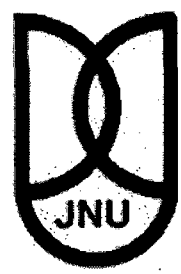
IMPACT OF CHINA'S DEVELOPMENT POLICIES ON THE TIBETAN ENVIRONMENT, 2001-2010

Dissertation submitted to Jawaharlal Nehru University
in partial fulfillment of the requirements
for award of the degree of

MASTER OF PHILOSOPHY

LOBSANG YANGTSO



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DECLARATION

I declare that the dissertation entitled **"Impact of China's Development Policies on the Tibetan Environment, 2001-2010"** submitted by me in partial fulfillment of the requirements for the award of the degree of **Master of Philosophy** of Jawaharlal Nehru University is my own work. The dissertation has not been submitted for any other degree of this University or any other university.

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CERTIFICATE

I recommend that this dissertation be placed before the examiners for evaluation.

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Abbreviations

CCPCC	Chinese Communist Party Central Committee
CGS	China Geological Survey
CTA	Central Tibetan Administration
DIIR	Department of Information and International Relations
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
HDI	Human Development Index
ICT	International Campaign for Tibet
IUCN	International Union for Conservation of Nature
MEP	Ministry of Environmental Protection
NDRC	National Development and Reform Commission
NSB	National Bureau of Statistic
NPC	National People's Congress
PRC	People's Republic of China
SEPA	China's State Environmental Protection Agency
TAR	Tibet Autonomous Region
TCHRD	Tibetan Center for Human Rights and Democracy
TEPB	Tibet Environment Protection Bureau
TIN	Tibet Information Network
UNEP	United Nations Environmental Program
WWF	World Wildlife Fund
WCED	World Commission on Environment and Development

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Chapter I

Introduction

The Tibetan Plateau is comprised of 2.5 million square kilometres and with an average elevation of 4,500 metres- world's highest and the largest plateau in the world. Thus, Tibet is known as the "Roof of the World," surrounded by the Himalayas in the south, Kunlun mountains in the north, and Hindu Kush and Pamir ranges in the west. Tibet is also referred as the "Third Pole of the Earth" as it holds the third largest store of glacial freshwater. The Tibetan Plateau is the "Water Tower of Asia", the source of rivers, and provide fresh water to South and Southeast Asian countries- China, India, Bangladesh, Nepal, Pakistan, Thailand, Myanmar, Vietnam, Laos and Cambodia.[1]

The Tibetan Plateau has an abundant source of rich mineral resources, precious metals along with high deposits of rare earth elements. 126 different minerals are found on the plateau. The grasslands, forests, and wetlands of Tibet contain magnificent landscapes, unique biodiversity, and natural resources. The Tibetan Plateau is home to endangered and endemic wildlife species, different kinds of mammals and species of birds. The plateau remained untouched by human disturbance before 1949 and traditional ecological managements have protected the Tibetan environment.

Ever since the Chinese control of Tibet in 1949, various development programmes have been implemented in Tibet in the name of so-called "liberation" and "modernization". Beijing's strategy of large scale western development was officially launched in 2001 through the "Great Western Development Programme" and it further accelerated the development projects in Tibet. The infrastructure development, natural resource exploitation, water projects, and the construction of railway on the Tibetan Plateau are the major development policies carried out by the Chinese government in Tibet. In order to

[1] The term Tibet here means the whole of Tibet known as Cholka-Sum (U-Tsang, Kham and Amdo). It includes the present-day Chinese administrative areas of the so-called Tibet Autonomous Region, Qinghai Province, two Tibetan Autonomous Prefectures and one Tibetan Autonomous County in Sichuan Province, one Tibetan Autonomous Prefecture and one Tibetan Autonomous County in Gansu Province and one Tibetan Autonomous Prefecture in Yunnan Province (Tibet.net).

uphold its rule, China believes that development is a necessary tool to nurture and further strengthen the occupation or "national unity" of Tibet with the rest of China.

However, development has basically proceeded over the last half-century in the world has remained inequitable, and has had growing negative environmental impacts. In recent years, the Tibetan Plateau faces major environmental degradation; thawing of permafrost, glaciers melting, degradation of grasslands, acute flooding from deforestation, water pollution, wildlife extinction, and desertification on the grasslands, due to both the climate change and the man-made activities. China's development programmes in Tibet have largely contributed to the destroying Tibet's fragile environment because there is a lack of sustainable development in Tibet and local Tibetan are excluded in the decision-making process. The depletion of the Tibetan environment not only affects the Tibet but it also affects the overall climate of the downstream nations and regions.

This chapter will study the various environmental theories to better understand the causes of environmental degradation. The chapter emphasis on the Chinese scholars' views on the environment as well as the Tibetan environmentalists from Tibet's view on the Tibetan environment. The chapter will give the review of the literature which is organised in a thematic structure, the scope of the study, the methodology, the hypothesis, and the outline of the dissertation.

Environmental Theories

People have had to face the environmental problems in one form or another for most of its time. The original concern of the environmental problem was the scarcity of food, shelter, and other essentials provided at least in part by nature. By the late eighteenth century, Western philosophers were beginning to recognise the theoretical possibility of worldwide scarcities and famines that could threaten the existence of civilisation (de Steiguer, 1995: 552).

From the mid-nineteenth century, writers expressed concerns of industrialisation and population growth for degrading the environment. However, the environmental degradation became major public concerns only after the publication of biologist Rachel Carson's "Silent Spring" in 1962. Thus, by the mid 1960s, environmental degradation had joined with the much older concern of resource scarcity to form the two interrelated and

central interests of modern environmentalists. Numerous theories have evolved to explain the causes and solutions of environmental problems and attempted to bring a confusing array of facts and hypotheses about the environment. There are two major schools of thoughts which explained the environmental problems, the Economists' school of thought and Naturalists or Environmentalists' school of thought.

Economists View on the Environmental Problems

The eighteenth century saw the widespread development of industrial manufacturing with introduction of coal as a principal energy source followed by the invention of the steam engine and then gas lighting. It improved the prospects of people's employment and wages which led many to migrate to the cities from the country. There was a rapid increase in urban population throughout Western Europe. There was a fall of the death rates and social and economic chaos as well. The magnitude of social change and population growth raised concerns about the fate of civilisation. Gradually depression and economic crises emerged. A distinct academic discipline called "Political Economy" rose to address the questions of resource scarcity, allocation and societal well-being. The objective of new economic philosophers was to obtain an understanding of the human condition. There are three major schools of Economic philosophers; Classical, Neoclassical, and Neo-Marxism.

Classical Economists

The first group of economic philosophers to emerge during the Industrial Revolution has been called classical economists. An important member of classical economists was Thomas Robert Malthus. In "An Essay on the Principle of Population" published on 1798, Malthus states that "Population, when unchecked, increases in a geometrical ratio. Subsistence increases only in an arithmetical ratio" (Malthus, 1798: 8). He proposed that the human population was capable of increasing in the geometric progression 1, 2, 4, 8, 16, 32, 64, 128, 256, and so forth whereas the food output was likely to increase in the arithmetic progression 1, 2, 3, 4, 5, 6, 7, 8, and so on. The example that Malthus used was agricultural production. According to him, land was one ingredient like labour or tools, and the quality of arable land is fixed. Land could be more productive through intensive cultivation but there will be decreasing in output with additional labourer as there were increasing masses to feed. The cost of extracting agricultural produce would increase as

population increase thus, it caused resource scarcity. However, the basic Malthusian theme of increasing resource scarcity was modified to a modern, neo-Malthusian perspective.

According to the new view, in addition to the traditional population concerns, world calamity could cause from environmental degradation which also diminished natural resources (de Steiguer, 1995: 544). Neo-Malthusian concerns were evident in Paul Ehrlich's "The Population Bomb" (1968), Meadows's "The Limits of Growth" (1972), and Kenneth Boulding's "The Economics of the Coming Spaceship Earth" (1973). It is important to understand that Malthusian doctrine is a hypothesis.

Harold Barnett and Chandlers Morse in 1963, tested the Malthusian hypothesis and found that between 1865 to 1957 in the United States, most natural resources (exception being forestry production) had not become scarcer but instead more plentiful from the economic standpoint. The lack of scarcity was due to decline in both extraction costs and resource prices. The rising resource prices had produced new resource discovery, substitution and more efficient technologies, all of which had lowered extraction costs. Thus, the Malthusian hypothesis had failed (Ibid). Mitigating factors such as technological developments, agricultural developments, changes in societal organization, and changes in governmental policies enabled humanity to avoid a situation where the number of people was greater than the capacity to sustain them. Malthusian theory then fell to the wayside as a result (Wolfgram).

There were many assumptions in Malthusian theory which failed the philosophy such as the fixed resources, population growth directly affects consumption, capital as a fixed variable, the production per workers falls with the addition of each new worker, an increasing population implies a population with a large base of children who are both consumers and non-producers and at a fixed income (Ibid).

Mill and the Stationary State

Following the classics, came the Utopian socialist philosopher John Stuart Mill (1806-1873). "The Principles of Political Economy" was his most important contribution with respect to economics and modern environment. Mill foresaw that increase in human population and wealth could not continue in perpetuity. At the same time, a steady, or he

said, 'stationary'- state would reach were both population and consumption were stabilized, but perhaps at some low level of human happiness. Therefore, there is need of immediate stabilisation of population, reduction of aggregate consumption and more equitable worldwide distribution of wealth to improve the human condition (de Steiguer, 1995: 553).

Neoclassical economics largely discarded Mill's theory about the steady state economy. In 1973, however, economist Herman Daly published an article, *The Steady-State Economy,* and he acknowledged Mill as his intellectual forerunner. Daly lamented the problems of "growth-mania" (Ibid: 555), over-population, pollution, and human stress. His solution was a steady state economy, where humanity would strive for the maintenance of a constant population level, a constant stock of physical wealth and an equitable distribution of economic production among the members of society. "Mill's theory, as rediscovered by Daly, has also greatly influenced sustainable development" (Ibid).

Neoclassical Economic Theory

The end of the nineteenth century saw the beginning of the Neoclassical School of Thought. The classicists have relied upon the philosophy of natural law to derive their theories; the neoclassical like Alfred Marshall employed the engineer's tools of analytical geometry. They emphasis the well-functioning or so-called efficient, market as the means of maximizing satisfaction. According to the theory, both producers and consumers meet in the market place, voluntarily exchange prices meet both the satisfaction. They encourage efficiency and substitution both in production and consumption. Any departure from the market cause less human satisfaction.

"A two-part, market-based measure of social well-being emerged from the neoclassical studies of societal welfare" (Ibid: 554). The first part is called producer's surplus, where the producer gets profits, difference of price received in the market for an item and the cost of producing it. The second measure is called consumer's surplus where the difference between the value of the satisfaction received from the consumption on an item and the price the consumer must pay for it. But it still a lack the means of accounting for pollution and other side effects which affect human welfare but external to the market

transaction. A. C. Pigou filled the gap by writing the book, 'The Economics of Welfare' (1932). Pigou had written about the modern notion of economic externalities-those changes in welfare due to unintended side effects that are not directly captured in the market transaction. Externalities incorporated environmental damage into economic assessments. Since it is connected to production prices and quantities, suggested remedies, such as taxes, which could be used to reduce environmental damage.

Neoclassical economists have made important contributions to environmental theory during 1950s by recognising the common property nature of environmental resources as the root cause of many economic externalities. Oceans and atmosphere belonged to everyone, hence to no one, they were freely exploitable. There were no defined property rights. Therefore, economists have given great importance to common property in environmental matters. Garret Hardin in 'The Tragedy of the Commons' (1968) presented the common property concept to a larger readership of noneconomists. Neoclassical also developed a specialised branch of learning called environmental economics as a part of the standard university economics curriculum.

Neo-Marxism School of Economic Thought

Neo-Marxism is an outgrowth of the thought of Karl Marx. Richard England and Barry Bluestone present a Neo-Marxian analysis of the pollution problem. They state, at the root of the crisis is, "the high premium we have put on material growth. So long as either population or the material standard of living is growing the total volume of pollution will eventually reach intolerable levels" (Myers, January 1975: 446). According to them, the only way to prevent ecological destruction is to assure the continual and rapid decline in the amount of pollution per unit of production, and this is not likely to occur unless all production and consumption activities recycle all wastes. Alternatively, "if ecological disasters are to be prevented and not simply postponed, material growth must eventually be restricted" (England and Barry Bluestone, 1973: 198).

For the Neo-Marxist the escape from ecological disaster is socialisation of the economy. According to them, all production is social and not private. Consumption or production of any products by anyone affects the welfare of other people. Therefore, economic policy-making should not rest with a few individuals. Everyone should

participate in decision making on what to produce, how to produce and how it is to be distributed. However, Neo-Marxist vision of environmental betterment through social control and restraint of production appeals idealists, naïve and muddled too many.

Wilderness and nature values according to Neo-Marxists will emerge as objective and inviolable truths in a socialist state. Thus, some Neo-Marxist economists endorse the naturalists' preference for wilderness values. However, England and Bluestone concede that no existing socialist model has been wholly successful in dealing with the environmental crisis. Industrial pollution has not been controlled, wilderness values have not triumphed. The Soviet Union is roundly condemned for its authoritarian economic policies which establish production quotas without regard for controlling waste and pollution and which encourage personal consumerism.

Naturalist's School of Thought

Aldo Leopold (1887-1948)

Aldo Leopold published '*A Sand County Almanac*' in 1948, has a strong influence on environment thinking. Leopold's view on man's recognition of his place in the ecological chain has become the representative of the thinking of many environmentalists and natural philosophers. His analysis is in two parts: the rejection of private property and capitalist institutions, and their replacement with a land ethic based on adherence to belief in the laws of nature (Myers, January 1975: 429). According to the economists, private ownership protects the land because man is self-interested and will protect what he owns but will not care what is collectively owned. However, many environmentalists reject the economists' argument by saying that private ownership fosters greater abuses than public ownership. But, Leopold goes further; he suggested that any notion of land ownership is abusive. According to him, people abuse land because people regard it as a commodity belonging to them. Leopold's ethic is based on the interdependence of man and nature. He believes that man is a part of nature, that his physical and mental well-being depend of rapport with nature.

Rachel Carson (1907-1964)

The science of ecology was not popularised until 1962 when American biologist Rachel Carson's book *Silent Spring* was first serialised in The New Yorker magazine. The book

has contained a message, "the natural environment was being poisoned by chemicals and the people had done it themselves" (de Steiguer, 2006: 28). Her book was immensely influential; cataloged the environmental impacts of the indiscriminate spraying of DDT in the US which may cause cancer, threat to wildlife and especially birds. This resulted in the creation of United States Environmental Protection Agency in 1970 which banned the use of DDT pesticides in 1972. Public interest on environment grew strongly and new pressure groups like the Greenpeace and the Friends of the Earth were formed.

In the book there was essential belief in the interconnectedness of nature. She believed that all life was connected and all life depended on each other's existence. Nothing stood alone, not even man (Silent Spring). Her outburst against humankind's attempt to use technology to dominate nature wrenched environmentalism from its relatively narrow, conservationist groove and helped transform it into a sweeping social movement that has since impacted almost every area of everyday life. "The ten or so years following Silent Spring was important both to the modern environmental movement and to the economic theories" (de Steiguer, 1995: 554).

Modern Environment Movements

The Club of Rome- The Limits to Growth

The Club of Rome was founded in 1968 at David Rockefeller's estate in Bellagio, Italy. The Club of Rome describes themselves as "a group of world citizens, sharing a common concern for the future of humanity." It consists of current and former Heads of States, UN bureaucrats, high level politicians and government officials, diplomats, scientists, economists, and business leaders from around the globe.

The Club of Rome subsequently founded two other organizations, the Club of Budapest and the Club of Madrid. The former is focused on social and cultural aspects of their agenda, while the latter concentrates on the political aspects. In 1972, The Club of Rome published their report *The Limits to Growth* which drew attention to the growing pressure on natural resources from human activities. The report basically concluded that the growth of the human population, and an increase in prosperity, would cause an ecological collapse within the next hundred years.

If the present growth trends in world population, industrialization, pollution, food production, and resource depletion continue unchanged, the limits to growth on this planet will be reached sometime within the next one hundred years. The most probable result will be a rather sudden and uncontrollable decline in both population and industrial capacity. It is possible to alter these growth trends and to establish a condition of ecological and economic stability that is sustainable far into the future. The state of global equilibrium could be designed so that the basic material needs of each person on earth are satisfied and each person has an equal opportunity to realize his individual human potential.

Deep Ecology

Arne Naess coined the term 'Deep Ecology' in 1972 "to express the idea that nature has intrinsic value, namely, value apart from its usefulness to human beings, and that all life forms should be allowed to flourish and fulfill their evolutionary destinies" (Green-agenda.com) The term signifies deeply felt spiritual connections to the earth's living system and ethical obligations to protect them. Many called deep ecologist semi-religious movement and the most radical philosophy (Zimmerman). Many deep ecologists' perspectives are 'ecocentrism' (an ecosystem-centered) or 'biocentrism' (life-centered values system). They trace this tragic situation to anthropocentrism (human-centeredness), which values nature exclusively in terms of its usefulness to humans.

This theory influenced many grassroots environmentalism to flourish in Europe, North America and Australia in writings and activism. They were criticized by people representing social ecology, socialist-ecology, liberal democracy and ecofeminism for intellectual incoherent, ignorant of socio-economic factors in environmental problems, overemphasizes on cultural factors (worldviews, religion, philosophy) and diagnosing the roots and solutions for environmental problems.

Sustainable Development Theory

Sustainable development is the prominent theory which talks about the sustainability of the environment, social and economic aspects. The idea of sustainability as a new mandate was adopted first by International Union for Conservation of Nature (IUCN) in 1969. It was a key theme of the United Nations Conference on the Human Environment in Stockholm in 1972. The concept was coined explicitly to suggest that it was possible to

achieve economic growth and industrialization without environmental damage. It was later progressively developed as a mainstream thinking through the World Conservation Strategy (1980), the Brundtland Report (1987), and the United Nations Conference on Environment and Development in Rio (1992), as well as in national government planning and wider engagement from business leaders and non-governmental organisations of all kinds.

The most commonly cited definition of sustainable development as "economic development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs." According to Gro Harlem the chairman of the World Commission for Environment and Development (WCED), sustainable development is the overriding and the global political concept which implies human progress and improvement. It is a goal not just for the developing nations, but for industrialised nations too. But the overriding priority should be given to the world's poor and to the needs of future generations (Brundtland, February 1987). Others takes a broader view by defining sustainable development as "the kind of human activity that nourishes and perpetuates the historical fulfillment of the whole community of life on earth" (Bossel, 1999: 2).[2]

However, many scholars critique the definition of the concept Sustainable Development by saying that the term Sustainable Development has come into common use but has no clear meaning as applied. The use of the term is institutional, yet its meaning has become vague, ambiguous, undefined, and often contradictory. To some extent the term has become a cliché applied to almost anything remotely related to the business operate, and the environment in which both processes and society are embedded (Fergus and J. I. A. Rowney, August 2005: 19).

Goals of Sustainable Development

Sustainable development is part of the mission of all international organisations, national institutes, sustainable cities and locales, transnational corporations, and nongovernmental organizations. Most of them have attempted to describe the combination of development,

[2] "Sustainable Development" is an economic programme along which average well-being of present and future generations, taken together, does not decline over time (See Dasgupta, 2007: 3).

environment and equity or economy, society and environment. However, proponents of sustainable development differ in their emphasis on what is to be sustained, what is to be developed, how to link environment and development, and for how long a time.

Some important goals of sustainable development has shown in the table which are described in the extensive literature that defines or debates sustainable development. In the first column, 'what is to be sustained,' there are three major categories: nature, life support systems, and community. Many studies emphasize life support systems in which nature or environment is a source of resources and services for the utilitarian life support of humankind. There are also claims to sustain cultural diversity, livelihoods, groups and places that constitute distinctive and threatened communities.

Similarly, there are three categories to 'what should be developed'. Many literatures focused on the economy where production sections provide employment and desired consumption and wealth. The economy also provides the funds for environmental maintenance and restoration. Recently, the focus has shifted on human development, increase life expectancy, education and opportunity. Finally, there are also calls to develop society, security of national states, regions, and institutions. In practice, groups and institutions adopt implicit objective functions that take the forms of such statements as sustain only, developed mostly, develop only but sustain somewhat, sustain, or develop for favored objectives (Paris and Robert W. Kates, August 2003: 561). Thus, sustainable development of human society has environmental, material, ecological, social, economic, legal, cultural, political and psychological dimensions that require attention.

The World Commission on Environment and Development (WCED) has set up goals of sustainable development. It was constituted in 1984 as an independent body of the United Nations General Assembly to re-examine the critical issues of environment and development, to strengthen international cooperation on environment and development and to raise the level of understanding and commitment to action on the part of individuals, voluntary organizations, business, institutes and governments.

Gro Harlem Brundtland, the chairman at the closing ceremony of the eighth and final meeting of the World Commission on Environment and Development in 1987,

emphasized on the involvement of people in decision making at all levels. With this can allow achieving sustainable development. In June 1987, 'Our Common Future' also known as the Brundtland Report was published by WCED.

(Table: 1.1) Taxonomy of Sustainable Development Goals

What is to Sustained	What is to be Developed
Nature	**People**
Earth	Child survival
Biodiversity	Life expectancy
Ecosystem	Education
	Equity
	Equal opportunity
Life Support	**Economy**
Ecosystem	Services Wealth
Resources	Productive sectors
Environment	Consumption
Community	**Society**
Cultures	Institutions
Groups	Social Capital
Places	States
	Regions

Source: (Parris, Thomas M., and Robert W. Kates,2003).

It called for multiculturalism and the interdependence of nations in the search of sustainable development. It placed environmental issues on the political agenda. WCED and its 'Our Common Future' laid the groundwork for the convening of the 1992 Earth Summit and the adoption of Agenda 21, the Rio Declaration.

Critics of sustainable development argued that the broad goals of *Our Common Future* at Brundtland were widely embraced, but the steps towards their implementation would be thwarted; first, by fundamental contradictions between the renewed call for economic growth in developing countries and enhanced levels of ecological conservation, secondly, by the lack of attention to power relations between local to global actors and institutions supporting unsustainable development, thirdly, by ineffective institutions and a

general lack of political will on the part of governments and citizens at multiples scales. Thus, the concept of "sustainable development as guiding institutional principle, as a concrete policy goal, and as the focus of political struggle remains salient in confronting the multiple challenges of our new global context" (Sneddon and Richard B. Howearth, August 2005: 254).

Another major challenge of the sustainable development is that the strategic plans for implementing and monitoring sustainable development at national and local levels are numerous, but these plans lack a constituency either within or external to government channels. Thus, these plans have been unconsolidated. Global trade, by the power of World Trade Organization (WTO) has deprioritises the environment as a focus of serious political action. These institutions like the WTO have been strengthened in the years since Brundtland and are expected to champion economic growth and market liberalization over environmental and social goals were as the United Nations and other multilateral agreements are weakened and their capacity to advance the global agenda is likewise lessened.

Many scholars, international organisations, and the Tibetan government-in-exile constantly raised their voices against the lack of sustainable development in Tibet. Many Chinese scholars also critique the Chinese government's model of development in China and lack of environment conservation in China.

Chinese Scholars' view on the Environment

Wang Yi

Wang Yi discusses on the China's environment and development issues. China has achieved developmental stages that have taken the developed countries a century. However, this unbalanced regional development accompanied by an excessive population increase, a traditional development model, and a questionable policy orientation has resulted in severe environmental damage in China. Wang highlights that the China is facing severe environmental issues and threats which has become major constraints on sustainable development and the peaceful rise of China in the world (Wang Yi, Spring 2006: 278).

Wang Yi further emphasis on the environmental pressure from a new round of socioeconomic development. With the rapid economic growth, entry into a stage of heavy industry and development of the petrochemical industry will increase intensive consumption of resources and energy which further put pressure on China's resources. China will face a tough situation in terms of resource depletion. China has a huge population of 1.3 billion with increased per capita income accompanied by an inevitable growing per capita consumption. This will lead to greater demand on resources and an increase in the pollutants discharged. Another major challenge to China's environment is the rapid urbanisation. In this process of industrialization, there will be a massive increase of urban waste-water, electronic waste causing difficulties in ecological conservation and pollution control. Thus, Wang Yi suggests the changes in the economic growth pattern and exercise integrated decision making for the environment and development and reorganizing institutional structures and promote better environmental governance (Ibid).

Yang Mu and Teng Siow Song

Yang Mu and Teng Siow Song state that the water crisis is the China's greatest environmental problem. Yang and Teng also share the similar view of Wang li where the rapid economic development in China is straining China's environment, especially the country's water supple. China's water shortage is estimated to be about 40 billion cubic metres, but it is likely to increase to 100 billion cubic metres by 2010 and 700 billion cubic metres by 2050. They said that the China's water shortage problem could be more serious in future due to poor water management, uneven water distribution and water pollution (Yang and Ten Siow Song, 2010: 165).

Today, China has the lowest per-capita water reserves but also the most polluted water system. Rapid industrialisation and urbanisation coupled with prolonged drought is also staining the water supply. They see the initiatives taken by the government like increasing investment on water projects, encouraging foreign investments as good initiatives.

Pan Yue

"Our current mode of economic development is not sustainable" according to Pan Yue the deputy director of China's State Environmental Protection Administration. Pan sees

Chinese economic development strategy as a great threat to the environment. China's development strategy is an unsustainable according to him. "We have a thinking errors, and is the only economy is everything. ... Development must be all around development, comprehensive development, not the only economic development" (Pan, 17 July 2007).

He divided the environmental protection in the world into four levels, environment as a professional, environment as an economic issue, environment as a political and social issues and the environment as a culture of ethical issues. From the worldwide environmental problems have no longer a professional, but involved in all aspects of the problems, like social and political.

Thus, Chinese scholars share their view on the unsustainable growth in China. Rapid economic development, increase of population and the industrialisation have been the major cause of environmental degradation in China. They call for the balance between development and environment for the China's future. Environmentalists in Tibet do not enjoy the freedom that the Chinese environmentalists enjoy and many of them are imprisoned due to their writings on the environment destructions caused by the Chinese development projects in Tibet.

Environmentalism in Tibet

Environmentalism has developed in a gradual way in Tibet. There are grassroots organisations and individuals working at village level. Any organisations or individual demonstrate against the government faces repression and imprisonment. It lacks both the opportunity and immediate urgency to openly confront the central government. Thus, there is no green movement capable of organising national demonstrations; rather, environmentalism is fragmented and highly localised. There are cases of imprisonment of environmentalists when they see some actions against the central government such as the case of Rinchen Samdrup, Kunga Tsayang and Dolma Kyab. China considers those nature loving people as a threat to their national security and economic development thus, give long sentences and harsh treatment to them.

Tibetan Environmentalist- Rinchen Samdrup

Rinchen Samdrup is an environmentalist in Tibet who works at the village level to protect the environment in his home village, a Gongjo village in Chamdo prefecture in Tibet Autonomous Region. In 2003, under his leadership, 11 Tibetan villages centered on Dongba Village in the Zirong River valley in Xiangpi Township, Gongjo County established 'The Kham Anjiong Seng'ge Nanzhong Ecological and Environmental Protection Voluntary Association' to undertake local ecological and environmental recovery and protection work by planting trees and grass, collecting litter, and jointly protecting the natural environment of their hometown. In 2004, they planted 446,850 various kinds of trees throughout the different villages, returning a total 373.8mu [61.6 acres] of farmland to forest in 2005, they planted 94, 7555 various kinds of trees and 85,523 trees in 2006, 101,023 in 2007 and in 2008 they planted 105,300 trees in the different villages. They also published the first village level independent magazine in Tibetan called "Self-Initiative" yearly on environmental protection information (Yongfeng, 3 February 2010).

According to Rinchen, "environmental protection is an environmental culture slowly formed throughout the historical development of the Tibetan people" (Ibid). In a short film directed by Kunga Lama and produced by Emily Yeh, he says that "environmental protection is integral to everything we do. It is pervasive and inseparable like blood flowing through the body" (Lama, 13 April 2011). He has won the first 'Alashan Environment Award,' 'Hu Yang Prize,' in 2005, the 'Environmental Protection First Prize' in 2006 by the Ford Motor Car Environmental Awards (Tang, 12 January 2010).

Rinchen Samdrup is sentenced in July 2010 to five years in prison on charge of "harming national security" by the Chinese government. His brother Karma Samdrup, a national prominent environmentalist, "award-winning conservationist and philanthropist" (Watts, 22 June 2010) who tried to secure his brother was himself sentenced in 2010 to 15 years in prison. Rinchen's second brother, Chime Namgyal was also imprisoned for 21 months charge of "harming national security" for their unregistered environment organization. When the person is not against the government, they give award and when Rinchen Samdrup and his brothers spoke about the truth- the environment destruction

caused by the various activities then they blamed them being harming the national security.

Kunga Tsayang

The author, Kunga Tsayang was arrested by the Chinese authorities on 17 March 2009 and sentenced him to 5 years of imprisonment for writing on environmental damaged caused by the Chinese in Tibet. Kunga raised two very important environmental issues in his writings. First, the natural resource exploitation in Tibet and its impact on the Tibetan people, second, the environmental protection and management in Tibet.

Kunga states that "the glacier of the upper valley is visibly melting; the lakes and the streams are dwindling and the trees and plants of the lower valleys are dying out silently" (Tsering, 29 April 2010). Moreover, mining activities have been carried out in Tibet since 1980s, but these activities have not benefited the local Tibetans and the local authorities failed to take actions against the mining activities.

Kunga calls for the local authorities' decisively enforcement of the necessary national laws, guidelines and policy to quickly stop environmental damage in Tibet. He quotes the 17th National Congress of the Communist Party of China's statement on the environmental protection, "whoever destroys the environment should restore it, and whoever receives benefits should also compensate" (Ibid). Thus, the Chinese government who has destroyed the environment and received the benefit should take the responsibilities of the environmental degradation caused in Tibet by their development policies.

Woeser

High Peaks Pure Earth (website) has translated an appeal letter "Please Stop the 'Development' of Mount Kailash and Lake Manasarovar for Profit" by a Tibetan writer, poet and blogger Woeser from Tibet that was published on her blog. Woeser appeals on the planned development of tourism and the commercialization of the sacred, religious sites like Mount Kailash and Lake Manasarovar. She states that the Tibetan Tourism Company is a subsidiary of the Beijing-based Guofeng Company which have been contracted to take over the holy Mount Kailash and Lake Manasarovar and turn them into

tourist areas. It is known as the 'Tibetan Kailash Manasarovar Tourism Development Project' and includes "the development of the scenic area, the building of hotels and restaurants, purchasing of environmentally-friendly vehicles, oxygen plants and other facilities, etc. In the future they plan to have a big entrance gate, scenic viewing towers, scenic motorcars and roads etc" (High Peaks Pure Earth, 15 July 2011). The construction of roads, hotels and other facilities will result in greater emissions and pollution to the environment.

According to Woeser, "it is completely unnecessary to build highways... this is a kind of "tourism imperialism" in order to blaspheme and destroy the holy mountain and lake" (Ibid). She also states that the Tibet has become 'open for development" to all kinds of mines, dams and tourism projects. But these developments will cause irreparable damage to the Tibetan nation, culture, and way of life, the sacred mountains and lakes, and in turn, the ecology of the world.

In 2010, the High Peaks Pure Earth published an another translated an essay of Woeser. In this essay Woeser talks about the mining activity in Gyama village of Meldro Gungkar County, the birthplace of Songtsen Gompo, the greatest monarch of the Tibetan Empire. Gyama village is rich in a variety of metals such as copper, lead, zinc, gold and silver. When Woeser visited the place, she learned that in some mining areas at Gyama village, there were none or no adequate sewage systems in place, which has caused water pollution with chemicals to flow over the place. The mining activities have decreased the harvest of highland barley in the fields, poisoned the forage grass on the pasture land. The most serious impact is that the livestock has been dying more frequently and many herdsmen and farmers have contracted obscure (High Peaks Pure Earth, 21 December 2009). She raises the same issue in her blog post, translated by High Peaks Pure Earth, "Songtsen Gampo's Hometown is About to be Completely Excavated".

Dolma Kyab

Dolma Kyab, like any other Tibetan writers is imprisoned on charges that appear to be espionage to the Chinese government. The real reason for his arrest was his unpublished manuscript of a book titled "Restless Himalayas" which talks about democracy, autonomy and Tibet. He was a Tibetan history school teacher at a middle school in Lhasa (TAR) and

was detained in March 2005 and sentenced in September for ten years. Kyab is from Haibei (Tibetan: Tsojang) Tibetan Autonomous Prefecture in Qinghai (the Tibetan area of Amdo). He is a highly educated and passed his postgraduate studies at Beijing University.

In a letter written by him to the United Nations' Human Rights Commission, International Women's Association, International Environmental Protection Committee and United Nations Educational, Scientific and Cultural Organisation he states that;

> As I was planning to write a book on natural geology and without even having begun to write the book they again subjectively judged that I was providing intelligence to foreign power. What was even more absurd was that they deemed that writing on natural geology was also promoting "Tibetan independence"... I believe that sentencing me for 10 years for works on protection on the environment,... study in the field of geology is unthinkable in the human history. They have taken away my freedom but they cannot take away my propagation of environmental protection and woman's health; they can kill me but they cannot kill off my love for the geological science. The environmental protection, protection of women and exploration in the natural environment are the dignity of the human kind. I stand firmly by these beliefs (Care2 Petitionsite).

Dolma Kyab's writings are motivated by the desire to express the opinions of Tibetan youth on various issues like human rights, democracy, literature and culture. He is particularly concerned about the destruction of the Tibetan environment under Chinese policies such as water pollution caused by the Chinese's development projects and the uranium mining in Tibet. Thus, China sees his writings as harm to their development projects. Since, his unpublished book does not constitute the crime of incitement of "splittism" under the Chinese law, thus, they charged him under the crime of espionage (English Pen, 29 February 2008).

Review of the Literature

The review of the literature is organised in a thematic structure; the Tibetan environmental degradation as a result of Chinese occupation of Tibet and ecological improvement and environmental protection work in Tibet by China.

Tibetan Environmental Degradation as a Result of Chinese Occupation

The Department of Information and International Relations (DIIR) of the Tibetan government-in-exile states that the Tibet was ecologically stable before the Chinese occupation and environmental conservation was an essential component of daily life. This

was much influenced by the Buddhist beliefs, the concept of 'interdependence' of both living and non-living elements of the earth. Therefore, Tibetans lived in harmony with nature. These beliefs are strengthened further by the Tibetan Buddhists traditional adherence to the principle of self-contentment: the environment should be used to fulfill one's needs and not to fulfill one's greed.

With the invasion of Tibet by China in 1951, it was followed by widespread environmental destruction in Tibet, resulting in deforestation, overgrazing, uncontrolled mining, nuclear waste dumping, soil erosion, landslides and other perils. The transfer of huge numbers of Han Chinese settlers into Tibet demonstrates the colonial nature of Chinese rule. Under such system, Tibetans have been marginalized in the economic, educational, political and social spheres and Tibet's rich culture and traditions are rapidly disappearing.

The Tibetan exile community's response to above mentioned environmental problems are the Five Point Peace Plan proposed by the Dalai Lama in 1981 and the release of reports on "The Impact of Climate Change on the Tibetan Plateau: A Synthesis of Recent Science and Tibetan Research" at Copenhagen in 2009. In the Five Point Peace Plan, Dalai Lama raises the issue of Tibetan environment for the restoration and protection of Tibet's natural environment and the abandonment of China's use of Tibet for the production of nuclear weapons and dumping of nuclear waste. During the Copenhagen, they focused direct human intervention by Hanisation, unsustainable infrastructure development and sedentarision of nomads was attributed to the decline. There are many scholars who work on the Tibetan environment and acknowledge that environment degradation is a serious problem in Tibet.

Justin Lowe also argues that historically both Buddhist doctrine and the Tibetan government promoted environmental protection through religious teachings as well as by formal edicts called Tsatsigs. These directives forbade the taking of animal life, the polluting water sources, and the unnecessary disruption of soil or the overcutting of forests. He disagrees on the Chinese government's view on Tibetans lacking in environmental protection before 1951. He further says that if the Chinese continue to accelerate in exploiting the Tibetan environment, the end result may be the irreversible

impoverishment of Tibet's ecological and cultural diversity and causing the curtain to fall for the last time on yet another of the world's irreplaceable ecosystems and peoples.

Daniel J. Miller discusses the traditional sustainable management of rangeland by nomads on the Tibetan Plateau. Raising different kinds of animals, allocation and reallocation of pastures, seasonal migration of nomads is characterised as one of the grand progressions in the evolution of human civilisation. Nomadic pastoralism is an "acculturation by humankind" to rangeland. Thus, he sees the nomadic pastoralism as a sustainable way of living, protecting nature as well as protecting herds in a complex and fragile environment.

Gabriel Lafitte talks about the China's intense project of forced relocation of 2.25 million Tibetan nomads and semi-nomads after the launch of China's "Western Development Campaign." According to him, the forced resettlement of Tibetan nomads to permanent structures imperils their survival due to loss of livelihoods. And the issue of Tibetan nomads is the collective violation of human rights; the violation of social and economic rights of the entire people. Chinese remove nomads increasingly from grasslands and concentrated them in concrete barracks, little tiny two room house made of concrete bricks, intensely cold in winter and intensely hot in summer which gives nomads tremendous social and economic problems. Lafitte says that China's rational for this policy is climate change to protect China's river sources from erosion, degradation, and desertification. He argues that China doesn't have to exclude the nomads from their grassland and eradicated their century old livelihood. Moreover, there has been no dialogue between the Chinese government and the nomads thus, there need to be dialogue and mutual learning from both sides.

Claude Arpi discusses on the China's control of Tibet's water. China sees Tibet as a water reserve for its own country, which becomes obvious taking into account the enormous dam constructions all over Tibet. Chinese officials not only accepts that countless people lost their home, but are also provoking social conflicts in other countries. Because most of the neighboring countries' rivers originate from Tibet. China's policies are endangering the water supply of hundreds of millions of people. He further mentions

that there are possible geopolitical implications and the imminent threat of armed conflict that could arise due to water shortages in the region.

The International Committee of Lawyers for Tibet group looks at the Tibet's problem with the legal point of view. According to them, China's exploitation of Tibet's natural resources is denying the Tibetan people their right to economic self-determination. They further mention that Chinese efforts to increase crop and herd yields have depleted the soil and left large tracts unsuitable for further agriculture or grazing. This process is a short-term exploitation of natural wealth but is a long-term poisoning of an already fragile environment which becomes a serious violation of the Tibetan's right to self-determination. The right to development, the right to information and the right to participate in government decision-making are the three obvious ramifications for Tibet's situation.

P. K. Gautam deals with the climate change, environment degradation in Tibet and its implications for environmental security in South Asia. According to him, ecology of Tibet is an issue of regional if not a global common. Therefore, dialogue on the political solution of the Tibet problem between the Chinese government and the Tibetan government-in-Exile is essential. He further emphasized that the limited dialogue of Sino-Tibet will not solve environmental problem of Tibet.

According to Brahma Chellaney, China is intent on managing and controlling Tibet's vast water resources. Moreover, China is increasingly exploiting the water resources of the Tibetan Plateau by China's magaprojects-interbasin and interriver water transfer projects, dams, barrages, and diversion at the southern and south-eastern Tibet. This will give large impact on the downstream water and gives transboundary effects to its riparian neighbours. Thus, Tibet gives a serious implication to Asia and the ecology of Tibet serves the large interest of Asia as well. However, many scholars and the Chinese government disagree with the above arguments and argue that the China has brought ecological improvement and environmental protection work in Tibet.

Ecological Improvement and Environmental Protection Work in Tibet by China

China's white paper on the "Ecological Improvement and Environmental Protection in Tibet" (2003) states that:

> The old Tibet before the 1950s had long been under the rule of feudal serfdom. The development level of its productive forces was extremely low, and it was by and large, in a state of passive adaptation to natural conditions and one-way exploitation of natural resources. It was absolutely impossible to discuss the objective law of the ecological environment of Tibet , or to talk about ecological improvement and environmental protection. ...It was after the peaceful liberation of Tibet that ecological improvement and environmental protection started there, and began to progress along with the modernization of Tibet.

According to the China's White Paper on the Tibetan environment, ecological management and environmental protection in Tibet started only after China's "peaceful liberation of Tibet". They disagree on the scholars and Tibetans claim of a sustainable way of environmental protection in traditional Tibet.

Chinese government has always emphasis on declaring how much money they have spent on the Tibetan environmental protection. Xinhua News Agency on January 4, 2011 announced that the regional government said that the Southwest China's Tibet Autonomous Region has spent 10.1 billion yuan (1.53 billion U.S. dollars) in 2006-2010 to protect its plateau environment, three times higher that of 2001 – 2005. "During the 2006-2010 period, we established eight new nature reserves to preserve Tibet's wetlands, natural forests and pasture lands," said Zhang Yongze, Tibet's environmental protection chief, at a meeting in Lhasa on environmental protection work.

Zhang said the regional government obtained 6.95 million yuan of special funds from the central government to step up construction of Tibet's two leading nature reserves - Mount Qomolangma and Lhasa's Lhalu wetland. At least 90 million was spent on the implementing of six key ecological projects, including the conservation of the endangered golden monkey in Mangkam County, Qamdo Prefecture, which is near the Tibet's border with Sichuan and Yunnan provinces. By the end of 2010, Tibet had established 47 natural reserves at national and regional levels that covered a total area of 413,700 square kilometers, or about 35 percent of the region's territory, to preserve the plateau's ecology and biodiversity, said Zhang.

He states that the "the major difficulty for environmental protection in Tibet comes from the pressure brought by rapid economic development." The rapid economic growth is unprecedented in Tibet's development history and the demand of development is urgent and thus will inevitably impose pressure on the environment of the region. However, Tibet has carried out strict environmental protection methods and strict environmental access conditions for construction projects, and strictly administrated development and construction activities. Similarly, an environmental impact assessment system is strictly enforced in Tibet.

According to Wang Jun, Tibet began to formulate the Plan on Protection and Construction of the Ecological Security Screen in Tibet (2008-30). According to the plan, within 20 years, China will mobilize all the resources at its disposal to make Tibet a protective screen or regional ecological security. There are five key conservation projects of the natural ecological system-natural pasture protection, forest fire prevention and pest control, wildlife protection, reserves construction and protection of important wetlands, as well as a traditional fuel alteration in agricultural and pastoral areas.

Tibet has formed a systematic, local legal regime concerning environmental protection. It has issued the Regulations for Environmental Protection in the Tibet Autonomous Region, the Rules for the Implementation of Management Methods for the Tibet Autonomous Region for Protection of the Environment of Construction Projects and the Methods of the Tibet Autonomous Region for Collection of Sewage Charges. The region has also drafted the Regulations for Natural Protection in the Tibet Autonomous Region, and Methods of the Tibet Autonomous Region for Comprehensive Management of the Urban Environment.

Jan-Erik Gustafsson discusses the how China has brought changes in land and water management in Tibet from 'feudalship' to today's 'modernized' Tibet. According to him, pre-1951 Tibet land was owned by 'manorial estates held by lay aristocrats, monasteries, and incarnated lamas' and land held by the government and its local administrative officials. After Chinese 'liberation of Tibet', China has taken numerous modernization projects in Tibet such as in 1987-1991, Lhasa authorities closed off 86,700 ha of hillsides to improve the climatic condition and to facilitate afforestation, in Xigaze

factories and institutions have drilled more than 30 wells and constructed more than 30 water towers for the their water supply. All these projects according to him have helped the local Tibetans therefore, the policy of promoting land and water improvement projects and rural modernization will continue and the changes have been profound as compared to the 'Lamaist State'.

A leading Chinese scholar on Tibet-Hao Shijuan, the director of Tibet Historical and Culture Research Center of the Chinese Academy of Social Sciences stated that the although it is greatly difficult to balance between economic development and environmental protection, the central government has always made environmental protection its top priority in promoting development in Tibet.

According to the scholar, in order to protect the environment, people need to preserve local biological diversity. The most effective way to protect diversity is to set up natural reserves or natural protection areas. Thus, Tibet has more than 40 various nature reserves. Secondly, he added, the central government has also been encouraging the development of environment-friendly industries such as tourism in the autonomous region. Therefore, Tibet ranks no. 1 in terms of ecological indexes used to measure the quality of the environment across the country.

Changhui Peng discusses on the adoption of "green policy" by the Chinese government while constructing the railway to protect soil, vegetation, animals and water resources. He gives a great detail on the key measures taken by the Chinese government on the railway project to minimize the negative impacts. Changhui further explains that the Chinese government has established five natural reserves and built more than 33 passageways along the route to protect animals.

There are different views on the Tibetan environment from some Chinese officials. Such as to Zheng Guoguang, China Meteorological Administration chief, "in Tibet, the mercury has climbed an average 0.32 degree Celsius every decade since records began in 1961. This is much higher than the national average temperature rise of 0.05-0.08 degrees Celsius every 10 years." He stated that the Tibet has felt some of the largest impact of

global warming. Following paragraph would mention the scope of the study, the research questions, research methodology and the hypothesis.

The study is confined to analysis of China's developmental policies in Tibet and their impact on the Tibetan environment. The period of the study is from 2001 (The Tenth Five-Year Plan, 2001-2005) to 2010 (The Eleventh Five-Year Plan, 2006-2010). These policies gave huge impact on social, cultural and environment of the region. Thus, it caused many concerned organizations to raise the voice of the importance of Tibet's ecology. The level of economic development and environmental protection should be following the same and since, China has failed to do so in Tibet, and it has gained major concern and importance in the present period.

The Tibetan Plateau is warming twice as fast as the rest of the world and the impact of the glaciers melting will be catastrophic, not only for the Tibetan and Chinese people in Tibet, but also for hundreds of millions of people downstream. Therefore, the impact of climate change and ecological depletion on the Tibetan plateau is not only a regional but also a global issue.

The study is confined to four major environmental issues: environmental degradation caused by the railway, water megaprojects, mining, and urbanisation and infrastructure projects in Tibet. These environmental issues need much concern as they affect not only to Tibet but also in Asia. However, limitations of the study would be the access to Chinese language sources therefore; there will be an emphasis on secondary sources of the study.

The major focus of the study is on the Tibetan environment hence, the study addresses on the following topics. What are the environmental theories? What is the nature of Tibetan environment? What were the China's policies towards Tibet in 2001-2010? What was the impact of China's policies on the Tibetan environment? What was the reaction of Tibetans on the China's policies? What would be the implications of environmental degradation in Tibet on Asia?.

In this study, I will test the following two hypotheses; a) China's policies in Tibet are aimed at bringing stability and national integration rather than the development of the area, b) China's policies in Tibet between 2001 and 2010 have contributed to the degradation of the environment.

The methodologies to be used in the study are historical, analytical and content analysis. Inductive method will be used to study the impact of China's policies on the Tibetan environment. Tibetan ecology is treated as an independent variable while China's policies of development are the dependent variable. Global and regional environmental effects as intervening variable for the purposes of study.

Both the primary and secondary sources will be used in the research. Primary sources from both People's Republic of China (PRC) and the Tibetan government-in-exile's reports and documents will be used. PRC's documents of the Tenth-Five Year Plan and the Eleventh Five-Year Plan, China's White Papers on Tibet, policies of western development strategies, and reports of Tibet Work Forum Meetings will be referred. Online official web news will be further referred such as the People's Daily, Xinhua News, China Tibet Online and Gov.cn. Secondary sources like books by various authors, journal articles, online articles, news articles will be used for the research.

Outline of the Dissertation

Chapter 2 focuses on the China's development policies on Tibet from 2001 to 2010. However, it is necessary to discuss the five Tibet Work Forums meetings held by the Chinese government in Beijing where they discussed the economic development policies on Tibet. China has accelerated the economic development in Tibet during the Eleventh Five-Year Plan through China's "Western Development Programme". The chapter will focuses on the China's Western Development Progamme, its broad application in the China's western countries and specifically in Tibet. The study identifies the major development programmes in Tibet, such the Gormo-Lhasa Railway, mining activities, grassland policies, water megaprojects and urbanisation and infrastructure development.

Chapter 3 emphasises on the impact of China's development projects on the Tibetan environment. Balancing economic development and the environmental protection

is the critical challenge that states face today and China is no exception. Thus, the chapter analyses on how environmental protection has been sidelined by the economic development in China and the major obstacles in the environmental protection. Tibet's ecology has been deeply disturbed by the China's development policies where "development" has been given the priority. This chapter also studies the nature of Tibetan environment and the traditional Tibetan environment management and protection. Chinese development policies in Tibet has affected the Tibetan Plateau, the chapter highlights the some of the environmental problems that Tibet faces by the Gormo-Lhasa railway, mining activities, water megaprojects, grassland policies, urbanisation, and the infrastructure development. It becomes necessary to study the responses of the Tibetans on the China's policies. Environmental issues in Tibet not only effect Tibet but gives huge implications to its neighbouring countries, thus, the implications of Tibetan environmental problems to the neighbouring nations- South and Southeast countries would be focused in the chapter. Chapter 4 will comprise of the main findings of the study.

Chapter II

China's Development Policies Towards Tibet, 2001-2010

Since, the beginning of economic reform and particularly since the announcement of the *Xibu da Kaifa,* or "Western Development Campaign" in 2001, "development" has been the special focus of China's discourse in Tibet. The development and reform in Tibet has been exceptional from the other western regions, there are high degrees of central state intervention, subsidies, and emphasis placed on stability. China had convened the First Tibet Work Forum in 1980 marked the end of draconian measures of the Maoist period and set out relatively liberal economic and cultural policies for the TAR. These forums were held by Central Beijing Government and were attended by China's most senior party members, military and government officials.[1] These Tibet Work Forums came into existence after Deng Xiaoping's call for "reform and opening up" in 1978 in China and post-Cultural Revolution policy for the "long-term promotion of economic development as a means to secure national stability and prosperity" (Congressional - Executive Commission on China).

During 1979, the central government in China took a new strategy of the United Front to gain support for the reforms. They introduced a major outreach that was extended to the Taiwanese and overseas Chinese. As a part of the United Work Front Department, they invited the Dalai Lama's delegations to observe conditions of Tibet in late 1979. However, the Chinese authorities were astonished to see spontaneous and impassioned welcome that the delegations received from the Tibetan people. Chinese authorities could not ignore the fact that even after so many years of attempting to build legitimacy in Tibet with their so called 'liberation from the backward and brutal old systems,' the Tibetans still look upto the Dalai Lama as the symbol of freedom from the Chinese cultural and political invasion. In the aftermath of the delegation's visit, the special work meeting on Tibet was held in Beijing in 1980 by the Chinese Communist Party Central Committee (CCPCC) (Sharlho, 1992: 38).

[1] A high level meeting convened by the Chinese Communist Party of all relevant Party offices, ministries and departments involved in a specific issue, to make a co-ordinated policy so as to strongly advance the achievement of official goals (DIIR, 2009: 253).

The First Tibet Work Forum- 1980

The special work meeting on Tibet is also known as the First Tibet Work Forum which was held on 7th April 1980. The meeting concluded: "We have been established for thirty years. Now the international situation is very complicated. If we do not seize the moment and immediately improve the relationship between the nationalities (Chinese and Tibetan), we will make a serious mistake. All the members of the Party must recognize the seriousness and we must reach a consensus" (Report of the National United Front Work Conference, 23 January 1982). The statement indicates the importance of the improvement of the ethnic relation between the Chinese and the Tibetans.

The First Tibet Work Forum meeting was held during the period of liberalization following the Cultural Revolution (International Tibet Network, January 2010). The Chinese government for the first time strives to build a "new socialist Tibet featuring unity, prosperity, and civilization" (China Tibet Online, January 2010). Since then, the central government in China has provided double aid to Tibet and preferential policies for the development of Tibet such as "long time right to use and independently operate land by individual households, and long-term right to have, raise and manage livestock by individual households" (State Council, 2011). They allotted annual subsidy of 496 million yuan (US $ 72.66 mn) and 262 million yuan to improve Tibet's infrastructure construction (China Tibet Online, January 2010).

In May 1980, Hu Yaobang, the then Secretary of the Chinese Communist Party (CCP) and Vice Premier Wan Li took a fact-finding visit to Tibet. During the visit, Hu witnesses the poor economic condition of Tibet and thus introduced preferential policies in Tibet. During the political speech given at a gathering of 5000 cadres in Lhasa on 29 May 1980, he publicly announced a liberal six-point reform package:

1. Under the unified leadership of the Central Government, the autonomous region's autonomy should be fully exercised;
2. In light of Tibet's seriously difficult situation, the policy of rehabilitation should be firmly implemented so that burden on the masses may be reduced;
3. Regarding economic issues and policies, Tibet should be treated as a special case and with flexibility according to Tibet's own conditions;
4. A substantial portion of the subsidies should be used for the development of agriculture, animal husbandry, and the essential needs of the Tibetan people;
5. Under the direction of socialism, Tibetan's science, culture, and education should be developed;

6. The Party's cadre policy for nationalities should be correctly implemented and Chinese and Tibetan solidarity must be greatly enhanced (Sharlho, 1992: 38-9).

In the statement of Hu, he announced that a law would be enacted to 'realise the right of autonomy' minority nationalities. The concept had been empty since 1965 and He defined it as 'right to decide for oneself.' In 1982, China adopted a new constitution; it defined more precisely the right of autonomy. However, it was only in May 1984, National People's Congress (NPC) passed a law on regional autonomy. No law could moderate the law of the Communist Party in China which has the final authority. All the major powers are held by the Chinese and Tibetans are given only at the 'grace and patronage' of the Chinese and the Party.[2] Another major reason for weakness of the right of the autonomy is the strategic position of Tibet, the army continued to play a very important role in the region. Thus, China's introduction of rights of regional autonomy has no meaningful implementation.

People were apprehensive at first about the reforms introduced by Hu Yaobang but Hu himself coming to Lhasa dispelled their apprehension. The decades of economic mismanagement and neglect had left the country in poverty. He said that although there have been some development, but still Tibetans live in poverty at some areas.[3] Therefore, the living standards of Tibetans must be brought up to at least pre-1959 levels. This statement indicates an official recognition of falling living standard of Tibetans in the last

[2] What China now refers to Tibet is just Tibet Autonomous Region (TAR) which is just created in 1965, the central plateau comprising U-Tsang and the western part of Kham, or roughly half the Tibetan Plateau. TAR is home to less than half of the 6.5 million Tibetans in today's China. It was created the last autonomous region in China, the others being Inner Mongolia (1947), Xinjiang (1955), Guangxi Zhuang (1958), and Ningxia (1958). All the so-called autonomous areas are in the lands of ethnic minorities, which make up 60 percent of the territory of PRC. These areas are "autonomous" just in name; they don't enjoy meaningful autonomy as claim by the Chinese government. All the powers in these areas are hold by Han Chinese who takes direct orders from the central government in Beijing. The strategic of ethnic and economic colonisation of the traditional Tibetan and Urghur lands is stoking deep unrest. China has given real autonomy to only two areas, both Han-Hong Kong and Macau. In the talks with envoy of Dalai Lama since 2002, China has rebuffed the idea of granting special administrative region to Tibet like Hong Kong and Macau (Chellaney, 2011: 111).

[3] The social and economic development of the various minority nationalities is uneven. Generally speaking, the Han as the majority group are the most developed, and those people who have had more contact with them are better off. In contrast, the minorities of remote areas are generally backward. By 1949, using the development of economic life as a yardstick, a number of minority nationalities still made a living in fishing, hunting, and /or gathering (the Hezhe, Oroqen, Ewenki, and Jing). Some minorities had engaged in animal husbandry over a long period of time (the Kazak, Kergez, Tajik, some Mongols and Tibetans) (See Hsieh, 1986: 2).

30 years (DIIR, 2009: 100). He acknowledged that the Communist Party had failed in Tibet. Thus, Tibetan people inside and outside of Tibet welcomed the reform as the reform gave relaxation in social and political control.

Hu's "reforms freed the peasants from the shackles of collectivism and eliminated the bureaucratic holdover economic activities and decision making" (Shakya, 1999: 388). Production decisions were reverted to individual households and people could sell their produce directly to the market. They were freed from taxes and thus, reforms had great impact on the agriculture management of Tibetan society.

By 1981, per capita income of the Tibetan peasantry has risen sharply, in 1979 the average income was 127 yuan, but within two years it had risen to 220 yuan (Sharlho, 1992: 44). The reforms had also impacted on the social level of the Tibetans as well. Tibetan people immediately returned to their traditional way of farming and nomadic practices, re-emerged their traditional social institutions and patterns of marriage.[4] They discarded the socialist or proletarian culture imposed on them. It was evident that the years of propaganda and ideological education has no dent on Tibet's society. However, these policies, rather than representing a long-term strategy, did little more than return the rural areas to the conditions of the early 1960s before the collectivization and communization period. The rise in the standard of living was mainly due to the elimination of the taxes; actual output in 1984 compared to 1980 declined considerably (Sharlho, 1992: 44).

According to Tsering Shakya, the changes in Tibet coincided with the rectification campaign being carried out in the rest of China thus, the adjustments in Tibet did not therefore, suggest any preferential treatment but rather to reestablish their authority over Tibet (Shakya, 1999: 390). The reform however, increased the heavy burden of administrative costs. A large number of employees in the state-owned enterprises (SOEs) are Chinese, massive amount of the subsidies was required for incentives and extra wages

[4] The post-1980 Tibetan culture policy of the Chinese government more or less parallels that implemented throughout China where the practice of religion and other traditional customs is again allowed. It also parallels minority policy in other "nationality" areas by rejecting assimilation and other accepting the validity and practice of traditional minority culture within the communist state. It differs from the general reforms in two major ways, it exempts Tibetan farmers and nomads from all taxes until at least 1990, and it empowers the TAR to reject or modify central government laws that conflict with traditional Tibetan culture (See Goldstein and Cynthia M. Beall, June 1989: 626).

for these workers which allowed the Chinese government to gain political control. An increasingly large percentage of the subsidy allocation has gone to support the direct cost of administration.[5]

Thus, the reforms actually encouraged to maintain their political and bureaucratic control in Tibet. The reform did not change the situation of economics nor make Tibet more self-reliant. The reform failed to stimulate growth in the rural areas and increased the gap in income distribution between the majority of the Tibetans and Chinese in Tibet (Sharlho, 1992: 47). From February 27 to March 6, 1984, Beijing held the Second Tibet Work Meeting which became yet another turning point in China's policy towards Tibet.

The Second Tibet Work Forum – 1984

The Second Work Meeting was to focus on only one thing: economics. The new development was the shift in Tibet's economy from one based on animal husbandry and agriculture to small-scale industrial production and exploiting the region's natural resources. The Second Work Forum Meeting held in 1984 was convened by Hu Yaobang. New policies of development were introduced such as, encouraging state-owned enterprises and individuals and China's rich provinces to make business investments in Tibet. A total of 43 infrastructural development projects amounting to 480 million yuan (US $60 mn) with state funds and aid from 9 provinces and municipalities were approved to encourage tourism.

> In September 1984, the Central Government decided to substantially develop Tibet Autonomous Regional undertakings including new energy, transportation, culture, education and religion, in a bid to implement the opening up policy to the letter. Following the conference, typical projects as the Lhasa Hotel, Tibet's Great Hall of the People and stadium were completed one after another, a total cost of 480 million yuan (China Tibet Online, January 2010).

Lhasa Hotel, Tibet's Great Hall of the People and stadium did not improve the living standard of the Tibetan people. These projects were simply to show cast their development

[5] After a period of stagnation and even recession in both the TAR and Qinghai up to 1995, the central government managed to initiate very rapid growth in the TAR from 1996 onwards and in Qinghai from 1998 onwards. This was achieved through the injection of massive volumes of direct budgetary subsidies exceeded 100 percent of GDP from 2001 onwards. As a result, real per capita growth rates in the TAR surpassed the national average from 1996 to 1999 and again from 2001 to 2003, and they were the highest in western China for most of those years, exceeding 10 percent a year (See Fischer, July 2009: 6).

policies in Tibet. Moreover, none of the 43 projects were designed for the benefit of the Tibetan people because the projects were mainly to build hotels in urban areas of Tibet and while around 85 percent of Tibetans live in rural areas. Thus, these hotels benefited only the people living in urban areas-Chinese.

The policy of reform and opening-up led to a massive Chinese migration inside TAR. In 1984, there were 60,000 Chinese peddlers and craftsmen from over 20 provinces and cities flooded into Tibet to work on these 43 projects. In 1985, another 30,000 Chinese settlers were flushed into TAR (DIIR, 2009: 100). The rapid increase of Chinese migration in Tibet led to the loss of employment and business opportunities to the Tibetan people.

This period was referred as liberal but it lasted only for a few years. In 1987-89 there were pro-independence demonstrations against the Chinese government in Lhasa. Thus, Beijing once again ruled Tibet by repressive measures and cracked down heavily upon the demonstrators with arms. However, China continued its economic development in Tibet. In July 1992, China introduced policies to deepen reforms, increase openness and accelerate the development of territory industry, townships and town enterprises (Ibid). In the month of June and July 1992, over 500 industrial and commercial entrepreneurs were flown into Tibet as mentioned by the Lhasa Bureau of Industry and Commerce. Thus, such policy had greatly impact on the Tibetan people where they were slowly started marginalised.

The Third Tibet Work Forum- 1994

The Third Tibet Work Forum was held in Beijing on July 1994. The White paper on Tibet in 2011 has grasped the two important tasks of the forum- the "securing high speed development of the economy and the lasting political stability in Tibet" (State Council, July 2011). Since 1989 pro-independence demonstration, political stability has been one of the major concerns of the Chinese government in Tibet. President Jiang Zemin stated that the "stability is a prerequisite for development and the Dalai clique is a factor of instability" [Xinhua News, 26 July 1994]. Instability here refers to the political protests by the Tibetans against China in Tibet and China blames Dalai Lama and the exile-Tibetan government in India for inciting such disruption in Tibet. Demonstrations didn't stop them from achieving rapid economic development in Tibet.

'Tibetan Aid Project' of 2.38 billion yuan programme was introduced by Jiang at the provincial level and large cities are allowed to carry out 62 economic development projects including energy, transportation; post and telecommunications sectors in the TAR (Congressional - Executive Commission on China). 17 projects were planned at the urban areas of Lhasa, Shigatse, Nyingtri, Chamdo, and Nagchu where government cadres and Chinese migrants have settled in huge numbers. Only the Chinese migrants and military cadres would reap the benefits of such projects and it would not bring about the slightest of any change in the livelihood of Tibetan people (DIIR, 2009: 101).

The Third Tibet Work Forum also witnessed the launch of an 'aid-Tibet cadres' (Yeh, 2003: Chapter 2) programme to send cadres from 15 counterpart provinces and municipalities to work in TAR government for three years. There were 621 officials in the first group, 637 officials in the second group and 685 in the third group. This programme further 'de-Tibetanised' (Ibid) the governing unit of TAR.

This Work Forum marked the end of moderate policies on religion and culture as the Chinese increased their control over monasteries, nunneries, and rigorous attack on the Dalai Lama. Political repression was increased with tighter internal security and longer sentences for political offenses (ICT, January 2010). It took seven years for the Chinese government to convene the Fourth Tibet Work Forum Meeting.

The Fourth Tibet Work Forum- 2001

"In June 2001, the Central Government held the Fourth Work Forum on Tibet, at which it drew up an ambitious blueprint for Tibet's overall modernization in the new century, and decided to adopt more effective policies and measures to further strengthen the support for the modernization of Tibet" (State Council, July 2001). The Fourth Tibet Work Forum launched 117 infrastructure projects which were from the direct state investments of up to 31.2 billion yuan (US $ 3.7 bn). One of the major initiative of the Fourth Tibet Work Forum was the "xibu da kaifa" or the "Great Western Development Programme" or "Go West" launched in 1999 for the implementation during the Tenth Five-Year Plan (2001-2005).

Western Development Programme

China is geographically and economically categorized into the Eastern (coastal), the Central and the Western Regions. The Western region comprises of 12 provinces and national autonomous areas. It covers 75 percent of China's total area with a population of 371 million, about 28.7 percent of the country's total population. China's West is a vast region, diverse in population, topography and climate. More than half inhabitants are in Tibet and Xinjiang, one third of the population in Qinghai and Ningxia are ethnic minorities, and other seven provinces are predominantly of the Han population.

China has focused primarily on the coastal regions since the introduction of its economic reforms. In 1988, Deng Xiaoping explained, "The coastal areas, which comprise a vast region with a population of 200 million, should accelerate their opening to the outside world, and we should help them develop rapidly first; afterward they can promote the development of the interior" (People's Daily, September 1988). Deng Xiaoping's slogan, "lets some regions get first rich" laid the ideological basis for the formulation and subsequent implementation of this economic trend (Barabantseva, 2009: 232). In the late 1999, after two decades of coastal development, Chinese leaders declared in the change of China's regional development strategy and initiated the Western Development Campaign.

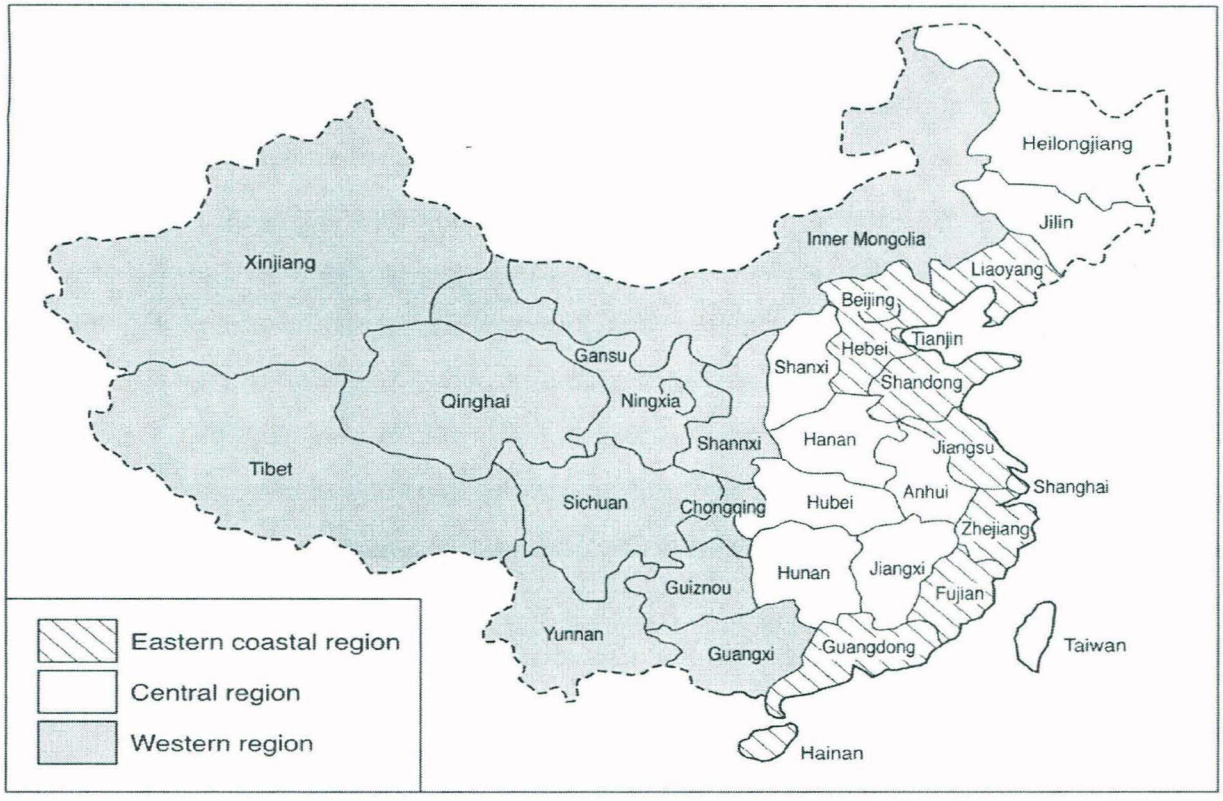
Reasons of the Policy: Reducing Regional Inequality and the Interior Region's Discontents

China grew rapidly in the post-Mao period. The coastal development strategy in the 1980s and 1990s and the fiscal reforms of 1994 have widened the gap between the coastal and the interior regions. The coastal development strategy has given an acute advantage in state investment, in terms of their exposure to the world economy and access to foreign direct investment (FDI). State investment has increased from 42.2 percent between 1976 and 1980 to 53.6 percent between 1996 and 1997 in the coastal region, whereas the central and western regions' shares dwindled from 50 percent to 38.8 percent (Lai, 2002: 437).

The coastal area has access to the external market and investment as early as 1985 but the Central Government of China has not created the open area in the interior regions until 1992. Between 1978 and 1995, the per capita Gross Domestic Product (GDP) grew most rapidly in the coastal region, at 10.2 percent per annum, compared to 9.5 percent in

the central region and 7.5 percent in the western region. As a result, while the coastal region's share in national GDP rose from 52.5 percent in 1978 to 59 percent in 1995, the central and western regions saw decrease from 29.7 percent to 26.5 percent and 17.8 percent to 14.5 percent, respectively (Ibid). Thus, 90 percent of the nation's poor lived in the interior in the late 1990s (Ibid: 438).

(Map: 2.1) China's Region



Source: (Tian, 2004: 613)

Developments related to fiscal reform lowered revenue in the interior due to increase in taxes on resource-extracting industries (concentrated in the interior) and decreasing taxes on the manufacturing and retail sectors (concentrated on the coast). On the other hand, the center required the provinces to remit the consumption tax on cigarettes and alcohol products- which were major sources of revenue in the interior provinces-to prevent local governments from overdeveloping these sectors for their own fiscal benefit. Thus, fiscal reform in 1994 did not provide any benefit to the interior regions. Leaders from interior regions raised the inequality created by the coastal development and paved the way to their discontentment.

The consumption of manufactured goods in the central and western regions remained far below that in the coastal regions and the western region also lagged far behind in infrastructural development as well. In 1980, highway density in the coastal region was 4.2 times that of the western region and by 1999, it was nearly 5 times.

Improving the Environment and Resource Supplies

Chinese leaders were hopeful that the western development would play a vital role in improving China's ecology especially in controlling soil erosion and desertification. They also expected the western region to help the northern China in water shortages, mineral resources and energy supply. Chinese economy had been badly affected by floods, sandstorms and water shortages. In 1998, a flood in the provinces of Yangtze left around 50,000 people dead or missing and losses of exceeding 540 billion yuan. There was an increase in the number of sandstorms in China with 13 in the 1970s, 14 in the 1980s and 23 in the 1990s. Western region has 1,863.4 billion cubic meters of water resources, 52.5 percent of the national total which could be used in the longstanding northern water shortages (Ibid: 444-45).

Chinese leaders hope that the western region's resources can satisfy the nation's rising demand not just for water but for minerals and energy. The western region contains huge minerals and energy resources, 80 percent of nation's potential hydropower ad 58 percent of the nation's natural gas reserves (Ibid).

Implementation

The Central Government of China has adopted a multifaceted approach towards western development. First, Jiang warned against "rushing headlong into mass action," and urged officials to conduct project analysis, adopt policy measures, and prepare for long-term effort. Second, national government favored economic, ecology and social development. Third, the Leading Group to Develop the Western Region (Xibu diqu kaifa lingdao xiaozu) was formed on 16 January 2000. Zhu Rongji and Wen Jiabao, the premier and vice premier became its director and vice director, and seventeen other ministers, along with two ministerial-level party officials later became members of the group. The center has chosen key areas for development; relatively firm economic bases and high population densities, close to transportation routes and hubs, the Yangtze and the waterways in the

south-west with outlets to the ocean. Most of the projects that the center has launched or planned focused on developing reliable infrastructures.

Infrastructure

Western Development Programme aimed to invest mostly on developing transportation, energy generation, communication, irrigation, and improving urban infrastructure in the interior regions. The Chinese government announced three measures to build a road system in the west. First, eight national highways of 12,600 kilometers will be built to connect the country's major cities, linking Dandong and Lhasa, Qingdao and Yinchuan, Shanghai and Chengdu, Shanghai and Ruili, Hengyang and Kunming, Erenhot (of Inner Mongolia) and Hekou, Lianyungang and Korgas (near Hüocheng, Xinjiang), and Chongqing and Zhanjiang. Second, state construction of regional and interprovincial and local highways in the western region, building 210,000 kilometers of roads. From the eight inter-provincial highways, four of which connect the central and western regions; Lanzhou and Panhan (in Yunnan), Baotou and Beihai, Altay (Aletai) and Kunjirap Daban (in Xinjiang), Yinchuan and Wuhan, Xi'an and Hefei, Changsha and Chongqing, Xining and Korla (in Xinjiang), and Chengdu and Zhangmu (of Tibet), totaling 15,000 kilometers. Third, the state will build 150,000 kilometers of roads between townships and villages in the west (Ibid: 451-52).

To develop western region's railway system, the center initiated the expansion of the railway network from east to west and internal and external routes. The state started the construction of the Xi'an-Hefei section of the Xi'an Nanjing Railway, the Chongqing-Huaihua Railway in 2000, and Qinghai-Tibet railway in 2001. Light railway in Chongqing is under construction and international railways are under study (Ibid: 452).

The center also had plans to upgrade and enlarge national airports as well as regional hubs. China has invested 5 billion yuan to renovate twenty airports (People's Daily, 18 May 2000). Xianyang International Airport in Xi'an, Shuangliu Airport in Chengdu, Wujiaba Airport in Kunming, Zhongchuan Airport in Lanzhou, and Urumqi Airport are all to be expanded or built as communication hubs and constructions began in 2000.

China had plans laid down a gas pipe-line in 2000 of 4,200 kilometers long, passing through eight provinces which run from the Qaidam Basin to Shanghai. In 2000, construction of the Sebei Qaidam Basin-Xining-Lanzhou Natural Gas Pipeline began. Three similar projects to transport gas from Shaanganning, Tarim Basin and Sichuan and three west to east power generation and transmission systems have been planned. Several large and medium scale irrigation projects to improve the water resources, especially in the northwest have been set up. Construction of the water conservancy and hydropower project at Zipingpu started in 2001.

Environmental Protection

The state also wanted environmental protection along with the development in the west. They have outlined three key environmental projects. The first was afforestation in the upper reached of the Yangtze River down to the Three Gorges Reservoir area and in the upper and middle reaches to the Yellow River to the Xiaolangdi Reservoir area. In 772 counties in thirteen provinces, including Yunnan, Sichuan, Shaanxi, and Gansu, the cutting of natural forests was prohibited and afforestation was initiated. The second project was to control desertification in the northwest, far north and western part of the northeast. The third project was to construct shelter forests in the northwest, north and northeast.

Prospects

The Western Development Program has been a long-term project which the center does not want to sacrifice the development of the coastal. The center government has invested huge amount in infrastructure development and protection of the environment. In the first half of 2001, total investment in fixed assets in the twelve western provinces amounted to 171.1 billion yuan, approximately 30 percent more than it was in 2000 and more than 10 percent higher to the increase in the coastal and central regions (Lai, 2000: 459). However, there are many challenges in the western development drive. The first challenge arises is from underdevelopment: poor infrastructure, inadequate human capital, slow flow of information, a dominant state sector, traditional and anti-market ideas and corruption. Officials especially in Guizhou, Shaanxi, and Qinghai have misappropriated half of the funds for aiding the poor to their personal benefits. Thus, western development could possibly lead to increase corruption and popular discontent.

The second obstacle was the already prevalent ethnic tension. The Western Development Program has attracted Han immigrants with higher education, better vocational skills than ethnic minorities to surge into other ethnic cities depriving the local ethnic minorities of job prospects and educational opportunities for their children. This led to income disparities and increased ethnic tension which would hinder the development program in the western provinces.

The third obstacle is that the market forces may thwart state plan to develop resource extraction, agriculture and animal husbandry which may be inefficient and unsustainable in the long run. The cost of resource extraction is high. However, the coastal areas obtain these raw materials at much cheaper rate from the world market. Thūs, this may weaken the demand for raw materials from the western provinces.[6]

According to Hongyi Harry Lai, western drive will economically help local population; large infrastructure projects will provide jobs to the local population, improved transportation and scope of tourism will expand local trade. He believes that politically, the growth of these cities and neighboring areas may ease the local resentment of the Han and the regime may win their loyalty, as it did in the coastal region between 1978 and 1994. "As the gap between the interior and the coastal regions is reduced, and as living standards of those living in the interior regions improves, ethnic separatism may lose some of its appeal" (Ibid: 459).[7] Jiang Zemin also announced that the Western Development Programme would ensure the continued stability of local societies while

[6] To adapt to the 'changing the development mode" and the needs of the new stage of growth, China needs to conduct a comprehensive social reform to provide momentum for future development. over the past three decades of reform and opening-up, China's primary approach has been largely oriented towards the reform of the economic institutional system, although concurrent reforms have been introduced in other sectors. Thus far, China has basically established a socialist market economic system. However, the great changes in the economic and social structures require continued adaptation of the systems of all sectors (See Peilin Li, March 2011: 142-143).

[7] To give an idea of the speed of such growth, the aggregate real GDP of the TAR grew by about three times between 1996 and 2004 and by about two and a half times in Qinghai, whereas it only doubled in China as a whole, which was nonetheless one of the most unprecedented growth rates witnessed in modern history. In this sense, the western development strategies were quite successful in reversing the trend of worsening regional inequalities in the first two decades of the reform period. However, these strategies were very polarizing within western regions and a sharp rise in intra-provincial inequalities accompanied the aggregate catch-up. This was particularly the case in the Tibetan areas, where heavy dependence on subsidies led to an excessively urban-centric strategy. Inequalities in the Tibetan areas were thereby structured according to the manner by which subsidies were channeled into the local economy, in contrast to other western areas, where inequalities were more rooted in patterns of local capital accumulation (See Fischer, July 2009: 6).

contributing to China's ethnic and national unity (DIIR, 2008: 7). But that has never come true because Chinese leaders showed no sign of revising their religious policy, which has radicalized many Tibetans and Muslim Uyghurs. The question of whether economic development can ultimately bring ethnic harmony remains (Wei and Clarke, 2011).

Western Development Programme in Tibet

The First phase of the "Western Development Programme" (2000-2005) invested in 'hard infrastructure' such as the Gormo-Lhasa Railway, potash fertilizer plant ($338 million), natural gas pipeline stretching 950 km to Lhanzhou ($300 million), and hydroelectric power stations in the South West (DIIR, 2008: 7). To attract foreign investments in these and other projects, China adopted preferential policies such as exemption from tax for importing equipments related to the projects and exemption of value-added tax.

The infrastructure development had its negative impacts upon the local Tibetans. Local Tibetans were forced to give away their land for these developments. There were protests against the seizure of the local Tibetans' land in the rural Songduo County in the name of 'Great Western Development' programme. Second, modern road and urban building construction designs, techniques and materials were unfamiliar to the local Tibetan workers; hence the jobs were taken by the Chinese construction workers, which led to increase migration of Chinese migrants into Tibet. Third, the initial selection of priority infrastructure investment projects does not correspond with the needs of the local population who are mainly dependent on traditional agriculture and livestock. Thus, all these factors generated income disparities between Chinese migrants and local Tibetans which is the main cause of ethnic tension. The Gormo-Lhasa railway is the most significant infrastructure projects which contribute China to export resources and import Chinese migrants into Tibet.

The Gormo-Lhasa Railway

China built its first railway to connect Tibet from the northern Tibetan area of Amdo (Qinghai) during China's Second Five-Year Plan period (1958-1962), the first decade of its occupation of Tibet. In May 1958, China began construction of a railway line from Lanzhou to Siling (Xi'ning) the capital of Amdo province. The construction was completed in October 1959 and became operational in March 1961 (DIIR, 2009: 110). The

814 kilometer-long stretch from Siling to Gormo (Golmud) railway line construction was begun in 1979 and began operational in 1984 (China.org). Tibetans believe that this railway primarily accelerated the colonisation of Tibet by Chinese which led to the massive influx of Chinese settlers into Amdo. The Amdo population increased from around 1.5 million in 1949 to more than 5 million today (DIIR, 2008: 9).

The Gormo was once a vast pastoral land inhabited by only a few hundred Tibetan nomads. At present it has some 200,000 populations and the second largest town in Amdo with only 3,600 Tibetans and then the rest are Chinese. In 1994, Chinese leaders were discussing linking Lhasa with the rest of China by rail. During the Ninth Five-Year Plan (1996-2000), route survey and feasibility studies were conducted. As a result, the Tenth Five-Year Plan (2001-2005) allocated a budget for the construction of a railway line between Gormo to Lhasa and launched its second railway project in Tibet on 29 June 2001 which became operational on 1 July 2006 stretching 1142 kilometers.

The Gormo-Lhasa railway is the world's longest plateau railroad (English.org.cn, October 2005). The railway covers 960 kilometers at an altitude of more than 4000 meters. The highest point of the line is 5,072 meters above sea level. 550 kilometers lies within the frozen earth area (China.org) which may cause problems due to seasonal expansion and contraction of the railway tracks. Today, Lhasa can be reached within 44 hours by railway and the Lhasa is connected to seven major places of China by railway; Beijing, Chengdu, Chongqing, Lanzhou, Xining, Guangzhou and Shanghai (see table : 2.1).

The Gormo-Lhasa Railway is a symbolic project of China in its Western Development strategy. China believes that the railway will accelerate the social and economic development of Amdo province and TAR. More importantly, the Chinese leaders aimed that the railway will build up ethnic solidarity between Han Chinese and the ethnic Tibetans. The former President Jiang Zemin has admitted the political motivations behind the construction. In an interview with the New York Times on 10 August 2001, Jiang Zemin states:

> Recently a project has been launched to build a railroad from Golmud (in Qinghai province) to Lhasa. It will be built through permafrost area at 4,000 to 5,000 meters elevation. Some people advised me not to go ahead with this project because it is not commercially viable. I said this is a political decision; we will

make this project succeed at all costs, even if there is a commercial loss (TCHRD, 2007: 63-4).

(Table: 2.1) Trains Connecting Lhasa to China

From - To	Distance (Km)	Hours	Hard Sleeper Price	Soft Sleeper Price
Beijing West-Lhasa	4,064	44.00 hrs	813 Yuan (US$ 102)	1,262Yuan (US$ 158)
Chengdu-Lhasa	3,360	43.41 hrs	712 Yuan (US$ 89)	1104 Yuan (US$ 138)
Chongqing-Lhasa	3,654	44.45 hrs	754 Yuan (US$ 94)	1168 Yuan (US$ 146)
Lanzhou-Lhasa	2,188	26.50 hrs	552 Yuan (US$ 69)	854 Yuan (US$ 107)
Xining-Lhasa	1,972	24.10 hrs	523 Yuan (US$ 65)	810 Yuan (US$ 101)
Guangzhou-Lhasa	4,980	35.02 hrs	650 Yuan (US$ 81)	1008 Yuan (US$ 126)
Shanghai-Lhasa	4,373	48.02 hrs	854 Yuan (US$ 107)	1314 Yuan (US$ 164)

Over the past five years from 2006-2011, The Gormo-Lhasa railway has sent over 23 million passengers and 120 million tons of goods exported (Xinhua News Agency, 13 May 2011). Thus, the Gormo-Lhasa Railway has become 'shining symbol of development' in the eyes of the world.

The Gormo-Lhasa Railway and Chinese Migration in Tibet

The Gormo - Lhasa Railway has been built with much hype and publicity. It was built in the name of developing the western regions. Considering the harsh terrain, climate and altitude, the construction was certainly a historic and a great technical achievement. However, it will take time for the professed objectives to be fulfilled. The railway is a great cause of concern to Tibetan nomads and farmers. The Chinese leaders have not consulted the local Tibetans thus; it remains great speculation whether the railway serves the purpose of the local Tibetans.

The Chinese constitution prioritizes the interests of the Chinese people and to respect their human rights. According to Article 33 of the Chinese Constitution, "The State

respects and preserves human rights" (TCHRD, 2007: 67). United Nations Declaration on the Right of Development have laid great emphasis on the participation of every human and all people in the economic, social, cultural and political development. However, Tibetan people's participation in the socioeconomic, cultural and potical development is not counted by the Chinese government.

(Map: 2. 2) The Gormo- Lhasa Routes

Source: (Tibet.cn, 2006).

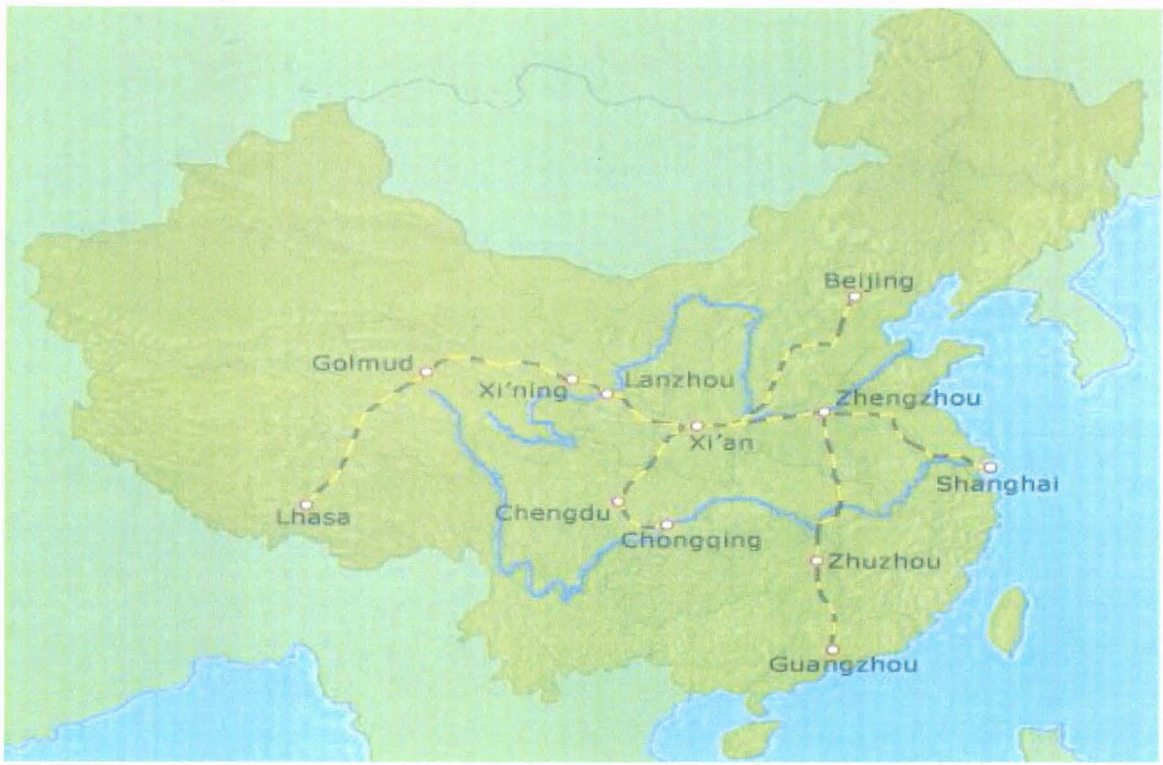
Increase in massive infrastructure projects in the Tibetan region and connecting Beijing with the heart of Tibet by railway created more favorable conditions for migration in Tibet. These Chinese migrants are fortune seekers, often desperately poor and displaced from the countryside by China's demand of land for urbanisation. The Gormo- Lhasa railway is one of the drivers of Chinese migration into Tibet.[8] With the completion of the Gormo-Lhasa railway in 2006, Gormo, Lhasa and inter-lying areas face tremendous

[8] In the future, the number of temporary in Lhasa is expected to grow, partly due to the large number of rural Tibetans who will gradually join the migration flow, and partly due to the completion of the railway liking Qinghai with Tibet, which will provide more convenient transportation Linking Lhasa with other cities in nearby provinces (see Ma Rong and Tanzen Lhundup, December 2008: 37).

population pressures. Nagchu prefecture has more than 25 towns in 2008 from only two in 2001 (DIIR, 2008: 10).

This increase of population in Tibet had its negative impact on the already fragile Tibetan environment which could not support the huge influx of population. The massive influx of Chinese immigrants have made also Tibetans minority in their own land. They are marginalised, excluded, repressed and unrepresented in their economic, social and political life.[9]

(Map: 2.3) The Gormo-Lhasa Railway



Source: (Chinatourselect.com)

[9] The economic foundations of immigration and exclusion in the Tibetan areas points to the legitimate concern that immigration might exacerbate economic exclusion among locals, even in the midst for rapid growth, although not because of swamping per se. Rather, exclusion operates through qualitative differences between migrants and locals. Out-of-province Han and Muslim migrants in the Tibetan areas emigrant from more competitive conditions and generally have much higher education and skill levels than local Tibetans. Hence, they enter the host country on a higher rung of the labour hierarchy than most locals, the education local elite side (for interethnic conflict in Tibetan areas, See Fischer, June 2004).

Due to the construction of railway, many Tibetan nomads have been displaced (TCHRD, 2007: 69). This practice is more vivid in the Golog region of Amdo area where nomads are resettling in uniform and poorly built houses since July 2006. They had to sell their livestock at half the market price, the grasslands are fenced and nomads are unemployed due to their language barrier. Thus, the Gormo-Lhasa railway has great impact on the livelihood of Tibetans as well as on the Tibetan ecology. The Gormo railway has further facilitated resources exploitation and transportation from Tibet to China. China has natural resource exploitation in their Western Development Campaign.

Natural Resource Exploitation

Tibet has rich natural resources; wildlife and plants, grasslands, minerals, salt and hydropower. Tibet's natural resources apart from the forests were hardly ever exploited for economic gain until the 1949, China's invasion of Tibet. Since, then efforts were made to locate resources on the Tibetan plateau. There is a long history of the use of metals in Tibet for sacred images, oracular mirrors, iron chain bridges, armour, coinage, reliquaries, jewellery and ceremonial offerings. However, mines in Tibet that provided raw materials were invariably small and were worked without tunneling, chemicals or explosives (DIIR, 2009: 150).

Since 1950, Tibet's natural resources have been under extensive exploration and actual extraction (DIIR, 2008: 150). Initially, rich minerals in Tibet were seen as opportunistic thus exploitation was carried out in small scale, artisanal and often highly destructive to the environment. The main reasons could be China's lack of capital and Tibet's remoteness. Gradually, over the decades, natural resource exploitation is carried out in a systematic and controlled by a higher authority, transported by state-owned enterprises to distant Chinese markets (DIIR, 2008: 150). Forest, fossil fuels and minerals would be given focus on the study as there are commercially exploited and transported to China and have major impacts on Tibet's environment.

China's Western Development Programme has special provision to encourage natural resource exploitation in Tibet and other western provinces. In 2001, the Chinese government has announced "Preferential Policies on Mineral Resources" aiming "to cultivate a market of mineral properties and promote the legal transaction of prospecting

and mining rights" (State Council, 2001: 9). The Tibet's natural resources have been calculated since the 1960s. For decades, Chinese geologists have swarmed over the entire Tibetan Plateau and seeking the mineral wealth in Tibet. The traditional Chinese name for Tibet is Xizang, literally "the treasure house in the west," Xizang now refers to today's TAR.

Tibet-Treasure House of the West

Tibet has been viewed as to exploit to develop China that is inherent in China's name for Tibet, Xizang, which translates as "treasure house of the west" (DIIR, 2009: 156; ICT). "The Chinese media routinely announce that the value of the natural resources of Tibet is several billion yuan" (DIIR, 2009: 156). In 2004, the People's Daily reported:

> It was learned from the Land and Resources Department of the Tibet Autonomous Region that years of prospecting and surveying on mining resources show that Tibet is rich in mining resources whose potential value is estimated at about 650.5 billion yuan (US $78.4 bn). With advantageous ore-forming conditions and how extent of exploitation Tibet is expecting to become an important mining base of China... its geological structure may enable China to search for mines in short supply and large-scale and super-scale mining areas... Among 173 types of ores, Tibet has 100 of them, of which more than ten are in short supply in China and 36 have verified deposits. A total of 1891 mine-producing areas have been discovered in Tibet. 103 mining areas have been listed in deposit table of which 30 are energy resources mining areas, 34 are metallic ore areas and 39 are non-metallic ore areas. Among the mining areas that have been listed in the deposit table, 19 are large-scale deposits. 18 are medium-scale and 66 are small-scale deposits. Among the mines whose deposits have been verified, copper (molybdenum) and lithium have the largest deposits in the world... Seventeen kinds of ore deposits such as chrome ore, crystal, corundum and high temperature terrestrial heat are rated among the first nine nationwide (People's Daily, 25 November 2004).

The Land and Resources Department of the TAR's research and survey show that Tibet is becoming an important mining base of China because it has a potential value of about 650.5 billion yuan of mining resources. Tibet has 100 types of ores among 173 types of ores in the world. A total of 1891 mine producing areas has been discovered in Tibet of which 30 are energy resources mining areas, 34 are metallic ore areas and 39 are non-metallic ore areas.

Since 1999 to 2005, China has discovered 12 types of minerals valued at more than 1 trillion yuan ($128 billion) and 747 mineral reserves sites in the western regions as stated by the director of the China Geological Survey (CGS) Meng Xianlai in China's

official news agency China Daily (Fangchao, 25 January 2005). Moreover, officials said that there is discovery of rich iron ore in Nixiong, in the western part of the TAR, estimated reserves of 1 billion tons, copper belt at the Yarlung Tsangpo River in the Qinghai-Tibet Plateau, and copper mine at Yulong, reserves of 14-18 million tons. Thus, Chinese government acknowledges that Tibet has rich natural resources which could serve as a treasure house for China.

Meng Xianlai announced new discoveries of mineral oil deposits along Tibet railway. "Yulong, not far from the newly built Qinghai-Tibet Railway, could serve as a turning point for Tibet's mining economy" according to Zhang Hongtao, CGS deputy director.

Impact of the Gormo-Lhasa Railway on Mining

The Gormo- Lhasa Railway is extended through the Tsaidam Basin city of Gormo. The railway could transport bulk commodities, high-volume across the vast distance from industrial users to the mostly concentrated minerals in eastern provinces. The cost of the extraction would be much reduced. The Gormo-Lhasa Railway has contributed in resource exploitation of China. China has direct connection to the Tsaidam Basin in Gormo and resources transportation has become easier from the eastern Tibet where most resources are concentrated. The exile Tibetan Department of Information and International Relations stated:

> The single tail track from Gormo to Lhasa will probably be expanded to double track, and its planned extension to the copper deposit at Shetongmon, to the west of Lhasa, has been set a completion date of 2010, at a cost of 11 billion yuan. To the east of Lhasa, similar plans are in place for a Chengdu-Nagchu-Lhasa rail line that will traverse through the copper zone of Kham. This will enable the effective extraction of copper from Yulong and the many significant copper and gold deposits... In addition, there are plans to install a more expensive railway line, financed by the Asian Development Bank that will connect Lhasa, via Nyintri, to the railway in Yunnan, from Dali to Lijiang at the foot of the Tibetan Plateau. Such a line would enable access to many more copper and gold deposits in Kham (DIIR, 2009: 158-9).

China is planning to expand the single tail track of Gormo to Lhasa to double track which would enable its reach to the copper deposits at Shetongmon to the west of Lhasa, Chengdu-Nagchu-Lhasa rail line through the copper zone of Kham and enable copper from the Yulong railway line from Lhasa via Nyintri to the railway in Yunnan which will

also give access to many more copper and gold deposits in Kham. Thus, plans of construction of railway line prove that this will facilitate them to access to the minerals in the Tibetan Plateau rather for the benefit of the local Tibetan people.

Tibet's natural resources are exploited more on today because of the railway networks in Tibet. The first mineral zone discovered in Tibet in the Tsaidam Basin, is connected by rail from 1980s. The second zone discovered was the ophiolite belt of southern Tibet of the Yarlung Tsangpo River, reached by the railway to Lhasa in 2006, and ophiolite belt to Shigatse by 2010.

Secondly, the structure of China's mining industry has been transformed. It has been owned by the state with transnational conglomerates or 'national champions' and plenty of capital. Portions of shares are sold to Chinese or international investors such as from Hong Kong or other stock exchanges like Zijin Mining[10] and Western Mining.[11] These mining companies are capital-intensive and technology-intensive and sponsored at the highest level of central authority. They are taking over the key deposits in Tibet and encouraged by state policies (Tibet Environment Watch).

Thirdly, there was a rise of prices in all metals and energy in 2005 and 2006 due to high demand in China. This rise of prices of resources produced more profit to extract minerals from Tibet. Thus, extractions of minerals from Tibet lessen its dependence on costly imports. The railway has been planned to build on the route areas of rich mineral deposits.

Forests

Tibet has rich forests of spruce, fir, juniper, larch, cypress, oak, bamboo and rhododendron. For centuries, these forests served Tibetans for shelter, rest, firewood, mushrooms, medicinal plants and construction timber. While the nomads have

[10] Zijin Mining Company is a large-scale state-owned mining group located in Shanghai County, Fujian Province. It is the largest gold producer and second largest copper producer in China.

[11] Western Mining has headquartered in Xining, Tibetan Plateau. It has a major stake in the Yulong copper deposit in Kham.

occasionally cleared a section of the forests for pastures for their animals, but preserved the majority of the forests (DIIR, 2009: 151).

Since, 1960s to the end of 1990 deforestation has been carried out immensely. In 1998, disastrous flood of the middle and lower Yangtze river stopped logging for water conservation. China took an official policy of reforestations. However, timber became shortage in China which they decided to import from Burma and Laos. Non-timber products trade in Tibetan herbs and mushrooms are growing rapidly.

Energy

Beijing has shortage of gas and People Daily stated that Beijing will need 23 million cubic meters of natural gas per day (People's Daily 25 November 2004). Oil and gas are exploited on a huge scale in the semi-arid Tsaidam basin (Chaidamu), in Tibet's far north. A railway that has built in this area over 20 years ago has allowed the exploitation of large amounts of oil and gas at Tsaidam basin.

In Gansu, the Eleventh Five-Year Plan (2006-2010) proposes intensification of petrochemical industries that are dependent on Tibetan oil, gas and hydroelectricity. According to news reports in 2005, Gansu province plans to build three large size chemical bases focusing on petrochemical, synthetic material, paints and polymers processing as well as isocyanic acid ester, fluorine chemical and fine chemical in new fields (Asia Info. Services 2005).

Minerals

Mining has been listed as one of the key industries in the Tenth Five-Plan Plan of the TAR. Over 126 different minerals have been identified in Tibet. Tibet has rich mineral resources like chromites, copper, magnetite, boron, lead, zinc, gold, petroleum, iron and other minerals. Gold, iron, chromites and copper are four metals of greatest interest to China today. They have been exploited extensively because of constant increasing demand in China. Amdo (Qinghai) is the largest areas of mineral resources thus; mining activities have been carried out extensively.

The Qiadam Basin in Haini prefecture of Qinghai is noted for its numerous large salt lakes and its petroleum deposits. China has exploited these areas since the 1950s. Tanjianshan is just to the north of the Qiadam Basin which has gold belt. It is under the joint venture between Eldorado Gold Corp of Vancouver, Canada, and Qinghai Number One Geological Brigade and Dachaidan Gold Mine (Qinghai). The Dachang Gold Deposit is to the south in Yushu Prefecture of Qinghai. It is owned by Inter-Citic (Canada) and the Qinghai Geological Survey Institute (Tibetan Plateau, 11 November 2011).

TAR has also a large amount of mines such as the Gangdese Porphyry Copper Belt extends east-west of north of the Yarlung Tsangpo in the region of Lhasa, the Yulong Porphyry Copper Belt extending north-south parallel to the Drichu from South Qinghai, through Qamdo into Yunnan, a lead-Zinc belt is found in Nujiang, Chromiun is found south of the Yarlung Tsangpo in Shanno. The uranium deposit information is kept in state secret in China. China NetTV SEC filling accidentally revealed about Zonglongde in Riwoche, Chamdo Prefecture and No. 792 Uranium Mine in Thewo County, Gansu in media due to protest regarding its illegal reopening and causing pollution. (Ibid). Shetongmon is located close to the Yarlung Tsangpo / Brahmaputra, near to Shigatse-second city of Tibet.

Uranium

Tibet has the world's largest deposits of uranium. The largest uranium mine is in Thewo, part of the Khalho (Gannan) prefecture of Gansu province which gave impacts of mysterious illnesses, new born babies with deformities to that area. Uranium mines are also in Tsaidam Basin, Yamdrok Tso and Damshung. The lithium extraction industry is found in Dartsedo (Kangding), Karze (Garze) prefecture, Sichuan Located in eastern Tibet.

Tibetan Gold

Chinese geologists have discovered many minerals: copper, silver, lead, zinc and the most precious of all-gold in Amdo and Kham. Gold and copper are at the heart of China's Twelth Five-Year Plan for Tibet. Intensive exploitation of Tibet's mineral wealth has been named repeatedly in successive five year plans. Only official media routinely announce stupendous mineral finds in Tibet, making it seem as if deposits are already mines.

Chromite mining is in steady decline, copper mining has barely begun and gold mining is intensifying in many locations, usually illegally. But this may change soon because of xibu da kaifa-opening up the great west-infrastructure build up, railways, highways, power stations and urban centers- to make profitable mining feasibility. Both copper and gold prices have risen steadily with a rise of demand from China as well.

(Table: 2.2) Extraction of Selected Resources in Amdo (Ch: Qinghai) in 2004

Commodity 2004	Annual Output (1000 tons)	Value Of Output (1000 yuan)	Profit (1000 yuan)
Total	331392	827377.04	2565867
Crude Oil	2220.2	503773.00	1750770
Natural Gas**	179356 mn cubic m		304640
Coal	2494.9	28072.12	3385.5
Geothermal Energy	246.6	36.00	13
Iron	411.6	3224.30	3435
Manganese	8	64.10	61
Chromite	3	140.00	5
Copper	343.4	6424.77	7386
Lead	73.3	1972.69	3310
Zinc	**1026.1**	**72039.00**	**367781.3**
Furnace Refractory Quartzite	441.1	1047.30	1739.9
Salt	1083.1	15085.73	1629.1
Potash	**17107**	**156628.13**	**105187.6**
Asbestos	1539.4	16409.64	3204
Limestone For Cement	1580.2	1828.17	3036
Quarrying For Roads	1244.3	2032.19	3082.9
Brick Clay pits	1610.7	7205.12	6630.3

Source: (CSB 2006: Qinghai Statistical Yearbook 2006, table 3-21, 59-60).

Copper and gold

"China's 12th Five-Year Plan for Tibet centers on copper and gold, with not only dramatic intensification of extraction but also a state-driven agglomeration of entire Chinese copper

industry, in order to create copper giants sufficiently capitalised to finance major expansions in Tibet" (Rukor) Copper and gold deposits are in Tibet at Shetongmon near Shigatse, at Gyama, upstream of Lhasa, and Yulong near Jomda and Chamdo, all located in TAR. Yulong and Gyama mines are already in production by world standards and production will soon begin in Shetongmon.

"China will push for further consolidation in its copper manufacturing sector, aiming to create three to four big producers during the Twelfth Five-Year Plan period from 2011 to 2015," a senior official at the China Nonferrous Metals Industry Association said (Rukor). The Twelfth Five-Year Plan is that China to become 30 percent self-sufficiency by 2015. The new locations of mines have been identified during the Twelfth Five-Year Plan-three of which are in Tibetan locations; TAR and Qinghai and Yunnan. Jiangxi is the other province which is already the largest copper mine in China. The other known but yet to be exploited copper deposit in Tibetan portions of Yunnan is Pulang/Xhujiping which is rich in gold and silver. Amdo is a China's long established mineral province in Tibet due to its rich in mineral resources and the railway line at Tsaidam Basin of Amdo from 1980s (see table: 2.2). "The latest production statistics for key mineral resources show that the exploitation is now intensive. The total declared profits of the 683 mining companies in Amdo in 2004 was 2.56 billion yuan (US $ 310mn)" (Qinghai Statistic Yearbook, table 3-21).

There are considerable copper mining in Amdo. Saishitang in Golok prefecture, about 400 Kms from Xining, the industrial capital of Qinghai, there is a deposit of 50 million tons, with high concentrations of copper, 1.13 percent of the ore, and 0.48 percent of gold. According to Qinghai Statistical Yearbook 2009, table 12-20, copper mining in Qinghai produced 22,700 tons of copper.

The China's fast growth and massive infrastructure according to Gabriel Laffite means heavy usage of metals, energy and raw materials. The Eleventh and Twelfth Five-Year Plans talk about the balancing environmental protection and development of the Tibetan people as well as rapid development, nothing so far has slowed China's accelerating consumption of global resources. China's has taken water projects in Tibet to develop agriculture and industries in China.

Dams and Water Diversion

Due to its geographic location and geological formation, Tibet becomes the principal watershed of Asia. There are nine major rivers in Tibet, such as the Yarlung Tsangpo (Brahmaputra), Sengey Khabab (Indus), Macha Khabab (Karnali), Langchen Khabab (Sutlej), Drichu (Yangtze), Zachu (Mekong), Machu (Huang He or the Yellow River), Gyalmo Ngulchu (Salween) and Bumchu (Arun) (DIIR, 2008: 23). Currently, 90 percent of these rivers flow downstream to ten countries; China, India, Bangladesh, Nepal, Bhutan, Pakistan, Thailand, Myanmar, Laos, Cambodia and Vietnam. There are more than fifteen hundred lakes scattered all over Tibet.

China now has the most number of dam projects than in any other country in the world. In 2006, South-North Water Transfer project of 11.9 billion yuan (US $ 1.5 bn) was built. In the same year Three Gorges Dam of 131 billion yuan (US $ 16 bn) was completed. Now, China is increasingly being diverted river waters for electricity generation, irrigation, mining and other economic activities on the Tibetan Plateau and China significantly expanding its water infrastructure there and pursuing interriver and interbasin transfer projects.

A rapid expansion of hydropower capabilities and a further exploitation of the irrigation potential of rivers are key emphasis of China's fifty-year infrastructure development programme (Western Development Programme) launched in its western region in 1999. Water resources development on the Tibetan plateau is tied also to publicly unveiled plans to take Tibetan waters to China's parched north. Even as new dams and reservoirs are being built or planned.

Dam Construction

The DIIR in 2008 stated that fourteen dams have been designed at the Zachu (Mekhong), with some dams already completed and others under construction. 13 hydropower dams are planned on the Gyalmo Ngulchu in Yunnan province alone. Overall, China has 22,000 existing large dams (Ibid: 24). According to the World Commission on Dams, the Chinese government increased the number of large dams from 22 in 1950 to 22,000 in 2000 (Jissica, 4 September 2007). China has dammed every major river on the Tibetan Plateau-including the Mekong, the Salween, the Brahmaputra, the Yangtze, the Yellow, the Indus,

the Sutlej, the Shweli and the Karnali. China has unveiled plans to dam the rivers that still remain free flowing, such as the Arun and the Subansiri (or Lorochu, which enters India's Arunachal Pradesh to drain into the Brahmaputra). Five major dams have been planned on the Arun near the Tibet-Nepal frontier, with the uppermost dam to be located at Kanggong and the lowest as Shali, almost on the international boundary. Moreover, a series of giant new dams are planned or under construction on the Mekong, the Salween and the Brahmaputra (Chellaney, 2011: 130).

Most significantly, China's water megaprojects have steadily been moving from the Han heartland to ethnically distinct lands-from east to west-with dam-building works now increasingly concentrated in the minority provinces of Yunnan and the TAR along with southwestern belt with neighbouring countries. In 1996, China has quietly built 1,500-megawatt Manwan Dam on the Mekong. Manwan is located 100 kilometers south of Dali in Yunnan. More dams on the Mekong followed in quick succession: 1,350 megawatt Dachaoshan, located in the Dachaoshan Gorge; the 750 megawatt Gonguoqiao; and the 1,750-megawatt Jinghong, near Jinghong city, about 30 kilometers north of Chiang Rai, Thailand- all completed in the first decade of the twenty-first century (Ibid: 131).

Another major dam construction project that China initiated is to build the world's largest dam and hydropower station on the Brahmaputra at Metog (Motuo in Chinese), just before the river enters India. According to the state-run HydroChina Corporation, the dam will generate 38 gigawatts of power, or more than twice the capacity of the Three Gorges Dams, which came with a price of $30 billion. The HydroChina is the charge of conducting the hydropower planning for the upper reaches of the Mekong, the Salween, and the Yellow and the middle reaches of the Brahmaputra- activities that focus on the Tibetan Plateau (Ibid).

China is also building a series of six major dams in the upper-middle reaches of the Brahmaputra, with the construction of the first- at Zangmu, beginning in 2009. In 2005, Li Ling zhu, a former officer of the People's Liberation Army published a popular book titled "Tibet's Waters Will Save China." He has written on how Tibet's water can save China. He proposes that China go beyond damming the Tibetan tributaries of the Yangtze, not

only channeling them north to the Yellow River, but also damming the Yarlung Tsangpo (Brahmaputra) to send water northward (DIIR, 2009: 126). Thus, China has dammed almost all the rivers on the Tibetan Plateau for irrigation and mineral resource extraction. This would give great implication to its neighbouring countries and could turn into hydropolitics and a growing shadow on Asian interstate relations.

The Great South-North Water Transfer Project

China had made water diversion scheme by three major routes-eastern, central and western with the construction of thousands of canals and aqueducts. It will transport about half of the Yangtze River's fresh water in northern China. The South-North Water Transfer Project was one of the infrastructure centerpieces of China's Tenth Five-Year Plan that set economic development priorities from 2001 to 2005. It was seen as a critical step in Chinese President Hu Jintao's "Scientific Development Policy," which relies on engineering, technology, and modern policy to address the nation's important resource challenges (Jaffe and Keith Schneider, 1 March 2011).

According to Zhang Jiyao, vice minister of Water Resources, the Project will have three water diversion routes, namely the East Route, Middle Route and West Route, after 40 years of investigation and analysis. The three planned water diversion routes are designed to connect the Yangtze (Drichu) with the three largest rivers in the north-the Yellow, the Huaihe and the Haihe rivers. The construction of each route will be carried out in three phases respectively. By 2010, the first and second phases of the Eastern Route construction and the first phase of the Middle Route construction should be complete, he added. The Middle Route construction of China's ambitious south-to-north diversion project started in 2002. Total cost of this work will be more than 180 billion yuan (about US $ 22 bn). The construction of the West Route, the largest of the three, will cost over 300 billion yuan (about US $ 36 bn) (People's Daily, 9 February 2002).

The origin of the Great South-North Water Diversion (SNWD) Project actually dates back to 1952, when Mao Zedong had an inspection tour to the Yellow River and he said, "The north of China needs water and the south has plenty; if possible, the north may borrow some water from the south" (People's Daily, 26 December 2001). Two decades later, the Danjiangkou reservoir was built on the Hanjiang River, the longest branch of the

Yangtze, laying a solid foundation for the water diversion project. In 1992, President Jiang Zemin gave full priority of the water diversion.

The western route of the south-north project aims to tap into the waters of the four large rivers flowing out of the Tibetan Plateau-the Salween, the Mekong, the Brahmaputra and the Jinsha. One challenging plan in the larger western route involves building a series of canals and tunnels along a 1,215 kilometer route bisecting the eastern Tibetan Plateau to connect the higher reaches of the Yangtze with the upper catchment of the Yellow.

Some of the most significant problems that have already emerged for SNWD are high water prices, timing and destination, pollution and water supply. Water from the transfer project will be very expensive and the western line will not be finished by at least a few decades as by 2020, China's demand for coal is projected to grow by 1 billion metric tons, a 30 percent increase. Thus, new reserves of coal that would be tapped lie in Xinjinga, Inner Mongolia, Shanxi and Ningxia provinces, supplied by the Yellow River, are too dry to develop since coal production and combustion uses vast amounts of water. Water due to be transported in the eastern line are too fouled with industrial and municipal pollutants to use and the fourth big barrier is that the southern China watersheds tapped by the transfer project may eventually not have enough water to supply the dry north. The water rich south is steadily losing moisture. In 2009, the latest year for accurate figures, total freshwater reserves in the Yangtze River Basin had dropped 172 billion cubic meters, or 17 percent, from 2005 level, according to the China Statistical Yearbook. Thus, transferring water from one region to another is some people's gain and other people's loss. How to coordinate their relations, and how to compensate one's loss is an important problem (Jaffe and Keith Schneider, 1 March 2011).

Urbanisation in Tibet

Urbanisation policy was made explicit in the Ninth Five-Year Plan (1996-2000) and was the core of the Eleventh Five-Year Plan (2006-2010) of China. "Urbanisation in Tibet is a contentious issue" (Yeh and Mark Henderson, December 2008: 1). On the one hand, Chinese government officials suggest that "the only way out for Tibet (i.e., the only way out of its current improvised condition) is urbanisation," and that urbanisation will dramatically improve quality of life. Some scholars asserted that the urbanisation in Tibet

has been used as a tool for economic development in Tibet and this will close the gap between Tibet and the prosperous eastern regions, because it is in fact "the inevitable outcome of the world economic development, and an unavoidable stage" (Ibid: 2). Xu Mingyang, then-deputy Party secretary and vice-chairman of the TAR announced that from 2000-2010, the TAR would aim to raise its urbanisation rate from 9.8 to 22 percent. Urbanisation is thus associated positively not only with economic growth but also with the "peaceful liberation," and the gratitude that Tibetans are said to feel towards the state for lifting them out of a pre-1951 condition officially described as barbaric, cruel, and economically stagnant.

According to the former Prime Minister of the Tibetan government-in-exile Samdhong Rinpoche, "China's policies geared towards increasing the unbanization in Tibet, its ongoing railway construction linking Lhasa to the major cities in China... are clear evidence that China treat the development of Tibet as a means to increase its control of Tibet and to exploit its vast resources" (Sangay, 1999).

The urbanisation in Tibet has been imposed from the development model of the coastal provinces. The policy of town creation and agglomeration is a part of China's drive to urbanise rural areas. Rural townships became urban towns and other towns are consolidated into larger rural townships. Since 2000, every year the numbers of towns have been increased and the numbers of rural townships have decreased in TAR. The greatest increase in the number of towns has occurred in Nagchu prefecture, there were two town in 2001 and then in 2004, there were 24 towns in Nagchu prefecture due to the Gormo-Lhasa railway (DIIR, 2009: 103-4) which led to the increased Chinese migrant workers inside Tibet.

Tibet had very few urban areas before 1950. Progress means urbanisation to China and China is implementing its policy of leap forward development in Tibet. The policy of urbanising Tibet has been pursued for years. Tibet has a large number of nomads who don't move from one place to another every season and such mobile population is becoming a challenge for China to control. Thus, China introduced the policy of resettling Tibet's nomadic population. In 2006, 18,559 people from the Kanlho (Cannan) Tibet

Autonomous Prefecture in Amdo have been forcefully moved into structured permanent settlements and the Chinese government calls it "Comfortable Housing Project".

Comfortable Housing Project

The Eleventh Five-Year Plan introduced the rural reconstruction campaign under the slogan of 'building new socialist countryside'- the "Comfortable Housing Project." The "Comfortable Housing Project" in Tibet began in 2006. According to scholars from the Institute of Social Economy of China Tibetology Research Center, the project is "aimed at improving the living conditions for local farmers and herdsmen and helping them settle down by providing affordable housing to 80 percent of them within five years" (Luorong and Yang Minghong, 28 January 2012).

Under this programme Tibetan villagers are required to build new houses for themselves by taking half of the construction cost as loan from the government. However, nomads are relocated to a place where their livelihood is threatened as such most of the houses remained unoccupied right now. According to TAR government, China had moved 250,000 Tibetan farmers and herdsmen a total of 47,000 households have been shifted into new houses in 2006. The government stated that region invested about 2.5 billion in housing projects in 2006 and apparently they have announced to have plans to improve the housing conditions of all rural Tibetans, who represent 80 percent of the total population of Tibet in 2010 (DIIR, 2009: 109).

In 2010, Chinese officials stated that the Tibet has solved housing problems for 1.2 million farmers and herdsmen from 230,000 farming and herding families and Tibet has accomplished its goal for the comfortable housing project construction more than one year ahead of schedule (Tibet.news.cn, 14 January 2010).

Woeser, a writer from Tibet gives a different view from the Chinese government on the impact of China's "Comfortable Housing" project on the Tibetans. The "Comfortable Housing", together with "Ecological Migration" and the "Settlement of Nomadic People" in Amdo and Kham areas are called as "guiding farmers and herdsmen towards a more modern and civilized lifestyle" by the Chinese government (Woeser, 4 May 2011). "Comfortable Housing" has different emphases in different areas; the most

terrible is the method of "ecological migration". Woeser says, "Not long ago, the government vigorously implemented a large-scale five year plan fostering the settlement of nomadic people from Qinghai Province, leading to fifty three thousand people leaving behind once and for all their nomadic lifestyles" (Ibid). The main reason given was the degeneration of the grasslands caused by too much grazing. However, in reality, decades of continuous mining have been the main cause of the destruction.

The Chinese policy of forced resettlement of Tibetan nomads to permanent structures threatened the livelihoods of the nomads. The issue of Tibetan nomads is the collective violation of human rights; the violation of social and economic rights of the entire people. There has been no dialogue between the Chinese government and the nomads on this policy which should have happened. China claims that they have built infrastructure developments in these resettlements as well. Tibetan nomads are further threatened by the grassland policies of the Chinese government.

Policies on Grasslands

90 percent of the Tibet's grasslands show deterioration. Thus, the Chinese government addressed the grassland degradation through its Planning Programme of National Ecological Environment Construction and Outline of the Eleventh Five-Year Plan (DIIR, 2009: 26). In 2003, China's State Council has released a white paper on Ecological Improvement and Environmental Protection in Tibet. In the white paper, China has detailed policies of grassland ecology protection:

1. Emphasis has been placed on fencing and building water conservancy projects on natural grassland, and raising both the output level of grassland and its carrying capacity per unit area.
2. A pasture responsibility system has been implemented. In line with the principle of limiting the number of grazing animals by the size of the pasture, rotations grazing periods, rotation grazing areas and "no-grazing areas" have been designated.
3. Man-made grassland is being promoted so as to ease the pressure brought to bear on natural grassland by the ever-growing livestock population.
4. Efforts are being intensified to prevent or control hazards caused by mice, insects and poisonous weeds, and to maintain the natural ecological balance of the grassland by utilizing scientific means, and artificial and biological technologies.
5. To build permanent settlements for roving herdsmen, and restore and improve natural grassland has been launched since 2001 (State Council, March 2003).

The 2003 White paper has listed several policies regarding the grassland protection- fencing and building water conservancy projects, pasture responsibility system,

promotion of man-made grassland, prevention and controlling of hazards caused by mice, insects and poisonous weeds and building of permanent settlements for roving herdsmen.

In 2008, China's State Council again stated, "A compensatory mechanism for grassland ecology has been created: a balance is maintained between the grass and livestock; a system is adopted to prohibit grazing, to have a stretch of grassland rest or grazed in rotation; and the numbers of livestock grazing are controlled to prevent it from deteriorating" (State Council, 29 October 2008).

China has introduced 'Pasture Responsibility System' or the Household Responsibility System[12]- "privatisation' of grasslands in the early 1990 (DIIR, 2003: 6; Yeh, 2010). Under this system, land contracts are granted to individual households on a long-term lease (30-50 years). The ownership of the land remains with the State. The rational for the promoting privatisation was based on the assumption that this would give herders the proper incentives both to better manage their land and also to become more efficient market producers (Yeh, 26 January 2010).

Allocation of limited lands to the nomads forced them to sell their livestock to reduce their herds. Since, there are limited herds, male herders remain unemployed and engage in activities like gambling. Moreover, grasslands redistribution creates social tension among the nomads because some have received pastures with access to water and some did not.

[12] Household Responsibility System was introduced in China in early 1980s which replaces the production team system as the unit of production and income distribution. It was an agriculture production system which allowed households to contract land, machinery and other facilities from collective organizations. This institutional change has resulted in remarkable growth in agricultural productivity in China.

Thus, it results the clash between nomadic communities over grassland ownerships.[13] Allocation of small lands to the nomads reduced herd mobility which concentrated herds in limited areas of pastures that becomes overgrazed. This has led to land the serious deterioration of the grazing land.

China's policy of 'retire livestock and restore grassland' (*tuimu huancao*) was introduced in 2003 in Tibet (Yeh, 2003; DIIR, 2009: 32). The *Tuimu Huancao* policy calls for removal of livestock and the complete removal of nomads from grasslands to allow regrow naturally (DIIR, 2009: 32). *Tuimu huancao* calls for grazing bans and restrictions by fencing for the purpose of restoring purportedly degraded rangeland and protecting rangeland. The destocking policy is intended to adjust the herd size to carrying capacity through a reward mechanism for the purpose of protecting rangeland" according to Yunden Nyima (Nyima, 2012). This is done by creating a zone in which grazing is to be permanently banned; grazing zone cease for a several years and to be seasonally closed (Yeh, 2005: 9-30).

The Ministry of Agriculture defines *tuimu huancao* as a basic rangeland construction project that aims to restore vegetation, improve rangeland ecology, enhance rangeland productivity, and promote coordinated development between rangeland ecology and pastoralism through fencing, seeding of grass (bubo), grazing bans (jinmu), grazing restrictions (xiumu) and rotational grazing (lunmu).[14] Tuimu huancao is one of the nine

[13] Violent pasture conflicts are one of the most disturbing features of life on the Tibetan grasslands today. One example is a dispute between Ngulra township herders in Machu county, which lies in Gannan Tibetan Autonomous Prefecture (TAP), Gansu province, and neighbouring Arig herders in Henan county, which is in Huangnan TAP, Qinghai province. This conflict resulted in the deaths of at least twenty-nine Tibetans between 1997 and 1999. The armed conflicts began when Henan county authorities officially assigned approximately 20 km^2 of pasture on the border between the two counties to the Arig. Although Arig herders had been settled in that area for several centuries, the official allocation and fencing of the land made their presence more visibly permanent, provoking the Ngulra Tibetans to assert their land claims. The dispute escalated into periodic armed fighting, involving some 2000 fighters on both sides, using smuggled automatic and semi-automatic weapons. At the time, government officials do not mediate, and nobody was arrested. In December 1997, after the abbot and other senior lamas (religious teachers) of nearby Lahrang monastery intervened, the two sides agreed to come to a peaceful resolution. However, the conflict resumed in March 1998. Both sides reportedly petitioned authorities at the county, prefectural and provincial levels for help in resolving the dispute, but officials only told the petitioners to submit their appeals elsewhere. According to one recent exile from Ngulra, disputants also petitioned central authorities for settlement, but to no avail (See Yeh, Emily T. 2003: 501-2).

[14] Rangeland construction (caochang jianshe) refers to rangeland improvement through man-made measures such as irrigation, seeding, fencing, etc. it is a concept that can be traced back to the early years of the PRC and the underlying principle is that rangeland should be managed like farmland.

programmes designed to achieve China's goals of sustainable use of rangeland resources, improvement of rangeland ecological environment and sustainable socioeconomic development in the National Comprehensive Plan for Rangeland Protection, Construction and Utilisation, which was most recently updated in April 2007 by the Ministry of Agriculture and describes specific targets for China's four different rangeland regions by 2010 and 2020 respectively. For example, the targets set for total jimmy areas and xiumu areas on the Tibetan Plateau are 12 million hectares and 25 million hectares respectively by 2010, and 13 million hectares and 42 million hectares respectively by 2020. Accordingly, *tuimu huancao* will be implemented in all of China's pastoral counties by 2030 (Nyima, 2012: 2-3).

Tuimu Huancao is implemented differently at different places. However, this is implemented quietly forcefully "in the core area of the Sanjiangyuan (the source of the three rivers) National-level Nature Reserve in Qinghai a region which has been dubbed China's "water tower," and is considered vital to the country's ecological security" (Yeh, 2003). This policy led ecological migration where nomads are to be settled in towns. Provincial government gives subsidies to the nomads.

However, *tuimu huancoa* policy has a huge negative impact on the environment because it may not be adaptive for climate change. The presence of moderate grazing helps controlling the effects of global warming on reduction of biodiversity and rangeland quality. Experimental warming leads to decreased species richness, including of medicinal plants, as well as decreased biomass.

Infrastructure Development

"Infrastructure development in Tibet is fully in keeping with China's developmentalist and productivist agenda" (DIIR, 2009: 109). Since, the People's Liberation Army marched into Tibet; infrastructure development has been a crucial task. They have built roadways, railways and airways in Tibet. China claimed that they have come into Tibet to develop the area and liberate Tibetans from serfdom. During the Tenth Five-Year Plan, China invested 15.2 billion yuan (US $ 2 bn) in road construction in TAR. During the Eleventh Five-Year Plan, TAR invested 39.8 billion yuan (US $ 6 bn) in the maintenance and

construction of 17,614 kilometers of road which focused on all highways from Amdo, Sichuan, Xinjiang and Yunnan.

The first airport, the Damshung (north of Lhasa) airport was built in August 1956. It was 4200 meters above sea level. The Gonggar airport (south of Lhasa) was built in November 1966 with an investment of 6.7 million yuan (US $ 0.80 mn). During the Third Work Forum, Gonggar airport was reconstructed and expanded. The Pomda airport was built in Chamdo in September 1994 at the cost of 275 million yuan (US $ 32mn). It is the highest airport in the world, 4,334 meters above sea level. The Nyingtri airport (near the border with Myanmar and India) was completed in July 2006 for 780 million yuan (US $ 97.5 mn). The airport at Dartsedo in the Karze was established in 2008 for 950 million yuan (US $ 119 mn) and Gunsa airport in the Ngari prefecture of western Tibet built in 2007. Tibet has one international air route which is linked to Kathmandu, Nepal (Ibid: 109-10).

The infrastructure development in Tibet has dual purposes. With the construction of infrastructure in Tibet, some evidence of economic benefit to the local population is seen since early 1980s. The second purpose is "military and strategic orientated" (Norbu, 2001: 228) which could bring tight and systematic organisational control of Tibet by People's Liberation Army. Wang Lixiong who spent 15 years researching on Tibet argues that "the main goal of road building was not, as the party claimed, economic development, but rather the creation of a stabilizing group (wending jituan) of Han: administrators and soldiers" (Dreyer, 2003: 424). Thus, roads have little relevance to the lives of the great majority of Tibetans, who live in rural areas.

The Fifth Tibet Work Forum- 2010

The Fifth Tibet Work Forum was held from 18-20 January 2010. President Hu Jintao and other senior leaders such as Chairman of the National People's Congress Standing Committee Wu Bangguo, Premier of the State Council Wen Jiabao, Chairman of the National Committee of the Chinese People's Political Consultative Conference Jia Qinglin, Li Changchun, Vice President of China Xi Jinping, Vice Premier of the State Council Li Keqiang, He Guoqiang, and Secretary of the Party Central Committee's Politics and Law Commission Zhou Yongkang have all attended the fifth meeting on the

work of Tibet (Xinhua News, 23 January 2010). A total of 332 officials representing the Party and central government, the TAR, other provincial-level areas, the People's Liberation Army, and the People's Armed Police attended the meeting (Congressional-Executive Commission on China).

The major focus of the Fifth Tibet Work Forum was to achieve "leapfrog development" and "lasting stability in Tibet Autonomous Region." Leapfrog development according to Hu Jintao means, "the combination of economic growth, well-off life, a healthy eco-environment, and social stability and progress" (Xinhua News Agency, 23 January 2010). This focus of development is evident in many political statement from China's leaders, such as Hu Jintao asserted that "development is the foundation for resolving Tibet's problems". He has consistently urged for Tibet's stability. Thus, he calls for accelerating the pace of development and firm handling the two important projects-development and stability in Tibet (BBC, 6 March 2006; BBC, 9 March 2009).

Hu expressed that the 'separatist forces led by the Dalai clique' is the major challenge to the development in TAR. Thus, he recognised the Fifth Tibet Work Forum's vital role to improve ethnic unity, social stability and national security. China's projection of development in TAR lies on the relationship between stability and economic development. Thus, a high-level work conference in Lhasa held in 1999 issued the following statement: "Tibet's experience in the past years has fully proven that social stability is the prerequisite for economic and social development and progress. Therefore, we must unswervingly wage a struggle against splittism, hold the anti-splittist banner even higher, enhance our consciousness of the struggle against splittism, and safeguard the unification of the motherland" (Tibet Daily, 1999).

The Fifth Tibet Work Forum was the first since the protests and crackdown that siege Tibet in March 2008 (ICT, January 2010). China believes that the large scale protests staged in March 2008 were instigated by the Dalai Lama and the exile-Tibetan government. They labeled the Dalai Lama as a splitist disturbing the integrity of the so-called "motherland" and treated him as a challenge for the development in Tibet.

The forum introduced a new development. It expanded its purview beyond the administrative boundaries of the TAR to include Tibetan autonomous prefectures and counties that are located in the Tibetan-inhabited areas in Sichuan, Yunnan, Gansu and Qinghai – encompassing the eastern Tibetan regions of Amdo and Kham.[15] According to 2000 official census data, there were approximately 5.42 million Tibetans living in China, approximately 2.43 million Tibetans in the TAR and approximately 2.57 million Tibetans in the Tibetan autonomous areas of Sichuan, Yunnan, Gansu and Qinghai (Congressional-Executive Commission on China). According to Gabriel Lafitte, the inclusion of Tibetan areas beyond the TAR is a major step. This restoration of a single policy is a remarkable extent the return of a natural unit (Phayul, 1 March 2010).

At the conference, Hu outlined the guidelines for social and economic development of Tibet in the next decade:

> ...by 2020 the per capita net income of farmers and herds' people in Tibet should be close to the national level. Tibet capacity to provide public service and infrastructure must also be comparable to the nation's average by 2020, through more government investment and better management....agriculture, animal husbandry, tourism, handicraft industry, and resource development would enjoy more support. ... More government budget will go to public services, such as education, medical services, telecommunication, and social security network that cover both urban and rural residents (Xinhua News, 23 January 2010).

Thus, China has paid great importance to Tibet's social services. According to Jia Qinglin, chairman of the National Committee of the Chinese People's Political Consultative Conference, the central government has invested 310 billion yuan (US $ 45.6 bn) in Tibet since 2001 and Tibet's GDP was expected to reach 43.7 billion yuan in 2009 (Ibid)).

Reports on the Fifth Tibet Work Forum in the official media do not indicate a shift in policy on Tibet. The emphasis is still to consolidate central control by further assimilation of Tibet into a unified Chinese state (Congressional- Executive Commission on China). However, there is a new emphasis on improving conditions in rural areas. This

[15] Official statements have tended before to characterize only the TAR as 'Tibet', although Tibetan areas incorporated in four other provinces are defined as 'Tibetan autonomous' prefectures and counties. Geographically, climatically and scientifically this large area is the Tibetan Plateau. China terms it as the Qinghai-Tibet Plateau.

new focus on rural areas could be a positive step, since China's development policy needs to be addressed. However, this emphasis still exists within a model of economic development based on infrastructure construction and resource extraction that has deepened the marginalization and poverty of Tibetans (ICT, January 2010).

The Fifth Tibet Work Forum has not provided any details about infrastructure and aid projects over the decade, or any information about the cost of any projects. This might be because China realized that flooding money in Tibet does not automatically secure loyalty to the state. There were protests from some of the most developed areas of Tibet and other areas from March 2008 onwards.

(Table: 2.3) Human Development Index & its Components by Province (2000/2008)

Province	HDI		Life Expectancy		Education Index		Income Index		Rank of HDI	
	2000	2008	2000	2008	2000	2008	2008	2008	2008	2008
Shanghai	0.8528	0.908	0.8412	0.886	0.8837	0.960	0.8336	0.879	1	1
Beijing	0.8453	0.891	0.8568	0.852	0.9188	0.968	0.7602	.854	2	2
Xinjiang	0.7068	0.774	0.7349	0.707	0.8124	0.953	0.5731	0.661	15	21
Inner Mongolia	0.6790	0.803	0.7248	0.748	0.7709	0.920	0.5414	0.742	22	13
Sichuan	0.6711	0.763	0.7316	0.770	0.7710	0.899	0.5107	0.618	25	24
Yunnan	0.6323	0.710	0.6753	0.675	0.7108	0.871	0.5107	0.585	27	28
Gansu	0.6322	0.705	0.7096	0.708	0.7088	0.829	0.4784	0.579	28	29
Qinghai	0.6249	0.720	0.6926	0.684	0.6637	0.838	0.5184	0.639	29	27
Guizhou	0.6020	0.690	0.6872	0.683	0.7062	0.860	0.4128	0.526	30	30
Tibet	**0.5212**	**0.630**	**0.6421**	**0.656**	**0.4181**	**0.634**	**0.5034**	**0.601**	**31**	**31**

Source: UNDP, China Human Development Report 2000 and 2009.

"Convening of a Work Forum on Tibet, only the Fifth time in the past 30 years brought together all official stakeholders, party and state, to thrash out a new policy. In itself this a sign that Beijing is facing up to its chronic failure to attain its most fundamental goal, of winning the loyalty of the Tibetan people, throughout Tibetan areas" (Lafitte, 1 March 2010). The Fifth Tibet Work Forum has shown great importance to the Tibetan environment. They looked to achieve sustainable development and laid emphasis on environmental protection of Tibet.

Tibet still remains the poorest of the region in Human Development Index (See table: 2.3). Qinghai, Yunnan and Gansu and Sichuan ranked in the lowest in their HDI where Tibetan resides. Thus, flowing of money in Tibet with heavy subsidies and convening Tibet Work Forum meetings needs to clearly see into the main problems in Tibet.

Summary

China convened five Tibet Work Forum meetings in Beijing in the years, 1980, 1984, 1994, 2001, and 2010 to discuss the economic development of TAR. The visit by the Dalai Lama's delegations in Tibet in 1979, 1987-89 protests and 2008 protests in Tibet had greatly influenced the outcome of these meetings. Hu Yaobang in 1980 acknowledged that their policies in Tibet had failed and brought any economic development in the region. Thus, convened the first Tibet Work Forum Conference and introduced many reforms; Tibetans were allowed to own their land, to cultivate and to be managed by individual households. People welcomed the reforms initiated by Hu but the Second reform was contrary to the first reform. Industrial production and exploitation of region's natural resources were introduced which led to the massive influx of Chinese immigrants in Tibet.

"Securing high speed development of the economy and the lasting political stability in Tibet" were the major focus of the Third Tibet Work Forum meeting. 62 economic development projects- transportation, energy and telecommunications sectors were introduced which further facilitated the Chinese to migrate into Tibet. The Fourth Tibet Work Forum continued the policies that were laid down in the Third Tibet Work Forum meeting. Ethnic Tibetan areas (Qinghai, Gansu, Yunnan and Sichuan) were

included in the development policies in the 2010 Tibet Work meeting and they promised to pay great importance to the rural areas' development and their social services.

In 2000, China launched a vast development project entitled the "Opening and development of the Western Regions" of Xinjiang and Tibet, which together comprise one half of China's land mass. This programme included plans to build railways, roads, and airports in the western regions of China, the exploration and exploitation of minerals and petroleum resources, the development of hydropower projects, and increased mainly Chinese, tourism. The Gormo-Lhasa railway project was initiated by the programme which started building in 2001 and opened in 2006. The railway transports Tibet's vast mineral resources to the mainland China and brings hundreds of Chinese engineers and laborers who have built at least 160 hydro dams across Tibet. The construction of railway line still continues inside Tibet.

Mining industry which has been listed as one of the key industries in the Tenth Five-Year Plan of the TAR and dam construction projects still continues to pollute the rivers of Tibet. The untouched mineral resources continue to decrease due to China's vast mining activities. The Gormo-Lhasa railway has contributed in the exploitation of natural resources. Central and the western region of Tibet witnessed the major infrastructure development because of their rich mineral resources. Impacts of the massive exploitation of natural resources are clearly evident from the displacement of the local Tibetans and destruction of the Tibetan environment. Hydropower and mining are intimately connected in the process of development. Electrical power is needed to operate mines, ore processing plants, smelters, and to provide some measure of comfort to attract immigrant workers. Mines provides the economic base to finance the hydropower projects, which are subsidized by Beijing.

A massive influx of Chinese settlers, urbanization, forced relocation of nomads swiftly followed. Thus, China has invested a huge amount in the infrastructure projects, dam constructions, mining projects which boost the Chinese economy. These development policies have not only excluded the Tibetans from economic activities but also threatened the fragile Tibetan environment.

The first hypothesis of the study is that the China's policies in Tibet are aimed at bringing stability and national integration rather than the development of the area. The study proves the hypothesis- the main objectives of all the development policies in Tibet by the Chinese government are to bring national integration, to unify Tibet with the rest of China and build stability in the region. Tibet's location, size, rich natural resources underlines its geopolitical importance. Moreover, its ecological integrity is critical for the well-being of the countries whose water sources originate from the Tibetan Plateau. The Political control over the Tibetan Plateau has gained tremendous leverage to China and Tibet has rich untouched mineral resources and is a water source of many of the South and Southeast Asian countries. Hence, Tibet is a crucial strategic region for China and its policies are meant to hold their power over Tibet and integrate with the China. therefore, Chinese leaders want Tibet to be their integral part of China.

Wen Jiabao during the State Council meeting on 30 March 2011 stated that the maintaining border stability and ethnic unity at the Tibet plateau is a crucial policy of the PRC. Thus, Tashi Tsering mentioned that the political objective of "developing" Tibet is to assimilate Tibet and its people completely into the Chinese "motherland". To ensure long-term "stability" the Chinese government have launched the "Western Development Campaign" in June 1999. Chinese government sees the campaign as to reduce the regional economic disparities and to strengthen its control over Tibet and build unity with the so-called "motherland". Jiang Zemin explicitly said that the campaign has major significance for the future prosperity of the country and the long reign and perennial stability.

The most significant project of the "Western Development Campaign" is the Gormo-Lhasa Railway which operated in July 2006 has accelerated the influx of Chinese into Tibet, further excluded Tibetans from the local economy and which contributed to economic marginalization of Tibetans. The railway also facilitates the swift deployment of military, the exploitation of Tibet's natural resources and threatens both Tibetan nomadic lifestyle and the Tibetan environment itself. Dawa Norbu argues that the China's economic vision of "develop the western" is Han centric in its essence and effect, and envisages a classical colonial pattern of development.

TAR's regional governor Padma Choling stated in the People's Daily on March 2011 that Tibet is developing because official statistics show that TAR's GDP reached 50.8 billion yuan (US$ 7.75 bn) in 2010, with an annual growth rate is 12.4 percent. The per capita net income of both farmers and herdsmen in 2010 hit 4,319 yuan; double that of 2005. He further mentioned that a total of 16 billion yuan was earmarked for investment in Tibet in 2010 and up to 46 percent spent on boosting the infrastructure such as airports, highways, and railways in the region. The Chinese government claims that the development has benefited to the Tibetan people but it rather marginilised the Tibetans in economic terms, threatened Tibetan culture and identity by the massive influx of Chinese and Tibet still remains the poorest region in the China.

However, no matter how much China has invested in Tibet, TAR's human development index (HDI- including life expectancy and education index) is the poorest/lowest among China's 31 provinces in year 2000 and 2008 as well. There is a lack of investment on education and health services in TAR which are the most basic needs of the people. Tibetan ethnic areas of Qinghai, Gansu, Yunnan and Sichuan continue to be the poorest provinces in China. Qinghai rank 29 in 2000 and 27 in 2008 where as Gansu rank 28 in 2000 and 29 in 2008.

China's financial investment in Tibet is substantial, but the emphasis is on the larger infrastructure rather than community-led projects which had seldom benefited the poorest Tibetans. Tibet is highly dependent on the State subsidies and external aid thus it can't become self-sustaining with the present policies. The primary objective of Beijing's investment in Tibet is to exploit its rich natural resources. Central and western areas of Tibet that holds rich mineral resources are the places from where the construction of railways and oil pipelines had to be begun than any other place. Almost all of these projects facilitate supply of raw materials to meeting China's growing demand. Thus, China sees Tibet as a resource extraction colony.

The Tibetan government-in-exile reported in 20003 that the colonialist policy has created two distinct economies in Tibet today. One is centered on the urban and resource extraction exclaves that are heavily subsidized, capital intensive, and dominated by a non-Tibetan populace. The other is based upon the predominant ethnic Tibetan rural economy

which is starved of capital and State support, still subsistence-based in the 21st century, and deprived of the social services concentrated in urban areas.

Hence, Tibetan resistance against the China's control over Tibet still continues, for more than 60 years, and the undying spirit of such resistance is evident from 2008 protests and the present self-immolation cases in Tibet. Beijing thinks the "development" is the solution for instability inside Tibet but the question is on whether development is causing instability or instability is the cause for failure of Beijing's development policies in Tibet. A detailed discussion on the impact of China's policies on the Tibetan environment will be dealt in the next chapter.

Chapter III

Impact of China's Development Policies on the Tibetan Environment, 2001-2010

> Political agenda should be sidelined for five to 10 years and the international community should shift its focus to climate change on the Tibetan plateau... Melting glaciers, deforestation and increasingly polluted water from mining projects were problems that 'cannot wait', but the Tibetans could wait five to 10 years for a political solution.
>
> The Dalai Lama told US diplomats and revealed by secret American cables leaked by the Wiki leaks website (The Guardian, 16 December, 2010).

Tibet issue has been presented either as political or in cultural terms in the international literature where the Chinese government and ethnic Tibetans are considered the foremost player. However, the Tibet issue is much larger and more fundamental than was presented. It is about Asia's water, climate security and its ecological interests. It is also about access to natural resources, ecology which could affect billions of people and securing Asia's future (Chellaney, 2011: 113). The fate of the ecosystem of the Tibetan Plateau affects all the nations and regions downstream. This ecosystem directly or indirectly affects the overall climate of the surrounding areas (UNDP, 2007: 9-10).

The economic development generated by China's productivist goal in Tibet has been soured by the accompanying environmental deterioration in the Tibetan Plateau as well as in China. Such degradation of Environmental is further accelerated by China's development policies in Tibet; the Gormo-Lhasa railway, water megaprojects, mining activities, and urbanisation and infrastructure development in Tibet. The eco-friendly Tibetan Plateau is threatened with wildlife extinction, grassland degradation, desertification, permafrost melt, and water pollution. Soil erosion, desertification, grassland degradation is continuously challenging Tibet's fragile environment.

The chapter studies the environmental conditions in China and the factors affecting the environment in China. Before studying the environment conditions in Tibet it is essential to explore the nature of the Tibetan environment and the traditional environmental management in Tibet. The chapter emphasises on the impact of China's

development policies on the Tibetan environment. China's development policies have been identified in the previous chapter, thus the chapter focuses on the impact of these policies on the Tibetan environment. The environmental degradation in Tibet is a regional issue if it is not a global issue. The implications of the Tibetan environment on Asia will be studied in the chapter and finally the responses of the Tibetan on the environmental degradation in Tibet will be dealt in great length.

Environmental Conditions in China

China has seen rapid economic development as well as severe environmental degradation over the past two decades. China's economic growth has paid significant environmental cost. Although the Chinese government has made a great effort to provide environmental protection, it has been hindered by China's economic development. The rapid economic development in China is causing environmental degradation (Pan, 17 July 2007; Wang, Spring 2006, Chen, 2010). However, in 2010, the Ministry of Environment Protection (MEP) of China has released a report on the environmental protection of China of 2008. The report lists several achievements in China's environmental protection in 2008.

The report states;

1) The environmental system took the combat against financial crisis as a good opportunity to transform the pattern of economic development, restructure the economy and develop environmental cause.
2) Pollution reduction has achieved notable result and some indexes for environmental quality continued to improve. COD discharge and SO_2 emission went down by 3.27 percent and 4.60 percent respectively compared with that of the last year and down by 9.66 percent and 13.14 percent against the 2005 level. The target of SO_2 reduction set in the Eleventh Five-Year Plan was accomplished a year ahead of schedule.
3) Environmental protection in rural areas and conservation of nature and ecology continued to improve.
4) The three basic strategic projects for pollution reduction produced abundant results and the early work of the 12^{th} Five-Year Plan was progressing smoothly.
5) Overall advance has been made in environmental policy and legislation, environmental monitoring, and international cooperation.
6) Positive results have been achieved in environmental planning and capacity building (MEP, 31 May 2010).

The reported stated that the environmental protection in rural areas is continuing to improve and have introduced environmental policy and monitoring, and positive results have achieved in environmental planning and capacity building. These achievements in state's environmental protection have not resolved all environmental problems in China. The major challenge or obstacle of China's environment is the economic development.

Thus, China faces severe water pollution, air pollution, desertification, grassland degradation, and soil erosion.

Environmental Degradation in China

Water and air pollution, garbage accumulation, biodiversity losses, deforestation, soil erosion, grassland degradation, salinisation, disappearing wetlands, and increasing frequency of human-induced natural disasters are the environmental problems that China face today. The MEP of China's 2010 report has identified environmental problems that China still confronts.

1) "Pollution of surface water in China remained serious. In general, the seven major water systems[1] were under slight pollution."
2) The air quality in urban areas across the country was good at large and better than that of last year, but some cities still suffer from relatively serious pollution. The acid rain distribution areas remained stable and acid rain pollution was still serious pollution.
3) Current total area subject to water and soil erosion is 3.5692 million km^2, taking up 37.2 percent of total land area. Among them, 1.6122 million km^2 are subject to water erosion, accounting for 16.8 percent, 1.957 million km^2 subject to wind erosion, talking up 20.4 percent of total land area.
4) At present, rural environmental problems are increasingly prominent and they pose severe challenges. It is mainly reflected by such facts as weak infrastructure for treating rural domestic pollution, worsening non-point pollution, prominent industrial and mining pollution, shift of pollution from cities to rural areas and no effective control of ecological degradation in rural areas (Ibid).

Thrust for rapid development and large population also places great pressure on China's environment and water pollution is the most serious environmental challenge of China. The seven major water systems of China are under slight pollution which led to the water shortage in China. China's water shortage is estimated to be about 40 billion cubic metres, and it is likely to increase to 100 billion cubic metres by 2010. China's water shortage problem could be more serious due to poor water management, uneven water distribution, and water pollution in China (Yang and Teng Siow Song, 2007: 165).

The MEP also stated in the report that the air quality in urban areas across was good but some cities still suffer from relatively serious pollution. The acid rain pollution was serious pollution in China and 37.2 percent of China's total area is subject to water

[1] The seven major rivers are the Yangtze River, the Yellow River, the Pearl River, the Songhua River, the Huaihe River, the Haihe River, and the Liaohe River. The MEP of China stated that these rivers were under slight pollution according to the report.

and soil erosion. China's rural areas face severe environmental problems and its pose severe challenge to China due to weak infrastructure for treating rural domestic pollution, worsening non-point pollution, and prominent industrial and mining pollution. There is a shift of pollution from cities to rural areas and no effective control of ecological degradation in rural areas.

China's environment continues to degrade also due to rapid industrialisation and increasing rates of per capita consumption (Pong (ed.), 2009: 525). With China's opening-up and Deng Xiaoping's market reforms, rapid productivist economic growth has been the policy of China. However; this economic growth had increased pollution and degraded the environment. The outcome of this unsustainable growth is the water pollution where 88 percent of China's waters are polluted by industrial wastes, domestic sewage, and leakage from outdated waste treatment systems and runoff from agricultural fertilizers. In 1994, 134 rivers were tested and 54 rivers are found contaminated, unsuitable even for industrial and agricultural use (Zhuoqiong, 2007).[2]

China continues to build dams and carry out water megaprojects which further deteriorated the environment, threatened people's livelihood, and created environmental migrants. China owns and operates more than 80,000 dams, about 22,000 of which are large dams and mostly built after 1949- Communist takeover. Millions of people were displaced due to dam constructions in China. In 1994, World Bank Report states:

> Since the founding of the People's Republic, more than 10 million people have undergone involuntary resettlement. This experience has not been entirely successful. It is estimated that 25 per cent of resettlers are better off than before, 25 per cent are at the same level as before and 50 per cent are not better off than before. This less than satisfactory situation is the result of inadequacies in regulations, planning, execution, and funding. The need to improve the situation is slowly being recognized (Woort, 1994: 69).

According to World Bank report of 1994, 10 million people have undergone involuntary resettlement in China and 50 percent of the people are not better off their living standards than before. These environment migrants' are forced to resettle at another place where their livelihood would be affected. Zhang Shaoshan, an official of the Office of

[2] Water pollution became more serious in China in the 1970s as industry expanded and the population increased. The Chinese made progress in wastewater treatment during the 1990s and the nature of water pollution changed as the portion municipal wastewater increased and industrial wastewater dropped. Treatment of both municipal and industrial wastewater has increased markedly. Even so, in urban areas 80 percent of surface water is still polluted, and ammonia and nitrogen as the main pollutants, and 50 percent of China's potable water is polluted. Sadly, water pollution has been reported to still be threatening the health of hundreds of cities (See Edmonds in Czeslaw Tubilewicz (ed.), 2006: 122).

Resettlement of the Ministry of Water Resources explains the above problems by saying that from the total number of resettlers, one-third are well settled, one-third are marginally settled, and one-third are poorly settled. An area of land allocated to them after the relocation is much smaller than the land that they owned before. Therefore, the land's productivity is also much lower. Another problem is that the public facilities in some areas are incomplete. So, they face problems accessing transportation, education and so on.

According to the World Bank, 16 of the world's 20 most polluted cities are in China. Almost one third of the country is affected by acid rain. Whereas 2 percent of the cities suffered from highly acid rain in 2000, this had increased to 10 percent of cities in 2004. Another serious environmental problem that China faces are desertification, soil erosion, biodiversity loss, and desertification. Desertification in China is caused primarily by excessive land reclamation and increasing livestock numbers in affected areas (Johnson, 2009). There are many factors which led to the poor environmental conditions in China; one major factor is the population growth in China.

Population Growth and its Impact on the Environment

China has 1.3 billion populations- the largest population in the world. This huge population gives an enormous challenge to China even if it has placed population growth under effective control. This huge population of China brings considerable pressure on resources and the environment. Increased per capita income accompanied by an inevitable growing per capita consumption lead to greater demand on resources and an increase in the amount of pollutants discharged which will have an impact on China's sustainable development (Wang, Spring 2006: 282).

Rapid Economic Development and Environmental Protection

China's rapid economic development period began in the 1980s and the country has quickly passed through the development stages that have taken the developed countries a century. China's economy has grown tenfold since 1978. "China has gone through industrialization in the past twenty years that many developing countries needed one hundred years to complete," said Pan Yue, the Deputy Director of China's State Environmental Protection Administration (SEPA). However, China is experiencing the same growing pains as any other industrialized nations "fundamentally mischaracterizes" the issue (Zissis and Jayshree Bajoria, 4 August 2008; Huang et al., 2010: 221). In fact, China's State Council also agreed on the same argument and stated in the White Paper on

Environmental Protection in China that "a lot of environmental problems that have haunted developed countries in different phases of their 100-year-long industrialization are appearing at the same time in China" (State Council, 5 June 2006).

In 1997, a World Bank study estimated environmental costs of China's Gross Domestic Product (GDP) at 8 percent with 93 percent attributable to air pollution and 7 percent of water pollution. In September 2006, the State Environmental Protection Administration of China (SEPA) and the National Bureau of Statistic of China (NBS) jointly released the first green GDP report. The report indicated that environmental pollution had cost China 511.8 billion yuan (US$ 64 bn) in economic losses, accounting for 3.05 percent of the country's GDP in 2004. The report shocked the government officials. Moreover, China ranked 121st out of 163 countries on the list of 2010 Environmental Performance Index report released by Yale University and Columbia University in 2010 (Huang et al., 2010: 222).

China's economic growth has followed the traditional development model, which depends on high material consumption. "In 2003, China's GDP accounted for 4 percent of the world total, whereas the share of key material consumption was much higher than other countries: steel 27 percent, coal 31 percent, aluminum oxide 25 percent, cement 40 percent, and petroleum 7.4 percent. The energy consumption per unit industrial product in China is 30 percent higher than that in developed countries" (Wang, Spring 2006: 282). China's economic growth comes at the cost of resources depletion and heavy energy consumption. Thus, Environmental management and protection is weak in China because the political structure itself creates unfavorable conditions for the preservation of China's environment.

Environmental Protection- Management and Regulation in China

The structure of China's environment institutions gives local government high degree of autonomy over environment policy and enforcement decisions. All the environment staffs are funded, staffed and controlled at the local level. It is difficult for provincial, municipal, district, and village-level environment regulations to implement national policy and enforce national laws and regulations. Hence, the local government becomes the primary unit responsible for policy implementation (Pong (ed.) 2009: 529-30).

The State Council represents all agencies of the central government in China. Its role in environmental protection is to make major decisions and coordinate the actions of all relevant agencies. The Ministry of Environmental Protection (MEP) is the chief organ for formulating and implementing environmental policies. Other agencies who function directly under the State Council are the National Development and Reform Commission (NDRC), the Ministries of Water Resources, Land Resources, Agriculture, Housing and Urban-Rural Development, Industry and Information Technology, Transport, Commerce, Finance, Science and Technology, Education and the State Forestry Administration. All the 14 agencies mentioned above have the jurisdiction to intervene in and guide local government management by providing information about policies, laws and regulations that are obliged to carry out (Huang et al., 2010: 227). Local government's enforcement of environmental law is weak and mostly overshadowed by the economic development. The officials and ordinary citizens who are concerned over issues of environmental can only complain or stage protests because they have few legal means to redress (Pong (ed.), 2009: 529-30).[3]

Continued internal dissatisfaction with the government's efforts at managing environmental policy led the leadership to designate the Environmental Protection Bureau one of the five new "major bureaus" created by the Eleventh National People's Congress (2008) under a new "major bureau systems". The question is whether the bureau will have authority over other traditionally more influential interests, such as energy and agriculture within the Chinese system. From 2002 and 2007, China has promulgated a series of environmental laws, regulations, practices and standards such as the provisional decision on penalties that can be imposed not only for violation of the letter of the law but also for behavior that is deemed contrary to the intent of national policy, guidelines for public participation in environmental impact assessments and so on (Ibid, 531).[4]

[3] China's environmental social movements are social movements from the small circle to the stakeholders of civilians as the main large-scale street protests. Until few years ago, the enthusiastic participants in the environmental movements is often also just love the natural vanguard of environmental protection, if the scholar: even at a great influence on the Nu River anti-dam event, the participants were mostly environmental NGO, media, academics and cultural celebrities, some college students, and residents of a small part of the local communities involved (See Tang Hao, 18 July 2012).

[4] China suffers from a series of wider 'governance deficits', including a lack of official accountability, public participation, and transparency and weak rule of law. These factors impede the effective enforcement of environmental legislation. It is widely acknowledge that environmental public participation and information disclosure is insufficient. As a result, the public is limited in the extent to which it can hold local officials to account (See Johnson, Thomas, 2009: 10).

Since 2004, China is spending 1.5 percent of annual GDP (Gross Domestic Product) in environmental protection, which is well above the 0.8 to 1.0 percent standard recommended by the United Nations Environmental Program (UNEP). Getting more out of that investment is China's current goal to strengthen and reform environment management. Similar policy applies to Tibet where Chinese government claims of environmental protection in Tibet but China receive more benefits than their investment in environmental protection. Tibetan ecology is threatened and further degraded by human activities. Traditional practices of environmental management are conceived as "backward" by China.

Nature of the Tibetan Environment

Tibet is commonly known as the "Roof of the World", situated at the heart of Asia, lies to the north of India, Nepal, Bhutan and Burma, west of China and south of East Turkistan. The Tibetan Plateau is known as the "The Third Pole" because it holds the largest perennial ice mass on the planet after the Arctic and Antarctica. It holds the more fresh water than any other place on Earth except the two poles. While the water in the North and the South poles are locked up, water sources on the Tibetan Plateau continue to flow into Asia (Chellaney, 2011: 95).

The Tibetan Plateau is the highest and the largest plateau in the world. It has a total area of 2.5 million square kilometers, stretches some 1,500 miles (2,400 kilometers) from west to east and 900 miles (1,448 kilometers) from north to south. It is situated at an average height of 3,650 meters above sea level and many of the peaks reach beyond 8000 meters (CTA, 2011). It is surrounded by the Himalayas in the south, Kunlun Mountains in the north, and Hindu Kush and Pamir ranges in the west (DIIR, 2012).

Tibet is a country of enormous biodiversity regions with the rarest medicinal plants, the tallest of peaks like Mount Everest, landscape extending from tundra to tropical jungles. It is a matchless realm of biogeographically formation and biological diversity with more than 12,000 species of vascular plants, 5,000 species of epiphytes, 210 species of mammals, and over 532 different species of birds. Tibet's forests cover over 25.2 million hectares with trees over 200 years old. The Tibetan Plateau also has rich and untouched mineral resources with deposits of about 126 different minerals accounting for a significant share of the entire world's reserve of gold, chromite, copper, borax and iron (CTA, 2011). "It is a reassure-trove of minerals, including precious metals and the so-

called rare-earth elements" (Chellaney, 2011: 95). Tibet is the World's No. 1 lithium producer and has China's biggest reserves of ten different metals. It is the largest supplier of China's timber, wool and cashmere. The Chinese name for the Tibet since the Qing Dynasty is Xizang, meaning "Western Treasure Land."

Most importantly, Tibet is the source of many of the Asia's principal rivers, which include the Brahmaputra (Yarlung Tsangpo), the Indus (Senge Khabab), the Sutlej (Langchen Khabab), the Karnali (Macha Khabab), Arun (Phongchu), the Salween (Gyalmo Ngulchu), the Mekong (Zachu), the Yangtse (Drichu), the Huangho or Yellow River (Machu), and the Irrawaddy. Tibetan rivers indeed are the lifeblood of the world's most populous nations- India and China and other countries that stretch from Afghanistan to Vietnam in a contiguous arc. They include Pakistan, Nepal, Bhutan, Bangladesh, Burma, Thailand, Vietnam, Laos and Cambodia (see Map: 3.1). These rivers and their tributaries with their origin in Tibet sustain the lives of 47 percent of the world's population and 85 percent of Asia's total population (CTA, 2011). Thus, Tibet remains the source of water for South and Southeast Asia. The plateau plays a triple role: Asia's main freshwater repository, largest water supplier, and principal rainmakers (Chellaney, 2011: 95).

(Map: 3.1) Tibet's River System

Source: (Circle of Blue, 8 May 2008).

Tibet has more than 1,500 lakes spread over 45,000 square kilometers of area holding 608 billion cubic meters of water which constitutes 70 percent of China's total lake-water reserves.

The Indus and Brahmaputra, the two major rivers of Asia originates from the southern Tibetan belt, the Himalaya rim. This region also serves as the head-water to other several important rivers like Karnale and the Kosi, which empty into the Ganges. The Sutlej (Langchen Khabab), 1,550 kilometers long also originates from this belt, the southern slopes of Mount Kailash finally drains into the Indus in Pakistan. The Southeast and eastern part of the Tibetan Plateau is also equally significant source of water. The Salween's primary source originating near the town of Nagchu in the Tibet Autonomous Region (TAR) and the Mekong from the remote Thangla Mountains of Tibet's Amdo Region, now in Qinghai Province. In the southward course, Salween and Mekong run parallel through the Tibetan Plateau into Yunnan before separating, the former entering Burma and the later, joined by the Ngomchu River, flowing into Laos. The Yangtze (Asia's longest river) and the Yellow river also originates from the eastern part of the Tibetan Plateau. The Yellow River originates from the place which China designated the "Yushu Tibetan Autonomous Prefecture" (Yushu, or "Jade Tree," is the Mandarin name for a place, the Tibetan name of the place is Kyegudo). The Irrawaddy, Burma's major river also originates from the Tibetan Plateau is fed by three Tibetan streams in Zayul County, near the border of India. Manas (Lhodrak Sharchu to Tibetans and Norbu Lakchu to Bhutanese) a 376 kilometer river of Bhutan and northeastern India is in Tibet (Ibid: 103).

The Intergovernmental Panel on Climate Change has pointed out that the eleven Asian megadeltas are formed by the rivers flowing from the Tibetan Plateau. These megadeltas are in megacities like Tianjin, Shanghai, Guangzhou, Bangkok, Calcutta, Dhaka and Karachi (Ibid: 97). These megadeltas are "critical diverse ecosystems of unique assemblages of plants and animals located in different climatic regions" (Intergovernmental Panel on Climate Change, 2007).

The Department of Information and International Relations of Tibetean government-in-exile (Dharamsala, India) states that Tibet was ecologically stable before the Chinese occupation and the environmental conservation was an essential component of daily life of the Tibetans. The Tibetan environment remained unspoiled and untouched by

human activities for many centuries due to four major reasons, Buddhist beliefs of the interdependence of nature and human, "remoteness and inaccessibility" (ICT, 2011) of the Tibetan plateau and its long isolation and its "sparse population and its slow economic development" (Dodin, 2008: 206). The size of the Tibetan population was in such that their needs were sufficiently met without disturbing the environment. In the past, the traditional Tibetan economy and religious value systems led to the evolution of successful environmental protection practices (Tsering, January 2009).

Buddhism and Traditional Environmental Protection in Tibet

Historically both Buddhist doctrine and the Tibetan government promoted environmental protection through religious teaching as well as by formal edicts called Tsatsigs. Tibet had constituted and made provision for land use systems and management both endorsed by Boshung Gandhen Phodrang (Tibetan Government) under the leadership of the Dalai Lama and respected by the Tibetan population. Such practices and beliefs became the part of social values and state policy. As early as the 17th century, in the water house year 1642,[5] the Fifth Dalai Lama, Ngawang Lobsang Gyatso, sought to protect the environment. In the tenth month of every year, a decree for the Protection of Animals and the Environment (Rilung Tsa Tsik) was issued in his name. These environmental directives forbade the killing of all creatures, the polluting water sources, the overcutting of forests, and consequent misuse of the land.

In 1901, the 13th Dalai Lama issued a general Decree on Wildlife Conservation.

> From the first month of the Tibetan calendar to the 30th of the seventh month, except tigers, leopards, bears, hyenas, rats and rushu, nobody will hunt, let alone kill the birds of the air, the animals of the hills and forests, fish and otter of the water... in fact any animals dry (land) or wet (water), no matter how big or small. Nobody, however noble or humble, should do violence to them or harm them. All the district officials and governors, instead of exerting all their energy for private gain, should see that these laws are fully and completely enforce.
>
> From the Potala Place, 1901 (DIIR, 2000: 143).

The 13th Dalai Lama, Thupten Gyaltso, the head of the State issued a very detail Decree on Wildlife Conservation. According to this decree, people should not kill animals and gave

[5] Tibetans have traditional way of naming years. From the 12th Century, there was usage of two sixty-years cycles. The first cycle is the rabqung cycle started in 1027. The second cycle was started in 1024 and it was called zhugu gor. The cycles were counted by ordinal numbers, but the years within the cycles were never counted but referred by special names. Each year is associated with an animal and an element. The order of animals is hare, dragon, snake, horse, sheep, ape, bird, dog, pig, mouse, bull and tiger. Fire, earth, iron, water and wood is the order of an elements. 2012 is water dragon year.

district officials and governors to see the enforcement of the laws. In 1944, Tagdra Rinpoche, Regent of Tibet issued another Wildlife Conservation decree:

> For the health of His Holiness the Dalai Lama, for the sake of the Dharma and for the benefit of all sentient beings, the village heads, officials and governors of all districts of Tibet are commanded to prevent the killing of all animals, except hyenas and wolves. The fish and otters of the water, animals of the hills and forests, the birds of the air, all animals endowed with the gift of life, whether great or small, must be protected and saved. Governors must see that the contents of this decree are carried out fully.
>
> 28th day of the seventh month of the Wood Monkey Year [1944] (DIIR, 2000: 144).

Above mentioned decree issued by a regent of Tibet shows great influenced by the Buddhism, it states that the for the health of the Dalai Lama, for the sake of the Dharma and all sentient beings, people should not kill animals. Governors were given the power to see law enforcement. This was fully implemented and Tibetans have always respected the cycle of nature. Buddhism was introduced in the Sixth century and has played an important role in people's preservation of the nature. The concept of interconnection between human beings, animals, nature and non-living elements like rivers, sunshine, sky, mountain valleys are the direct result of Buddhism. In fact it has become difficult to differentiate between the practice of religion and the concern for safety of the environment. For example, land irrigation and cultivation was and is still forbidden during the holy month of Saka Dawa- the month in which the Lord Buddha attained enlightenment. The main reason is that many insects and worms are killed during the tiling process. This has been practiced by the people and the regulation is much influenced by the Buddhist beliefs.

The Buddhist concept of 'interdependence' (CTA, 2011) of both living and non-living elements of the earth have influenced the Tibetan environment protection. Therefore, Tibetans lived in harmony with nature. These beliefs are further strengthened by the Tibetan Buddhists traditional adherence to the "principle of self-contentment": the environment should be used to fulfill one's needs and not to fulfill one's greed. "Buddhism prohibits the killing of animals and advocates love and compassion for sentient beings and the environment" (Ibid).

Tibetan people deeply believe in the world of deities and demons. They believe that mountains, lakes, ponds, springs and river sources are dwelling places of the gods

who protect Tibet. Mountains like Everest (Jomolangma), Amnye Machen, and Mount Kailash (Ghang Rinpoche) are regarded as the abodes of the twelve female guardian deities that were believed to be present at the formation of the Tibetan landscape and civilization and dwelling places of various trans-worldly deities. Even lakes such as Manasarovar (Mapham Yutso), Turquoise Lake (Yamdrok Yutso) and Kononor Lake (Trishor Gyalmo) and others are widely revered as abodes of various female deities such as Vajra Yogini (Dorji Phagmo). Lakes like Lhamo Lhatso and Tsari Yutso are believed to have contributed in identifying the next incarnation of lamas including the current Dalai Lama. The Mount Kailash and the River Ganga are sacred places of worship for the Tibetans and also for many in India and Nepal (Choezin, 2004).

Thus, "this [Buddhism] religion was the principal source of all Tibetan environmental knowledge and understanding" (Huber and Paul Pedersen, 1997: 579). Traditional Tibetans are said to have the same ecological awareness of that developed by Western scientific thought. Yuthok says, "the Tibetan traditional heritage, which is known to be over three thousand years old, can be distinguished as one of the foremost traditions of the world in which the humankind and its natural environment persistently remained in perfect harmony" (Ibid: 579).

Luorong Zhandui and Fan Yibing of China Tibetology Research Center have done a great detailed study on the Tibetan people's traditional way of preserving and maintaining the holy Mount Kailash (Gang Rinpoche in Tibetan)[6] sacred landscape where the environment is rather fragile. According to Luorong and Fan, the Tibetan people of the Mount Kailash have maintained a sustainable way of living and protect the environment in a sustainable way. Many of their practices are greatly influenced by Buddhism and Bon religion[7]. Luorong and Fan states that the People of Kailash's sacred land has a deep respect for nature that shapes their production techniques, their way of life, their social behavior, their traditions and their correspondent culture. In time, all of these elements were gradually extracted by the local people and subjected to their religious perception-

[6] Mount Kailash is situated in the far west of Tibet, near the borders of Tibet, Nepal and India. Kailash means 'crystal' in Sanskrit and the Tibetan name of the mountain is 'Gang Rinpoche' which means 'the precious jewel in the snows.' The Bon call the mountain 'Yung-drung Gu-tzeg' or 'the nine-story swastika.'This area is administrated currently by Purang County of Ngari Prefecture in the People's Republic of China. The Mount Kailash is a holy sacred place for Buddhism, Hinduism, Jainism and Bon.

[7] Bon was the first religion practiced by the Tibetans before the introduction of Buddhism in the seventh century. It reduced its adherents to a minority.

which in turn impacts on their understanding and behavior towards nature (Luorong and Fan Yibing, 4 May 2011).

Thus, Tibetans have traditionally maintained a sustainable living and carried harmonious relationship between human beings and nature. Tibetan nomadic pastoralism in the Tibetan rangeland has been one of the most sustainable and environmentally protective strategies in the traditional Tibet.

Nomadic Pastoralism in the Traditional Era

Tibet's rangeland covers approximately of 70 percent of the total area of Tibet's plateau. It extends from the Northern Plateau of upper Tibet (Jhangthang) to the extreme edge of the plateau, with an average altitude of 4000 to 5000 meters (DIIR, 2009: 17). The Tibetan nomadic pastoral area is a sub-region of the Tibetan Plateau where pastoral nomadism is the dominant land use.

Nomads have been herding livestock on the grazing lands of the Tibetan Plateau for nearly 4000 years. They raise different kinds of animals like yaks, sheep, goats and horses. Each animal has their own special characteristics and adaptation to the environment. Raising mix animals together also maximizes the use of rangeland vegetation more efficiently than a single species would. "This kind of herding .... demonstrates sophisticated adaptive responses by nomads to the complex environment in which they are and the resource availability of them" (Miller, February 1999: 17). Livestock production is much supportive than cultivating agriculture in Tibetan rangeland.

Nomadic pastoralism is an "acculturation by humankind" (Miller, December 1998: 64) to rangeland. Pasture allocation and reallocation was the one of the unique features of the traditional pastoral system. The nomads could use only assigned pastures and households had multiple pastures. Nomads' seasonal migration allows sufficient time for replenishment of the pastures. Over many centuries, the nomads of Tibet have developed a mobile way of life with sustainable use of the entire plateau and an area roughly the size of Western Europe. It has also been characterised as one of the grand progressions in the

evolution of human civilisation.[8]

The climatic condition of high plateau is harsh and extreme and the temperature in winter drops to minus 30 degree Celsius and snowstorms are common in summer. Annual precipitation varies from about 700 millimeter in the east to less than 100 millimeter in the West. Heavy snowfalls devastates livestock but it did not work in negative effect to the rangeland. In fact, heavy snowfall increased the grass growth in the next spring and it reduced the livestock which reduced the pressure on the rangeland and vegetation (DIIR, 2009: 17). Some nomads maintain permanent camps at as high as 5,000 metres.

Moreover, nomads of the Northern Plateau (Jhangthang) traditional systems have survived for centuries without destroying the natural resources because it fostered a balance between highly adapted herds and their challenging environment. According to Richard, "this region is an ecological and cultural landscape that fosters a rich diversity of human interactions within a complex socio-political and biophysical environment" (Richard, 2000: 1).

Thus, Tibetans believe that the environmental protection of traditional Tibet (pre-1949) has been sustainable and Tibetans lived in harmony with nature. Pasture and herd management strategies protected the ecosystem of Tibet's rangeland. Over the centuries, Tibetan nomads had acquired complex knowledge and understanding of the environment in which they lived and upon which their lives depended.

With the occupation of Tibet by China in 1949, China has marched into Tibet in the name of 'liberation' and brought out various economic development policies in Tibet. But these policies implemented by China in Tibet had greatly affected the Tibetan environment. "Leapfrog development of Tibet economy" cost the Tibetan people very dearly.

[8] Pastoralism on the Tibetan Plateau is an adaptation to a cold environment at elevations above the limit of cultivation. For centuries, the Tibetan nomads, drogpas, in Tibetan, and herders have successfully maintained a sustainable and mobile lifestyle, traveling from winter to summer pastures lands and from autumn to spring pasture lands. The grasslands on the Tibetan Plateau represent one of the last remaining agro-pastoral regions in the world. ... through their efforts, they have maintained sustainable use of this area for many centuries. China's grassland policies over the past several decades, however, threaten the sustainability of this delicate environmental balance (See Norbu, July 2012).

Impact of China's Policies on the Tibetan Environment

The Wildlife Conservation Decree issued by the Tibetan government and Buddhist beliefs were the guiding principles of Tibet's environment and people worked within the framework and saved the land from environmental pollution. With the China's control in Tibet, development became the main goal of the People's Republic of China in Tibet. With the introduction of "Western Development Programme" in China in 1999, various developmental programmes were implemented in Tibet such as building of the Gormo-Lhasa Railway, natural resource exploitation, dams and water diversion plans (South-North Water Diversion Project), and urbanisation and infrastructure developments in Tibet. All these development policies threatened the Tibetan people and its ecology. Tibet's environmental condition is degrading and affecting not only Tibet but its neighboring countries as well.

Impact of the Gormo-Lhasa Railway on the Tibetan Environment

The Chinese government has budgeted 26.2 billion yuan (US $ 3.39 bn) for the Qinghai-Tibet railway and allocated 1.54 billion yuan for ecosystem restoration and environment protection (Peng et al., 2007: 546). According to Chinese scholars like Changhui Peng, the Chinese government has adopted "green policy" while constructing the railway to protect soil, vegetation, animals, and water resources. To minimize the negative impacts of the construction, the Chinese government has taken several key measures:

1. Locations where earth was removed and construction sites were placed were carefully selected. Vegetation was then removed from these sites and was restored after the work was complete.
2. Where possible, the railway path was directed around sensitive natural zones, and construction work was confined to the smallest possible area surrounding the railway.
3. Planners detoured around wetlands and lakes wherever possible, and when this was not possible, they built bridges rather than surface routes to minimize the impact.
4. Insulation and temperature-reducing facilities for frozen layers were used below the tracks to stabilize permafrost along the railway line (Peng et al., 2007: 546).

There were four major measures taken by the Chinese government while constructing the railway; locations were carefully selected, vegetation then removed from the sites during the construction were restored after the work was completed, bridges were built to minimize the impact on the sensitive natural zones and finally insulation and temperature reducing facilities for frozen layers were used to stabilise permafrost along the railway line. Peng further notes that the Chinese government has established five natural reserves along the route; Kekexili (Hoh Xil), Qinghai Sanjiangyuan, Chang Tang, Lin-chou

Pengbo, and La-Lu and built more than 33 passageways in the Hoh Xil and Chang Tang natural reserve in Tibet to protect animals and permit undisturbed migration of animals. Building huge railway bridges across three big rivers to protect water bodies were also prioritised. According to China Tibet Online, the railway was named as an "environment-friendly project" in 2008 (China Tibet Online, 30 March 2012) or "green railway in China" (Peng et al., 2007: 546).

However, many international organisations and Tibetans criticised the China's Tibet railway project which caused environmental degradation. Thus, there are two contradictory views from the literatures on the impact of the railway on the Tibetan environment-railway as the 'green railway' which does not harm the ecology whereas the other view states that the railway further degrades the Tibetan ecology. Large numbers of study emphasises the environmental destruction caused by the railway line on the Tibetan Plateau. The Major concern of the ecology of Tibet brings the extinction of wildlife due to the Gormo-Lhasa railway on the Tibetan Plateau. Grassland ecosystems that once supported extensive animal movements and seasonal concentrations of large grazing animals are now seeing habitats diminished by urbanisation and construction of infrastructure like railway line in Tibet. A great number of studies raise the melting of permafrost and its impact on the environment.

Wildlife Extinction

Many of the China's development policies like urbanisation and infrastructure development- railway and fencing grasslands have reduced the number of wildlife on the Tibetan plateau. The most vulnerable of which are the Tibetan antelope or Chiru (a mascot of the 2008 Beijing Olympics). On the Tibetan Plateau, the annual migration of the endangered Tibetan Antelope from their winter ranges to their traditional birthing grounds is an event that reveals 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 (ICT: 214).

The railroads are of enormous disturbance to the migration pattern and the food source of the Tibetan antelope. Studies 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 (DIIR, 2009: 42b). China has built over 33

passageways however; wild animals get deterred by heavy day and night traffic on the highways.

The study of Chinese scholars on 'The Effects of the Qinghai-Tibet Railroad on the Migration of Tibetan Antelope,' underscores that Chiru are active in daytime and their migration season is in summer. But all the construction of the railway and highways and other activities on the plateau are carried in summer too. Human activities like chasing, shouting and taking pictures scare the Chiru herd. Thus, increasing human presence associated with railways and highways may be the main threat to Chiru now, in the future or may be greater than the threat from the infrastructures per se (Xia et al., 19 September 2005).

With the construction of railway, more and more roadways and hotels are coming up on the Tibetan plateau which adds to the degrading Tibetan environment and hindering sanctity of wildlife existence. The Tibetan antelopes are also threatened by "extractive activities, including oil drilling, gold mining, and increasing human settlement" (DIIR, 2005: 43). Another species of antelope, Przewalski's gazelle, is also under serious threat of extinction due to the China's policies of fencing grasslands in Qinghai Province.

The construction of the railway on the Tibetan Plateau has threatened the survival of the Tibetan antelopes. There is illegal poaching of the Tibetan Antelopes for Shahtoosh[9]-[high quality fabric made from the wool of endangered Tibetan antelope] in the 1990s (DIIR, 2009: 39b; UNPO, 2007: 10). It is being used in traditional Tibetan and the Chinese medicines, but medicinal use accounts for a minority of the poaching of the antelope. The main aim of poaching is for shantoosh (DIIR, 2005: 43). Thus, animal smuggling is a serious concern caused by the railway (Peng et al., 2007: 547). In 2003, International Union for Conservation of Nature and Natural Resources listed the Tibetan antelope as a threatened Species (DIIR, 2009: 39b).

Grassland Degradation

Tibet's grasslands have been degraded by both natural force-climate change and human factors-infrastructure development. With the opening of the Gormo-Lhasa railroad that

[9] Shahtoosh is a fabric made from the Chiru or the Tibetan Antelope. It is known for their lightness, warmth and softness. The shawl is sold for very high prices in the luxury markets.

runs across Changthang (Qiangtang) grassland has further added to the degradation. Another major environmental impact of the railroad is the waste disposition. Though, the Chinese government has taken several measures to prevent environmental degradation caused by waste materials, disposal of waste becomes another major impact of the railway.[10]

Permafrost Melt

Tibet is underlined with high-altitude permafrost or perennially frozen ground that has been below zero degrees Celsius continuously for at least two consecutive years. During the past forty years, the permafrost on the Tibetan Plateau has experienced noticeable degradation along the Siling-Lhasa Highway. Such changes in permafrost brought by climate change could affect land desertification, ecosystem deterioration and changes in carbon pools and fluxes. Permafrost degradation can also increase greenhouse gas emissions in frozen layers which further increase greenhouse gases in the atmosphere (DIIR, 2009: 52).

The Siling-Lhasa railroad has been built on 632 km of permafrost, out of which 550 km of continuous permafrost with 190 km categorized as unstable and 100 km as the most unstable (Chinese Academy of Sciences, 14 September 2009). Although railroads and oil pipelines have been built on permafrost since the early 1900s in Alaska, Canada and Russia, these projects require extensive maintenance. The Russian railway which the Chinese researchers modeled their engineering experienced a 30 percent failure rate and nearly a third of the track had to be reconstructed every few years.

Some Chinese scholars have done study on the effect of climate change and the engineering activity on the permafrost on the Qinghai-Tibet Plateau. According to these Chinese scholars, the effect of the climate change is larger than the effect of engineering activity for cold permafrost, but the effect of climate change is smaller than the effect of engineering activity for warm permafrost (Qingbai et al. 2007, 683).

[10] Direct destroy of vegetation is obvious during road construction. Therefore, vegetation conservation and recovery projects along the road are carried out to alleviate the damage that brings to ecosystems. Besides the habitat fragment, traffic noise and vibration could be impact factors of disturbing breeding or other behaviors (See Zhang et al, 2009: 269).

Zhang Shiyun, General Manager of the Siling-Lhasa Railway Corporation states that they have installed ventilation pipes and thermosiphon to maintain the ground temperature. In thermosiphone, 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. However, the cost of these pipes is very high which demands costly scientific solutions in the maintenance of such problems.

According to a study of Chinese Academy of Sciences, high temperature and the global weather change becomes one of the most challenging issues to the railway on the Tibetan Plateau. If the ecological balance is upset, the consequences will be irrevocable and disastrous. Thus, it is of great importance to the China's Railway Ministry, construction planners, engineers and ecological scientists to work together and maintain the safety of the railroad. Chinese scientists from Cold and Arid Regions Environmental and Engineering Research Institute which designed the railroad also states;

> Environmental management and protection along the Qinghai-Tibet Engineering Corridor is urgent and important for the long-term stability of engineering foundations, and for sustainable development on the Qinghai-Tibet plateau. Proper protection and management require the development of a non-interference plan and acceleration in the enactment and enforcement of environmental protection (laws, regulations and stipulations) based on an extensive and thorough understanding and practical rehabilitation techniques for disturbed or damaged permafrost environments (Jin et al., 2008).

They state that the environmental management and protection of the Tibet railway is urgent. They acknowledge the importance of the long-term stability of the engineering foundations for the sustainable development on the Tibetan Plateau. They raises a very important point in their article- the development of a non-interference plan and thorough understanding of the permafrost environment. Local Tibetan people are never consulted or included in the decision-making process in Tibet. Thus, it is very essential to develope a non-interference from the Chinese government and inclusion of local Tibetans in the development projects in Tibet, this is allow sustainable development in Tibet.

Impact of Mining on the Tibetan Environment

Mining is one of the Beijing's 'Four Pillar' industries in the TAR. China's economic development and industrialization demands huge mineral resources and it invests a massive amount of money on it. Tibet has rich mineral resources which have been kept unhindered for centuries and Tibetans have never exploited their natural resources.

However, to a varying degree, mining activities degrades the environment and creates a danger to both ecology and social systems.

Ever-since the Chinese invasion of Tibet, the Chinese authorities had started conducting surveys and mining Tibet since the 1950s. The mining industry expanded considerably during the economic reforms of the 1980s and 1990s. However, it remained a small-scale business during that period. As China began to face growing shortages of the mineral resources in the domestic and increases in demand, there had been an accelerated exploitation of minerals from Tibet. Infrastructure development also facilitated to natural resource exploitation thus it has become increasingly accessible (UNPO.) But China has failed to see the impact of mining on the environment and mining has not benefited the Tibetans because many of them still live in impoverished conditions. Poor governance and control over mining have in some cases exacerbated its environmental impacts.

The extensive mining activities have led to the destabilisation of fragile mountain slope, degradation of pastures, soil erosion, increased rates of sediments in river catchments, deforestation and other perils such as contamination of water, air pollution and noise pollution. Mining activities had completely damaged the landscape of the Tibetan plateau. Despite protests by the local population, the pastoral land of Tsalung, Diru, Kham has turned into a mining zone. Nomads and farmers of Nagchu, Central and Eastern Tibet have raised their objections when gold mining activities began on their pasture land but yet no positive result was achieved so far (DIIR, 2000: 95).

On 7-8 August 2010, at least 702 people were killed, 1,042 went missing and thousands of people left homeless by the mudslides in Drugchu (Zhouqu) County in Khalo (Gannan) Prefecture of Gansu Province. China had only rainfall to blame for this horrific disaster but according to Beijing-based Tibetan writer Woeser; it was mainly caused by man-made disaster, damming the valley, mining and deforestation. She noted that there are 47 hydroelectric power plant construction projects in the region at present, out of which 15 of them have already been built and 14 others are under construction (Tibetan Review, 11 August 2010). Mining waste contaminates the water bodies and leads to substantial reductions in water quality and destruction of aquatic ecosystems.

Water Pollution

Water pollution is a major challenge that China continues to face today. It is caused by three main factors: sedimentation, acid mine drainage, and metal deposition. The erosion of waste from rock piles, or runoff after heavy rainfall, increases the sediments of nearby water bodies. High sediment concentration increases the turbidity of natural waters, which reduces the light that is available to aquatic plants for photosynthesis. When the sediments settle on the streambed, it reduces the depth of the streams which often led to flood. Mining may also modify stream morphology by disrupting a channel, diverting streams flows or changing the slope or bank stability of the channels, which significantly reduces the water quality (WRI, 2003).

The most serious concerns in water pollution is acid mine drainage. When sulphide-bearing minerals such as pyrite or pyrrhotite are exposed to oxygen or water, it produces sulphuric acid. Many of these sulfide minerals originate from waste rock removed from the mine or from tailings. Waste rock, which accounts for more than 80 per cent of the rock mined at many copper sites, tends to contain high concentrations of sulphide, toxic metals and non-metals. These waster rock piles are often the source of acidic effluents. This acid mine drainage is hazardous to human beings if acidic waters are discharged into nearby streams and surface waters and have severe impacts on aquatic life (DIIR, 2009: 177c).

Most mining operations use certain reagents or heavy metals, such as cyanide, mercury and other compounds, to process valuable minerals. Syanide and mercury particularly value for their conductive properties and are therefore in frequent use. The release of metals into the environment can be triggered by acid drainage or through accidental releases from mine tailing impoundments. While small amounts of heavy metals are considered essential for the survival of many organisms, large quantities are toxic. An aqueous concentration of heavy metals has disastrous impacts on both plant and animal species (Ibid: 177-78c).

A study revealed the presence of concentration of zinc in the tributary of the Gyalmo Nyulchu (Salween River) and relatively high concentration of nickel was identified in a tributary of the Drichu (Yangtse). Though the origin of these elements is not known but it could be caused from mining activities (DIIR, 2009: 40b). Tibetan scientists

stated that there is already a natural heavy metal load in the river, and if there is any leakage from the hillside dam waste tailings could be disastrous. This will affect the rivers flowing downstream India and Bangladesh, if the planned water diversion of Tibetan rivers to the Yellow River (Huang He) includes capturing the Yarlung Tsangpo is to be executed, China's water purity would also be threatened (Laffite, 11 October 2011).

Gyama (Jiama) mine is in TAR and it is a threat to the purity of the water in Tibet's most sacred city, Lhasa (capital of Tibet) controlled by Vancouver-based China Gold International. The area is unstable and vulnerable to earthquakes. The mine is close to the route that is to be built from Lhasa to Nyingti (Nyingchi). It poses a serious threat to the downstream rivers. Due to its environmental destructive mining operation in the region, Tibetan villagers in the Gyama Township of Maldrogungkar County, Lhasa protested on 20 June 2009 (Tibetan Review, 19 August 2009).

Mining is a significant emitter of GHGs (greenhouse gas). To produce just one tone of copper, around 125 tons of ore are excavated. A total of 2.5 million tons of soil will be excavated yearly. Thus, mining destroys whole of permafrost soils and it pollutes the water and poison aquatic lives and inject more GHGs in the atmosphere. It harms human health, livestock, and wildlife.

Health Deterioration

Mining impacts on the water as it contaminates the water. Tibet is the source of all the rivers that runs into 10 neighboring countries. Therefore increased water pollution and siltation of rivers affects downstream countries. Dozens of ferro-silicon, steel, aluminum and silicon carbide plants release their daily dosage of thick poisonous smoke. This is hazardous to human health and local people. Deaths, injuries and human and animal birth deformities in nearby mining areas are all caused by the mining in Tibet.

People living in the town (in the southern Ural Mountain of Russia where copper mining activities are carried out) show have high rates of congenital defects, central nervous system disorders, cancer and other diseases. Two-thirds of the children suffer from lead, arsenic or cadmium poisoning and many suffer from asthma, respiratory diseases and skin disorders (DIIR, 2009: 39b).

Population Transfer

One positive impact of mining could be the creation of jobs to the local residences. But, that did not happen in Tibet because Tibetans are restricted in mining jobs. China's policy of implementation of development is at local level, thus these jobs are rewarded for non-Tibetans. Chinese immigrants are paid intensives to work in Tibet and conditions are more favorable for them to take jobs in Tibet. Tibetans often failed to compete with these skilled Chinese migrant workers. International Committee of Lawyers for Tibet submitted a memorandum at APEC People's Summit in 1997 in Vancouver, Canada on Human Rights and the Long-term Viability of Tibet's Economy. They state: "...majority in Tibet are Chinese... Chinese control virtually all significant government jobs and most large business firms. As a result, a disproportionate number of public and private jobs are held by the Chinese. Development projects, including infrastructure, mining, logging and industrial projects, import most labor from China" (Tibet Justice Center, 2010).

Thus, mining activities led to the massive migration of Chinese labour and technicians into the Tibetan regions. This rapid increase of population in the region gives extra pressure on dwindling natural resources. It further results in shrinking of arable land, loss of biodiversity and increased exploitation of natural resources including forest wealth. Amdo (Qinghai) has witnessed a large number of Chinese settlers and the government had built several towns to accommodate the workers. The government gives incentives in the form of tax breaks and lower interest loans and plus subsidies from Beijing are provided to attract more Chinese settlers and workers into Tibet.

Deforestation

Forests play a very crucial role in the environment. It controls stream flows, maintains ecological services, stores carbon, generates rainfall and climate, and conserves soil. It is a home for 90 percent of the land-based plants and animal on the plateau. Tibetan Plateau has trees of tropical-montane and subtropical-montane coniferous forests, with evergreen spruce, fir, juniper, pine larch, cypress, birch, and sclerophyllous oak. Yet, Tibet's forests rank among the most endangered forest ecosystem. Continued deforestation disturbs the water-runoff regime and reduced natural habitats and native species.

Deforestation in some Tibetan regions has serious implications for freshwater reserves and stream-flow regimes and the survival of endemic species due to over-cutting, inaccurate government reporting of forest cover, and poor land-use decisions (Chellaney,

2011: 119). Logging has been carried out by China for more than six-decades until 1998, the devastating flood in the Yangtze basin which killed more than 4,000 people.

Social Unrest and Anti-Mining Protests

Tibetan local people have continuously raised the voices on the negative impacts of mining on their land but local authorities ignored their pleas. The Chinese companies engage in mining activities upon the places that are sacred for the Tibetan population that causes great resentment and anger which is demonstrated in the form of protests staged by the local Tibetans. Such peaceful protests which are crushed down with violence and imprisonment of innocent Tibetans further added to their resentment. The hostility caused by the disregard of sacred places and not respecting the sentiments of the local residents caused by mining activities in many places in Tibet is another growing concern.

On 6 March 2012 Phayul (Online news website) reports that a group of monks from Lingka Monastery, Tamo town and Xietongmen county, TAR have been jailed for four or five years by the court in Shigatse Prefecture of TAR for protesting against rampant Chinese mining in their area on 22 November to 18 December 2011. Tamo Town is internationally well-known for copper and gold. (Tibetan Review, 6 March 2012). In another protest, Chinese police in Dzogang Country of Chamdo Prefecture, TAR had arrested a total of around 50 Tibetans for protesting against several mining projects in the area in June and July 2011 (Tibetan Review, 7 August 2011).

In 2010, Chinese police in Palyul (Baiyu) County of Karze (Ganzi) Prefecture in Sichuan Province has opened fire on a group of Tibetan villagers petitioning against a greatly expanded Chinese gold mining operation in their area on 17 August. They have killed four and injured 30 local Tibetans. The Tibetans demanded compensation from the government for environmental damages and livelihood harms by mining (Tibetan Review, August 29 2010).

In May 2010, local Tibetans in the U Yuk Sogchen sub-district of Namling Shigatse protested against the gold mining in the region after repeated appeals to the local authorities for an end of the hazardous gold mining (Phayul). Mining led to the destruction of the local environment, it caused soil erosion, and frequent rainfall, heavy hailstorms and many wild animals and birds have died due to the toxic gases released from these mining activities.

Zhang Qingli, secretary of the Tibet Autonomous Regional (TAR) Committee of the Communist Party of China remarks, "we have to accelerate exploration to know what we have before planning how to make of it... exploitation should be conducted in an environmentally friendly was and help create job opportunities for local people and raise their income" (Phayul, 17 August 2012).

Tenzin Norbu, head of the Environment and Development Desk of the Central Tibetan Administration notes that the China also claims to have benefited Tibetans from its mining activities but it was never practical. He argues, "Promises of job creation and raising income levels were made to the local Tibetan residents of Phondo, Lhundrup Zong and many other mining areas but they were turned down during the actual mining period. Mining protests relating to environmental negligence and pollution are frequent in Tibetan area" (Ibid).

There have been many protests against China's mining activities in Tibet and its lack of proper protection of the environment. But China's goal of 'leap forward development' never stopped them from these activities. Moreover, mining activities are increasing in Tibet and it is becoming transnational in nature. For instance, Continental Minerals, a Canadian subsidiary of the Hunter Dickinson group is developing the gold, copper and silver deposit in Shetongmon (Xietongmen), with an announced intention to mine 10 million tonnes of rock annually, from which 50,000 tonnes of copper will be smelted. The water supply to this smelting is drawn from the Yarlung Tsangpo (Brahmaputra river), which is less than one kilometer downhill from the mine. The mine was scheduled to begin operation in 2010, when the rail line extension to Shigatse will be complete. Tibetans fear that once the operation starts, it will harm the ecosystem, pollute the river and affect the people of downstream (DIIR, 2009: 178c).

With the development of mining industries, there is growth of national economy but benefits are not equally shared. The local residents are the most affected by the mining activities in Tibet. According to the Department of Information and International Relations of the Tibetan government-in-exile,

> The authorities at provincial, Prefectural and county levels enthusiastically promote mining and see little reason to propose caution on environmental or social grounds. On the contrary, they have vested interests in extracting the resources as quickly and cheaply as possible. Until now, there has been no involvement of local people in the decision-making process, and the affected regions are largely beyond

any effective policing by environment agencies or local authorities (DIIR, 2009: 197c).

Thus, DIIR greatly gives concern over the non-inclusion of local Tibetans in the decision-making process in the development projects in Tibet. They also see provincial, Prefectural and county level authorities promoting mining in Tibet without giving any concern to the fragile Tibetan environment. Profit is the only goal in mining in Tibet and the environment protection has been given very little concern in it.

Impact of Water Megaprojects on the Tibetan Environment

"The Tibetan Plateau's vast freshwater supply is emerging at the center of the increasingly tense political and cultural strife between China and Tibet. Tibet's vast water resource is an important cultural and political strategic element that China intents on managing and controlling" (Schneider and C.T Pope, 8 May 2008; Chellaney, 2011: 129). China is one of the planet's most arid regions where a quarter of its land is desert. Each year, hundreds of square miles of grasslands are turning to desert. China's waters are either too polluted or filled with silt to provide the China's 1.3 billion population with sufficient fresh water. China has their eyes on Tibet's water resources long back. They have built dams in Tibet for hydropower and transport water hundreds of miles north and east of China for agriculture and industries purposes.

Mining, deforestation and other industrial activities are polluting Tibet's water system. In March 2007, Report of global environment organisation, World Wildlife Fund (WWF) stated that the four of the world's ten most endangered rivers are in Tibet: Drichu (Yangtze), Gyulmo Nyulchu (Salween), Zachu (Mekong), Sengye Khabab (Indus) due to dams, pollution, overfishing and climate change. There is a rise of temperature (global warming) that causes the melting of glaciers, faster than anywhere else in the world. In some regions in Tibet, it decreases by three feet (9 meters) per year. "At least 500 million people in Asia and 250 million people in China are at risk from declining glacial flows on the Tibetan Plateau," said Rajendra K. Pachauri, chairman of the Intergovernmental Panel on Climate Change. Glaciers serve as the storehouses of fresh water. During the cold weather the glaciers grow with snows and it melts in the hot seasons. The climate change increases the runoff and gradually the glaciers melt and possibility of water crisis occur. The effect of a shortage of water supply would have to be faced by the neighboring countries and possibly China would be the most affected due of its huge pollution.

A study done by the Ministry of Foreign Affairs of PRC and the United Nations states;

> Due to imbalanced regional ecological rehabilitation, the western part of China, especially northwest China, struggles with huge challenges to environmental sustainability. The vulnerable ecosystem in western China is a leading factor restricting socioeconomic development there. It is also critical to the rest of the country because it is the origin of the northwest monsoon wind and the main rivers (Ministry of Foreign Affairs of the People's Republic of China and United Nations System in China, 2008: 60).

Both the Chinese government and the United Nations acknowledge the importance of the ecosystem of Tibet for the rest of the country because it is the origin of the northwest monsoon wind and the sources of the main rivers in China. The vulnerable ecosystem in Tibet is the leading factor restricting socioeconomic development in Tibet. However, China is increasingly exploiting the water resources of the Tibetan Plateau. Northern and Central provinces of China has used unsustainable water consumption patterns in agriculture and industry. The Huai River basin, an intricate network of river, lakes and fishing villages have over-exploited and contaminated the water resources in mainland China.

(Table: 3.1) Threats to Tibetan Rivers

River	Percentage of Forests	Percentage of Original Forest Lost	Percentage of basin protected	Dams in basin
Sengye Khabab (Indus)	0.4	90	4.4	(3)
Yarlung Tsangpo (Brahmaputra)	18.5	73	3.7	(3)
Gyalmo Ngulchu (Salween)	43.4	72	2.2	4 (5)
Zachu (Mekong, Ch: Lancang)	43.2	80	3.8	22 (25)
Drichu (Yangtze, Ch: Chang Jiang)	6.3	85	1.7	63 (101)
Ma Chu (Yellow River, Ch: Huang He)	1.5	78	1.3	40 (47)

Source: (D. Viviroli et al., 2003: 23-40) (UNEP, 2005) cited in (DIIR, 2009: 127)

- Figures in brackets are dams under construction with walls of 60 meters high or more.

China is pursuing major inter-basin and inter-river water transfer projects on the Tibetan plateau by putting severe pressure on the natural flowing of water. Furthermore, China has megaprojects for building dams, barrages, and diversion at the southern and southeastern Tibet, close to the other countries which immensely decrease the water flow at the downstream of the river. If the water is consumed or diverted from upstream, it

damages the fluvial ecosystems resulting in reduced water supply downstream. The existing hydro engineering facilities have started affecting the hydrology of the rivers flowing out of the plateau and their sediments loads, besides promoting riparian-vegetative attrition and stream-bank erosion and disturbing or depleting aquatic life.

(Table: 3.2) Hydropower Dam Plans on Gyalmo Nyulchu (Salween River, Ch: Nujiang)

Name of the Dam	Location	Elevation above sea level (in m)	No. of people to be relocated	Dam height (in m)	Status
Song Ta	On the border of TAR & Yunnan	1,950	3,633	307	Designed
Bin Zhong	Nujian Lisu Autonomous Prefecture (Yunnan)	1,690	n/a	55	Designed
Ma Ji	Nujian Lisu AP	1,570	19,830	300	Designed
Lu Ma Deng	Nujian Lisu AP	1,325	6,092	165	Designed
Fu Gong	Nujian Lisu AP	1,200	682	60	Designed
Bi jiang	Nujian Lisu AP	1,155	5,186	118	Designed
Ya Bi Luo	Nujian Lisu AP	1,060	3,982	133	Designed
Lu Shui	Nujian Lisu AP	955	6,190	175	Designed
Liu Ku	Nujian Lisu AP	818	411	36	Site preparation 2003
Shi Tou Zhai	Baoshan Prefecture (Yunnan)	780	687	59	Designed
Sai Ge	Baoshan Prefecture	730	1,882	79	Designed
Yan Sang Shu	Baoshan Prefecture	666	2,470	84	Designed
Guamg Po	Baoshan Prefecture	609	34	58	Designed

Source: Update on Yunnan Hydropower Expansion, a working paper on Chaing Mai University's unit for Social & Environmental Research & Green Watershed, Kunming, PRC, March 2004, cited in DIIR, 2009: 140.

The world's dams are contributing millions of tonnes of harmful greenhouse gases and spurring on global warming. When water flow is stopped, vegetation and soil in the flood area and from upstream are left to rot, as well as fish and other animals which died in the dam which then release carbon dioxide, methane and nitrous oxide into the air (Jissica, 4 September 2007). Thus, the transboundary effects of the China's megaprojects on the rivers have complicated the China's relation with its riparian neighbours. Dam constructions in Tibet have caused great concerns due to lack of democratic decision-making in these projects, lack of transparency, disregard for environmental and social costs and the corruption (Tsering, 2004).

Thus, there are many important issues to be considered while building dams. It should be safe engineering design which is environmentally friendly and sustainable, and the social, economic and financial implications for local communities must be considered before any dam is constructed. United Nations in 2007 mentioned that dam development should follow an informed and participatory decision-making process. The Tibetan people need to be recognized as stakeholders. Compensation should be paid fully to those who are affected by the projects (Tibetan Women's Association: 26-35). Table 3.1 shows that the Yangtze and the Yellow River have the most number of the dams whereas the Indus has lost the 90 percent of its forests.

China's Water Projects and Displacement of the People

With the construction of dams on the Tibet's river, many ethnic Tibetans have been displaced from their homeland. They had to move to other places where they earn less than their homeland. The Pondo Water Control Project in Lhasa is designed to irrigate over 400 sq km and generate 599 million kilowatt electricity annually. However, it draws criticisms for its impact on the massive relocation of people and the environmental impact of altering the landscape and ecosystems (Tibet Third Pole). Displacement of the local residents is also done by the mining activities. There is need of building industries near mining areas which forces people to leave their places. Therefore, it threatens the traditional livelihood of the Tibetan people. Compensation paid for the dislocation is very low. Table: 3.3 shows that large numbers of people get displaced at every dam construction. Compensation is not paid well and it finally affects the livelihood of ordinary citizens whose social and economic condition further deteriorates. Thus, it is very essential to study over before construction of any megaprojects. People's life should not be affected.

Impact of Urbanisation/ Infrastructure Development on the Tibetan Environment

Infrastructure development has resulted in increased mining, hydro power development, poaching, deforestation of watersheds, and agricultural expansion with increasing irrigation, redistribution of domestic animals into more marginal grazing lands and drainage of wetlands (UNEP, 2005). However, China's had prioritised infrastructure development in Tibet since its first march into Tibet. Despite the hazardous implication of these projects, highways, airways and railway projects still continue in Tibet because Tibet becomes strategic location to Asia.

Desertification

In the past, due to global warming and the deteriorating climate condition in Tibet, desertification and other environmental problems had surfaced and these problems are becoming more serious nowadays. Desertification is caused by both natural factors and human-induced factors. The natural factors are the climate, frozen soil conditions, frequent droughts and strong winds are the causes of the desertification. The Tibetan Plateau is high, cold with harsh climate and precipitation is just 100-200 mm per year. The wind, which is the natural cause of desertification, is very strong during winters in Tibet. The drought and windy season occurring in the same period accelerates the desertification process (Yang et al., 2004: 49).

The Permafrost degradation has caused the seasonal thawed layer to thicken, the disappearance of the permafrost layer and the lowering of underground water level, decreased the soil moisture content in the surface layer and an increase in the ground temperature.[11] Therefore, the surface becomes dry and the variation of grasslands and vegetation had also changed. These accelerated the grasslands degradation and desertification. There is a close link between grassland degradation, desertification and permafrost degradation.

If the grassland degradation is not stopped in permafrost regions, the permafrost environment will be destroyed which would result in loss of water and soil which causes desertification. Permafrost layer supplies abundant moisture and special ecological

[11] Permafrost refers to a thick subsurface layer of soil that remains frozen throughout the year, occurring chiefly in polar regions. The permafrost environment is a very fragile ecological environment, once destroyed takes long period to recover or most cases it is irreversible. Desertification is changing the permafrost environment.

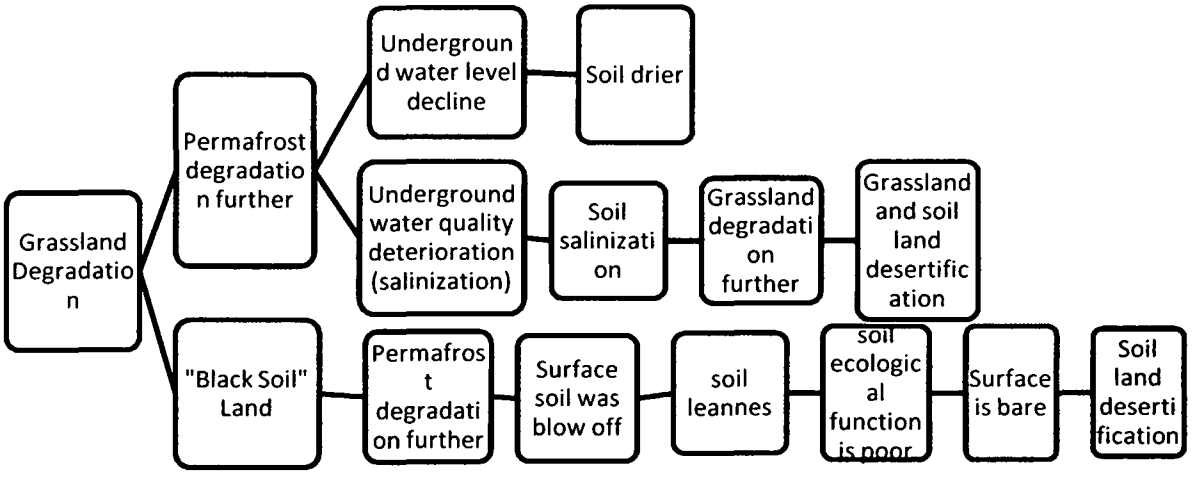
environments for plant growing which restrains the desertification. Degradation of the permafrost would increase the seasonal thawing depth; reduce the surface layer ground temperature and decrease the water content and the floristic number. Eventually it would result will accelerated desertification. Thus, permafrost layer and soil desertification are very much linked with each other and evolved with each other (Yang et al. 2004: 51).

"Human activities are the main factor in desertification now" (Ibid). Rapid growth of the population contributes largely on environmental degradation. Rise of population led to increase in demand of food, meat, mineral resources and fuel which resulted in overgrazing, over cultivating, abusive mining practices for gold, over cutting and digging the vegetation as fuel. All of these factors together lead to accelerated desertification (Ibid).

Grassland degradation

China's 40 percent of the total land is covered with grassland. The majority of the grasslands is found in only a few provinces or autonomous regions: Tibet, Inner Mongolia, Xinjiang, and Qinghai. 60 percent of Tibet's landmass is open grasslands which sustained

(Diagram: 3.1) Succession of the Permafrost and Ecological Environment During Grassland Degradation



Source: (Yang et al., 2004: 52)

Tibetans, their pastoral herds over the millennia. However, Tibet's grasslands are degrading and it imposes grave impact on the livelihood of Tibetan nomads as well as affecting the climates of China and the world. Grassland degradation results in loss of productive capacity, reduces biodiversity values, watershed protection and air quality.

Causes of grassland degradation:

1) Conversion of grassland (the most fertile and lower altitude pastures) to cropland in the Great Leap Forwards of the early 50s and since then abandoned. From 1950s to 1970s grasslands were viewed as wastelands by China. Large areas with better soils and rich water access were converted to crop production as part of the national food self-sufficiency policy.
2) Privatization of communal land, the traditional pastures of semi-nomads, under a new policy to allow commercial development.
3) Growing rapeseed on low-lying pastures-particularly by Chinese settlers and military units-around the pastoral plains of Amdo's Tso Ngopo (Lake Kokonor).
4) Uncontrolled gold mining and illegal harvesting of wild medicinal herbs on grasslands with the connivance of local authorities.
5) Infrastructure development such as highways, airports, new townships for settlers and railroad tracks.
6) Elimination of indigenous predators leading to the loss of natural checks on the population growth of pest species (DIIR, 2003: 4).
7) Sedentarisation: policy of fencing and permanent settlement. The settlement policy restricts the flexibility and mobility of the nomads leading to the concentration of herds in limited areas of pasture that quickly becomes overgrazed.
8) Mountain closure: to facilitate the reforestation program restrictions was imposed upon Tibetans and their livestock by sealing off mountainous areas reducing the already marginal grazing land areas and further exacerbating the shortage of forage availability to the livestock (DIIR, 2008: 27).

Table: 3.3 depict two levels of grassland degradation: degraded rangeland and black soil. The level of degradation, 'degraded rangeland' can still maintain herds but at "reduced levels as grasses dies in patches, invasive species take over, infestations of burrowing animals explode and productivity is reduced" (DIIR, 2009: 22). At this stage the degradation is however reversible with much local labour contribution. The stage is 'black soil' where "the soil is completely exposed to the forces of gales, blizzards, rain, hail and snow, and soon stripped altogether down to bare rock- never to regenerate" (DIIR, 2009: 22). This process is known as desertification. Therefore, rangeland degradation has become a serious threat to both herds and nomads.

(Table: 3.3) Degradation of the Tibetan Rangelands

Tibetan Province	Grassland areas (in sq kms)	Degraded rangeland		Rangeland degraded to black soil	
		1980s	1990s	1980s	1990s
TAR	644,000	18%	30%	15%	16%
Qinghai	316,000	28%	32%	13%	21%
Ngaba/Karze	142,000	27%	33%	9%	13%
Kanlho	161,000	44%	49%	8%	12%
Total (in sq kms)	1282,000	321,000	425,000	169,628	215,240

Source:, Miller, Daniel (ed.) et al., ICIMOD, Kathmandu, 1997, table 5, pp 105-114, cited in (DIIR, 2009: 22).

In 2001, the World Bank states that in China "the total area of degraded grassland increased by about 95 percent between 1989 and 1998, with a notable acceleration in the middle of late 1990s.... It is hard to avoid the conclusion that the most fundamental underlying cause has been poor government development policies" (World Bank, 2001: 24).

Tibet faces the grassland degradation but China blames the plateau's nomads and labeled them as 'backward' and ignorant of the consequences of their actions. Thus, China has adopted policies based on ignorance of the dynamics of grassland ecosystems, and the positive role of nomads and farmers have resulted in misinformed and misguided policies which have harmed instead of helping the animal husbandry (DIIR, 2003: 7). China also claimed that global warming and the general drying up of the Tibetan Plateau are the responsible for grassland degradation.

Few aspects of China's official response to the crisis over grasslands sustainability;

1) During 1980s, China reversed the communisation of grassland. They distributed the land and animals to the nomads. They were forced to live in houses and fence their land. This enclosure policy stopped nomads' mobility and led overgrazed. "Tibet's

pastureland is characterised by a short growing season, marginal terrain and a fragile ecosystem necessitating the nomads to more herds seasonally between varying altitudes" (DIIR 2003: 6).

2) The allocation of land remained unchanged for over two decades despite the expansion of nomad families. Peng Liming of the Qinghai Animal Husbandry Bureau admits in a 1999 interview that the intention of the curb on land to civilize the nomads. Once the children realised that their life will not sustain on land, they will move to Chinese cities (Ibid: 7).
3) In January2003, Zeng Peiyan member of the Political Bureau of the Central Committee of the Communist Party of China and Minister in charge of the State Development Planning Commission said, "one billion mu (66.7 million hectares) of seriously damaged grassland in north China's Inner Mongolia Autonomous Region, northwest China' Xinjiang Urgur Autonomous Region and Tibet Autonomous Region will be removed from grazing in the next five years, accounting for 40 percent of the endangered grasslands in western regions" (China Tibet Information Center, 12 January 2003).

This exclusion of indigenous pastoralists, with their intimate local knowledge of grasslands has alienated the nomads, marginalised them and restrained them from using the native populace's century old wisdoms and knowledge in protecting the environment. China's 2003 white paper boasts of this policy of enclosure, "sealing off mountainous areas to facilitate afforestation...in line with the principle of limiting the number of grazing animals by the size of the pasture, rotation grazing periods, rotation grazing areas and no grazing areas have been designated" (State Council, March 2003). China's non-involvement in the primary stakeholder is quite contrary to global practice. The UN Food and Agriculture Organisation have identified that the Tibetan pastoralists could play an important role in preventing degradation, managing risks, and ensuring sustainability.

Implications of the Tibetan Environment on Asia

Continue destruction of the Tibetan Plateau environment has potentially far-reaching transboundary impacts. The degradation of the Tibetan environment gives a serious implication to Asia and symbolizes some key Asian challenges (Chellaney, 2011; Lowe, 1992). Ecology of Tibet serves the large interest of Asia therefore; it requires the protection of delicate Tibetan ecosystems. Environmental degradation in Tibet affects Asia because "the plateau is a barometer of climatic conditions in southern, southeastern, and

central Asia, as well as in mainland China" (Chellaney, 2011: 111). The Tibet Plateau is witnessing accelerated thawing of its glaciers, degradation of grasslands, deterioration of watershed quality, soil erosion, and water pollution.

The Tibetan Plateau is warming faster and earlier than the rest of China and the rest of the world because of its extremely high elevation. "The average annual temperature in southwest China's Tibet autonomous region is rising at a speed of 0.3 degree Celsius every ten years, higher than the growth rate of the country and the world," according to the Tibet Meteorological Bureau's research titled "Tibet's Climate under the Global Warming Trend" (Xinhua News, 22 July 2007). This rising of climate will give significant impact on climate stability in the rest of Asia.

This is not only because the mountain ecosystem of the Tibetan is a headwaters of many major rivers in Asia, and as an alpine region it is very fragile and susceptible to the rapid loss of habitat such as soil erosion from inappropriate management of natural resources; but also because this ecosystem, directly and indirectly, affects the overall climate of the surrounding areas (UNDP, 2007: 9-10). The degradation of the Tibetan Plateau may have crucial transnational impacts on weather phenomena, like the Indian monsoon.

Extreme weather condition in Tibet gives severe consequences like "receding snow lines, shrinking glaciers, drying grasslands, and desert expansion is increasingly threatening the natural ecosystem in the region," according to the director of the Tibet Regional Meteorological Bureau. "Natural disasters like droughts, landslides, snowstorms and fires are more frequent and calamitous now" (Xinhua News, 21 November 2007).

Another major challenge to Asia- the changing patterns of mountain snowmelt and glacier thawing. The Tibetan and Himalaya glaciers are the water bank built for thousand years. If the present trends of accelerated glaciers thawing continue, this water bank would come empty. Many studies have revealed that 5.5 percent of river runoff increased in northwestern China in the 1990s due to the Tibetan glacier thawing.

Various studies have underscored the link between the ecology of the Tibetan environment and the water related interests of Asian countries including the stability of the monsoonal cycle and weather patterns. It is very crucial to Asia for sustainable managing

of Tibet's fresh water. Ten Asian countries' river sources are from Tibet. China's plan of water diversion and construction of dams have great implication to all the neighboring countries. Both China and India are constructing dams at the great Himalayan watershed. China and India are not only competing its own initiates of dam construction but also aiding other states to tap the resources of the Great Himalayan Watershed. Chinese state-owned firms are involved in dam construction in Pakistan, Nepal, and Burma whereas India in financing in Bhutan and Nepal's dam.

There is a lack of transparency regarding sharing information on dam construction from the Chinese government (Chellaney, 2011: 134; Bansh Jha, 30 September 2011). After the flash floods in India's Himachal Pradesh State, China agreed in 2005 to provide New Delhi with data on any abnormal rise or fall in the upstream level of the Sutlej River, which it has quietly dammed. Furthermore, after the series of flash floods in Arunachal Pradesh State, China, in June 2008, signed a memorandum of understanding with New Delhi to share flood-session data on the Brahmaputra and two of its tributaries- the Parlung Tsangpo and the Lohit (Zayu Qu in Chinese) (Chellaney, 2011: 134).

China's policies of water projects and mineral resources activities have transboundary effects. It is necessary for China to adopt environmentally conscious policies and the Asian countries to take responsibility to protect Asia's fresh water. Otherwise, the 2 billion Asian uses of water flowing from the Tibetan Plateau will experience a serious crisis. Claude Arpi states that the China's control of Tibet's water and its policies are possible geopolitical implications and the imminent threat of armed conflict that could rise due to water shortages in the region. As one Chinese analyst has admitted, "China's water-supply crisis has taken on an international dimension, not only in respect of other countries affected by the pollution in China, but also in disputes over water resources" (Ibid: 129). According to Hari Bansh Jha, " Factors like population surge, industrialisation and other development activities compel a country to control waterways. When such activities begin to affect the livelihood, ecology and growth of the lower riparian countries, they become a source of dispute" (Bansh Jha, 30 September 2011). Jha further says that the tension has been growing in South Asia and Southeast Asia due to China's unilateral decision to construct dams and river diversion projects in Tibet."The ecology of Tibet is an issue of regional if not a global common" (Gautam, 2010: 745).

Tibetan Responses to China's Policies

Tibetans have always raised the issue of environmental degradation caused by China's policy. Reports have been published each year by the Department of Information and International Relation on the environmental conditions of Tibet along with recommendations on the preservation of ecology of Tibet. Tibet people inside Tibet get no legal protection of the Tibetan environment. They could only appeal or protest their concern on the issue to the local government who has the major power of environment. The exiled government raises the issue in the international forum and the Dalai Lama the spiritual head of Tibet has always warned the danger of ecological problems not just in Tibet but also in its neighboring countries as well.

Five Point Peace Plan for Tibet

The Dalai Lama proposed a five point peace plan for Tibet on September 21, 1987 while addressing the United States Congress' Human Rights Cause. Five Point Peace Plan for Tibet:

1. Transformation of the whole of Tibet into a zone of peace;
2. Abandonment of China's Population transfer policy which threatens the very existence of the Tibetans as a people;
3. Respect for the Tibetan people's fundamental human rights and democratic freedoms;
4. Restoration and protection of Tibet's natural environment and the abandonment of China's use of Tibet for the production of nuclear weapons and dumping of nuclear wastes;
5. Commencement of earnest negotiations on the future status of Tibet and of relations between the Tibetan and Chinese Peoples (His Holiness the 14th Dalai Lama of Tibet).

The proposal calls for the abandonment of China's population transfer policy, transforming the whole of Tibet into a zone of peace, restoration and protection of Tibet's environment. However, the five-point peace plan have gained little response from the Chinese government so far.

The Dalai Lama tirelessly raised the concern over the degradation of the Tibetan environment. He states that;

> Tibetans have a great respect for all forms of life. This inherent feeling is enhanced by the Buddhist faith, which prohibits the harming of all sentient beings, whether human or animal. Prior to the Chinese invasion, Tibet was an unspoiled wilderness sanctuary in a unique natural environment. Sadly, in the past decades the wildlife and the forests of Tibet have been almost totally destroyed by the Chinese. The effects on Tibet's delicate environment have been devastating. ... future

generations are threatened by China's lack of concern for Tibet's unique and delicate environment (Ibid).

Above Statement of the Dalai Lama criticized the China's development policies in Tibet which threatened the delicate environment. Such unsustainable development in Tibet threatened the future generations as well. Therefore, we have seen numbers of protests from Tibetans inside Tibet which indicates the failure of Chinese policies in Tibet.

Protests inside Tibet

Many analysts asserted that the recent protests in Tibet in 2008 were caused by China's continuous destruction of the Tibetan environment. "Many analysts assert that the fighting is caused, at least in part, by fear that the Chinese government's long-standing strategy to open Tibet's vast reserves of copper, iron, lead, zinc, and other minerals will accelerate with the railroad's development" (Circle of Blue, 8 May 2008). 2008 protest marked the failure of China's repressive policy towards Tibet.[12] The protest rose cross the Tibet and even beyond the traditional Tibetan areas that have been incorporated in Han provinces. Tibetan protests were against the China's economic marginilisation, Han migration and the ruthless repression on the Tibetan religion and ecology. It was the largest rebellion after 1959, when the Dalai Lama and his followers were forced to flee to India (Chellaney, 2011: 107).

There is a strong sense of grievances that has come with polarize disempowering from the development in Tibet, part of it is expressed by the fact that Tibetans are very disadvantage from economic development because economic development are centered in the urban areas, controlled largely by outsiders (outside government, companies, private investors). Those who can profit from the economic development are those who can speak fluent Chinese, who have connections. So Tibetans are fundamentally disadvantageous. There are also grievances from Haves, also from the Tibetans who do have the government jobs, who have recently been considered the "loyal" to the Chinese

[12] The 2008 March 10-14 unrest are predominantly rural areas, most of which have not seen nationalist uprisings since the 1950s, and some of which enjoy highest level of economic development and educational opportunities of all Tibetan regions of the PRC. If it were true that the majority of rural Tibetans are reconciled with Chinese communist rule and prospering under recent economic policies, Khalho Tibetan Autonomous Prefecture (Chinese: Gannan TAP) in Gansu province and eastern Qinghai, the most affluent Tibetan regions, is closest proximity to urbanising centres in mainland China, should provide the most evidence of this. Instead, they were at eh forefront of the uprising (See ICT, 2008: 15).

government.[13] There are more of nationalism, nationalism here does not mean secession, separating from the state, it is just the identification with more of local control of decision making, how development happens, and its impacts on the local communities, its reaction to disempowerment and also Han chauvinism, certain forms of discrimination that they experience, essentially being ruled by outsiders (Fischer, 2 September 2010).

"40 Tibetans have set their bodies on fire since 2009 demanding the return of His Holiness the Dalai Lama from exile and freedom in Tibet" (Phayul, 17 June 2012). Self-immolation has become a new way of protesting against the failed policies of China on Tibet. Yet, China blames the Dalai Lama and the exiled community for instigating the incidents. They have further tightened their control in Tibet. China believes that development is the solution for all problems but it has failed to resolve the core problems of Tibetans and the situation will get worse in future.

Summary

China faces serious environmental degradation due to its rapid economic development since early 1980s. Some of the major environmental problems in China are water and air pollution, deforestation, soil erosion, garbage accumulation, biodiversity loss, and grassland degradation. The environmental protection and management is weakened in China by political structure where a high degree of autonomy over environment policy enforcement is given to the local government. The local government's enforcement of environment protection is overshadowed by economic development. Thus, local people who have concerns over the environment can only appeal or protest against the activities which threatened the environment.

Similarly, the Tibetan Plateau is threatened by the economic activities and the local government's protection of the environment is very minimum or absent. Tibet has rich natural resources; different kinds of animals, mineral resources, plants and forests. Tibet is the source of many of the Asian's principal rivers and lifeblood of more than 2 billion population in Asia. Tibet is known as the "Roof of the World" or "The Third Pole" which holds the largest perennial ice mass other than North and South Pole. The Tibetan environment remained protected before China's rule over Tibet due to four major reasons;

[13] To recognize Tibetan agency, however, requires recognizing that the protests were over determined, not reducible to one ultimate factor that was determining in the last instance. Many Tibetans, differently positioned within society vis a vis class, gender, religious status and sect, geographical and urban/rural location, took part in the protests, making a wide range of states claims and demands (See Yeh, 2009: 987).

sparse population, slow economic development, long isolation from the rest of the world, and the Buddhist beliefs.

Buddhism played very important in protecting and managing the environment in Tibet. The Fifth and the Thirteenth Dalai Lama issued a general decree on wildlife protection which prohibits killing of animals. The Buddhist concept of 'interdependence' between both living and non-living elements and the 'principle of self-contentment' allowed Tibetans to live in perfect harmony with nature. Lakes, mountains and rivers are respected and considered sacred by the Tibetans hence, Tibetans natural resources remained untouched therefore, and Tibetan people maintained sustainable way of living. Many scholars assert that traditional nomadic pasture and herd management strategies have survived for centuries without destroying the Tibetan environment.

Nevertheless, The traditional method of environmental preservation was disturbed by the Chinese rule in Tibet. Their main objectives of controlling Tibet is to exploit the natural resources and to integrate Tibet with the rest of China's region. Therefore, China thinks that the development is the final solution or method to unify Tibet into the "motherland". However, these development policies carried out by the Chinese in Tibet further degraded the fragile Tibetan Plateau.

In 2000, the "Western Development Programme" introduced various development projects like the Gormo-Lhasa Railway, the South-North Water Diversion, exploration and exploitation of the Tibetan natural resources, urbanisation, infrastructure development and the grassland policies in Tibet. These development projects are the main causes of the environmental degradation and deterioration in Tibet. The second hypothesis of the dissertation states that the China's policies in Tibet between 2001 and 2010 have contributed to the degradation of the environment. The study proves the hypothesis stated above in the following paragraphs. .

First, the Gormo-Lhasa railway has been projected as the symbol of Tibet's development and referred as the 'green railway.' Many scholars however raised the massive environmental degradation caused by the railway on the Tibetan plateau. The Major concern of the ecology of Tibet brings the extinction of wildlife and diminishing of grassland ecosystems that once supported extensive animal movements and seasonal concentrations of large grazing animals by urbanisation and construction of infrastructure

like railway line in Tibet. A great number of studies raised the melting of permafrost due to the railway construction on the Tibetan Plateau.

Second, the Chinese railroad to Tibet- further expanded and extended towards the Himalayan frontiers has helped boost the extraction and transportation of Tibet's mineral resources to China. With the construction of railway on the Tibetan Plateau, many previous unknown deposits of a large number of minerals were found and made Tibet into one of the most important mining centers in Asia. Mining poses devastating social, economic and ecological consequences for the local Tibetans. Mine operations particularly affect the environment, especially gold and copper mining, which use strong chemicals like cyanide or arsenic in the processing stage are very harmful chemicals to both animals and humans. Moreover, it contaminates the water when the waste rocks are discarded from mine sites into the river system which harms human health, livestock, and wildlife because many of the Tibetan people who rely on agriculture based economy are located near the sites of mining deposits.

The most devastating impact of the mining in Tibet is the migration of Chinese labourers into Tibet causing immense pressure on the fragile ecology of Tibet as well as marginalising the Tibetan in both social and economic spheres and sometimes such factors lead to potential conflict between Tibetan residents and non Tibetan settlers. Thus, there are social unrest and anti-mining protests evident in Tibet due to the unsustainable way of mining and China's destructive policies towards Tibet. Grasslands of these areas get degraded due to the mining activities which impact the livelihood of local residents. In some cases entire village of the Tibetan are forced to relocate to provide the land for the mining activities. Thus, mining has degraded the Tibetan environment by degrading the pasturelands, contamination of water and destabilization of fragile mountain slope, soil erosion, deforestation, and air and noise pollution.

Third, another major project in Tibet is the continuous infrastructure development from 1950s onwards. The strategic location of Tibet in Asia forced China to build roads, airports and railways on the Tibetan Plateau. Infrastructure development greatly contributed to the destroying the ecosystem of Tibet.

Fourth, China has introduced a large numbers of water megaprojects in Tibet-building of dams on the Tibetan rivers and diversion of Tibet's water to North China for

irrigation and industrial purposes. These policies have damaged the fluvial ecosystems and reduced water supply downstream. It also led to the water logging, greenhouse gas emission, salinity, affect the aquatic life, and displacement of local Tibetan people.

China's water projects have transboundary impacts such as floods and change of monsoon in the neighbouring countries. Thus, environment degradation in Tibet gives huge implications to the neighbouring countries which should be given major concern. Tibetans have always raised the issue of environmental degradation caused by China's rapid development in Tibet. On 1987, Dalai Lama put forward environmental protection and restoration as one of the Five Point Peace Plan for Tibet while addressing the United States Congress' Human Rights cause. There are continuous protests inside and outside Tibet against the China's policies towards Tibet which gives huge negative impacts of the Tibetan environment.

Fifth, man-made environmental change has already affected the Tibetan nomads. A policy of 'restore the grassland' forced the traditional nomads to move to "retire livestock, restore pastures" in search of menial jobs, endangering the Tibetan's centuries-old tradition of herding yak, cattle, sheep across the plateau grasslands. Thus, the herd levels continue to fall on the plateau.

Therefore, China's development policies have further degraded the Tibetan environment. Human activities of mining, deforestation and dam construction have degraded the watershed promoting soil erosion, sedimentation in lakes and reservoirs. Chinese water projects and other development work led to the influx of Chinese workers which further disturbed the balance between soil, water, and plant species. Diminishing of water resources confronted an ecological crisis to Asia's billions of people. Development projects like urbanisation and infrastructure projects- railways, airports, highways created desertification, grassland degradation and wildlife extinction. If China could have included Tibetans in the decision making process there would be less destruction to the Tibetan environment.

Chapter IV

Conclusion

Since, the beginning of economic reform and particularly since the announcement of the *Xibu da Kaifa,* or "Western Development Campaign" in 2001, "development" has been the special focus of state discourse in Tibet. The development and reform in Tibet has been exceptional from the other western regions, there are high degree of central state intervention, subsidies, emphasis placed on stability. China had convened the First Tibet Work Forum in 1980 marked the end of draconian measures of the Maoist period and set out relatively liberal economic and cultural policies for the TAR. Hu Yaobang, the then Secretary of the CCP acknowledged the CCP's failed policies in Tibet, and introduced reforms which gave relaxation in social and political control and freed peasants from the collectivism which gave a great impact on the agricultural management of Tibetan society. However, the changes in Tibet coincided with the rectification campaign being carried out in the rest of China, thus the reforms did not suggest any preferential treatment but the reforms rather encouraged maintaining the political and bureaucratic control in Tibet.

Four years later, China convened the Second Tibet Work Meeting in 1984 where there was a shift in Tibet's economy from one based on animal husbandry and agriculture on small-scale industrial production to exploiting the region's natural resources. 43 infrastructural development projects were introduced in the urban areas of Tibet whereas 85 percent of Tibetans lived in rural areas. The policy of "reform and opening-up" in China as well as in Tibet led to a massive Chinese migration inside TAR, however, the period was referred a liberal in religion and culture but China's repressive measures continued after 1987-89 demonstrations against the Chinese government in Lhasa.

The main objective of the Third Tibet Forum Meeting in 1994 was to "secure high speed development and the lasting political stability in Tibet." Thus, the Chinese government introduced 62 economic development projects and launched "aid-Tibet cadres" programme to send more Chinese cadres inside Tibet to tighten the internal security. China further expanded its development goal by introducing the "Western Development Campaign"- 'xibu da kaifa' during the Tenth Five-Year Plan (2001-2005) in the western regions- 12 provinces and national autonomous areas. The major reasons of

the policy were to reduce regional inequality between the interior and the coastal and the interior region's discontents. The announcement of the *Xibu da Kaifa* or "Open up the West" campaign launched China's plans to build railways, roads and airports, the exploration and exploitation of minerals and petroleum, and development of hydropower projects. However, no sign of revision in their religious policy by the Chinese leaders led many to question the pursuit of ethnic harmony using economic development.

The purview of China's development policy has expanded beyond the administrative boundaries of the TAR-Tibetan Autonomous Prefectures and counties that are located in the Tibetan-inhabited areas in Sichuan, Yunnan, Gansu and Qinghai during the Fifth Tibet Work Forum Meeting in Beijing in 2010. Great importance was given to the Tibet's social services and rural areas. However, the reports of the Fifth Tibet Work Forum do not indicate a shift in policy on Tibet. The emphasis is still to consolidate central control by further assimilation of Tibet into a unified Chinese state and to bring "leapfrog development" in Tibet.

The Gormo-Lhasa railway is one of the major infrastructural propramme of the *xibu da kaifa* and considered the "shining symbol of development in the eyes of the world" by the Chinese. China has invested huge amount of money in this project. There are contradictory views on the impact of the railway on the Tibetan environment. Chinese officials claim that the Gormo-Lhasa railway project is an "environment-friendly project" and great care has been taken to protect the unique, fragile and sensitive geographical environment of this plateau while building the railway. Many scholars counter this argument by stating that the major concern of the ecology of Tibet brings the extinction of wildlife due to the railway on the Tibetan Plateau. Railway and highways hinder the annual migration of the wildlife like endangered Tibetan antelope. Studies have shown that the largest barrier for antelope reproduction is caused by the highways. Another major problem is the increase of poaching of the Tibetan Antelopes for Shahtoosh (high quality fabric made from the wool of endangered Tibetan antelope).

Scientists have warned that infrastructure development such as the Gormo-Lhasa railway which runs on the permafrost could cause environmental degradation. Permafrost has experienced degradation; such changes in permafrost brought by climate change can affect in land desertification, ecosystem deterioration and increase greenhouse gases in the

atmosphere. Thus, proper protection and management of Qinghai-Tibet Engineering Corridor is urgent for the long term stability of the railway and for the Tibetan Plateau.

Tibet draws a massive amount of tourist and Chinese migrant workers through railway. This further gives pressure on the Tibetan environment and resources and the Tibetan people are marginalized in social, political, and economic spheres. This policy of population transfer into Tibet is to transform the Tibet's ethnic composition just one dimension of a systematic Chinese policy that threatened the survival of the distinct Tibetan culture and the natural environment.

The Gormo-Lhasa also accelerated exploitation of Tibet's minerals by reducing the transport cost and migration of Chinese mine labours and engineers. Today, China can exploit more of Tibet's natural resources because of the railway which are constructed near mineral deposits. The first mineral zone discovered in Tibet in the Tsaidam Basin, Haini prefecture of Qinghai province is connected by rail since 1980s. The railway route has been so planned to make the extraction and transportation of the minerals easier.

China's Western Development Programme has special provision to encourage natural resource exploitation in Tibet and in 2001; the Chinese government has announced "preferential policies on mineral resources' which created a favorable environment to extract Tibet's minerals. Tibet has been viewed as the "treasure house of the west" and the Chinese media routinely announce that the value of the natural resources of Tibet is several billion yuan. Since 1999 to 2005, China has discovered 12 types of mineral valued at more than 1 trillion yuan. The Chinese government acknowledges that Tibet has rich natural resources which could be served as a treasure house for China. Tibet has rich and untouched mineral resources thus; mining is one of the Beijing's 'Four Pillar' industries in TAR.

Exploration and exploitation of Tibet's natural resources have been carried out in a massive way by the Chinese government to fulfill China's demand of raw materials. The extensive mining activities have led to the destabilisation of fragile mountain slope, degradation of pastures, soil erosion, deforestation, contamination of water and ecological migration. Due to water contamination by mining and toxic gases released from these mining activities, people are affected and caused birth deformities in human and animals as well. The mining companies in Tibet totally disregard the sacred places and the

sentiments of the local residents and continue to extract resources. This led to the anti-mining protests in Tamo town, Xietongmen County, TAR in December 2011and another protest occurred in Palyul County of the Karze Prefecture in Sichuan Province in 2010 and anti-mining protests are still continuing in Tibet.

Another major resource that China continues to exploit is Tibet's water. Tibet is the "Water Tower of the Asian" countries and nine major rivers of Asia have originated in Tibet and flows into ten South and Southeast countries; China, India, Bangladesh, Nepal, Bhutan, Pakistan, Thailand, Myanmar, Laos, Cambodia and Vietnam. Due to China's control over the Tibet's water they have initiated large scale water projects like The Three Gorges Dam and the Great South to North Water Diversion which has three major routes-eastern, central and western with the construction of thousands of canal and aqueducts. The South-North Water Diversion Project was one of the infrastructure centerpieces of China's Tenth Five-Year Plan that set economic development priorities from 2001 to 2005. China has constructed large dams and still continuing its projects which gives huge impact on the environment. China's projects of dam construction and water diversion projects to move water into northern and eastern China will disrupt already overstressed water supplies of hundreds of millions of people in south and Southeast Asia.

If the water is consumed or diverted from upstream, it damages the fluvial ecosystems resulting in reduced water supply downstream. Water logging, salinity, greenhouse gas emissions, increase in production of water intensive crops, change in sediment loads through the course of the river and in the delta, aquatic life affected and change in natural ecosystem are the consequences of water projects. A large number of people get displaced and their livelihood gets affected.

Diminishing of water resources confronted an ecological crisis to Asia's billions of people. Thus, With Asia's environmental security tied to the preservation of the fragile natural ecosystems of Tibet, the new megaprojects on the plateau to dam rivers or to divert river waters threaten to wreak lasting ecological damage. China's plan of water diversion and construction of dams have great implication to its neighbouring countries. Ecology of Tibet is one of the major environmental security of the Asia because continuing degradation of Tibetan environment has transboundary impacts. The rise of climate will give significant impact on climate stability in the rest of Asia. Thus, it is essential for all the people who are affected by the China's policies towards Tibet to strengthen their

responses and confront China on this issue. Tibetans have always shown their grievances against the Chinese policies towards Tibet, also from the section of Tibetan who have the Chinese government jobs and labeled them as "loyal" towards the Chinese government. Protests from all parts of Tibetan area proves their discontent and China's massive investment of money have not gained Tibetans' trust and loyalty even after more than 60 years.

Another major development project of the Chinese government in Tibet is urbanisation. Urbanisation policy was made explicit in the Ninth Five-Year Plan (1996-2000) and was the core of the Eleventh Five-Year Plan (2006-2010). Tibetan urbanisation follows the development model of the coastal provinces which involved developing the rural townships into urban towns and other towns are consolidated into larger rural townships. Since 2000, every year number of towns has been increased and the number of the rural townships has decreased in TAR. With the aim to realize the goals of the urbanisation policy in Tibet, the Chinese government introduced "Comfortable Housing Project" in 2006 in TAR which has threatened the stability and independence of the nomads by forcing them to settle in new houses built by taking loans from the Chinese government.

Tibetan herders and nomads are forced to give up their traditional lifestyle and moved to settle in resettlement towns in the name of development. These policies led to four major negative economic and ecological consequences: reduction in pastoralists' claim to their land and its uses, increase in land degradation through overgrazing, opening former pastoral land for mining and forcing former self-sufficient nomads to be dependent on markets. Thus, Tibetans have lost their cultural and economic autonomy as well.

Chinese government's policies on grassland protection have a huge impact on the Tibetan ecology as well as to the Tibetan people. The major policies are the "Pasture Responsibility System"-privatisation of grasslands, the policy of "retire livestock and restore grassland"- *tuimu huancao*, fencing and building water conservancy projects, and promoting man-made grassland. However, many scholars argue that these policies may not be adaptable and sustainable to the Tibetan ecology because the presence of moderate grazing helps rangeland quality. These policies have further harmed the ecology of the Tibetan Plateau and China's infrastructure development also gives massive impact on the ecosystem of Tibet.

China has pursued infrastructural development in Tibet since the beginning of its control over Tibet. The major emphasis on development in Tibet has always been on highways, roadways, and airports. During the Tenth Five-Year Plan (2000-2005) China invested 15.2 billion yuan in road construction in TAR and 39.8 billion yuan during the Eleventh Five-Year Plan (2006-2010). The infrastructure development has dual purposes in Tibet; economic development and military and strategic orientation. It brings tight and systematic ogranisational control of Tibet by People's Liberation Army thus; roads have little relevance to the lives of the great majority of the Tibetans who live in rural areas.

Thus, the economic development generated by China in Tibet has been soured by the accompanying environmental deterioration in the Tibetan Plateau. China's rapid economic growth has also paid significant environmental cost. Economic development overshadows the environment protection in Tibet as well. Under the disguise of development, Tibet's fragile ecosystems are being destroyed and exploited at an increased pace with no checks in place.

In short, China increasingly exploits Tibetan Plateau's natural resources and water, large amount of money has been spent on the infrastructure development in a big way. Between 2000 to 2009 Beijing invested $46 billion in the TAR to help build roads, railways, telecommunication and other infrastructures to integrate Tibet more closely with China and to facilitate resource exploitation. Construction of strategic railroad and express highways paved the way to launch hydropower and other megaprojects on the Tibetan Plateau. China has become a potential water power and controls the rivers which are lifelines for the millions of people. But the Chinese rule over the plateau significantly contributes over the decline of natural resources and environmental degradation.

China's development policies in Tibet are aimed at bringing stability and unifying Tibet with the rest of China. Development has been seen as a solution for attaining the stability and integrating Tibet with China by the Chinese government hence, rapid development has become urgent in Tibet. This focus of development is evident in many policy statements from China's top leaders; such as Hu Jintao asserted that the development is the foundation for resolving Tibet's problems. He has consistently urged for Tibet's stability. Thus, he called for accelerating the pace of development and firm handling the two important projects-developments and stability in Tibet.

The Gormo-Lhasa railway became operational in 2006 and they are further extending within Tibet to connect to the rest of China. The Chinese leaders aimed that the railway will build up ethnic solidarity between the Han Chinese and the ethnic Tibetans. Jiang Zemin admitted that the construction of Gormo-Lhasa railway is a political decision. The railway has accelerated the mining activities and favored further exploitation of natural resources and other development projects in Tibet. China's policies geared towards increasing the unbanisation in Tibet, its ongoing railway construction linking Lhasa to the major cities in China are clear evidence that China treat the development of Tibet as a means to increase its control of Tibet and to exploit its vast resources.

China's projection of development in TAR lies in the relationship between stability-loyalty to the State and Party, in opposition to "splittism" and economic development. A scholar has stated that the stability is a prerequisite for development, but development is also a strategy to increase stability in Tibet. The Tibet Daily in 1999 reported a high-level work conference held in Lhasa, the conference has issued a statement saying that the social stability is the prerequisite for economic and social development and progress. They called for unswervingly wage a struggle against "splittism," to safeguard the "unification of the motherland." The preservation of what China's leaders call "stability" and "unification of the motherland" serves as their justification to maintain state power through control of even religious institutions, as in Tibet.

The extent to which political dissent is made to disappear is thus a key indicator by which the state judges the success of its development in the TAR. Thus, almost any expression of explicit dissent with state policies by Tibetans is subject to interpret and treated as a political threat to national unity. China insists that Tibet is "an internal affair of the China." Brahma Chellaney states that the more the Chinese government sought to present Tibet as a "core sovereignty issue for China; the more it has helped highlight Tibet as a key lingering problem. And the more it has sought to portray Tibet as its "internal" matter, the more Tibet has emerged as a region where Chinese activities hold international implications.

China repeatedly justifies its control over Tibet by maintaining its position that it "liberated" Tibet from feudalism and created a socialist state and ushered in economic development. State stresses those achievements in development that have already been attained. According to the Chinese government, TAR's GDP reached 50.8 billion yuan

(US$ 7.75 bn) in 2010, with an annual growth rate of 12.4 percent. Thus, according to China, it indicates that Tibet is developing and Tibetans have benefited from the China's economic development. However, Beijing has a long tradition of manipulation of statistics by officials to advance their careers and many scholars question the validity of China's statistics. Beijing's large amount of investment has been on the infrastructure build up rather than for the real benefits of the Tibetans.

China's development policies in Tibet have only destroyed the Tibetan way of life while allowing the Han Chinese to profit from the exploitation of Tibet. State subsidies and external aids prevent the Tibetans from becoming self-sustaining while population swamping by the Han Chinese further marginalizes the Tibetans in their own backyard. Macroeconomic policies have created a space for Han migrant entrepreneurs to move in, out-competing rural Tibetans and the urban poor. TAR still remains the poorest/lowest among China's 31 provinces in HDI. More than 80 percent of Tibetans reside in rural areas and they are deprived of the social services. Thus, China's developments have not benefited as the Chinese government claimed, it further degraded the fragile ecology of the Tibetan Plateau. Inequalities in Tibet are urban/ rural and most of the Tibetans reside in rural areas and they are poor.

The Tibetan government-in-exile claims that Tibet was ecologically stable before its occupation and environmental conservation was a part of its culture. They provide four important reasons for the environment conservation by the Tibetans; Buddhist concept of "interdependence", remoteness and inaccessibility of Tibetan Plateau- isolationism, sparse population, and slow economic development.

Buddhism prohibits the killing of animals and believes that the mountains and the lakes are the dwelling places of the protector gods of Tibet such beliefs are deep-rooted in Tibetans which allows them to better protect the Tibetan environment. Decree for the Protection of Animals and the Environment and Wildlife issued by the Tibetan government in Tibet also prohibits the killing of animals. Nomadic pastorialism in Tibet is the great example that has survived for centuries without destroying the natural resources because it fostered a balance between highly adapted herds and their challenging environment. Over the centuries, Tibetan nomads have acquired complex knowledge and understanding of the environment in which they lived and upon which their lives depended.

According to Zhang Yongze, the director of the Environment Protection Bureau of Tibet Autonomous Region (TEPB), the major difficulty for environment protection in Tibet comes from the pressure brought by rapid economic development and the demand for development is urgent, imposing great pressure on environmental protection. The rapid developmental activities have lost touch with ancient tradition and vision and wisdom in protecting the natural ecological balance. The ecological imbalance is caused by the developmental activities by utilizing natural resources and modern technology in an unsustainable method. The pressure of the population and growing demand for resources and poverty which depend directly on natural resources for their survival leads to environmental degradation.

The Tibetans are an ecological ethnicity-a people who have developed a respectful use of the natural resources and consequently a commitment to creating and preserving a technology that interacts with local ecosystems in a sustainable manner. Even today, large numbers of the population are still dependent on agriculture, pastoralism, and nomadic life. Tibet's vast land, low density of population, little knowledge of technology and Buddhist culture has resulted sustainable use of the local resources. China ignored traditional knowledge of subsistence economy and imposed their economy which is totally away from the sustainable development.

Thus, the study highlights that the China's policies of fast-track development based on an urban industrial model in Tibet are contributing to the warming of the plateau, damaging the fragile high-altitude ecosystem, threatening to severely after the natural hydrological regime of the plateau, and excluding Tibetans from the stewardship of their land at a time of environmental crisis. If Chinese efforts to exploit the Tibetan environment continue to accelerate, the end result may be the irreversible impoverishment of Tibet's ecological and cultural diversity, causing yet another of the world's irreplaceable ecosystems and peoples. The vulnerable ecosystem in Tibet is one the leading factor restricting socioeconomic development, thus it is essential to protect the Tibetan environment to bring stability and development in Tibet.

Glossary

Amdo The Indigenously defined region of northeast Tibet, which is currently subdivided between Qinghai, Gansu and Sichuan.

Han This dissertation uses the official terminology for ethnicity in China. Thus, Han are the ethnicity commonly referred to as Chinese, whereas Chinese is accepted as a term that designates citizenship within the Chinese nation. It is acknowledged that this definition is sensitive among minorities because it implies that Tibetans or Uyghurs are Chinese. Nonetheless, here Tibetans will be simply referred to as Tibetans, and for clarification, sometimes the Han will be referred to as Han Chinese.

Kham The indigenously defined region of eastern Tibet, which is currently subdivided between the TAR, Sichuan, Yunnan and Qinghai.

TAC Tibetan Autonomous County, the lower level of autonomous status, incorporated into prefectures. Other minority autonomous areas are similarly designated such as HAC for Hui Autonomous County, TMAP for Tibetan/ Mongolian Autonomous Prefectures, and so forth.

TAP Tibetan Autonomous Prefecture, the higher level of autonomous status given to Tibetan (and other ethnic) areas outside the TAR and incorporated into the other four provinces containing Tibetan areas, namely Qinghai, Gansu, Sichuan and Yunnan.

TAR Tibet Autonomous Region: China's translation of *Xizang zizhiqu*. TAR is largely the same area as U-Tsang, one of the three provinces of Tibet. The term is used in parentheses because it is only half the area and less than half the population of Tibet, and is not genuinely autonomous. Outside of TAR China classifies around 75 counties as Tibetan areas of "autonomous" governance, usually in Tibetan "Autonomous" Prefectures, or *Zangzu Zizhizhou*.

Tuimu huancao Chinese, literally "retiring pasture to restore grassland." A current Chinese policy of compulsory grazing bans, destocking and exclusion of nomads from lands leased to them.

U-tsang The indigenously defined region of Central Tibet. U is the area under Lhasa and Lhoka, the main seat of the Dalai Lama, whereas Tsang is the area around Shigatse, the main seat of the Panchen Lamas.

Xibu da Kaifa Chinese, literally "Open up the Great West" or "Exploit the Great West". More often translated into English as the "Great Western Development" of "Go West". A Chinese policy announced in 1999 to accelerate development in the western half of China, in an attempt to narrow the widening inequality, and alleviate widespread poverty.

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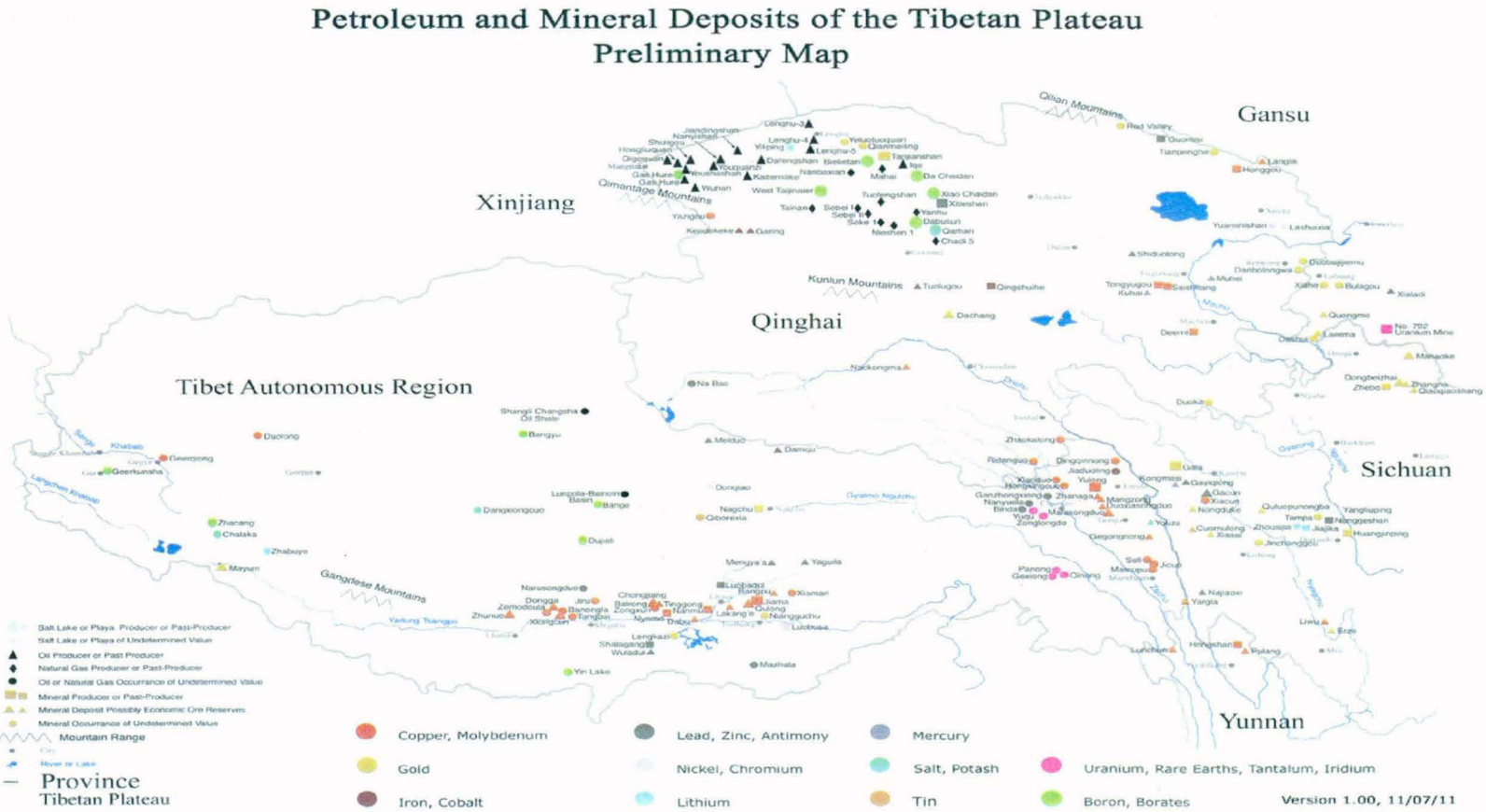
(Annexure: 1) The Major Known Deposits, Mines and Smelters in Tibet

Mine name	Mineral Ore	Location	Remarks
Norbusa mine	chromite	Chusum, Lhoka prefecture, TAR	Mined intensively
Padma mine	Iron ore	Ngaba, Ngaba prefecture, Amdo	Large scale mining began 2006
Kamalog metal extraction	Magnesium	Salk Lakes, Tsoshar prefecture, Amdo	
Jiajika extraction	lithium	Dartsedo, Karze prefecture, Sichuan	
Mepa smelter	aluminium	Rebgong, Malho prefecture, Amdo,	
Tsaidam Basin	oil and natural gas	Tsonub prefecture, Amdo	large scale extraction of oil began 1980s, gas late 1990s
Nyishung deposit	iron ore	Tsochen, Ngari prefecture, TAR	not yet mined
Shetongmon deposit	copper	Shigatse prefecture, TAR	mining due to begin 2010
Yulong deposit	copper	Jomda, Chamdo prefecture, TAR	mining due to begin
Toshasumdo,Dr alhaka, Mangdrung and Malasumdo deposits	copper and gold	close to Yulong, Jomda, Chamdo prefecture, TAR	not yet mined
Mangya mine	asbestos	Tsonub prefecture, Amdo	operating many years
Tsaidam Basin	potash (potassium salts)	Tsonub prefecure, Amdo	17 million tons extracted Annually
Yangla, Xue Ji Ping, Hongshan deposits	copper	Gyalthang, Dechen prefecture, Yunnan	not yet mined
Bonghe deposit	gold	Gyalthang, Dechen prefecture, Yunnan	not yet mined
Kelu, liebu, Chongmuda and Chenba deposits	gold	Lhoka prefecture, TAR (Area of Gangtesi Cu-Au belt)	not yet mined
Duoba-Jijiemu, Danbolongwa, Shuangpengxi Gold Mine, J	copper, gold, and silver	Malho prefecture, Amdo	not yet mined
Tanjian mountains deposit	gold	Tsaidam, Tsonub prefecture, Amdo	not yet mined

Tomorite deposit	gold	Tulan, Tsonubprefecture, Amdo	not yet mined
Nakartse deposit	gold	Lhoka prefecture, TAR	not yet mined intensively
Norbusa	diamonds	found in the chromite belt along Yarlung Tsangpo river, TAR	not yet exploited
Draknak	chromite	near Amdo town on the Lhasa rail route, Nagchu prefecture, TAR	mined 1980s, bandoned, may be reopened due to closeness to railway
Qulong deposit	copper	Meldrogungkar, TAR	not yet mined
Sashitang deposit	copper	Tsigorthang, Tsolho prefecture, Amdo	not yet mined
Menyuan mine	copper	Tsojang prefecture, Amdo	mined since 1950s
Terney mine	copper	Golog prefecture, Amdo	mined since 1989
Pulang S	Copper and other minerals	Gyalthang, Dechen prefecture, Yunnan	not yet mined

Source: (DIIR, 2009)

Annexure: 2 Mineral Deposits of the Tibetan Plateau



Source: (Tibetan Plateau, 12 July 2011

Annexure: 4, Names of the Rivers

Tibetan Name	English/Chinese Name
Bumchu	Arun River
Gyalmo	Ngulchu Salween River
Langchen Khabab	Sutlej River
Macha Khabab	Karnali River
Machu	Yellow River, Huangho
Sengey Khabab	Indus River
Yarlung Tsangpo	Brahmaputra River
Zachu	Mekong River
Drichu	Yangtse River
Jomolangma	Mount Everest
Gang Rinpoche	Mount Kailash
Mapham Yutso	Manasarovar Lake
Yamdrok Yutso	Turquoise Lake
Trishor Gyalmo	Kononor Lake