment in traditional transport industries, involve large numbers of "Europeans or Westernized Chinese" working permanently over a large area, and require foreign loans, Shen Baozhen, in the late nineteenth century ordered the demolition of the first railway, as governor general in Nanjing. The railway was only 16kms long and ran from Shanghai to Wusong.¹



Train to Lhasa (Photo Source: Sam Wangyal, London)

In 1900, the Boxer Rebellion occurred, and mobs attacked railway and telegraph lines between Beijing and Tianjin. In 1911, there was a revolt in Sichuan over the construction of railway lines, which ultimately culminated in the collapse of the Qing Dynasty.² However, for Sun Yatsen, the Chinese revolutionary hero and the Director-General of National Railways during the reign of the Nationalist Party (1911-1949), railways became essential to national political life. He pursued an "open door" policy, seeking to depose the yoke of foreign control by encouraging capital

investment and limiting concessions. ³ “A new era of railway construction, nationalist, ambitious and cerebral, appeared to have arrived”. ⁴

Dr. Yatsen designed plans to construct 100,000 miles of railroads from three main trunk lines—under the Southern line Tibet was to be connected to China from Chengdu in Sichuan Province.⁵ This grand vision was then revived in 1918 when the Party sought to construct a “Plateau system” rail network, “designating Lhasa as the center of a Tibet-wide network, connecting to Lanzhou, and Chengdu.”⁶ The six-system rail network blueprint included a “central system” to cover the north and the west. Chang Kia-ngau, former Railway Minister (1935-37) and Minister for Communications (1937-1942), in his book, *China's Struggle for Railroad Development*, provided the following assessment:

The colonization of Mongolia and Chinese Turkestan would be greatly encouraged by the construction of this system, colonization and railroad construction being dependant upon each other for their success. ⁷

The plan, however, could not be executed because of the growing Japanese agitations in Manchuria, followed by the Sino-Japanese war and the civil war. Rail-building efforts, hence, had to be shifted to Eastern parts as a defensive policy. By the time, the Chinese Communist Party (CCP) declared victory in 1949, the Nationalist Party under Dr. Yatsen had built 22,000 km (13,000 miles) of railroads mostly in the north and northeast part of China. ⁸

The “fanciful and insurmountable”⁹ plan designed by Dr. Yatsen to connect the Tibetan Plateau with China was later revived in the early 1950s when Mao Zedong as Chairman of the CCP took over China's leadership. Perceiving threats from the ‘imperialist America’ and the ‘revisionist Soviets,’ Mao ordered the speedy construction of railway lines in Sichuan, Guizhou and Yunnan even if this involved taking out railway tracks in other parts of China.¹⁰ The urgent need for a railway became more acute when the Communist government decided to exploit and explore natural resources in Xinjiang, Tibet, Inner Mongolia and Manchuria.¹¹

In *Crossing the Line*, a report published in 2001 by the International Campaign for Tibet (ICT), based in Washington DC, it is noted that “indigenous populations like the Tibetans near the frontier with China were simply enveloped by the swiftly advancing matrix of Chinese and their administration architecture, creating interspersed pockets of colonists living nearby existing Tibetan communities or displaced people whose lands were expropriated. In all the frontier areas bordering China, economic integration and resettlement became keys to extending political hegemony, and railways played an instrumental role”.¹²

During China’s Second Five-Year Plan (1958-1962), Mao implemented the first railway project to connect the Tibetan Plateau with China. In May 1958, railway construction began between Lanzhou and Siling (Ch: Xining), the capital of Amdo Province.¹³ The line became operational in 1961 and for the first time the Tibet was connected to China by a rail link at one of its lowest elevations.

This laid the foundation for the more difficult railroad construction to Gormo. Although China had commenced on the extension work from Siling to Gormo as early as 1958 to coincide with the establishment of the Northwest Nuclear Weapon Research and Design Academy at Xihai City, the capital of Tsojang “Tibetan Autonomous Prefecture,”¹⁴ the work was stopped after a year because of intense famine caused by Mao’s disastrous campaign “Great Leap Forward.” “The agricultural fiasco [as a result of the “Great Leap Forward”] took 900,000 lives in Amdo province alone, leading to the dismissal of the overzealous ultra-leftist Party Secretary Gao Feng ”.¹⁵

The extension project to Gormo was started again in 1977 and completed in 1979. Until 1984, the 846 km (526 miles) line was reserved exclusively for military use.

Route Selection for a new line connecting China to Tibet

Between 1996 and 2000, route surveys and feasibility studies were conducted under Beijing's Ninth Five-Year Plan to construct a railway linking China to the heart of Tibet, Lhasa. Such a plan was only a re-initiation of earlier efforts of the 1970s, which were halted by the Communist Party Secretary, Hu Yaobang, under Deng Xiaoping, when he concluded after visiting Tibet, that the railway, aimed at reaching to the center of Tibet, would face insurmountable obstacles, both technically and financially. When an announcement was made in October 1994 that those unfinished plans might be set in motion again, Chinese authorities enthusiastically embraced the notion of "an inseparable organic link"¹⁶ between the economies of China and Tibet. Gormo-Lhasa route was given top priority among four other routes and work started in February 2001 with fund disbursed from China's Tenth Five-Year Plan.

Among the four railway lines that were considered to connect the Tibetan capital Lhasa to China, Gormo-Lhasa route was selected because of its low cost (the initial cost for the route was much less compared to the other three routes, which were estimated between U.S. \$7-\$9 billion) and ease of construction.¹⁷ The other three routes that were rejected were Lanzhou-Nagchu-Lhasa (Ch: Gansu-Tibet), Chengdu-Nagchu-Lhasa (Ch: Sichuan-Tibet) and Dali-Nyingtri-Lhasa (Ch: Yunnan-Tibet). The Number one and two Survey and Design Institute of China's Ministry of Railways conducting the feasibility studies on the alternate routes had estimated Lanzhou-Lhasa route to cost \$7.7 billion. If chosen it would be 2,126 km long, 1,771 km of the tracks would be built on permafrost, and the railroad would link China to Tibet from Yongling near Lanzhou. The Chengdu-Lhasa route was estimated at \$9.3 billion and would link from Dujiangyan near Chengdu. It would have 819 km of tunnels and bridges. The Dali-Lhasa route was estimated at \$7.7 billion and would have 601 km of bridges and tunnels.¹⁸

The initial estimate for the Gormo-Lhasa railroad, finalized among the four other choices, was optimistically set at 23 million yuan (US \$2.87 million) per route km or 19.4 billion yuan (U.S. \$2.34 billion) for the entire construction. However, at the end of its construction phase, the entire project cost had jumped up to US \$4.2 billion, almost \$2 billion more from its initial estimate. Today, the entire Siling-Lhasa that operates year-round and carries 80 percent of the cargo and passengers to the “Tibet Autonomous Region”. The Gormo-Lhasa railway project is the first step in a more extensive plan to build rail networks throughout the Tibetan Plateau and China, whereby both Tibet and its resource would become more susceptible to Chinese control.

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Railways as Imperial Tools of Control

To understand the complexities involved in the construction of the Siling-Lhasa railway, it is essential to examine how infrastructure development such as railroads, in other parts of the world and in the so-called autonomous regions of China, have affected the dynamics of the local population, trade and environment.

The “Inner Mongolia Autonomous Region” has the third largest land area in China with its grasslands accounting for one fourth of China’s total grassland.¹ In the 1920s, the Chinese population increased drastically in the region after the railroad from Zhangjiakou to Hohhot was completed.² Experts estimate that the population in the region increased some five times from 1912-1949. By 1949, the Chinese had outnumbered the Mongolians by 11 to 1.³ This disrupted not only the native population but also their way of life that depended on “age-old nomadic traditions,” involving herding and local trading. It also led to grassland degradation and displaced caravan trading that was common to the Chinese traders who used to trade in the region before the arrival of the railroad. ICT reports, “The railway [in Inner Mongolia] facilitated a restructuring of local production patterns and exchange. Many raw goods like wool and hides were exported outside the region to China and beyond [,] while more localized markets for traditional products stagnated”.⁴ According to the Chinese population census of year 2000, there are only 3.9 million ethnic Mongols in Inner Mongolia, a small fraction of the total 23.76 million inhabitants.

Similar marginalization of Manchus had also taken place in Manchuria where “throughout the last century, immigration into Manchuria from adjacent regions has been heavy, and today the population is predominantly Chinese”.⁵ The railroads built by the Japanese during their occupation of the region, later facilitated large sweeps of Chinese migration.

In East Turkestan (Ch: “Xinjiang Uyghur Autonomous Region”), migration from China has been rampant since the “People

Liberation's Army" occupied it in 1949. Massive immigration programs have led to a significant rise in the Chinese population from an estimated 200,000 to at least seven million since 1949. Its distance from China and significant resistance to Chinese rule before the occupation has, however, resulted in a seemingly slow migration that is now being challenged by railroad construction in the region. In 1961, many Chinese penetrated this "new territory" by a rail link from Lanzhou to Urumqi. In *Crossing the Line*, ICT states that "the rail line at the close of the Great Leap Forward was of singular importance in Urumqi's eclipse of border towns like Kashgar and Gulja (Ch: Yining), the reorientation of its commerce away from Russia, and the integration of its entire region with China."

According to a 2001 estimate, the completion of the railroad to Kashgar, near Kazakhstan border, has led to a 30 percent increase in Chinese population in the "Xinjiang Uyghur Autonomous Region," compared to the 2.5 percent increase a year before.⁶ The construction and extension of a similar railroad from the capital Urumqi to Kashgar has further disturbed the indigenous Muslim population, leading to a Chinese predominance in some areas of the region including Urumqi and "creating widespread ethnic tension and economic disparity".⁷ Although the indigenous people in the region still constitute the majority in Xinjiang's population, in cities such as Urumqi, the Chinese already outnumber them.

After the construction of the railroad, it is reported that many Uyghurs lost their jobs of transporting goods by road and faced tremendous economic pressure because of the competition created by increases in the number of Chinese migrants entering the region. A western tour operator who makes frequent visits to the area told ICT,⁸ "The people of Kashgar are losing their will to resist. The town which used to be full of tough Uyghur Muslims now seems cowed and resigned to their fate, as if their identity and culture have been taken away from them." In this way, not only have Chinese migrants introduced economic pressures into areas formerly dominated by native minority populations, but they have also undermined the particular political and cultural interests of those minority groups by further outnumbering them in their own lands. It is only by such means that ethnic Tibetans in Lhasa have already become a minority, a situation that can only escalate with the population influx that the railroad will occasion.

In 1859, Li Hung Chang, the viceroy of Jiangsu, objected to the construction of the British railway from Suzhou to Shanghai on grounds of foreign encroachment, claiming, “The construction of the railway was deemed to be beneficial to China only when the construction of the railways is undertaken by the Chinese themselves.”⁹ Yet today, many ethnic groups including the Tibetans are not consulted with, nor included in the decision making process for large development projects that take place in their surroundings. Such exclusion of ethnic population from policies that affect their lives only creates a rift between the administration and the people, further fueling ethnic tensions in different regions.



Tanggula the highest station (Photo Source: Wikimedia Common)

As in China, railroads in other parts of the world have also served as imperial tools, helping to colonize and assimilate the native populations that are spread around the country. In 1869 after the railroad linking the Eastern American States with California on the Pacific Coast was completed, the ‘First Trans Continental Railroad’ helped speed up the process of colonizing the Native American land. The railroad did not only facilitate the process of uniting the country during the American Civil War, but it also began a massive assimilation process of the Indian tribes, thus assisting the newly formed American government to exert complete control. Large influx of Europeans brought in by the railroad to predominantly Native American areas marginalized the native population and forced them to conform to

the rules and regulations of the newcomers. Such efforts to colonize the minority native population were also seen after the completion of the Trans-Siberian railway in Russia.

The primary fear concerning the Siling-Lhasa railroad, therefore, is the influx of Chinese migrants the railroad will attract to Lhasa and other parts of Tibet, and the economic and social marginalization of the Tibetans as a result of it. Already at the end of 2006, five months after the completion of the Gormo-Lhasa railroad, Tibet recorded a 36 percent increase for inbound tourists for that year. Of these, 93 percent were from China, noted *Xinhua*, the official mouthpiece of PRC.

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Environmental Implications

The Northern-Tibet Plateau (NTP) covers a vast territory of the western China with an average altitude of 4,500 m. Also known as the roof of the world and the third pole of the earth, it is the source of the ancient and modern glaciers as well as the source of many large rivers in China such as the Yangtze, the Yellow, the Nujiang and the Lancang Rivers [1-3]. The NTP plays an important role as the thermal forcing to the atmospheric circulation in Asia. The thermal state of the NTP links closely to the regional weather and climate condition, such as temperature, precipitation regime, and the status of the monsoon.¹



Development or Destruction (Photo Source: EDD Archive)

The Tibetan Plateau shelters some of the most unique animal species, including many that are endangered. Among those on the plateau, Tibetan antelopes, Bengal Tigers, Red Pandas, Giant pandas, Tahr, Asiatic Black Bears, black-necked cranes, snow leopards, blue sheep, wild yaks, brown bears and Tibetan gazelles² are the most notable.

In recent decades, however, there has been a significant reduction in the number, variety, and range of wild animals on the Plateau. Tibet, once known as the “high altitude Serengeti” [term coined by Dr. George Schaller to portray Tibet as one of the last examples of native flora and fauna in Central Asia] is an environment increasingly unable to support the wildlife that resides there under the pressures of urbanization and infrastructure development.⁴ Today, there are about 40 known species of endangered plants and 141 known species of endangered animals in Tibet.⁵ With a GDP growth rate of 11.9%⁶ a year, Chinese dominated burgeoning economy in Tibet has also resulted in an equally fast degradation of Tibet’s grassland and forest.

The Tibetan Plateau is also the source of many of Asia’s major rivers, including the Yellow River, the Yangtze, the Mekong, the Salween, the Indus, and the Yarlung Tsangpo, which downstream becomes the Brahmaputra.⁷ These rivers are the primary source of water for more than 80 percent of the Asian population and almost half of the world’s population.⁸ But today, many of Tibet’s rivers are either drying up due to climate change⁹ or in the plan of being diverted to the eastern part of China to meet the increasing water demands of its farming industry.¹⁰

With an average elevation of 4,000 meters, covering an area of 2.5 million sq. kms, the ecosystem of the Tibetan Plateau is “extremely fragile.”¹¹ According to Dawa Tsering, Head of WWF China’s Program Office in Lhasa, “[Once Tibet’s ecosystem is] damaged, [the effects will be] extremely difficult to reverse,” therefore, “integrating the needs of local development with conserving Tibet’s biodiversity is in need of urgent attention.”¹²

From research conducted on the Plateau by Chinese and other environmentalists, it is evident that global warming is having a serious impact on Tibet’s environment. Tibet is warming at twice the global average.¹³ The mean warming amplitude of the Tibetan

Plateau during the past 50 years has been greater than that of the northern hemisphere and other regions of the same latitude.¹⁴ Based on instrument-measured data, it was found that the mean annual temperature of the Plateau in 1980s was higher than in the 1950s by 0.1-0.3⁰ C per decade.

Moreover, the surface areas of many lakes in the Plateau have decreased over time.¹⁵ Namu Lake, the biggest lake of the Plateau has decreased by 38.58 sq kms from 1970-1988, with a decreasing rate of 2.14 sq kms each year. During the past 21 years, the temperature of Lhasa has also increased by 0.00623⁰C annually.¹⁶ Since the magnitude of global warming increases with the increase in altitude, the high altitude of Tibet makes it particularly vulnerable to the impacts of global climate change.

Furthermore, climate change is resulting in the degradation of Tibet's grasslands¹⁷ and the melting of its glaciers.¹⁸ A recent study conducted by Chinese and U.S. scientists reported that global warming could cause a dramatic decline in plant species diversity on the rangelands of the Tibetan Plateau.¹⁹ The study reported that there had already been losses in some of the plant species abundant on the Plateau. Medicinal plants had an average annual loss of 4.9 species from 1999 to 2001, while palatable plants had an annual average decline of 5.4 species.²⁰

Such environmental impacts of global climate change on the Tibetan Plateau are further accelerated by major development projects that PRC designs as part of its "Western Development Strategy." World Wide Fund For Nature, (WWF China), has stated, "Development is the major factor influencing the quality of Tibet's ecosystem," and concluded that the main factors contributing to the detriment of Tibet's natural environment are human, consisting of:

- * Demands by Tibet's fast-growing human population, construction of roads, mining, and poor grazing practices, which are degrading Tibet's grasslands.
- * Commercial logging, slash and burn cultivation, collection of wood for firewood, construction, traditional agriculture practice, and making incense, which are destroying Tibet's old-growth forests
- * Illegal hunting of wildlife

- * Conflicts between wildlife conservation and livestock raising, which threatens species such as the brown bear and wild yak.²¹

Although it is evident that the current rate of climate change and environmental degradation on the Tibetan Plateau can prove devastating to Asia and the world, the policies designed by the PRC are focused solely on economic benefits with serious disregard for the environmental effects of the actions that they set in motion. With its vast plateau (larger than Western Europe) and unexploited hydro and mineral resources, Tibet has the potential to fulfill the growing energy demand and, supply the raw material that China's coastal areas need to fulfill the markets' demand for cheap products. One of the major concerns for the Siling-Lhasa railroad, therefore, is Tibet's fragile natural environment. The railway-induced projects would not only be used to extract Tibet's abundant natural resources but also degrade the carrying capacity of the land.²² Weng Hengsheng, a senior research fellow in Amdo (Ch: Qinghai), who has conducted several studies on social and economic development of the Tibetan Plateau, expressed his concern over the railroad and cautioned that "[an] even bigger challenge to environmental protection will unfold after the railway opens to traffic."²³ He further warned, "The vulnerable ecological environment will face the danger of irreversible destruction."²⁴

In 2006, soon after the launch of Gormo-Lhasa Railroad, environmentalist groups in Tibet also called for tourists visiting the plateau not to buy products made from endangered species such as the Tibetan antelopes and tigers. "The sale of souvenirs and other products made from endangered species is growing due to tourist consumption, and is increasing pressure on local biodiversity. Tourists can make a difference simply by not purchasing these products," added Dawa Tsering.²⁵ China's railway ministry also admitted that the railroad will have a "devastating impact on the surrounding ecological environment," but said that it was seeking "effective measures to minimize the negative effects."²⁶

To that end, the PRC spent about US \$192.5 million on environmental protection efforts along the railway line.²⁷ The funds that were allocated under China's Tenth-Five Year Plan were used to implement several environmental projects. Special underpasses

to serve as special migratory routes for wild animals were built along the railroad's tracks, liquid coolants were used to keep the permafrost from melting, and careful handling of trashes and discharges was imposed to safeguard Tibet's sensitive environment. Measures ranging from reducing vegetation degradation, protection of trees and grasses and piling of wastes and trash were supposedly undertaken since the first day of the construction of the railway. On July 2, 2007, China Daily reported that the ministry had "properly" disposed off 70,000 tons of waste and sewage.²⁸ In an earlier article published on June 17, 2006, Chinese government's official web portal People's Daily Online, had reported that "a special train would run on the Qinghai-Tibet [Gormo-Lhasa] railway every week to collect garbage and "protect the plateau [s] environment."²⁹ Additionally, Green River, a Sichuan-based environmentalist group, that has worked for the protection of the wildlife and ecosystems of the Tibetan Plateau for more than a decade, also "collaborated closely with the rail planners and construction crew over the five-years of construction to ensure that environmental considerations were included. Measures to minimize construction damage included backfilling, setting specified routes for work trucks, and building suspended wildlife corridors for the plateau's endangered Tibetan antelope."³¹

Some Chinese have viewed this attention given to protect habitats and animals along the Gormo-Lhasa railroad during its construction as "unprecedented' in Chinese history."³¹ But despite all these seemingly favorable policies, the railroad construction did cause some damage to the surrounding environment, including the wildlife and the critical grassland habitat it runs through.³² Yang Xin, the founding President of Green River accepted that the railway did disturb sections of the grass crest as roads and rock quarries were dug to source materials for the rail bed. He also stated that the possibility of restoring the biodiversity to the region, once lost, (as a direct result of the railway,) is minimal, and that it could take 100 years or more to rebuild damaged topsoil or grass crest.³³

Soil around the railway lines is already seriously threatening the safety of the trains by turning into desert because of dry temperature and strong winds. Fearing further desertification of areas in and around the railroad, on July 9, 2008, China Economic Net reported that China has now developed "OH sand-solidifying and foliage-

planting technology” to be used along the Siling-Lhasa railway line to solidify the sand and prevent it from eroding. Li Runjie, chief of the project under the Qinghai Provincial Water Conservancy and Hydropower Scientific Research Institute, stated that “The main part of the technological development is a special kind of sand-solidifying drug [and that] the chemical treatment, which is able to solidify the sand into a rubber-like solid earth, has no poisonous or harmful elements.”³⁴ Although its effectiveness is not yet known on a wide scale, the Chinese are hopeful that this innovative technology will save the world’s highest railroad.

Despite such energetic emblem to safeguard “the engineering marvel,” on July 7 and 8, 2007, at the tenth meeting of the Siling-Lhasa railway construction group, Chinese Vice Premier Zen Peiyan stated that it is “more difficult and arduous” to maintain the 1,956 kms railway than it was to build it. He stressed that the railroad should be further improved by ensuring safe operation, better service, efficient transportation and better environment protection.³⁵ The vast area that the plateau encompasses is extremely sensitive to global warming and resource exploitation, and the impacts the railroad will occasion on the Plateau’s environment may cause irreversible damage to the natural ecosystem.

Additionally, ICT argues that the negative environmental impacts of the railway will substantially outweigh the benefits conferred upon the overall Tibetan population.³⁶ The fact that the track runs through vast inhospitable terrains on stretches of unstable permafrost along with the implications of global warming makes it more daunting for the Chinese government to maintain the U.S. \$4.2 billion project for a long time.

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Note: The article further comments that “Glaciers in China, as well as India and Nepal, are receding at an average rate of 10—15 metres per year.” The author also comments that the “warmer climate conditions are attracting more cattle and sheep farmers to this harsh but beautiful high-altitude area, putting additional pressure on the already fragile alpine landscape. This pressure is also starting to squeeze out local wildlife, such as Tibetan antelopes, that depend on the grasslands too. There have even been reports of brown bears wandering close to villages in search of food[...]. Experts today agree on one trend: Glaciers, rivers, wetlands and lakes— all elements of the fragile high-altitude ecosystem— are being altered at a speed never seen before,” the consequences of which can be devastating to the plateau as well as its surrounding countries.

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22. To see what carrying capacity means, please read the following. Please not that the explanation for “carrying capacity” has been directly taken from definition provided in the *Global Development Research Center* website. To read more, refer to the web address: <http://www.gdrc.org/uem/footprints/carrying-capacity.html>

“A common fallacy is to equate existing and seemingly open or “unused” spaces with the kind of resources and ecologically productive land needed to support human life under modern conditions. In fact, the criterion for determining whether a region is overpopulated is not land area, but carrying capacity.

Carrying capacity refers to the number of individuals who can be supported in a given area within natural resource limits, and without degrading the natural social, cultural and economic environment for present and future generations. The carrying capacity for any given area is not fixed. It can be altered by improved technology, but mostly it is changed for the worse by pressures which accompany a population increase. As the environment is degraded, carrying capacity actually shrinks, leaving the environment no longer able to support even the number of people who could formerly have lived in the area on a sustainable basis. No population can live beyond the environment's carrying capacity for very long.”

We must think in terms of “carrying capacity” not land area.

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Wildlife

The continuation of the Tibetan Antelope migration, one of the last great ecological marvels on earth, depends on better protection of the species, improved understanding of the ecology and the dynamics of the Tibetan Plateau ecosystem, and innovative approaches to conservation and pastoral development that adopt participatory, integrated ecosystem management models.¹



Yak risking their lives on the railway track.

Along with urbanization, gentrification and infrastructure development, China's policies of nomad resettlement, land privatization and fencing, leading to reduced mobility for wildlife, and over grazing have resulted in the reduction of wild animals on the Tibetan Plateau.² One of the most vulnerable of these wild animals, the Tibetan Antelope or Chiru, is "perhaps more than any other animal, [the embodiment of] the vastness of the Tibetan plateau ecosystem [...]. On the Tibetan Plateau, the annual migration of the endangered Tibetan antelope from their winter

ranges to their traditional birthing grounds are an event that reveals one of the earth's most outstanding ecological spectacles. Like the migration of caribou in North America and wildebeest in East Africa, this annual event has taken place for thousands of years unimpeded by people, roads or fences."³

Today, however, the groups of 15,000 Tibetan antelopes that once used to inhabit the Tibetan Plateau can no longer be seen, but herds of 1,000 or more still exist.⁴ Illegal poaching of the Tibetan Antelopes for Shahtoosh,⁵ used to make shawls sold in luxury markets, seriously threatened its survival in the 1990s. In 2003, International Union for Conservation of Nature and Natural Resources (IUCN) listed the Tibetan antelope under its Red List of Threatened Species. The Tibetan antelope, also listed under Appendix I of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), was adopted as one of China's five Olympics mascots for Beijing Olympics 2008 and given priority as a Class I protected animal by the Chinese government.⁶

Today, Tibetan antelopes are limited to protected areas that do not encompass the entire migratory range of the animals. The responsibility of fighting poachers on the Tibetan highlands has fallen to poorly trained and ill-equipped staff and volunteers. Although efforts by the Chinese authorities have, in limited ways, reduced poaching and restricted illegal Chiru wool trading, one of the major concerns for the railroad is to ensure that the vast feeding and migration grounds of the Tibetan Chiru is not lost.

In one study conducted by Center for Transportation and the Environment, a research institute based in North Carolina, United States of America, it was found that "Mortality of mammals due to collisions with trains can be of considerable proportion. At times these railroad fatalities can have a severe impact on mammal populations, especially for mammals that are already endangered, species with large home ranges, low population density and low reproduction rate."⁷

To ensure that the Siling-Lhasa railroad do not hamper Chiru's survival by disrupting its migration pattern or by ensuing railroad fatalities, the railway planners have built 33 "wildlife migration passages,"⁸ especially for the Chiru to facilitate wildlife migration

on the 1,956 kms railroad. However, these passages may be too few in comparison to projects implemented in other parts of the world that pass environmentally sensitive areas. In Banff National Park, Canada's oldest national park, there are 22 underpasses along the 75 kms long highway that runs through the park.⁹ In case of the Siling-Lhasa railroad, there is only one underpass for every 60 kms of new railway, not comparable to the underpass schemes that have been implemented in other parts of the world.

Furthermore, wildlife passages and adaptations in non wildlife passages can be effective in preventing these mishaps only when they are placed in proper locations along the railroad tracks "with respect to habitat and migration routes, passage dimensions, sufficient cover/vegetation at the entrances, the distance to suitable habitats, human co-use and the mammal species concerned."¹⁰ However, insufficient research studies and lack of data regarding proper implementation of wildlife passages disables planners from determining proper location of these passages, and may prove fatal to the survival of endangered species such as the Tibetan antelope.

In an article published on July 2, 2007, *China Daily* reported that "the railway line had caused little to no impact on local vegetation and wildlife" and that "animals had started to become accustomed to the special passages."¹¹ But according to Dr. Yang Qisen of the Institute of Zoology with the Chinese Academy of Sciences, these special passages for the animals to cross the tracks are "a last resort in wild animal protection – a compensatory measure granted by humans to animals," and although animals may be gradually adapting to the passages, "it is still too early to judge whether the passages are successful or not – it will take five to 10 years of the railway being in operation to make the necessary conclusions."¹²

Since the railroad and the highway that runs parallel to the railroad, cross one of the key migratory routes of the Chiru,¹³ there is fear that the constant traffic on the road and the rail tracks will disturb and disrupt the antelopes' migration. These fears raised by many environment protection agencies have also in its wake triggered some controversies.

In December 2006, Liu Weiqiang, an acclaimed Chinese photographer, had his picture titled “*Qinghai-Tibet Railway Opening, Green Passageway for Wild Animals*,” named among the ten most impressive news photos of 2006 at an annual event sponsored by Chinese Central Television(CCTV). Later, the chief editor for the newspaper that published the picture resigned because the picture had been manipulated to show Tibetan antelopes roaming under a bridge on the Siling-Lhasa railway.¹⁴

These controversies led several environmentalists to believe that PRC’s evaluation of the railway’s environmental impacts was based largely on the photo. In response to an article published in the reputed science journal *Nature*, two Chinese zoologists of the Mammal Research Group at the Chinese Academy of Sciences’ Institute of Zoology and currently studying the impact of the railway on plateau wildlife, wrote a letter claiming that although the photo had been faked, what it depicted was real and that they too had witnessed several antelopes using the passages in similar fashion as the picture showed.¹⁵ In another article that appeared in an online Web portal *China Dialogue*, it was reported that from those Tibetan antelopes that go to Kekexili to give birth, 98.17% used the passageways in 2006.¹⁶

However, the total effects of the Siling-Lhasa railway on the environments through which it passes remain unknown despite Chinese authorities’ claim that it is an environmentally friendly project. In a study by a group of Chinese scholars assessing the effects of the railroad on the migration of Tibetan antelope it was determined that railway infrastructure would be an increasing danger to the survival of the Chiru.¹⁷ “The railway is a physical barrier and its impact on the activity of chiru was visibly apparent. When antelopes reached the railway they hesitated under the slope of the rail bed and gathered into large groups. The modification of the land surface in the underpasses and along the railway appeared to have a major effect.”¹⁸

The efficacy of the railway passages, which passes through the eastern limit of the Hoh Xil National Nature Reserve, where the study was conducted, was, however, noted as “having greatly improved in 2003 and 2004, and that the use of wildlife corridors was affected by the structure of the passage,” disrupting migration.¹⁹

Although the current effects of the railroad remain disputed and the future effects remain unknown, only the Chinese Government has concluded without evidence that the railroad will have little to no effect on the natural environment through which it passes. Yet, this is not to say that the Chinese government has not implemented resources to safeguard the environment along the railroad's track. Through generous government funding, a thorough Environmental Impact Assessment (EIA) was conducted during the planning stage. With the help of scientific studies conducted by Green River, they were able to convince the planners to alter the original route. With the help of research, other detailed ecosystem assessments, educational efforts and written recommendations, Green River persuaded the planners to avoid critical habitat area, build bridges and corridors for the antelope, and even halt construction altogether during key migration times.²⁰

The problem, however, according to Lila Buckley, assistance executive director of the Global Environmental Institute, based in Beijing, "if the generous budget, thorough research, and extensive nongovernmental and media involvement contributed in large part to the minimal impact of the rail project, then the alternative—misinformation, poor public participation, and a lack of funding—is the recipe for environmental damage in most Chinese development projects, particularly those implemented at the provincial level. For example, the Qinghai-Tibet Highway, an ongoing road project that began over 50 years ago, has led to serious documented decline of the endangered Tibetan antelope population."²¹ Quoting Yang Xin, she adds, "These roads crisscrossing the fragile alpine grasslands not only affect the land itself, they also fragment the habitat for native animals, disrupting their migration patterns and food sources.' Studies conducted by Green River have shown that the antelope's greatest barrier to reproduction over the past 50 years has been the highway, which hinders the movement required for mating and birthing practices."²²

The Siling-Lhasa Highway, opened in 1954, has indeed in its more than fifty years of operation affected wildlife migration. Lack of wildlife corridors to serve as migratory routes for Tibetan antelopes has further impacted the animals' population. The 1,900 kms highway that crosses the Kunlun Mountain, Hoh Xil and Tanggula mountains and the Zangbei plateau is the most important

highway carrying 85% of Tibet's inbound and outbound goods.²³ Yet lack of environmental planning, heavy traffic, and constant maintenance that the road needs has seriously disturbed the surrounding ecosystem.

According to a report conducted by a group of Chinese researchers headed by Lin Xia on *The Effect of the Qinghai-Tibet Railroad on the Migration of Tibetan Antelope*, "Human activities, including the activities of tourists, railway construction workers and other persons brought by highway, were the most serious factor that affected the efficiency of all crossing structures. Chiru are active in the daytime and therefore cannot avoid the disturbance of human activities. The migration season is in summer, which was the busiest period for construction of the railway and activities on the plateau. We observed that activities along the highway such as chasing, shouting, and taking pictures scattered the Chiru herd, making it difficult for them to cross. Although during the short periods of the westward and eastward migrations all construction activities were limited near the main wildlife passages, the activities of tourists and truck drivers were not controlled. Increasing human presence associated with railways and highways may be the main threat to this species now in the future, and may be greater than the threat from the infrastructures per se."²⁴

Yet this is not to say that infrastructure will have no affect on wildlife. As with any other development, the railway is bound to prompt new hotels and businesses, bringing in more people and traffic in an environmentally sensitive zone. "Over its five-year planning and construction process, the rail has already encouraged the building of numerous new roads, hotels, and other buildings, as well as cheap industrial throw-away goods, not just in Tibet, but all along the route," notes Yang. Quoting Yang, Lila Buckley raises concern over additional infrastructure development that have been prompted by the railroad, which may invoke irreparable ecological impacts, "as nomadic populations gradually adopt industrial food production methods, a "plastic products lifestyle," and motorcycles and fossil fuels for transportation—"in place of the cattle and sheep which provide all of this in a dynamic relationship with the prairie ecosystem."²⁵

Buckley further adds that the Chinese government is depending on the revenues that the railroad will spur through increase in

tourism and trade to offset the environmental and cultural disadvantages that the railroad is creating by prompting further infrastructure development along its course. She writes, “While the rail project itself has received top funding and resources for the environmental impact assessment and planning, the many related building projects and roads have not received equal attention. Government officials, China’s State Environmental Protection Administration, (SEPA) and the media have focused mainly on the railway and its endpoint in Tibet, but the project’s multiplier effect is largely ignored, leaving related projects ill-equipped to conduct EIAs or to adjust for their negative impacts.”²⁶

Therefore, to avoid the deprivation of the fragile environment of the Tibetan Plateau and to ensure that the Tibetan antelope receive adequate care and protection, it is imperative that the Chinese government involve more environmental groups to study and recommend procedures for big infrastructure development in environmentally sensitive areas, make sincere efforts to allocate resources as it has done with the railway project, train people on environmental issues at all levels, and conduct more studies before making remarks on the impact that the railroad may cause on the Tibetan Plateau.

In addition to the effects created by infrastructure development on wildlife, China’s policy on nomad resettlement and fencing vast tracts of grassland in Amdo Province have seriously threatened the survival of Przewalski gazelle, another species of antelope found on the Tibetan Plateau and listed as Critically Endangered on the IUCN’s list. According to a report by ICT, as of 2006, there were only about 600 gazelles remaining in the steppes and stabilized dunes around *Tso Ngonpo* [Ch: Qinghai Lake]. In a report carried out by Dr. Jiang Zhigang, “Fencing is physically preventing the gazelles [from] moving within their range [...] some areas are now completely unsuitable for the species. One of the most distressing factors is that fencing directly kills animals as they become entangled in the wires when trying to jump over them.” Dr. Zhigang further recommends in the report that fencing should be reduced in some densely fenced areas, their heights reduced to 0.8 meters (2 feet 8 inches) and a new reserve established that is dedicated only to the animal.²⁷

Endnotes:

1. International Campaign for Tibet. 'Tracking the Steel Dragon: How China's economic policies and the railway are transforming Tibet,' *Chapter: The Impact of the Railroad on Tibetan Wildlife: New threats to the high altitude Serengeti*, p. 215. Washington DC. Available at: <http://www.savetibet.org/trackingthesteeldragon>.

2. *Ibid*, p.211

3. *Ibid*, p: 212

4. The information has been gathered from a report published by the Environment and Development Desk at the Department of Information and International Relations entitled 'Endangered Species of Tibet.

5. Shahtoosh is the name given to wool derived from the Chiru or the Tibetan Antelope. Shawls made from shahtoosh are known for their lightness, warmth and softness. The wool is derived from the inner covering of the antelope that hugs the antelopes' skin and is not the visible coat, which is coarse. Because the wool derived is from the inner covering, the poachers have to kill the antelope in order to obtain the wool, whose shawl is then sold for extraordinarily high prices in the luxury markets. For more information on Shahtoosh and their demand in the black market see <http://www.kekexili.com/english/chiru.htm>. Additional information is also available in the net.

6. The information has been gathered from a report published by the Environment and Development Desk at the Department of Information and International Relations entitled 'Endangered Species of Tibet.

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Available at: <http://www.savetibet.org/trackingtheesteeldragon>.

13. The highway and the railroad cross the migration corridor of the Tibetan Antelope at the boundary between Hoh-xil National and Sanjiangyuan Nature Reserves, 130-150 km from the calving grounds.

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Note: The researchers involved in this study were from the "Institute of Zoology, Chinese Academy of Sciences, Beijing"

19. International Campaign for Tibet. 'Tracking the Steel Dragon: How China's economic policies and the railway are transforming Tibet,' *Chapter: The Impact*

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Grassland Degradation

The grassland ecosystem of the Northern Tibet Plateau (NTP) is the third largest in China. According to a study on the grassland dynamics of the NTP by Chinese researchers Jiahua Zhang and his team, the economic development and increasing population have caused rapid degradation in the grassland ecosystem and decreased the grasslands.¹ Additionally, logging, overgrazing, digging, and sandstorms have also contributed to the “occurrence and expansion of grassland degradation due to acidification and desertification.”²



View of degrading grassland through a traveler's lens while experiencing train ride (Photo source: Alice)

Climate change has also affected the inter-annual variations of vegetation conditions and grassland dynamics. Soil erosion and desertification as a result of drier and warmer climate in the plateau have sparked concern over its fragile grassland ecosystem. The researchers further claim that in recent years, “under the dual influence of natural and human factors, a large expanse of grassland on the NTP [Tibetan Plateau] region has seriously degraded.”³ This has also raised concerns over the further destruction of Tibet’s

grassland as a result of new infrastructure development, especially with the opening of the Siling-Lhasa railroad that runs across Changthang (Ch: Qiangtang) Grassland, connecting Beijing to Lhasa.

In an article examining the environmental impacts of the railroad construction on Tibet's natural environment, Lila Buckley, writing for the World Watch Institute, interviewed Yang Xin, who confirmed that the Gormo-Lhasa railroad construction has indeed disturbed sections of the grass crest as roads and rock quarries were dug to source materials for the rail bed.

Lin Xia and his team of researchers studying the railroad's effect on Chiru migration stated that the area around the tracks had indeed been damaged by the rail bed's construction, although railway construction planners and the Qinghai Environmental Protection Bureau said that they planned to return the area to its original condition once the construction was completed. The researchers further added that during the period of their research they "saw some turf being planted back to the rail bed."⁴

Lin Xia and his team of researchers further stated, "In general the swathe of tundra disrupted by railway construction is narrow but the most disturbed areas are the staging areas and sand quarries located off to the side of the railway."⁵ They also asserted that as the tundra is replanted, the negative impact on Tibet's grassland created by the infrastructure development would diminish.

However, the U.S. Embassy report stated that their researchers "saw no evidence of turf being 'rolled up' or otherwise transplanted. It is in fact quite doubtful that any such schemes will be carried out. The tundra of Amdo's 15,000-foot-high plateau is not composed of 'turf' in the golf course sense, but rather short-rooted grass plants growing in isolated tufts. Using seed to plant new grass in the dry, sandy soil will also be exceptionally difficult—even if sufficient quantities of the right kind of grass seed could be found."⁶

Although the swathe of tundra disrupted by railway construction is reportedly quite narrow, the main concern for Tibet's grassland is the additional infrastructure that the railroad will prompt along its course and the constant maintenance efforts made on the highway.

“When people think of the [...] Tibet plain, they usually think blue sky and white clouds, prairie surrounded by snow-capped mountains.”⁷ But the highway construction has eroded nearby vegetation and topsoil, creating large dust storms. “It is not uncommon now for the region to be engulfed in sand clouds several hundred meters high,”⁸ adds Yang Xin in Buckley’s article.

To counter the effects of soil degradation and desertification and its impact on the 1,956 kms Siling-Lhasa railroad, China is experimenting with a new technology, “OH sand-solidifying and foliage-planting technology” to solidify the sand along the railway’s tracks and prevent it from eroding. Although initial results for this innovative technology have been positive, its viability cannot yet be proven.

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Permafrost

It is impossible to predict whether the Siling-Lhasa railroad will last and successfully withstand the fluctuating permafrost better than the highways. Some leading scientists are openly cautious, attributing their concerns to climate change, while experts have warned that parts of the track could become unstable, triggering derailments if warm weather melted frozen ground under the railway route.

Tibet is underlain with high-altitude permafrost or perennially frozen ground that has been below zero degrees Celsius continuously for at least two consecutive years. In a study on Tibet's permafrost, researcher Guodong Cheng noted that permafrost on the Tibetan Plateau has experienced noticeable degradation during the past forty years and "a comparison of ground temperatures taken in the 1970s and 1990s indicate [d] widespread degradation of permafrost along the Siling-Lhasa Highway.¹ Such changes in permafrost dynamics brought on by climate change can affect surface and subsurface hydrological processes in the region resulting in land desertification, ecosystem deterioration and changes in carbon pools and fluxes. Also, when spring thaw starts late, summer precipitation in the middle and lower reaches of the Yangtze River and in the lower reaches of the Huai River decrease. Permafrost degradation can also increase greenhouse gas emissions in frozen layers, further contributing to increase in greenhouse gases in the atmosphere.²

The Siling-Lhasa railroad has been built on 632 km of permafrost, 550 km of which is continuous permafrost with 190 km categorized as unstable and 100 km as the most unstable. Although railroads and oil pipelines have been built on permafrost since the early 1900s in Alaska, Canada, and Russia, "these projects – including the Russian railway that Chinese researchers modeled their engineering on – have required extensive maintenance. The Russian railway experienced a 30% failure rate, [...] meaning that nearly third of the track had to be reconstructed every few years."³

Zhang Shiyun, General Manager of the Siling-Lhasa Railway Corporation said that they had discovered a new solution to keep the ground frozen as the climate warms, so as to avoid problems that plagued the Russian railroad and take into account the “different features” of the permafrost in Tibet.⁴ To draw the heat out of the ground and prevent the permafrost below ground from freezing and refreezing, Shiyun and his team took advantage of cooling methods and natural convection cycles. In some places, the engineers installed ventilation pipes in the ground where they would allow the cold air to circulate underneath the rail bed. In other places, thermosiphon, a special kind of pipe to maintain the cool in the ground was sunk 300 feet into the ground and filled with ammonia.

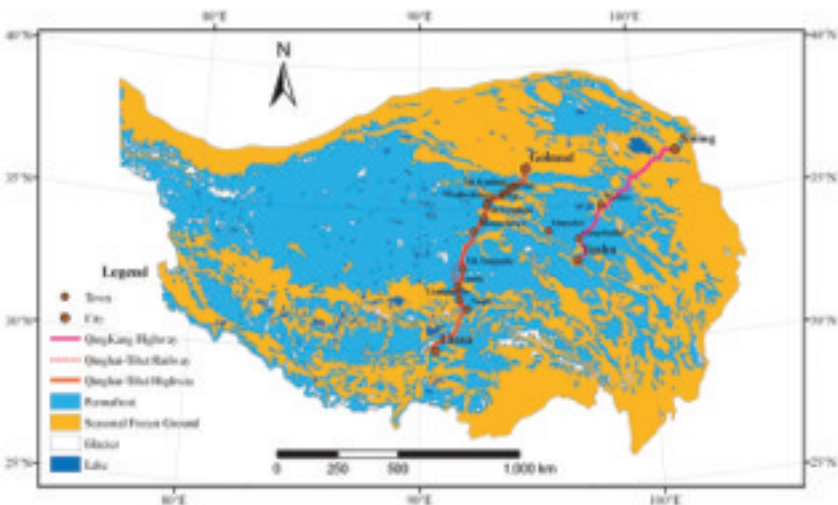
According to Abraham Lustgarten, author of the book “China’s Great Train,” who conducted an in-depth study on the impacts of the railway, thermosiphon has been used in Trans-Alaskan pipeline and is a proven method to keep permafrost ground from cooling. However, he said quoting Douglas Goering, the problem, is that one “might know this cooling stick works, but [one might not know] how many of them do [one] need, and where [to] place them”⁵

The railway engineers have also utilized very simple techniques such as stone embankments, discovered initially by Russian researchers, where “a layer of loosely piled chunks of granite about the size of baseballs that allows enough space between the rocks for air to circulate freely” is used.⁶ In case of thermosiphon, “the ammonia becomes gas at a low temperature, giving off a vapor that draws heat from the bottom of the tube and flushes it out the top, cooling at the same time. Two pipes, costing \$1,000 each, [have been] buried every four yards.”⁷ One reason, Lustgarten says the Siling-Lhasa railway cost about \$6 million a mile to build, not withstanding China’s low labor costs.

In some forty miles of the railroad, however, the engineers were not able to implement these technologies because of delicate permafrost and they decided to elevate the railway on concrete viaducts. Despite all these innovations and money put into the construction of the railroad, Lustgarten warns that “a great portion of the cost of the railway, are based on an assumption that the rate of climate change, and thus the rate that the ground will melt on

the plateau, is predictable. The Lanzhou engineers modeled a two-degree Celsius change over 100 years. But their estimate allows little room for error. And it differs from another set of models, created by the Beijing Climate Center, that predict a faster rate of warming.”⁸

On March 10, 2007, the Head of China’s Meteorological Bureau stated, “Maintenance costs [for the railway] could be pushed up because of the unusual climatic conditions. Safety of passengers on the new railway and a new highway in Tibet could be affected by global warming.”⁹



Permafrost distribution on the Tibetan Plateau (Photo Source: Cheng, G., and T. Wu (2007))

Since the railroad has been built on icy roads that freeze and refreeze everyday and every season, it is imperative that proper maintenance and environmental measures be implemented on the rail beds to avoid derailment. Researchers at the Chinese Academy of Sciences have said during the construction process, “the high-temperature plateau permafrost, coupled with global weather change, becomes one of the most challenging issues facing the railway’s construction [and] if the ecological balance is upset, the consequences will be irrevocable and disastrous.”¹⁰

Although to date, there has been only one derailment with no reported casualties, desertification, sand storms, and the stretches

of permafrost can be dangerous to the safety of the passengers if proper safety measures are not implemented. It is therefore important that China's railway ministry, construction planners, engineers and ecological scientists work together to examine and maintain the safety of the railroad so that the lives of passengers can be safeguarded.

Other Environmental Issues

One of the many concerns for the railroad construction was proper waste disposal. Chinese government has taken several measures to prevent environmental degradation due to waste generated by tourists and locals who will use the railroad. Water discharge has been banned along the railroad. As of June 17, 2006, Liu Xinduo, a senior engineer with the environment control and labor sanitation institute of the Academy of Railway Sciences said that 15 sites had been built along the railway to treat wastewater by using bio-chemistry, electrochemistry and oxidation.¹¹ Ma Baocheng, deputy general manager of the Sining-Lhasa railway added that the train carriages are equipped with garbage collecting systems, which can compact refuse, which will be then carried to Gormo or Lhasa for disposal. He also noted that the train carriages have been installed with "vacuum equipment" to gather toilet excrements and "special facilities" to gather all kinds of waste on the train.¹²

But according to Yang Xin, the Founding President of Green River, "Even before tourists arrived on the first train in July, the increase in inexpensive industrial products brought in by the railway had begun filling local rivers with trash. In the absence of government collection services, the waste 'runs its own course, dancing through the air and spreading urine and feces from the open sewers until the entire town is surrounded by trash and deadly bacteria.' The costs for piping and for sewage and wastewater treatment in the new towns springing up along the rail route fall on local authorities, a burden that remains too high for these poorly developed areas. Most of the area's nomads have not yet developed resistance to diseases common among settled peoples, and still own large numbers of animals that could easily fall ill."¹³

The present concern, therefore, is not the waste generated by the people who use the train, but the additional infrastructure it is generating along its tracks such as the new roads, hotels, businesses and shops that have not been fitted with proper waste management

systems. This does not only pose health risks to the natives and the visitors, but also to the Plateau's ecosystem and wildlife.

Tibetan nomads are forced to give up their traditional way of life, slaughter their herd and relocate in urban areas such as Gansu, Qinghai, Sichuan, and the new towns springing up in the "TAR".

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Economic Marginalization and Social Exclusion

Majority of the Tibetan people lack both formal and vocational trainings that prevent them from competing with the job market of Tibet, which is predominantly Chinese. China's so-called development programs in Tibet are targeted only at urban areas and sectors where Tibetans have the hardest time competing with the Chinese immigrants. According to ICT economic opportunities created by large development projects such as the railways mostly benefits workers and entrepreneurs who speaks fluent Chinese and have connections with the government officials and business networks in China. "This combination in turn exacerbates inequality and the exclusionary dynamics of growth, given that the majority of Tibetans have more and more difficulty accessing the state or private networks that control the dominant sources of wealth in the economy. Therefore, the most urgent problem within these developments is what can be called 'ethnically exclusionary growth'," according to development economist Andrew Fischer.¹

The railroad, one of China's most important development projects implemented to connect Tibet to China, will also facilitate a similar growth pattern where the Tibetans will find themselves being marginalized by their Chinese immigrants in Tibet's burgeoning economy. As increasing number of tourists use the railroad for easier access to the Tibetan capital, additional infrastructure development will be promoted in Lhasa and along its routes, which will create job opportunities for many. Already, there are a number of new towns, hotels and businesses in and around Lhasa. The problem arises, however, when these economic prospects, meant for the Tibetan people, ends up benefiting the Chinese migrant workers who are better trained, better educated and therefore better able to compete in these service oriented job sectors. Even in sectors where Tibetans could excel, the sheer number of Chinese in the capital poses serious challenges to their sustainability. According to the ICT's report on the impact of the railroad on the Tibetans and their land, "the gulf between the educated elite and the urban and rural poor has widened in the year since the railway was opened [...] Despite years of investment under the "Western Development Strategy," the vast majority of Tibetans in Tibet are severely

disadvantaged both socially and economically by the inadequate provision of education [...and] hampered further by a lack of any meaningful access to vocational training which could prepare them to compete with migrants from the Chinese interior who seek work and opportunity in Tibet—migrants who have multiplied with the railroad.”²

An Australian professor and Chair of the Eastern Tibet Training Institute, Ben Hillman also noted the discrepancy between China’s education and economic policies in Tibet. In an article titled *Reviewing China’s Tibet Policy*, he noted how “Ethnic Tibetans remain amongst the most illiterate in China. Only a small minority has secondary education, and more than 40% of Tibetans have no formal schooling at all, compared to China’s national average of 8% [, and therefore,] although there is no systematic discrimination of Tibetans by employers, the high rate of illiteracy among Tibetans make them incompetent for the service-oriented jobs prevalent in Lhasa and other cities of ‘TAR,’ as well as in other Tibetan prefectures.” He also noted how the lack of vocational training—“the kind of training that will allow Tibetans to compete with migrants from the east in construction, tailoring, food preparation and a host of other jobs in the dynamic service sector”—make the Tibetan natives unable to compete in Tibet’s rapidly increasing job markets.³

With the advent of the railroad, the immediate concern, therefore, is the social exclusion of the native Tibetan population as growing numbers of Chinese migrants enter the Tibetan plateau, and especially the capital Lhasa. This will accelerate and in some cases, occasion the economic and social marginalization of the ethnic Tibetans. As many non-Tibetans enter the region and take the jobs provided by developing businesses, the native population will find themselves excluded, fueling ethnic tensions between the two groups.

This is not to say that all Tibetans will be excluded. There are some who have done particularly well in business and real estate boom that has occurred in the “TAR” because of Chinese economic policies and the arrival of the railroad. These are, however, a small number of people with “privileged access to channels of state-stabilized wealth such as cadres and other government employees.”⁴

Of the majority of the Tibetans who still live in rural areas, they will benefit little from urban-oriented development projects like the railways. Moreover, with China's nomadic resettlement policy and hundreds of thousands of Tibetans relocated in cities and towns, the mean income disparity between the urban and rural population will further widen. Currently mean urban incomes are already five times higher than average rural incomes. It will be harder to balance this widening income difference as resettled nomads find themselves increasingly unable to sustain their family after losing their traditional livelihood, and the ones who could find job opportunities in cities and towns, find themselves lacking the skills needed to make a living in Tibet's booming economy.⁵ Already, most are dependent on state subsidies, and because they lack viable expertise required in many jobs, these nomads are prevented from finding alternate means of making a livelihood.

Fischer further notes that each year in the "TAR," Tibetans on average "eat more and more meat, butter and other staples; they have more and more mobile phones, motor bikes, televisions and other durable goods; and they spend more and more money on internet cafes and karaoke bars. Yet it would be surprising if this were not the case given the sheer torrent of subsidies that the



*Tibetan workers in the rail road construction in Lhasa
(Photo Source: EDD Archive)*

central government has been spending and investing in the “TAR.” What is surprising is how little actually does trickle down. This situation arises precisely because of who controls the subsidies and investments (mostly the government itself along with Chinese out-of-province state-owned enterprises) and where the money is spent (mostly in urban areas or in large infrastructure projects).⁶

Such unsound Chinese education and economic policies, and moreover with the increase in nomad resettlement in Tibet’s rural areas, rural Tibet and Tibetans are experiencing “increased levels of vulnerability and poverty.”⁷ Unemployment faced by nomads who have lost their livelihoods, and often their livestock, is leading to community and family breakdowns, alcoholism, and crime.⁸ Still China’s policies are dependant on a select few who have faired extremely well in China’s booming economy, to lead the way. Such dependence has, however, instead of rectifying social and economical discrepancies, fueled ethnic tension as more competent people enter Tibet to take advantage of the opportunities created by it.

As Mr. Hillman has stated, “China’s policy makers have failed to appreciate the importance of investing in people as part of the “Western Development Strategy.” Their approach has been to expand markets and to encourage more ‘advanced’ migrants to lead the way. The policy assumption is that once Chinese migrants from central and eastern provinces will move into new markets, open small businesses, work on building sites, drive taxis (most taxi-drivers in Lhasa are non-Tibetan),⁹ Tibetans will watch and eventually copy them. That approach is not working.”¹⁰

Although we lack official data recording the number of Chinese people who travel to Tibet by the railroad for purposes other than tourism, a survey study conducted by the “TAR” Development and Reform Committee alludes that the Gormo-Lhasa railroad will have impacts similar to those of other railroads connecting China to Inner Mongolia and Xinjiang, where the original inhabitants are now insignificant minorities compared to resident Chinese.¹¹ Based on this survey of 270,000 passengers over a period of approximately 75 days, or about 3,600 passengers per day, the Director of the “TAR” Development and Reform Committee, Jin Shixun, asserted that 60% of those using the Siling-Lhasa railway were businessmen, students, transient workers, traders, and

individuals visiting relatives, and only 40% were tourists. ICT estimates that if a similar proportion prevailed throughout the remainder of the first year of operation, then approximately 900,000 passengers of the 1.5 million who took the train that year could have been non-Tibetan businesspersons, workers, and traders, who intended to remain in the “TAR” for a certain period of time.¹²

Already there are reports of a dramatic expansion of Lhasa around Liuwu New District (Tib: Ne’u), which is where the new station for the railway was built. The report that appeared in an official Chinese paper stated that Lhasa’s area would increase by 60 percent with the establishment of an urban district to house the city’s growing population. The report said, “The 42 sq km Liuwu New District on the southeastern bank of the Lhasa River that flows across the city center will enlarge Lhasa’s city proper to about 100 sq km from the current 60 sq km when the district takes shape in 2009.” In 1965, the area of Lhasa was only five square kilometers. Although Chinese officials have stated that “the planned residential buildings in the new district [will be] two-storey, quake resistant structures in traditional Tibetan style,” Dawa Tsering, head of WWF China’s program office in Lhasa, says that with such an expansion, Lhasa would “lose its unique character.”¹³

Such boom in tourism and real estate in Lhasa led to an influx in Chinese investors who take advantage of the easier access to Lhasa and further leave out the Tibetan people from the opportunities created by the developing businesses. This sort of migration prompted by infrastructural development seriously threatens Tibetan culture and interests, as more non-Tibetans enter the region and take away the jobs provided by upcoming businesses, further denying the Tibetans their legitimate political representation and economic opportunities. Unfortunately, non-Tibetans, and particularly the Chinese, have better access to wider social networks, capital and information about where and how to seek employment.

Official tourism data also allude to increase in Chinese migration in the “TAR” after the railway opened to the public in 2006. Official reports in *Xinhua*, the official mouthpiece of the PRC, noted that in the year 2006 alone, there was a 36 percent increase

in the number of tourists in Tibet. Of these, 93 percent were from China.¹⁴ In the first ten months of 2007, Tibet received 3.72 million tourists, a 64 percent increase from the previous year.¹⁵ Of these, only 350,000 were from west.¹⁶ An article that appeared on *People's Daily online* stated that "On July 1, [2006, after] the 1,956-km Siling-Lhasa, comprising the Siling-Gormo and Gormo-Lhasa segment, was put into operation, [travelers were provided with] cheaper and safer access to the region."¹⁷

Although most of the tourists visiting Tibet and in particular Lhasa are Chinese nationals, Fischer says that most of them stay in "Chinese-owned hotels on the west side of Lhasa, close to an abundant supply of Chinese restaurants and entertainment centers, complete with Chinese brothels and Chinese sex workers, who obviously service the military personnel and cadres stationed there as well. It is likely that much of the revenue that such tourism generates is channeled through such venues and eventually out of the province altogether. Under such conditions, the tourism industry will have a difficult time functioning as a self-sustaining pillar industry that accumulates capital and profits in the "TAR," rather than servicing as another drain from which incoming resources flow back out of the province almost as fast as they enter."¹⁸

Thus, despite claims that railroad will increase tourist revenues and make Tibet self-sustaining, most revenues generated through tourism eventually go back to China, benefiting very few Tibetans along the way. In ICT's report, a Tibetan hotelier in a traditionally Tibetan part of Yunnan Province estimated that 65 percent of profits from tourism go to outside businessmen, 10 percent to the government, 20 percent to local businessmen, and less than 10 percent to local villagers.¹⁹

The increase in tourism also threatens Tibetan cultural identity and heritage. In recent years, the Paris-based United Nations Educational, Scientific and Cultural Organization (UNESCO) has expressed concern for the Potala Palace, and recognized as a World Heritage Site in 2004, and has proposed to put it on UNESCO's 'Danger List.' After the railway opened in July 2006, the old wooden palace received 6,000 visitors a day during peak season, from 1,400 visitors per day in previous years. The officials had to then limit visitors to approximately 2300 per day, hoping that

the new restrictions will “lighten the pressure on the ancient wood palace”. ICT further claims that “the dramatic increase in tourism since the opening of the railway has been especially acute at Lhasa’s historic cultural sites, such as the Potala Palace, the Jokhang Temple in the Barkhor area, and the Dalai Lama’s former summer palace, the Norbulingka,” all of which have deep religious and cultural significance to the people of Tibet.²⁰

Thus, the economic benefits—increased revenues from the tourist industry, new businesses, hotels, and jobs for the Tibet Autonomous Region and the ethnic Tibetans—brought to Tibet as a result of the railroad have largely benefited the Chinese immigrants who are better educated and better trained. Indeed, PRC is to be blamed for the absence of institutes offering vocational training to Tibetans as they have failed to include Tibetans in its development schemes and Tibetan participation have been minimal.

Ma Rong, a Chinese scholar from Beijing University, has also stated that “if the Chinese government keep using migrant labor within centrally managed development strategies in the western regions of the PRC, and neglect to provide ample education and vocational training opportunities to the natives, they may face similar consequences whereby the ethnic groups will face serious challenges due to their disadvantages in education, and the ethnic tensions arising as a result could be a fatal threat to the success of the “Western Development Strategy.”²¹

ICT provides a gaudy perspective of the crowds of people, ICT quoted a Tibetan from Lhasa, which it refers to as “a plague of locusts” descending on the city since the advent of railroad: “It feels as though the city’s going to burst; prices for food are getting more and more expensive on the market, with 16 Yuan [US \$2.15] for a half-kilo of yak meat and 17 Yuan [US \$2.29] for a half kilo of butter; going to the temple to pray, it’s hard to move through the mass of tourists, and furthermore the tourists speak so loudly, they spit on the ground and the men smoke and the women bare their flesh; go to a shop or a restaurant and the owners ignore the locals, with the Han just looking out for the Han, and Tibetans truly becoming marginalized.”²²

Endnotes:

1. International Campaign for Tibet. 'Tracking the Steel Dragon: How China's economic policies and the railway are transforming Tibet,' Chapter: *The Second Exclusion and China's Economic Policies*, p.61. Washington DC. Available at: <http://www.savetibet.org/trackingtheesteeldragon>

2. *Ibid.* at p:62.

3. Hillman, Ben. 'Rethinking China's Tibet Policy,' *Japan Focus, an Asian Pacific e-journal*, 2008. Available at: <http://www.japanfocus.org/products/details/2773>

4. International Campaign for Tibet. "Tracking the Steel Dragon: How China's economic policies and the railway are transforming Tibet," *Chapter: Social Exclusion and China's Economic Policies*, p. 62. Washington DC. Available at: <http://www.savetibet.org/trackingtheesteeldragon>.

5. *Ibid* at Chapter:*Social Exclusion as a Result of China's Economic Policies*, p. 111.

6. *Ibid* at Chapter:*Social Exclusion and China's Economic Policies*, p. 61.

7. International Campaign for Tibet. "Tracking the Steel Dragon: How China's economic policies and the railway are transforming Tibet," *Chapter: Social Exclusion as a Result of China's Economic Policies*, p. 117. Washington DC. Available at: <http://www.savetibet.org/trackingtheesteeldragon>.

8. *Ibid.*

9. In a study conducted in 2005 by some Chinese scholars, it was found that 99% of taxi-drivers in Lhasa were non-Tibetans.

10. *Ibid.*

11. The numbers and comparisons provided in the passage have been taken from an earlier report by the International Campaign for Tibet based in Washington D.C. International Campaign for Tibet. *Crossing the Line: China's New Railway to Lhasa, Tibet*. www.savetibet.org. Washington DC: USA, p. 17-20.

In Inner Mongolia, experts estimate that the population in the region increased some five times from 1912-1949. By 1949, the Han Chinese outnumbered the Mongolians by 11 to 1. Such migration has not only marginalized the native Mongolian population, diluting its political significance and overshadowing its particular concerns with those of the Han Chinese, but it

has also forced Mongolians to abandon their “age-old nomadic traditions,” and led to grassland degradation. Similarly, in Xinjiang, according to a 2001 estimate, the completion of a railroad to Kashgar, near the Kazakhstan border, led to a 30 percent increase in the Chinese population in the region, compared to a 2.5 percent increase the year before.

12. International Campaign for Tibet. ‘Tracking the Steel Dragon: How are China’s economic policies and the railway are transforming Tibet,’ *Chapter: The Second Invasion: Chinese migration to Tibet and the Railroad*. See footnote four, p: 57. Washington DC, USA. Available at: <http://www.savetibet.org/trackingtheesteeldragon>.

13. Xinhua News Agency. ‘Lhasa city area grows by 60%,’ November 19. Available at: <http://lr.china-embassy.org/eng/gyzg/a123/t382355.htm>

14. People’s Daily Online. *Tibet Records Rapid Tourism Growth*. 12/28/2006. http://english.people.com.cn/200612/28/eng/200612/28_336590.html, accessed July 05, 2008.

15. Tibet.cn. *Tibet sees sharp increase in tourists in first 10 months*. 12/02/2007. http://info.tibet.cn/news/index/ywxw/200801/t20080116_352356.htm, accessed July 05, 2008.

16. *Ibid*.

17. People’s Daily Online. *Tibet Records Rapid Tourism Growth*. 12/28/2006. Available at: <http://english.people.com.cn>
http://english.people.com.cn/200612/28/eng/200612/28_336590.html.

18. International Campaign for Tibet. ‘Tracking the Steel Dragon: How China’s economic policies and the railway are transforming Tibet,’ Chapter: *Tourism, the Railroad and Tibetan Cultural Identity*, p. 80. Washington DC. Available at: <http://www.savetibet.org/trackingtheesteeldragon>.

19. *Ibid*.

20. *Ibid* at p: 82-83

21. International Campaign for Tibet. ‘Tracking the Steel Dragon: How China’s economic policies and the railway are transforming Tibet,’ Chapter: *The Second Invasion: Chinese migration to Tibet and the railroad*, p. 40. Washington DC. Available at: <http://www.savetibet.org/trackingtheesteeldragon>

22. *Ibid*. at p.39

The Economics of Gormo-Lhasa Railway

One of the more controversial aspects of the Gormo-Lhasa railroad has been its cost. International agencies such as the ICT have claimed that the “demand in the short and medium run will hardly justify the enormous capital outlay required [by the railway, and] even over the railway’s lifetime, capacity utilization may never deliver a positive rate of return.” Some have claimed that “Indeed, Beijing’s unrelenting pursuit of this roughly USD 4.2 billion project was more like an obsession; [and today] it is the highest, most complex, and one of the most expensive railway engineering feats of its kind.”¹

Estimated initially at US \$2.34 billion, the cost for the world’s highest railroad had rose to US \$4.2 billion at the end of its construction phase. Collaborating with international giants like Bombardier, General Electrics and Nortel to establish communication networks and locomotives capable of hauling high altitudes, the Chinese government made great investments to complete the rail link. In five years of construction, the project had brought [with it] a wave of globalization to what had been one of the most secluded places on Earth.²

China also spent US \$192.5 million, which makes about 5 percent of the total investment of the railway, on environmental protection measures along the Gormo-Lhasa Railway.³ According to the construction plans laid for the railroad, the internal construction section of the railway in the “TAR” accounted for 16 million Yuan.⁴ The prediction was that the increase in investment for the railway and its related industry would further enhance the local population and their economy. Indeed it was to be so. During the construction, the railway created 100,000 new employments and its operation would further create 2060 more jobs.

According to statistics provided after China’s “Ninth Five Year Plan”, the increase in tourism from China and abroad was about 20 percent during 2000-2001 in Tibet, with each visitor directly contributing 1,100 Yuan to Tibet’s economy. It is predicted that if the number of passengers taking the train increases at an annual

rate of 30 percent, the total inflow of tourists coming into Tibet will reach 5.3 million in 2010 with a direct tourism income of about 5.8 billion Yuan. *China Daily* reports that the greatest impact of the railway would be felt in the tourism sector with revenues expected to double by 2010 in Tibet. However, according to Dr Abanti Bhattacharya,⁵ “the rationale for building roads and railways in the “TAR” is essentially “military and strategic-oriented,” while economic benefits emanating from them are mainly “side effects”. She further says “Devoid of local ownership and dependent on central subsidies, the fruits of the [railway] are thus not likely to reach the 85 percent rural population of Tibet.”⁶

Furthermore, the advent of the railroad and rich deposits of mineral resources all along the railway line from Siling to Lhasa create favorable conditions for the extraction of these resources. Since areas with rich mineral resources in Tibet are usually areas of poor economic development when measured in terms of Gross Domestic Product (GDP), PRC government authorities claim that the operation of the railroad will help to reduce the imbalance of economic development in these regions by improving the GDP of these particular rural areas and its population.⁷ Most of the populations of Nagchu (Ch: Naqu) and Lhasa municipality—two of the most important places that the railway line cuts through—are mostly farmers and pastoralist engaging in animal husbandry, which is primarily responsible for its low per capita GDP.

The government of the PRC believes that many of these visions of economic development would be accomplished through the tourism boom that the railway would bring forth. Tourism in Tibet has shown a tremendous rise during the past few years and so has the pace of its development. The skyrocketing figures of tourism industry during its two years of operation since July 2006 clearly depict what they believed in.

In the year 2006 alone, Tibet received 2.45 million inbound tourists from China and abroad which is an increase of 36 percent from the previous year. 93 percent of these tourists were from China. This raised the total revenue by 39.5 percent making a total of 2.7 billion Yuan. State press reported that “A record four million tourists will have visited Tibet in 2007, thanks to a new railway linking the Himalayan region to the rest of China and another airport.”

On December 31, 2007, the official Chinese news agency *Xinhua* also reported that the number of tourists that visited Tibet increased by over 60 percent from the previous year, bringing in about 5.5 billion USD in tourism revenues. *Xinhua* further quoted Zhang Qingli as saying, “The golden era of Tibet tourism has come.” He further added that the rapid increase in tourism and the growth in tourism industry is primarily due to the opening of the railway. The number of visitors to Tibet is expected to hit 5 million in 2008, up 25 percent from a year earlier, and tourism revenue is predicted to reach 6 billion Yuan (826 million USD), up 24 percent.⁸ Chinese officials estimate that by 2020, 10 million visitors may come to Tibet.⁹



Railway Bridge (Photo Source: Wang)

Locals estimate that a part of the tourism boom is the new railway line that allows faster, cheaper, easier and safer access to the region. The comparative lower traveling cost of the train is a great temptation not only to the international and domestic tourists wishing to see and visit the Tibetan Plateau, but also to immigrants wishing to make their fortunes in Tibet's burgeoning economy. For many Chinese, traveling to the vast inhospitable terrains of Tibet has always remained their greatest wish and the present railroad gets them into the heart of Tibet, the Potala Palace. With the advent of the railway and the increasing tourism industry triggered by the railroad, development in Tibet is also bound to accelerate. The fear therefore is that with lack of Chinese policies to safeguard Tibet's culture, the Chinese economic motivations

for development in Tibet, especially with the railway will invite more migrant workers and unprecedented number of tourists that has the potential to dilute Tibetan culture.

The Chinese government has always claimed that the operation of the railway would boost Tibet's economy, lower the prices of commodities and improve the consumption power of the local Tibetans. They estimated that the train would be used to transport 75 percent of goods coming in and out of Tibet, driving down highway freight transportation by 80 percent.¹⁰ However, the sky rocketing figures¹¹ showing increase in the number of tourists and the revenues generated as a result have so far benefited only few, leaving behind a major portion of Tibetans unaffected.

According to China Tibet Information Center, "Since the opening of Qinghai to Tibet railway, costs of freight for goods and materials in and out of Tibet have decreased by a large margin [and will also soon trigger] the key productive elements for economic development, such as capital, labor, technology and natural resources, [to] enter Tibet at a reasonable price." It further added, "The Qinghai [Amdo] to Tibet railway could bring benefits to Tibet in extending its market to outside of Tibet and enhancing its productive capacity in competition. It will result in stimulating consumption and expanding internal demand, especially for products from various industries and services that are needed by government agencies, enterprises, and individuals."¹² Officials at the Ministry of Commerce also said, "As more and more low-price and high-quality goods enter Tibet via the line, the purchasing power of local residents will be greatly enhanced."¹³

However, according to a Lhasa resident interviewed by Radio Free Asia,¹⁴ "the prices of the commodities have increased rather than decrease after the railway opened to the public." The caller added that the increased costs of commodities are already making it harder for the Tibetan people to buy quality food products and making them vulnerable to malnutrition. Moreover, the import of packaged products from China and other places are being accelerated by the railway, which in turn would have serious environmental and economic repercussions.

Although the Chinese government claims that the benefits of the railway will far outweigh the environmental and social implications

as feared by several critics and environmentalists worldwide, it seems as though the local nomadic population will be the last to see any reward. A Chinese government official reported, “Benefiting from the advantages of the market economy requires a shift from a nomadic to a settled, agriculture-based livelihood, a Han education and language ability, and a business savvy that is easier said than achieved.” He explains that so far, “the restaurants and management positions along the highways and rail are all monopolized by people from other places. There is considerable prejudice among these city people against the nomads.” Andrew Fischer also agrees that there has been a considerable increase in the average and real incomes of the Tibetans in the “TAR.” He further adds that only a small minority of Tibetans have benefited as a result of the new railroad and economic policies of the Chinese government.¹⁵

Such claims and exclusion of the Tibetan people from policy making and reaping any benefits from development induced in their regions, poses several questions on PRC’s policies in Tibet. If the Tibetans are to genuinely benefit from these infrastructural developments, then they need to have more participatory involvement in them which means creating better schools, opening vocational training institutions and limiting the inflow of Chinese migrants into Tibet so that the economic and social marginalization and the ethnic tensions thereof could be avoided.

Endnotes:

1. Lustgarten, Abraham. ‘Next Stop, Lhasa,’ *Fortune Magazine*, June 8, 2006. Available at: <http://money.cnn.com> http://money.cnn.com/magazines/fortune/fortune_archive/2006/06/12/8379261/index.htm

2. *Ibid.*

3. China Tibetology. ‘Funds for environmental projects for Tibet railway well spent,’ *China.cn, China Tibet Information Center*, June 27, 2006. Available at: www.chinaview.cn. http://news.xinhuanet.com/english/2006-06/27/content_4757807.htm

4. Gang, Zong. ‘The Construction of the Qinghai-Tibet Railway and Its Impact on Tibetan Development,’ *China Tibetology: China Tibet Information Center*, Available at: <http://www.tibet.cn/english/zt/TibetologyMagazine/200312007421130047.htm>

5. Abanti Bhattacharya is an associate fellow at the Institute of Defense Studies and Analysis (ISDA) in New Delhi. It is considered to be the premier strategic and security studies think tank in India. The Institute is funded by the Indian Ministry of Defence, but functions autonomously.

6. Dr Bhattacharya, Abanti. 'Strategic Implications of the Qinghai-Tibet Railway,' *Institute for Defense Studies and Analysis*, July 07, 2006. Available at: <http://www.idsa.in/publications/stratcomments/AbantiBhattacharya060706.htm>

7. Gang, Zong. 'The Construction of the Qinghai-Tibet Railway and Its Impact on Tibetan Development,' *China Tibetology: China Tibet Information Center*, Available at: <http://www.tibet.cn/english/> <http://www.tibet.cn/english/zt/TibetologyMagazine/200312007421130047.htm>

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9. Kurlantzick Joshua. 'Tibet Now,' *The New York Times*, December 10, 2006. Available at: www.nytimes.com <http://travel.nytimes.com/2006/12/10/travel/10Tibet.html?pagewanted=all>

10. Xiao, Li. 'Qinghai-Tibet Line: An Instrument of Change,' *China.org.cn*, August 28, 2006. Available at: <http://www.china.org.cn/english/> <http://www.china.org.cn/english/2006/Aug/179340.htm>,

11. Tibet received 1.86 million tourists in the second half of last year, up 48 percent from the same period a year earlier, while tourism revenues reached 2.1 billion yuan (270 million U.S. dollars), up 40 percent, according to the regional Tourism Bureau. For more information see, http://english.gov.cn/200701/19/content_501817.htm

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13. People's daily Online. 'What are the tangible benefits for locals?,' July 08, 2006. Available at: <http://english.peopledaily.com.cn/> http://english.peopledaily.com.cn/200607/08/eng20060708_281252.html

14. Radio Free Asia is a broadcasting agency based in Washington DC, USA. It provides accurate and timely news and information to Asian countries whose governments prohibit access to a free press.

15. Fischer, Andrew M. 'State Growth and Social Exclusion in Tibet: Challenges of Recent Economic Growth,' Nias Press, 2005.

Looking Forward

In spring 2007, a train derailed on the Siling-Lhasa railroad with no casualties. This, however, raised several concerns over the railroad's safety especially since the tracks have been laid on stretches of icy road that "melts and refreezes with the seasons and the rising and setting of the sun."¹ The region the track passes, is earthquake prone (an 8.1 rocked the region in 2001), "winds whip sand and ice at 50 miles an hour, creating an ecological sandblaster that can peel the paint from vehicles and lacerate human skin, temperatures on the plateau bottom out at 35 degrees below zero for months, [...and when the ice] thaws, the ground can drop a foot, only to heave up again the next time it freezes. Over time it can move as much as 15 feet and the path of least resistance climbs to 16,900 feet, 2, 400 feet higher than California's Mount Whitney."² Nonetheless, the Chinese overcame these difficulties and built the world's highest railroad.

Today, along with maintenance of the 1,956 km railway track that runs on unstable permafrost, the main concern for the railroad's stability in the long run could be Tibet's increasing temperature due to global warming, is desertification and threatening many such development efforts along its ways. Apart from new technology that may prevent sand storms and desertification, effective policies regarding overgrazing, highway maintenance (for instance, making sure that transportation department removes all equipments for the Chiru or restores the tundra it disrupts on the road side is replanted) and education classes for the locals may prove more beneficial in preserving Tibet's fragile grassland ecosystem.

However, Environment and Development Desk of CTA feel that it is time to look forward. Since the development induced from the railroad cannot be undone as long as it continues to operate and carry millions of tourists and locals in and out of Tibet, we recommend the government of PRC to implement policies that will provide safeguards to the Tibetan culture, people and its environment. The new towns springing around the railway stations

should have strict laws and statutes enforcing environmental policies to protect Tibet's grasslands, climate, and endangered species such as the Chiru and the Wild Yak. Additionally, the Government of PRC should put greater emphasis to force other provinces to establish and enforce strict environmental policies.

The Chinese government should also take into account the need for improved educational system in Tibet to enable Tibetans to take advantage of the new jobs that are directly or indirectly created by the railroad.

There is also a need for national parks, to protect both the grasslands and the wildlife. Although the builders of the railroad sought to ameliorate the impact upon wildlife by creating wildlife corridors, the same is not the case for the older highway and other new developments. Therefore, overpasses should be made in these highways to facilitate for the migration of the Chiru and other migratory animals.

The PRC government should further focus more on multicultural education to protect the unique culture and identity of the Tibetan people and their pristine environment that has sustained them for generations.

Endnotes:

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ACRONYMS USED

CCP	Communist Party of China
CCTV	Chinese Central Television
CITES	Convention on International Trade of Endangered Species of Flora and Fauna
CTA	Central Tibetan Administration
EDD	Environment and Development Desk
EIA	Environmental Impact Assessment
IUCN	International Union for the conservation of Nature and Natural Resources/ world Conservation Union
NTP	Northern Tibetan Plateau
PRC	People's Republic of China
SEPA	State Environmental Protection administration
UNESCO	United Nations Educational, Scientific and Cultural Organization

Cover design :

The train (a symbol of the new economic development of China) is coming out of an old Tibetan icon which shows the penetration of a new communist/capitalist empire into a world where tradition is strong. While the Tibetan religion, culture and tradition and overall way of life is being stifled, its presence is still powerfully embedded in the hearts of Tibetan people and of those individuals who acknowledge and share the urgency of time and situation.

