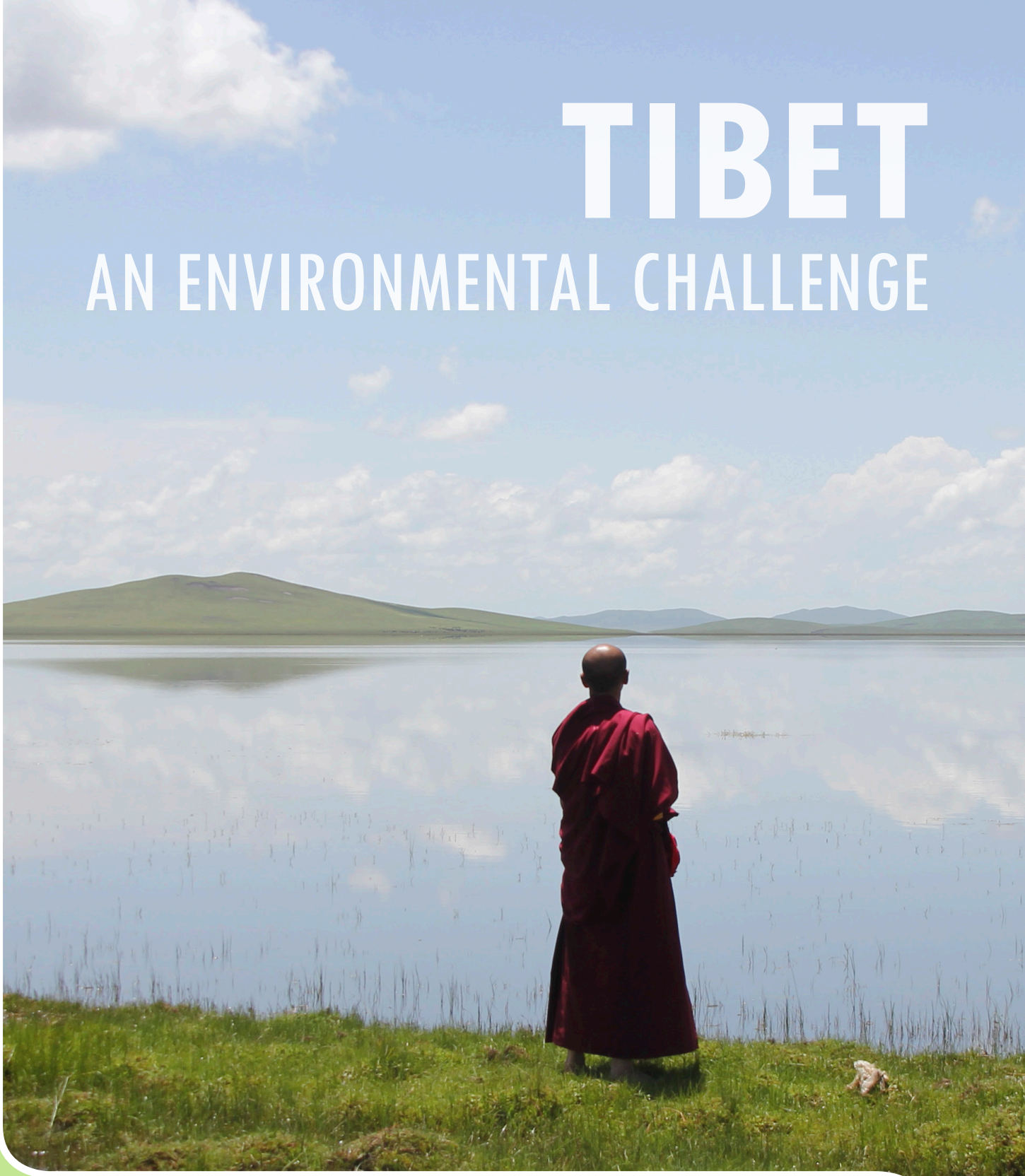

TIBET

AN ENVIRONMENTAL CHALLENGE

WHY TIBET LIES AT THE HEART OF THE GREAT DEVELOPMENT CHALLENGES OF THE ASIAN CENTURY

Australia Tibet Council 2016

2nd Edition. Updated following the Paris Agreement.

TIBET: AN ENVIRONMENTAL CHALLENGE

WHY TIBET LIES AT THE HEART OF THE GREAT DEVELOPMENT CHALLENGES OF THE ASIAN CENTURY

This report was written by Dr Simon Bradshaw. Australia Tibet Council acknowledges the assistance of Kyinzom Dhongdue, Paul Bourke, Chris Teasdale, and Kunchok Gyaltsen in its production.

For further information on the issues raised in this report please email tibet.council@atc.org.au

First published October 2015. This edition February 2016.

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Cover image: Lake in Amdo, eastern Tibet. Photo by Kunchok Gyaltsen

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"Ultimately, humanity is one, and this small planet is our only home."
The Dalai Lama

Lake and pasture in Amdo, eastern Tibet. Photo by Kunchok Gyaltsen

INTRODUCTION: TIBET, THE HEART OF ASIA

For all that has been written and spoken about Tibet, there remains surprisingly little recognition of its significance to the wider world.

In the popular imagination, Tibet remains a remote and faraway place. Wild, beautiful, troubled. But, beyond the enduring injustice facing Tibetans, of little consequence to rest of the region.

This misconception represents a profound gap not only in our understanding of Tibet but of Asia as a whole. In this short report we aim to broaden recognition of the immense environmental and geostrategic importance of Tibet. And how it is in all countries' long-term interests to see a peaceful resolution of the current Tibetan situation.

The overall message is a very simple one: Tibet is not a faraway issue but fundamental to many of the great challenges of the 'Asian century'. If we are concerned about climate change, if we are concerned about inequality, if we are concerned about food and water security, then we need to pay closer attention to Tibet. Most importantly, we need to understand that the Tibetan people can be part of the solution.

The report is divided into seven main sections:

Part 1, Asia's Water Tower, identifies Tibet as the source of Asia's major rivers, upon which an estimated 1.4 billion people across 11 large downstream nations depend. We look at China's ambitious plan for engineering Tibet's rivers and the striking implications for the region.

Part 2, Powering the Monsoon, explores the influence of the mighty Tibetan Plateau upon the region's climate.

Part 3, The Treasure House, looks at China's exploitation of Tibet's bountiful mineral reserves, and the environmental and social consequences.

Part 4, Between Waking Giants, recalls Tibet's strategically important location, wedged between India and China, the world's two most populous countries, and how for centuries Tibet acted as a peaceful buffer between the region's great powers.

Part 5, Rapid Change, explains the rapid and coercive changes to the social fabric of Tibet and offers a forceful critique of China's removal of nomadic herders from Tibet's grasslands.

Part 6, The Big Melt, looks at Tibet – the earth's 'Third Pole' - through the lens of global climate change. We take a glimpse at the melting of Tibet's glaciers and other changes already underway, and what these mean both for Tibetans and downstream nations.

Part 7, Transforming the Region looks beyond Tibet to China's grand plans for greater connectivity and infrastructure investment beyond its borders.

In an effort to ensure balance and objectivity, the chapters draw on a wide range of literature, including Tibetan, Chinese and western sources: from the Asian Development Bank to the Chinese Academy of Sciences, from Greenpeace to the Central Tibetan Administration.

In the final section we present a series of conclusions and recommendations for action.

The issues outlined in this report should be of concern not only to Tibetans but to all countries of the Asia Pacific. As daunting as they may appear, they are not insoluble. And as a significant trading partner to China, Australia has a strong hand to play. In the recommendations we present a range of avenues through which Australia can help address the challenges presented in the following pages, helping secure a brighter future for Tibet, Australia, and the world at large.

DEFINING TIBET

The term "Tibetan Plateau" is used at many points in the report, particularly where discussing climatology, hydrology and other physical sciences. It refers to the physical geographical feature – the vast elevated plateau on which Tibet lies.

There is a remarkable correlation between the physical area of the Tibetan Plateau and the area that is historically, ethnically, and culturally Tibetan. Throughout this report the term "Tibet" refers to the area covered by the three traditional Tibetan provinces of Ü-Tsang, Amdo and Kham, which cover more-or-less the entirety of the Tibetan Plateau.

Today the Chinese Government has divided this historically Tibetan area into a number of separate administration areas, including: the so-called 'Tibet Autonomous Region' (which covers roughly half of historic Tibet, including Ü-Tsang and part of Kham), Qinghai, two 'Tibetan Autonomous Prefectures' and one 'Tibetan Autonomous County' in Sichuan, one 'Tibetan Autonomous Prefecture' and one 'Tibetan Autonomous County' in Gansu, and one 'Tibetan Autonomous Prefecture' in Yunnan.

Every effort has been made to ensure accuracy and consistency across the various maps in this report. The border of Tibet is based on maps published by the Central Tibetan Administration.[1] Any errors are the mistake of the author and not Australia Tibet Council. Satellite images are obtained from Google Earth.

Nomadic children in Amdo, eastern Tibet. Photo by Kunchok Gyaltsen

"If the wars of this century were fought over oil, the wars of the next century will be fought over water – unless we change our approach to managing this precious and vital resource."
Ismail Serageldin, former Vice President of the World Bank

1 ASIA'S WATER TOWER

One only has to look at a map of Asia and run a finger along the major rivers to realize that what happens in Tibet has consequences for vast numbers of people across Asia. A staggering proportion of the earth's population lives downstream of Tibet and have a stake in the rapid changes taking place on the 'roof of the world'.

Many new large hydroelectric dams, mammoth water diversion projects, unregulated mining in the headwater regions, and the compounding effects of global climate change are matters of growing concern for the region. Ensuring food and water security, particularly in the face of climate change, must begin with a sustainable, long-term and trans-boundary approach to water governance.

Tibet is the source of most of Asia's great rivers. The Ganges and Brahmaputra, which bring water and sustenance to countless millions in India and Bangladesh, begin life in the far west of Tibet. So too the Indus, which flows along the length of Pakistan and into the Arabian Sea. The Irrawaddy, lifeblood of Burma, has its source in the south east of Tibet. Further north we find the sources of the Salween and the Mekong, upon which much of Southeast Asia, including Vietnam, Cambodia, Laos and Thailand, depend. And from the vast centre of Tibet rise the Yangtze and the Yellow, which meander across the breadth of China to the great cities in the east.

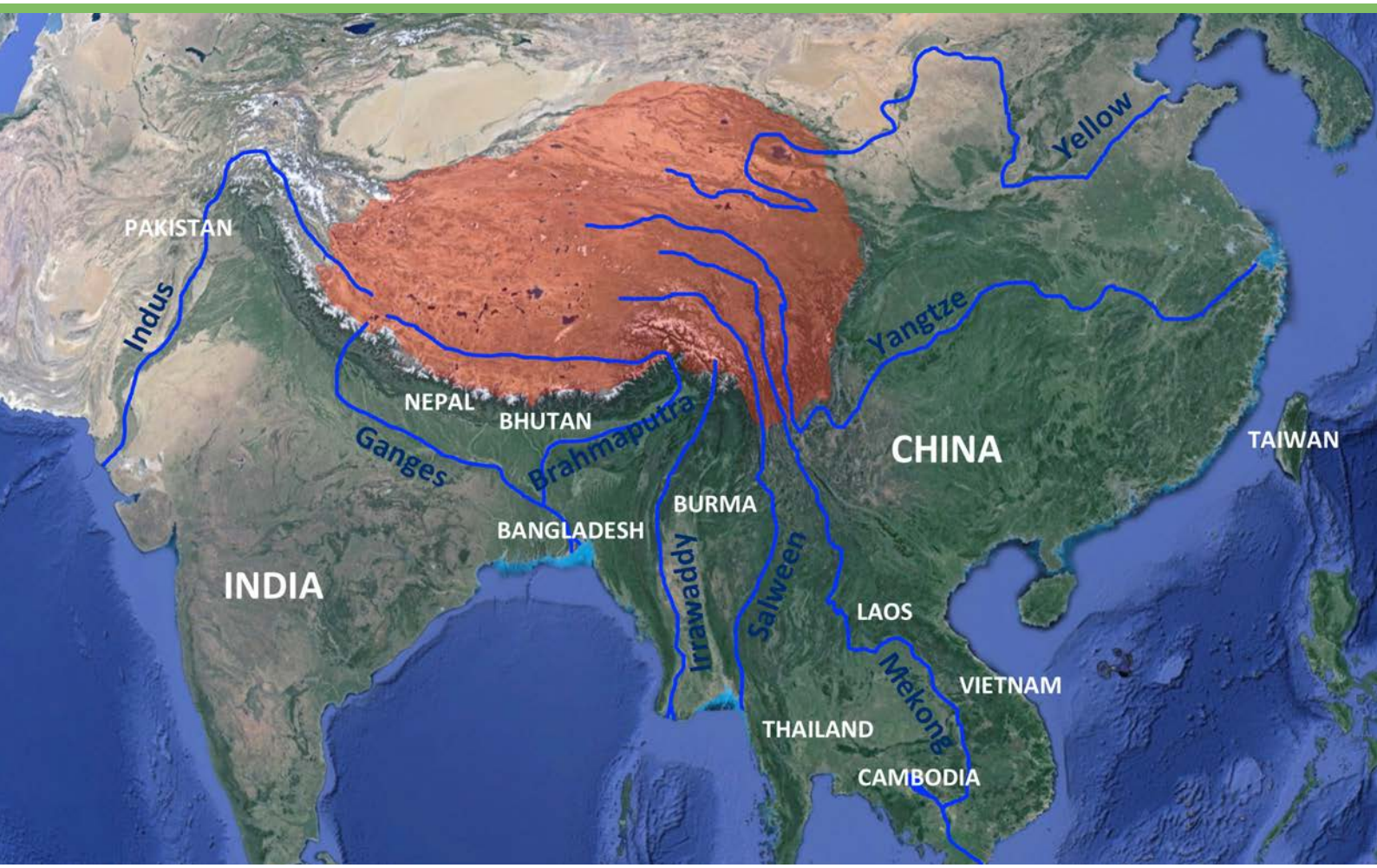
China has been building dams on a staggering scale and at an extraordinary rate. By 2000, China had built 22,104 large dams[2] (defined as having a wall height of over 15m), providing a total of 77GW electricity generating capacity. For comparison, the US, the world's second most prolific dam builder, had 6,390 dams, and India 4,000. By 2010 China had installed 220GW of hydropower[3] – nearly sixty times the generating capacity of Australia's Snowy Mountain Scheme,[4] and well over four times Australia's total electricity generating capacity.[5] It met its 2015 target of 290GW a year ahead of schedule and plans to reach 430GW (increasing its earlier target of 380GW) by 2020.[6] China has built more large dams than the US, Brazil and Canada combined[7] and shows

no sign of slowing down. While only a faction of these dams are found in Tibet, with the middle and lower courses of its rivers already heavily dammed, the only way for China to reach such capacities is to begin heavily damming rivers in Tibet.[8]

The deep canyons through which the Salween and Mekong cascade towards Southeast Asia, the Brahmaputra heads into India, and the Yangtze leaves Tibet to begin its long meander across China, hold the highest hydropower potential in the world.[9] In the map on p. 9 we look at China's plans for just one of these rivers, the Mekong. Equally ambitious plans are afoot for the Brahmaputra, Salween[10] and Yangtze.

The world's largest dam is the Three Gorges Dam on the Yangtze River in China, with 22 GW of capacity. It is the largest electricity generating facility in the world, with around seven times the capacity of Australia's largest coal-fired power station. An even larger dam is on the drawing board for Tibet, a 38GW giant[11] at the point where the Yarlung Tsangpo (which becomes the Brahmaputra) takes a giant bend before descending off the Tibetan Plateau into India. The Xiaowan Dam on the Mekong, completed in 2010, has a wall height of 292m – around the height of an 80-storey building.[12]

As with large hydropower projects the world over, local communities bear the brunt of these controversial projects and reap few if any of the benefits. The electricity generated serves the needs of large cities and industrial centres rather than the local population.



Dams not only disrupt the flow of water. They block the flow of silt which otherwise carries vital nutrients downstream. And with less silt being deposited at the delta, salt water encroaches on cropland.[13] Upstream, land is lost and communities displaced by dam reservoirs. Habitats are destroyed and species threatened.[14] Downstream, ecosystems are profoundly altered, affecting fisheries and livelihoods.

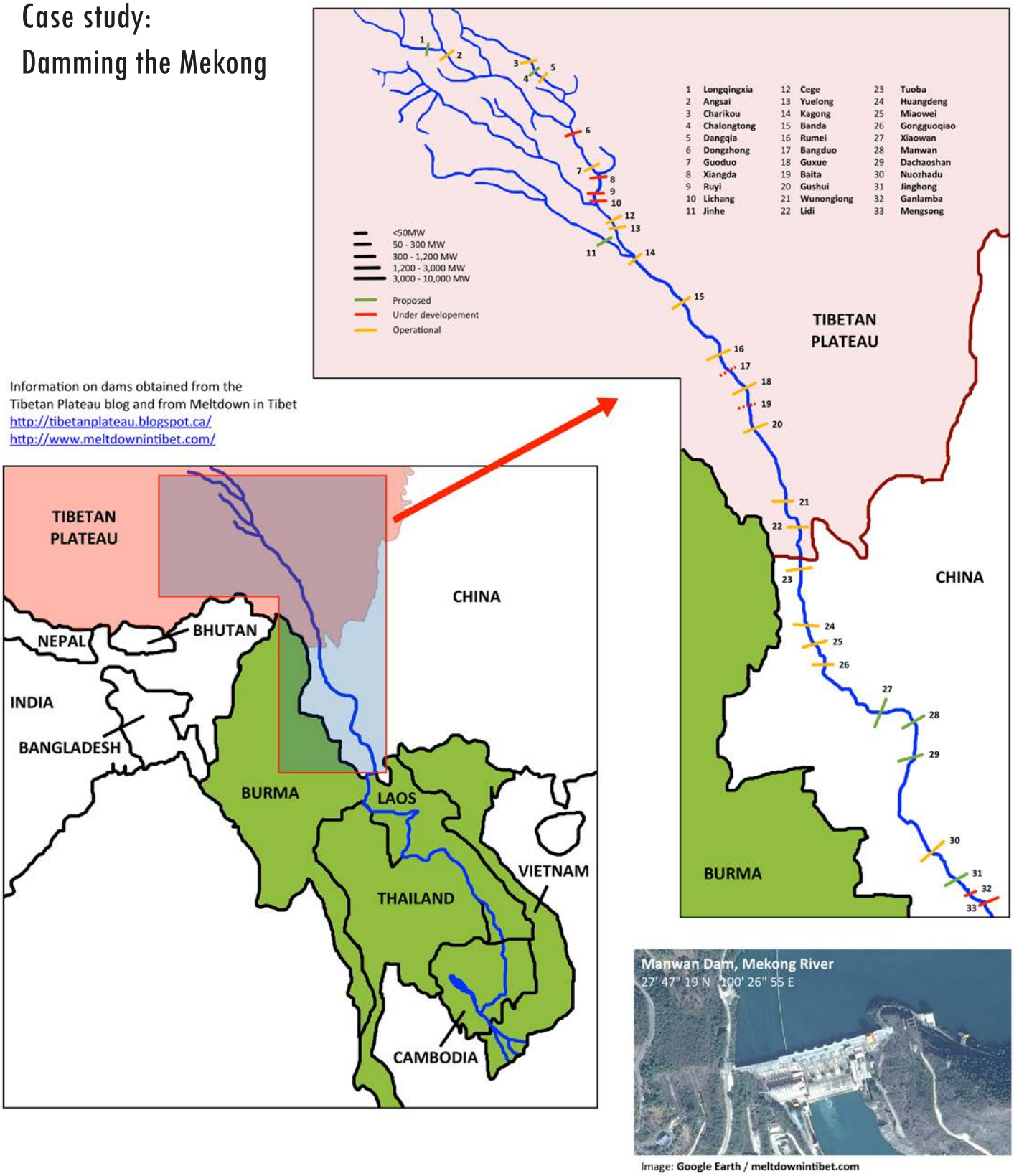
China has done little to engage its downstream neighbours over its dam building projects.[15] It has not joined the Mekong River Commission – an intergovernmental agency that works directly with the governments of Cambodia, Laos, Thailand and Vietnam on the trans-boundary management and sustainable development of the Mekong.[16] Nor has it ratified the UN Convention on the Law of the Non-Navigational Uses of International Watercourses, which aims to help manage transboundary water resources.

Needless to say, China's intention to build many more dams along Tibet's rivers has striking implications for downstream nations. Yet the government has an even more controversial plan for Tibet's rivers. China already diverts water from the lower Yangtze north to Tianjin and Beijing via over a thousand kilometers of canals and tunnels and has even grander plans for moving water from the south to the parched north, defying the country's physical geography. The next stage of China's mindboggling South-North Water Diversion, while still on the drawing board, would divert water from the upper reaches of the Yangtze to the Yellow River.[17]

Remarkably, feasibility studies have been undertaken for diverting water from the upper reaches of the Indus, Brahmaputra, Mekong and Salween – four transboundary rivers – to further satiate growing demand for water from the north.[18] While we have to wonder whether these colossal schemes will ever come to fruition, they pose questions of water sovereignty the likes of which the world has never before had to contemplate. By controlling the Tibetan Plateau, China has control of Asia's water tap and seems ready to use that power, with little regard for the needs of its neighbours. However, it seems inconceivable that downstream nations would be willing to accept large volumes of water being funneled from their proverbial arteries.[19] The first dam on the Brahmaputra (known as the Yarlung Tsangpo in Tibet) – the Zangmu Dam – was completed in 2014 and has already caused considerable controversy in India.[19a] Should China move ahead with plans to divert the waters of the Brahmaputra, this could become a flashpoint in Sino-Indian relations.[20]

Tibet's rivers, and the estimated 1.4 billion people across 11 large downstream nations who depend on them, are threatened not only by the aspirations of China's wildly hubristic planners and engineers. As explored in chapter 7, climate change is affecting the flow of these rivers through melting glaciers and shifting precipitation patterns. Maintaining water security in the face of climate change will depend, among other things, of the effective trans-boundary management of Tibet's rivers.

Case study:
Damming the Mekong



Information on dams obtained from the Tibetan Plateau blog and from Meltdown in Tibet
http://tibetanplateau.blogspot.ca/
http://www.meltdownintibet.com/

Image: **Google Earth / meltdownintibet.com**

Further information

Meltdown in Tibet: China's reckless destruction of ecosystems from the highlands of Tibet to the deltas of Asia
Michael Buckley, 2014

Water: Asia's new battleground
Brahma Chellaney, 2011

International Rivers
http://www.internationalrivers.org/

2 POWERING THE MONSOON

The vast Tibetan Plateau is the world's largest and highest plateau. It is located at the centre of Asia and surrounded by colossal mountains – the Karakorum to the west, Kunlun to the north, and the Himalayas, formed 70 million years ago by the collision of the Indian and Eurasian tectonic plates, to the south. At around 2,500km from east to west and around 2,500,000km^2 in area, it is approximately the size of Western Europe or Western Australia.

Rising high above the surrounding plains, the Tibetan Plateau has a major influence on the region's climate, including the monsoonal winds that draw moist air from the Indian and Pacific oceans and bring rain to large parts of South, East and Southeast Asia.

In chapter 1, we identified Tibet as the source of Asia's major rivers. The next step in understanding the environmental significance of Tibet requires looking into the influence of the Tibetan Plateau on the seasonal winds and rains upon which so much of Asia depends.

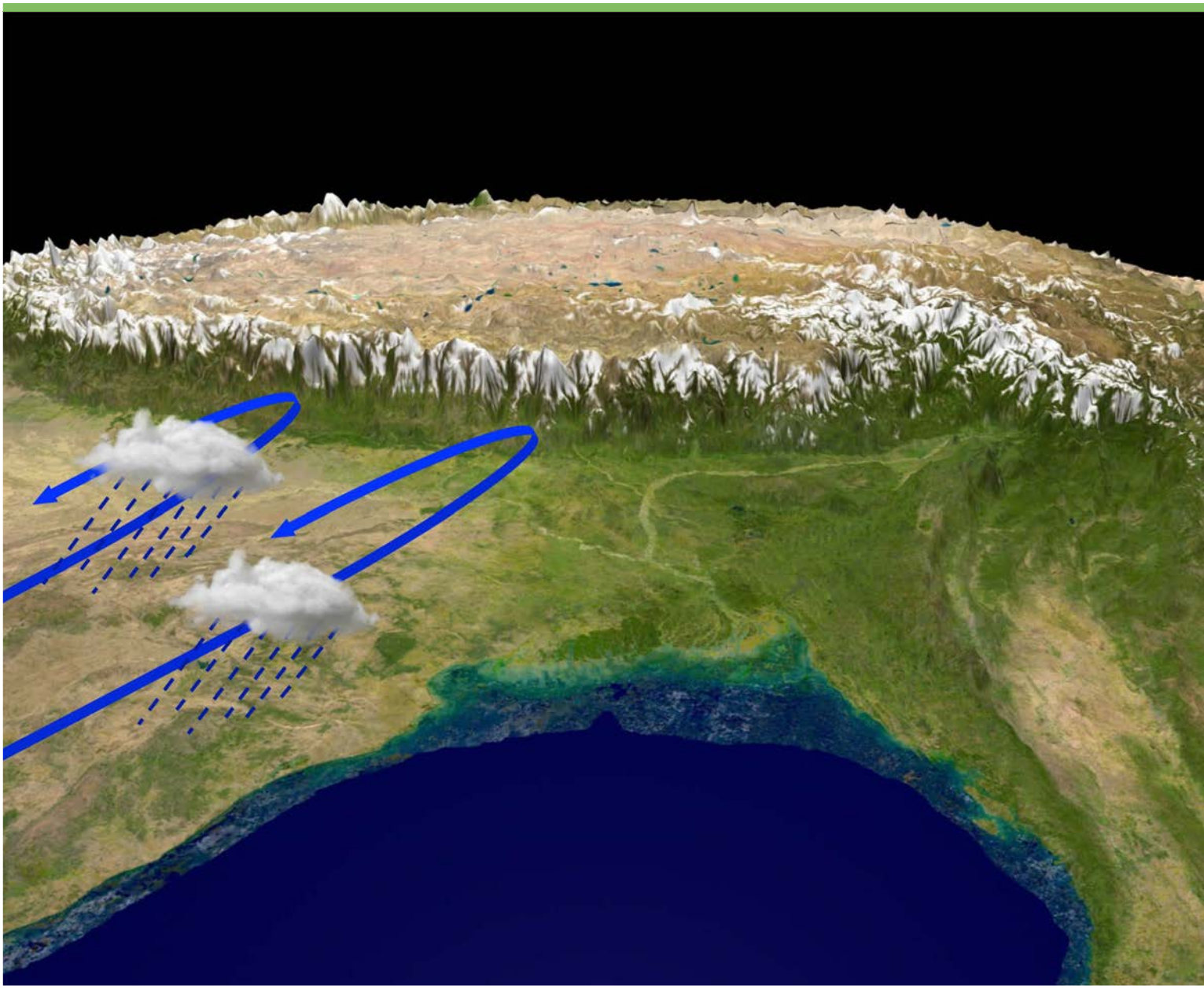
The four-month long South-West Monsoon season accounts for three-quarters of India's total rainfall. It is so fundamental to India's economy that a delay in its arrival sends the stock market into jitters.[21] More importantly, it underpins India's very ability to feed itself. The South-West Monsoon is one of a number of monsoon systems influenced by the Tibetan Plateau, and upon which billions of people depend.[22]

When the Tibetan Plateau heats up during the summer, the warmer air rises and moist air from the Indian Ocean is drawn inland across the Indian plains, bringing rain. In winter the pattern reverses: As the Tibetan Plateau cools and the Indian Ocean is relatively warmer than the continent, the wind changes direction, bringing an end to the rain.

While the source of life-giving rains, the Asian monsoons can also cause disaster, such as the deadly flooding in India and Pakistan in October 2014.[23]

Climate change, including its effect on the Tibetan Plateau, may already be altering the behavior of the Asian monsoons[24] – an issue that demonstrates not only the environmental significance of Tibet but the imperative of stronger action to reduce global greenhouse gas emissions, an issue discussed in detail in chapter 6.

The Tibetan Plateau's role in global climate and weather systems extends beyond its influence on the region's monsoon systems. For example, a recent Chinese study has linked reduced snow cover on the Tibetan Plateau with recent summer heatwaves in Europe and northeast Asia.[24a]



3D rendering of the Tibetan Plateau created by NASA
http://svs.gsfc.nasa.gov/cgi-bin/details.cgi?aid=2356

3 THE TREASURE HOUSE

From copper for transmission lines to lithium for batteries, Tibet holds immense stores of key minerals craved by the modern Chinese and global economies. Much like the Arctic, the Tibetan Plateau is even a new frontier for fossil fuel extraction.[25]

Until recently Tibet was protected by its remoteness, its vast mineral reserves largely beyond reach. Today this is changing, as the Chinese Government pours billions of Yuan into new infrastructure, opening up Tibet's once inaccessible riches to industrial exploitation. Tectonic changes in the Chinese and global economies make it hard to predict the pace and scale at which China will mine Tibet.[26] However, the consequences for the Tibetan people and environment are, in many cases, already severe. And concern is mounting about flow-on effects for the region.

Tibet, as a consequence of its geology and formation, reportedly has 132 different types of mineral resources, including copper, gold, iron ore, aluminium, chromite, lithium, coal, crude oil, and natural gas.[27] China has long known that immense riches lie beneath Tibet's mountains and plains. The Chinese name for Tibet – Xizang – translates roughly to "Western treasurehouse".[28]

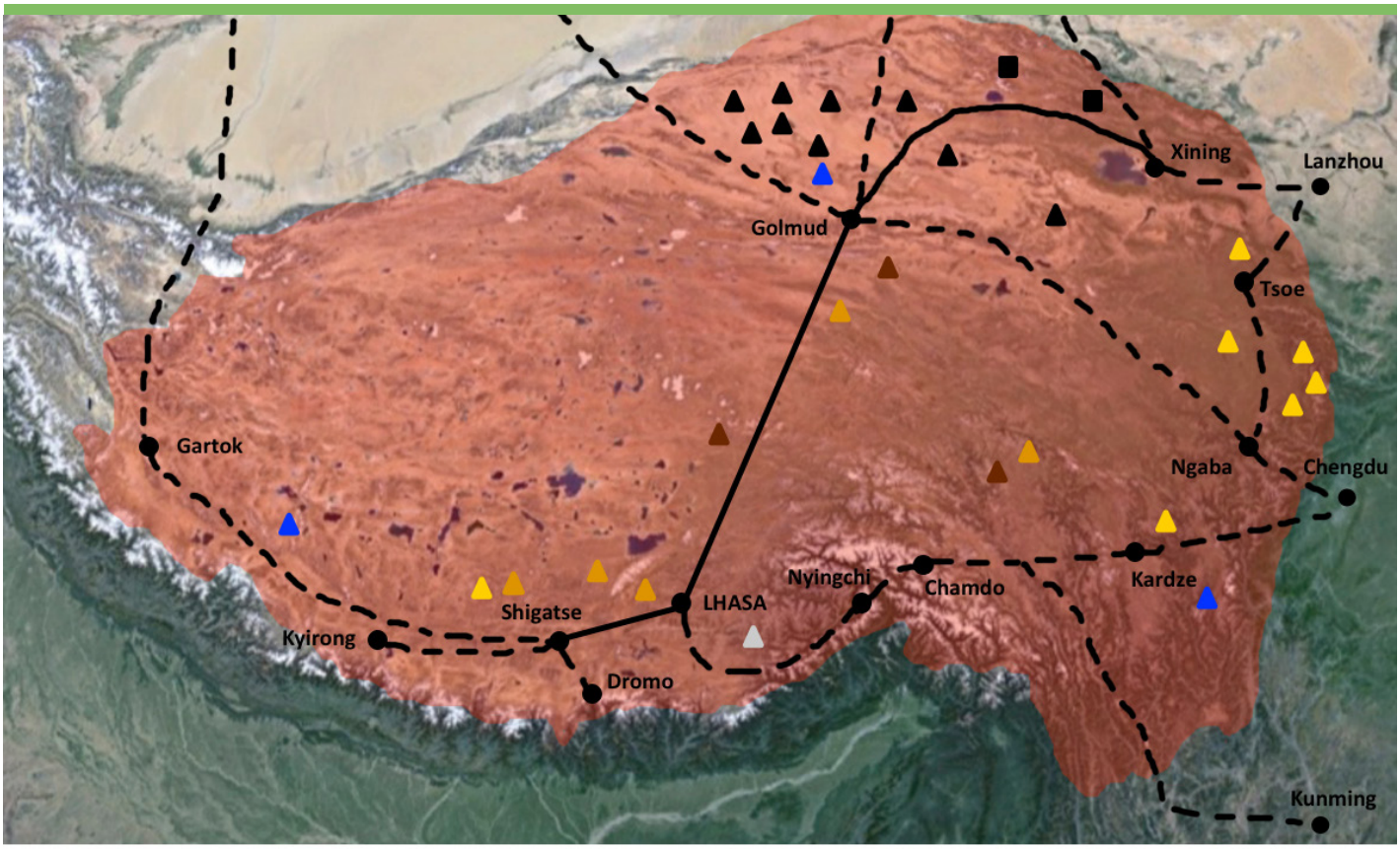
However, large-scale mining in Tibet is a recent phenomenon. Tibet's extreme geography has till now largely prevented resource-hungry China from extracting resources from the high plateau at significant scale and moving them the vast distances to where they might be used.

Long before China's arrival, Tibetans had a rich tradition of metalwork, turning gold and silver into religious objects, coins and jewelry, iron into bridges and armour, and more.[29] However, traditional beliefs, technological limitations, and the kind of acute awareness of the impacts of over-exploitation that a close dependence on the immediate natural environment inevitably fosters, meant mining operations were incomparable to those we see today. Tibetans used alluvial gold (i.e. gold deposited

in stream and river beds) rather than digging. When Tibetans did dig for minerals, the mines were invariably small, and did not involve tunneling, chemicals or explosives.[30]

In 2006 China completed the first railway into Tibet, linking Tibet's capital Lhasa to China's national rail network. The 'Qinghai-Tibet' railway is the world's highest railway, extraordinarily costly to build and maintain, and considered one of China's most remarkable feats of engineering. Its completion was a pivotal step in enabling the industrialization and exploitation of the Tibetan Plateau. For Tibetans such developments have undeniably been a mixed blessing. At best the benefits of economic development in Tibet have been shared unequally.[31] At worst, Tibetans have been left substantially worse off – edged out of the market by Chinese migrants, their land compromised, and their traditional livelihoods taken away. By 2014 the railway had been extended to Shigatse. Plans for several more lines in Tibet are on the drawing board, which would further open up the Tibetan Plateau to large-scale resource extraction.[32]

Tragically, Tibet has become a prime example of the resource curse – the all-too-common paradox that sees many people in resource-rich countries, rather than benefitting from their natural endowment, driven into poverty.



SOURCES
Information on railways obtained from International Campaign for Tibet:
http://www.savetibet.org/new-strategic-rail-network-to-tibets-borders-endangers-environment-raises-regional-security-concerns/
Information on deposits obtained from *Spoiling Tibet* (Gabriel Lafitte, 2013)
(This is a greatly simplified version of the very detailed map of mineral deposits on the Tibetan Plateau in *Spoiling Tibet*)

In April 2013 a disaster at the Gyama mine, a large mine near Lhasa extracting several metals including copper and gold, brought the impact of mining in Tibet into the international headlines. Reports of the tragedy, in which a 3km-long landslide (according to Chinese state media) buried 83 miners, also documented Tibetans' anger at the environmental damage being caused in the Gyama Valley and by other mines on the Tibetan Plateau.[33] However, recent reports of a road being cut towards the Gyama Valley have raised fears that more mining is about to begin.[34]

Image obtained by Radio Free Asia of a standoff between locals and security forces in Shigatse in 2010. Tibetans were protesting a gold mine that has affected their drinking water and grazing land.

Tibet is consistently identified as one of the most repressive places on earth. In its latest annual comparative assessment of political rights and civil liberties, US-based non-government organization Freedom House has again placed Tibet in its 'worst of the worst' category, with the worst possible rating for both political rights and civil liberties.[35] There is little tolerance of protest, particularly in the more restive areas of Tibet's east. Surveillance,[36] control of media,[37] 'patriotic re-education',[38] curbs on religious and cultural activities, and harsh punishments for almost all forms of dissent are enduring and, by many accounts, worsening characteristics of today's Tibet.[39]

Nonetheless, there are regular reports of local Tibetans protesting mining developments in Tibet. On 24 August 2015 the Tibetan Centre for Human Rights and Democracy reported that "Chinese authorities have used intimidation and threats of force to block attempts by local Tibetans to save a sacred mountain from uranium mining" in Ngaba in the north of Amdo.[40] On 23 July 2015, Radio Free Asia reported that a Tibetan village chief, Lobsang Yeshi, detained for his role in protests against a Chinese gold mine in Kham had died in custody.[41] Lobsang Yeshi had reportedly been tortured and severely beaten, eventually succumbing to his injuries.[42]

On 5 May 2015, Radio Free Asia reported that "Chinese authorities have cracked down on villagers protesting road work linked to plans for mining on a sacred mountain" in Kham.[43] On 2 July 2014, Radio Free Asia reported that police in Kham "attacked and beat a group of Tibetan women who had gathered to protest copper mining on land considered sacred by residents living near the site."[44]

Attempting to protect a sacred site is a consistent theme of environmental protests in Tibet. Traditional Tibetan beliefs and understanding of the land have played an important part in maintaining a harmonious relationship between Tibetans and their environment.[45]

Further information

Spoiling Tibet: China and resource nationalism on the roof of the world
Gabriel Lafitte, 2013

Case study 1: Lithium

The rise of smart phones, tablets, laptops and other electronic devices has meant a surge in demand for lithium – a key component in many types of rechargeable batteries. The rise of electric vehicles (China aims to put 5 million on the road by 2020) will create an even greater demand over the coming years.[46]

Unsurprisingly, this growing demand is leading towards the full-scale exploitation of Tibet's lithium deposits.[47] Unfortunately, obtaining lithium is a hazardous and polluting business. Lithium can be found in many rocks and salts though generally at a low concentration. This means that recovering large quantities of lithium involves extracting large quantities of rock or salt, using large amounts of water and solvents, and creating large volumes of waste.

The salt lakes of the Tsaidam Basin in northern Tibet, already exploited for potash and magnesium, are the most accessible source of lithium on the Tibetan Plateau. Existing operations in the Tsaidam Basin have paid little attention to environmental concerns, impacting local communities through water contamination and other fallout.[48] As demand grows, the focus will likely move to new frontiers including Nyagchu county, home area of the late and revered Tibetan environmentalist and community leader Tenzin Delek Rinpoche,[49] whose environmental advocacy and other noble activities landed him a life sentence in prison. Tenzin Delek Rinpoche died in custody in 2015.

"It may not be long before your latest handheld passport to mobile connectivity is powered by Tibetan lithium."

Gabriel Lafitte,[50] author and expert on environment and development challenges in Tibet

Case study 2: Coal

While China may be the world's largest investor in renewable energy and taking progressively more serious steps towards tackling climate change, the country remains by far the world's largest burner of coal. And while both production and consumption of coal have recently fallen in China, Chinese companies continue to open up new frontiers.

In 2014, an investigation by Greenpeace China highlighted a series of four large opencast coalmines at the Muli coalfield in Amdo, 4,000m above sea level and near the source of the Datong River – a tributary to the Yellow River. Two of the mines, which have been operating since 2003, overlap with the "Qilian Mountains National Ecological Functional Zone for Glacier and Water Conservation." The other two are expanding into this reserve. According to Greenpeace, this places the mines "in violation of national laws and provincial regulations protecting nature reserves, water source conservation, and wetland and grassland protection."[51]

Greenpeace claims these mines are "threatening the water supply to the Datong, with possible knock on effects for the over 50 cities and 420 towns that rely on the Yellow River - China's second longest - for their drinking water and thousands who use it to irrigate their fields."[52]

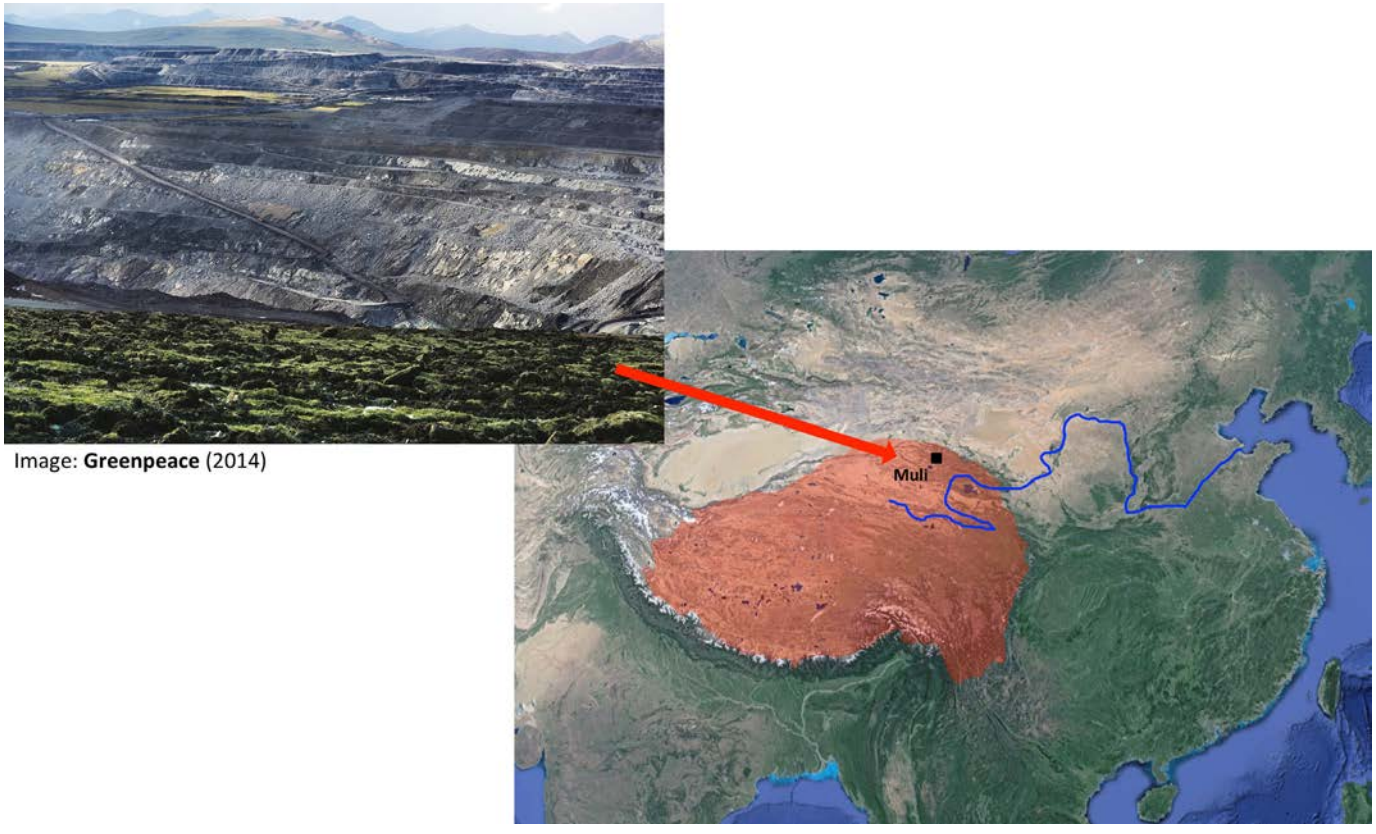


Image: **Greenpeace** (2014)

"But for China's occupation, Tibet would still, today, fulfill its natural role as a buffer state maintaining and promoting peace in Asia."

The Dalai Lama[53]

"To understand today's global conflicts, forget economics and technology and take a hard look at a map."

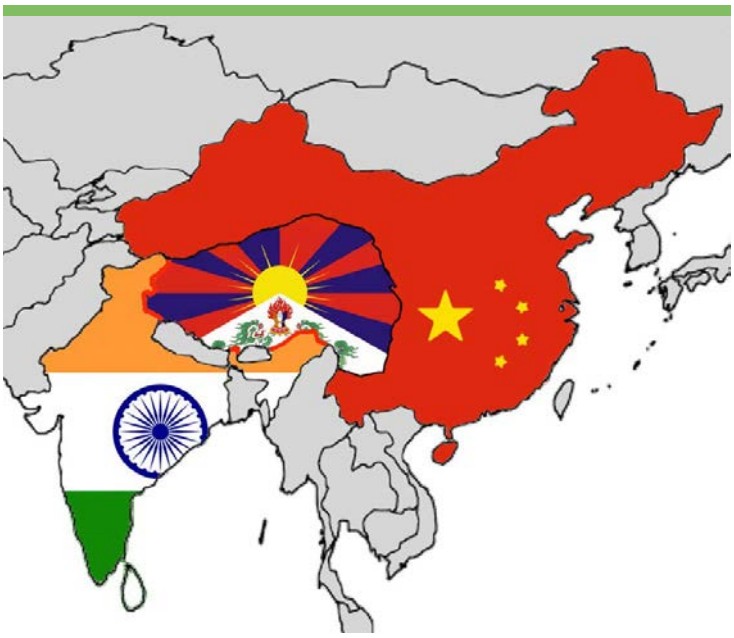
Robert D. Kaplan, writer on foreign affairs[54]

4 BETWEEN WAKING GIANTS

The Tibetan Plateau lies between India and China – rising economic giants and the most populous countries on earth. To the west lies Pakistan, completing a triangle of nuclear-armed states.

Before China seized control of Tibet, China and India had no common border. These days there are hundreds of incidents a year[54a] along the approximately 4000km long border between India and Chinese-controlled Tibet. A resolution of the Tibetan issue, including return of self-governance to Tibetans and restoration of this peaceful buffer at the heart of Asia, would go a long way to ensuring long-term peace and stability for the region.

In proposing his Five Point Peace Plan, the Dalai Lama noted the role that Tibet, by virtue of its location, has historically played in the maintenance of peace and stability in the region. "This is precisely why, in the past, Asia's empires went to great lengths to keep one another out of Tibet. Tibet's value as an independent buffer state was integral to the region's stability."[55]



Ongoing Sino-Indian border tensions made headlines in 2015 when Prime Minister Narendra Modi upset the Chinese Government by visiting remote Tawang in Arunachal Pradesh in the northeast of India, a historically Tibetan area still claimed by China as part of 'South Tibet'.[56]

Arunachal Pradesh is just one disputed area along the border between India and Chinese-controlled Tibet. Thousands of troops and sophisticated weapons are stationed on both sides. While the prospects of another all-out war between China and India may feel remote – after all, it is hard to see how it could end well for either country, let alone for the world at large – the ongoing situation was considered serious enough by the Pentagon to warrant a mention in its 2015 Annual Report to Congress on Military and Security and Developments Involving the People's Republic of China:

> *"Despite increases in China-India political and economic relations, tensions remain along their shared 4,057 km border… China and India continue to accuse each other of frequent incursions and military build-ups."*[57]

As the Dalai Lama elaborated back in 1987:

> *"Historically, relations between China and India were never strained. It was only when Chinese armies marched into Tibet, creating for the first time a common border, that tensions arose between these two powers, ultimately leading to the 1962 war. Since then numerous dangerous incidents have continued to occur. A restoration of good relations between the world's two most populous countries would be greatly facilitated if they were separated - as they were throughout history - by a large and friendly buffer region."*[58]

Further information

Caught in the middle: India, China and Tibet
Ellen Bork, World Affairs, May 2015
http://www.worldaffairsjournal.org/article/caught-middle-india-china-and-tibet

An uneasy strategic triangle: The troubled China-India relationship and US Asia policy
Brahma Chellaney, Japan Policy Research Institute, January 2014
http://www.jpri.org/publications/occasionalpapers/op48.html

Tibetan succession drama
Robert D. Kaplan and Rodger Baker, Global Affairs, January 2013
https://www.stratfor.com/weekly/tibetan-succession-drama

"...the EU questions whether the objective of environmental protection can only be reached by eliminating the traditional way of life of Tibetans who have lived in harmony with nature for centuries. The EU is concerned that compulsory resettlement of all nomads has the potential to destroy the distinctive Tibetan culture and identity."

Catherine Ashton, EU High Representative for Foreign Affairs and Security Policy and Vice President of the European Commission[59]

5 RAPID CHANGE

The forced relocation and settlement of nomads is one of the most severe and arguably most misguided aspects of Beijing's grand plans for Tibet. In only a few years Chinese authorities have reportedly moved over two million Tibetans[60] from their home on the grasslands to newly constructed settlements, profoundly altering Tibet's social and environmental fabric.

The policy is as self-defeating as it is unjust. Stripped of the livelihoods that have sustained them for thousands of years, a once proud and resilient people now face an uncertain future. And while carried out on grounds of environmental protection, the controversial policy has further compromised the ecological balance of the Tibetan Plateau.

The exact beginning of nomadic pastoralism in Tibet is not known. Some experts cite evidence that Tibetans were raising livestock at least 4,000 years ago.[61] Others claim 9,000 years.[62] Whatever the case, it is clear that nomads have flourished sustainably on the Tibetan Plateau for a very long time. Indeed, until more recently, nomadic herding was likely the only way that humans could possibly have lived on the cold, arid highlands of Tibet.

It is cruel irony that nomads have been made scapegoats of China's environmental woes, purportedly relocated in order to preserve Tibet's grasslands. In reality, nomads are an integral part of the ecology of the Tibetan Plateau and can play a vital, ongoing role in the maintenance of this globally significant ecosystem.

According to the Food and Agricultural Organization of the United Nations, the world's grasslands hold around one fifth of the world's soil carbon.[63] Grasslands are a source of livelihoods and food security for some one billion people worldwide.[64] Furthermore, pastoralists play a critical role in managing grasslands and maintaining the soil carbon.[65]

"Not only are the policies threatening one of the world's last systems of sustainable pastoralism, but scientific evidence shows that these policies are threatening the survival of the rangelands and Tibet's biodiversity."[66]

Tibet is one of the world's most important grassland ecosystems. Tibet's grasslands cover around 1,650,000km^2 – more than half the Tibetan Plateau.[67] The Chinese Government is right that Tibet's grasslands are degrading. But fundamentally wrong that this is due to traditional nomadic herding.[68]

Nomads move between summer and winter pastures, grazing only lightly so that the grasslands can regenerate for the following year. They have a remarkably sophisticated knowledge of their environment,[69] and their lives are governed by its rhythms.[70] The nomads and their herds have long been an important component in the grassland ecosystem. The animals' waste adds nutrients to the soil and maintains its fertility. As they move their hooves aerate the soil, pressing in seeds and burying dead plant matter, which is broken down by microorganisms. All this helps maintain the health of the grasslands and, importantly, generates soil carbon.[71] When the nomads and their herds are removed, biodiversity declines and invasive species flourish.[72]

As with its mining operations in Tibet (see chapter 3), the Chinese Government has tried to obscure the effects of its relocation policies by heavily restricting access to media and refusing to allow independent fact-finding missions. Nonetheless, a number of recent reports have been able to document the social impacts of the Chinese Government's relocation policy, including increased living costs, loss of the ability to make a living, indebtedness, and the decimation of traditional community

Nomad resettlement town. Photo: freetibet.org

structures.[73] These studies have offered a new way forward based, among other things, on proper recognition of the value of Tibet's traditional rural economy, on the protection and harnessing of traditional knowledge,[74] and a people-centered approach to conservation.[75] As explored in more detail in chapter 6, Tibet's nomads can and must be part of the solution to the challenges that Tibet now faces.

> *"If I could go back to herding, I would. But the land has been taken by the state and the livestock has been sold off so we are stuck here. It's hopeless."*
>
> **Shang Lashi**, former nomad from Kham[76]

> *"Our land, our precious environment, is being destroyed. There are Chinese mining projects everywhere, our grasslands are being degraded, nomads are no longer free to roam and continue their sustainable livelihoods. They are taking our plants, our Tibetan medicine, and making this into a commercial product. Because of what has happened to our land, many people do not have enough to eat. Their land has been taken away and compensation is not given or it is not enough for them to live."*
>
> Extract of a message from a group of young Tibetan students in eastern Tibet (2012)[77]

In an extreme sign of exasperation with their circumstances, more than 140 Tibetans have self-immolated since 2009. A significant number have been from nomadic areas, including families affected by the Chinese Government's relocation policies.[78]

While the relocation of Tibet's nomads has been rightly at the centre of many recent discussions on development in Tibet, it is by no means the only way in which China is reshaping Tibet. Under the benignly named 'Comfortable Housing' policy, rural Tibetans whose houses are deemed unsuitable are instructed to knock them down and rebuild, either in the same location or in new settlements. While some degree of support is provided, it appears compensation is often inadequate and families are left with a host of new problems.[79]

> *"People in the village are desperate about abandoning their homes and having to resettle. They don't have any other skills than farming, and won't have any herds or land worth speaking of anymore. How is the next generation going to survive as Tibetans?"*
>
> **Tenzin Gyaltso**, Ü-Tsang province[80]

Tibet's urban settlements are being transformed into modern Chinese cities, sometimes at the expense of sacred sites and Tibet's Buddhist heritage.[81] Many new roads and airports are being built, again a mixed blessing.[82] Reports of land grabs are common, whether to make room for road construction,[83] hydropower,[84] or by cash-hungry local governments pursuing lucrative property deals.[85]

The Chinese Government has long encouraged Chinese workers, investors and merchants to migrate to Tibet, causing Tibetans to become marginalized and disempowered within their homeland.[86] While the Government's attempts to pacify and tame Tibet through development may have had mixed success, they have undoubtedly consolidated state power and control.[87]

Debate over the sustainable development of Tibet has become polarized. Chinese authorities are quick to shun justified criticism and to boast among other things about the improvements in life expectancy among Tibetans, ignoring the fact that benefits have been unequally shared. Meanwhile, many well-meaning critics are arguably focused more on their preconceptions about how Tibet should be than on supporting the right of Tibetans to determine their own future.

Ultimately the question we must ask is development for whom? And on whose terms? The first step towards a more ecologically sustainably and socially equitable path for Tibet is to ensure that Tibetans themselves – those whose land and culture is at stake, and who lived successfully and sustainably in the land of snows – have the right to make their own choices.

Further information

Wasted Lives: Analysis of China's campaign to end Tibetan pastoral lifeways
Tibetan Centre for Human Rights and Democracy, 2015
http://www.tchrd.org/wp-content/uploads/2015/05/Download-Report.pdf

"They say we should be grateful": Mass rehousing and relocation programs in Tibetan areas of China
Human Rights Watch, 2013
https://www.hrw.org/report/2013/06/27/they-say-we-should-be-grateful/mass-rehousing-and-relocation-programs-tibetan

The disempowered development of Tibet: A study in the economics of marginalization
Andrew Fischer, 2013

Taming Tibet: Landscape transformation and the gift of Chinese development
Emily Yeh, 2013

Trouble in Tibet: Rapid changes in Tibetan grasslands are threatening Asia's main water supply and the livelihood of nomads
Jane Qiu, January 2016
http://www.nature.com/news/trouble-in-tibet-1.19139

"Safeguarding the plateau environment is crucial not only for sustainable development of the region, but also to social stability and international relations."

Professor Yao Tandong, Director of the Institute of Tibetan Plateau Research, Chinese Academy of Sciences[88]

"Changes to climate, glaciers and snow cover in the high mountains of Asia are of vital importance for water supplies to a fifth of the world's population."

Professor Hayley Fowler, Professor of Climate Change Impacts, Newcastle University[89]

6 THE BIG MELT

While climate change impacts us all, it is hitting some regions and communities harder than others. Moreover, communities who have contributed the least to global greenhouse emissions – such as Tibet's nomads – are often among the most vulnerable.

Like the Arctic and the Pacific Island nations, Tibet is on the frontline of global climate change. The impact of rising temperatures, changing precipitation patterns, melting glaciers and extreme weather are being felt directly by Tibetans[90] and impacting the wildlife[91] and ecosystems[91a] of Tibet. The Tibetan Plateau is a sensitive ecological hotspot and likely to undergo greater changes than other regions.[92]

However, as the headwater of Asia's major rivers and with its important role in global climate and weather systems, these changes have ramifications far beyond Tibet's borders and threaten the fresh water supply and food security of billions.[93]

As the international community comes together to tackle the twin challenges of poverty alleviation and global climate change, it's time to recognize Tibet and Tibetans as a part of the solution.

The Tibetan Plateau as a whole is warming at least twice as fast as the global average. Temperatures have risen 0.4°C per decade since the 1960s.[94] Moreover, higher altitude regions of the Tibetan Plateau are warming faster than lower regions,[95] meaning glaciers are losing ice even at high elevations.[96]

The rapid warming has caused Tibet's glaciers to reduce in area by 15% over the last three decades, from 53,000km^2 to 45,000km^2.[97] As annual runoff from glaciers has

increased (from 61.5km^3 to 79.5km^3 over the same period), so too has the size of Tibet's lakes.[98] This has inundated some pastures and increased the risk of floods and landslides.[99] At worst, a glacial lake may burst, causing a devastating flash flood.

As explored in chapter 1, rivers that begin their life on the Tibet Plateau, including the Indus, Ganges, Brahmaputra, Irrawaddy, Salween, Mekong, Yangtze and Yellow, support about 1.4 billion people.[100] The melting of Tibet's glaciers significantly affects the flow in these rivers. While the overall hydrological cycle is dominated by the monsoon systems, meltwater from snow and glaciers provides an important source of flow pre and post the monsoon seasons.[101] In the short term, glacial melt will increase river flow. While in the longer term there will be a large impact on water availability during the dry seasons.[102]

In December 2015 the international community adopted the Paris Agreement – a comprehensive new framework for tackling climate change and the culmination of over two decades of international negotiations. But while the agreement commits us to limiting the global average temperature rise to "well below 2°C" and to aiming towards a limit of 1.5°C, the aggregate of current national commitments towards reducing greenhouse emissions have us on a path to around 3°C[102a] of warming and potentially catastrophic disruptions. Mounting evidence suggests that even a rise of 2°C will push many vulnerable communities and ecosystems beyond their ability to adapt.

Image: Jamie Williams

The impacts of climate change on the Tibetan Plateau and their knock-on effects for the region not only stand as an unequivocal call for greater action to reduce greenhouse emissions. The Tibetan experience also provides many other important lessons on how we could and should be tackling climate change. Reducing emissions and improving lives can, and indeed must, go hand in hand.

The forced removal of Tibet's nomads, discussed in detail in chapter 5, has unnecessarily harmed both the environment of Tibet and wellbeing of Tibetans. The policy is all the more heart-aching given the positive role that Tibetan nomads could be playing in China's response to climate change, and, conversely, the benefits that could theoretically be reaped by nomadic communities if China were willing to recognize them as part of a solution.

As the world struggles to curb greenhouse emissions, the ability to sequester carbon dioxide and other greenhouse gases will become an increasingly valuable service. Maintaining Tibet's grasslands is essential to tackling global climate change.[103] It is possible to conceive of Tibetan nomads supplementing their traditional lifestyles by receiving payments for capturing and storing carbon,[104] though either global carbon markets or China's national emissions trading scheme,[105] much as indigenous communities in Australia can be paid under the country's Emissions Reduction Fund for reducing greenhouse emissions by using traditional savannah fire management.[106]

From Mongolia[107] to the Sahel, nomadic herding is increasingly recognized by governments and development agencies not only as an important strategy for the sustainable use of grasslands, but equally as a tool for both climate change mitigation (reducing greenhouse gases) and adaptation (building resilience to impacts that can no longer be avoided.) As one researcher on the effects on climate change on nomads notes:

> *"The most important way to increase resilience to climate change is to maintain and facilitate the application of nomads' traditional strategies to deal with climate risk and especially drought, such as transboundary mobility and pasture reserves for emergency times."*[108]

Nonetheless, a growing body of evidence challenging both the ecological and social wisdom of China's policies – from further degradation of the grasslands to poverty and unemployment among resettled nomads – has failed to curb plans to settle all of Tibet's remaining nomads.

2015 was a defining year for international action to address climate change, culminating with the landmark Paris Agreement. Australia must now increase the pace and depth of its emissions reductions, in line with what the Paris Agreement demands, and substantially scale-up support for climate action in poorer countries.

The Paris Agreement states all actions to address climate change must respect human rights, the rights of indigenous peoples, the rights of peoples in vulnerable situations, and the right to development, as well as promoting gender equality and empowerment of women.[109] It is vital that these principles are adhered to. As stated by UN human rights experts on World Environment Day in 2015:

> *"Bringing a human rights perspective to climate change not only clarifies what is at stake; it also helps to ensure that responses are coherent, effective and responsive to the concerns of those most affected."*[110]

Tackling climate change, along with any challenge, should begin with recognizing existing strengths and opportunities. Will China learn this vital lesson before it is too late?

Further information

Climate Change 2014: Impacts, Adaptation and Vulnerability
Intergovernmental Panel on Climate Change
http://www.ipcc-wg2.gov/AR5/ (In particular Chapter 24: Asia)

Tibet Third Pole (An initiative of members of the International Tibet Network)
http://tibet3rdpole.org/

Blue gold from the highest plateau: Tibet's water and global climate change
International Campaign for Tibet, 2015
http://www.savetibet.org/wp-content/uploads/2015/12/ICT-Water-Report-2015.pdf

A nomadic family's tent and animals in Amdo, eastern Tibet. Photo by Kunchok Gyaltsen

7 TRANSFORMING THE REGION

While there is talk everywhere these days of China's economic slowdown, there is no denying China's influence and presence across the Asia Pacific region and beyond is continuing to grow. And fast. Utilizing its vast foreign exchange reserves,[111] China is increasingly seeking to expand its breakneck model of development beyond its borders.

Announced in 2013, China's One Road, One Belt initiative is a transnational development strategy of epic proportions. The audacious plan would dramatically increase China's connectivity with countries across Asia and Europe, expanding export markets and unleashing investment in new infrastructure. The new Asian Infrastructure Investment Bank, initiated by China, will help to finance projects under the initiative.[112]

How to respond to China's continuing rise and influence is one of the central economic and political issues of our time. However, hunger for growth and new economic opportunities, coupled with fears of an increasingly confident and assertive Chinese Government, can have a stifling effect on debate. Those who urge greater questioning of China's ambitions are often slammed for an unwillingness to move with the times and accept the new global economic order. Or worse, as driven by xenophobia.

In reality, we should neither accept China's reshaping of our region unreservedly, nor have a knee-jerk response to every new development. Rather, Australia must be an active participant in shaping the region and be willing to challenge where appropriate, in particular on grounds of ecological sustainability, inequality or human rights. The multiple failures of China's Great Western Development Strategy, including enduring environmental and human rights concerns in Tibet, are grounds enough to treat China's international ambitions with caution.

Having joined the Asian Infrastructure Investment Bank, Australia now has an opportunity to help ensure it adopts appropriate environmental safeguards and works for the benefit not only of Beijing but communities throughout the region.[113]

"This blue planet is our only home, and Tibet is its roof. The Tibetan plateau needs to be protected, not just for Tibetans but for the environmental health and sustainability of the entire world."
The Dalai Lama[113a]

"Tibet is not only vital for six million Tibetans, but for the whole world -- from an environmental point-of-view, a spiritual point-of-view and a strategic point-of-view."
Lobsang Sangay, Sikyong (Prime Minister) of the Central Tibetan Administration[113b]

CONCLUSION AND RECOMMENDATIONS

"Tibetan civilization was light on the land; China is heavy. A light touch is suitable for a land so cold that organic life takes centuries to establish itself, and does not recover when cut for railways, highways, mines, towns and so on. China is creating a manufactured landscape, remaking Tibet in its own industrial image, and it won't work. It may take a long time before this is realized. By then, it will be too late, the damage will be irreversible, the nomads will have been long removed, the land depopulated, the minerals exhausted, the Tibetans remade into factory workers in Chinese cities. Only then will it become obvious that the modern project of making the land of Tibet submit to human will was mistaken, unworkable, even disastrous."
Gabriel Lafitte, author and expert on environment and development challenges in Tibet

Since seizing control of Tibet more than half a century ago, the Chinese Government has held six major strategy meetings, known as 'Tibet Work Forums', to set the direction of its policies in Tibet. The most recent, held on 24-25 August 2015, was attended by President Xi Jinping and the entire Politburo – the top decision making body within the Communist Party of China.

The Fifth Tibet Work Forum, held in January 2010, placed particular emphasis on economic development, increasing rural household income, and improving social services.[114] By the recent Sixth Tibet Work Forum, emphasis had moved squarely to 'stability' – a term that, as noted by the International Campaign for Tibet, is strongly associated with expansion of military and police powers.[115] Official Chinese media elaborated on this theme, identifying "the struggle against separatism", "consolidating ethnic unity" and "the rule of law" as primary tasks for the region.[116]

The tone of this most recent major policy meeting on Tibet was particularly unsettling, revealing little recognition of the underlying causes of problems in Tibet, including the economic marginalization of Tibetans and degradation of the environment, and instead an intention to respond to dissent and ongoing tensions with ever more heavy-handed measures.

The rhetoric has been matched with action, with a further intensification of security in Tibet, including more checkpoints, further stepping up surveillance and large-scale movements of troops.[117] Rather than listening to the well-founded concerns of Tibetans and working together to address the root causes and find a better path forward, the Chinese Government is doubling down on failed policies, inflicting further harm on the environment and people of Tibet.

This worrying trend requires a firm and strategic response from the international community. And contrary to common feelings of powerlessness in the face of China's growing power and influence, there are many avenues through which Australia can and must help address the multiple and interconnected issues outlined in the this report:

A political resolution

- Through public statements and diplomatic representations, proactively support meaningful dialogue between the Chinese leadership and His Holiness the Dalai Lama's representatives towards a peaceful resolution of the Tibetan political situation.
- Adopt a multilateral approach to the resolution of the Tibetan political situation, working in a coordinated manner with likeminded governments to encourage real progress.

Lifting the veil

- Request unfettered access to all Tibetan areas for independent media, scientists, non-government organizations, UN monitors and other international observers.

Water governance

- Support the equitable and sustainable management of Asia's rivers through encouraging China's participation in effective trans-boundary management frameworks, ensuring greater accountability to downstream nations and safeguards against violations of water sovereignty.
- Through public statements, bilateral channels and international institutions such as the International Union for the Conservation of Nature, express concerns over the unsustainable development of Tibet's water resources and the implications for the region.

Reparation for failed policies

- Advocate for an immediate halt to the relocation of nomads from Tibet's grasslands, and for those already displaced to be provided with the option of returning to their traditional land.

Responsible mining

- Encourage the Chinese Government to uphold the principle of free, prior and informed consent in relation to all mining projects on the Tibetan Plateau.
- Both publicly and privately, express concerns over the impact of mining on the environment and communities on the Tibetan Plateau, and the ramifications for the region. Urge the adoption of far greater environmental and social standards for mining in Tibet.
- Advocate for the Tibetan people to be full participants in decisions over development of Tibet's resources.

Responding to climate change

- Increase Australia's own commitment to reducing greenhouse gas emissions, in line with the international goal of limiting the global average temperature rise to 1.5°C.
- Through ongoing engagement with UNFCCC negotiations, help ensure that all actions to address climate change uphold human rights, are driven by the needs of vulnerable groups and ecosystems, and incorporate traditional and indigenous knowledge.

Responsible financing

- Through Australia's membership of the Asian Infrastructure Investment Bank, work to ensure the Bank adopts environmental and social standards that are at least as robust as those of the existing multilateral development banks, and that the Bank operates transparently and is accountable to the people affected by its investments.

Endnotes

1 http://tibet.net/about-tibet/map-of-tibet/

2 A history of water: Volume 1 – Water control and river biographies (Terje Tvedt, 2006)

3 China's Renewable Energy Revolution (John Mathews and Hao Tan, 2015)

4 http://www.snowyhydro.com.au/energy/hydro/

5 Data on Australia's electricity generating capacity is from the Australian Energy Regulator: https://www.aer.gov.au/wholesale-markets/wholesale-statistics/generation-capacity-and-peak-demand

6 China ready for flood of hydropower (Shanghai Daily, 6 January 2011, posted on Phayul.com) http://www.phayul.com/news/article.aspx?id=28883

7 The hidden cost of China's shift to hydropower (Beth Walker and Liu Qin, The Diplomat, 29 July 2015) http://thediplomat.com/2015/07/the-hidden-costs-of-chinas-shift-to-hydropower/

8 The price of damning Tibet's rivers (Michael Buckley, New York Times, 30 March 2015) http://www.nytimes.com/2015/03/31/opinion/the-price-of-damming-tibets-rivers.html

9 Op Cit.

10 Hydro dams could jeopardise 'Grand Canyon of the east', say green groups (Jonathan Kaiman, The Guardian, 29 January 2013) http://www.theguardian.com/environment/2013/jan/29/hydro-dams-china-ecosystem

11 Meltdown in Tibet: China's reckless destruction of ecosystems from the highlands of Tibet to the deltas of Asia (Michael Buckley, 2014)

12 Meltdown in Tibet: The Mekong http://www.meltdownintibet.com/f_river_mekong.htm

13 China's great dam boom: A major assault on its rivers (Charlton Lewis, Yale Environment 360, 4 November 2013) http://e360.yale.edu/feature/chinas_great_dam_boom_an_assault_on_its_river_systems/2706/

14 Chinese ecologists call for halt in dam projects in Tibet (3 May 2015, Indian Express, posted by Canada Tibet Committee) http://tibet.ca/en/library/wtn/13169

15 China fails to build trust with Mekong neighbours (Darrin Magee, China Dialogue, 24 July 2013) https://www.chinadialogue.net/article/show/single/en/6234-China-fails-to-build-trust-with-Mekong-neighbours

16 Mekong River Commission: http://www.mrcmekong.org/ See also: Transboundary water governance: Adaptation to climate change (International Union for Conservation of Nature, 2014) https://portals.iucn.org/library/efiles/documents/IUCN-EPLP-no.075.pdf

17 China's water diversion project starts to flow to Beijing (Jonathan Kaiman, 13 December 2015) http://www.theguardian.com/world/2014/dec/12/china-water-diversion-project-beijing-displaced-farmers

18 Meltdown in Tibet: China's reckless destruction of ecosystems from the highlands of Tibet to the deltas of Asia (Michael Buckley, 2014)

19 Tibet and 21st century water wars (Nina Ninkovic and Jean-Pierre Lehmann, The Globalist, 11 July 2013) http://www.theglobalist.com/tibet-and-21st-century-water-wars/ China will have mastery of Asia's water tap by 2020 (Catriona Luke, The Huffington Post, 10 March 2012) http://www.huffingtonpost.co.uk/catriona-luke/china-will-have-mastery-o_b_917158.html

19a Completed in 2014 and operationalised in 2015, the Zangmu Dam is also known as the Zam Hydropower Station China operationalizes $1.5bn dam on Brahmaputra in Tibet, India sees red (The Indian Express, 13 October 2015) http://indianexpress.com/article/world/neighbours/china-operationalises-1-5-bn-dam-on-brahmaputra-in-tibet/ Tibetan PM in-exile warns impact in Northeast from dams built by China in Tibet (Times of India, 2 November 2015) http://timesofindia.indiatimes.com/india/Tibetan-PM-in-exile-warns-impact-in-Northeast-from-dams-built-by-China-in-Tibet/articleshow/49629701.cms

20 Water wars: China, India and the great dam rush (Sudha Ramachandran, The Diplomat, 3 April 2015) http://thediplomat.com/2015/04/water-wars-china-india-and-the-great-dam-rush/

21 India cannot keep relying on monsoon (Indian Climate Dialogue, 23 July 2014) http://indiaclimatedialogue.net/2014/07/23/india-keep-relying-monsoon/

22 The role of the heat source of the Tibetan Plateau in the general circulation (Meteorology and Atmospheric Physics, 67, 181-198, 1998)
http://link.springer.com/article/10.1007%2FBF01277509

23 Tibetan plateau gets wired up for monsoon prediction (Nature, 514, 16-17, 2014)
http://www.nature.com/news/tibetan-plateau-gets-wired-up-for-monsoon-prediction-1.16030

24 See, for example:
The Indian Monsoon in a changing climate (Andy Turner, Royal Meteorological Society)
http://www.rmets.org/weather-and-climate/climate/indian-monsoon-changing-climate
Effect of climate change on seasonal monsoon in Asia and its impact on the variability of monsoon rainfall in Southeast Asia (Geoscience Frontiers, March 2014)
http://www.sciencedirect.com/science/article/pii/S167498711400036X

24a Can the Tibetan Plateau snow cover influence the interannual variations of Eurasian heat wave frequency? (Climate Dynamics, 2015, p. 113) http://link.springer.com/article/10.1007%2Fs003820152775y#/
Cited in: Less snow in Tibet means more heatwaves in Europe (Beth Walker, China Dialogue, 28 September 2015)
https://www.chinadialogue.net/blog/8204Lesssnowin TibetmeansmoreheatwavesinEurope/en

25 China drills 7km borehole in 'roof of the world' in oil and gas hunt (Stephen Chen, South China Morning Post, 7 April 2014)
http://www.scmp.com/news/china/article/1466600/china-drills-7km-borehole-roof-world

26 New directions and shotgun weddings: Xi Jinping and the economy of Tibet (Gabriel Lafitte, 13 March 2015, Rukor.org)
http://rukor.org/new-directions-shotgun-weddings/

27 Environmental Justice Atlas: https://ejatlas.org/conflict/gyama-mine-landslide-in-tibet

28 Taming the West: The Community Party deepens Tibet's integration with the rest of the country (The Economist, 21 June 2014)
http://www.economist.com/news/china/21604594-communist-party-deepens-tibets-integration-rest-country-taming-west

29 Spoiling Tibet: China and resource nationalism on the roof of the world (Gabriel Lafitte, 2013)

30 Environment and Development Desk, Central Tibetan Administration (2007); cited in Spoiling Tibet, Op Cit.

31 See, for example:
Labour transitions and social inequalities in Tibet and Xinjiang: A comparative analysis of the structural foundations of discrimination and protest (Andrew Fischer, 2013)
http://www.case.edu/affil/tibet/moreTibetInfo/documents/ourtransitionsandSocialInequalitiesinTibetandXinjiang.pdf

32 New strategic rail network to Tibet's borders endangers environment, raises regional security concerns (International Campaign for Tibet, 21 November 2014)
http://www.savetibet.org/new-strategic-rail-network-to-tibets-borders-endangers-environment-raises-regional-security-concerns/
See also: China may build rail tunnel under Mount Everest, state media reports (Haroon Siddique and Jason Burke, The Guardian, 9 April 2015)
http://www.theguardian.com/world/2015/apr/09/china-may-build-rail-tunnel-under-mount-everest-state-media-reports

33 Fatal landslide draws attention to the toll of mining in Tibet (Edward Wong, The New York Times, 2 April 2013)
http://www.nytimes.com/2013/04/03/world/asia/deadly-tibetan-landslide-draws-attention-to-mining.html
The price of gold (The Economist, 6 April 2013)
http://www.economist.com/news/china/21575783-fatal-landslide-tibet-raises-questions-about-rush-regions-resources-price

34 Tibetans fear new mine is planned for polluted Gyama Valley (Radio Free Asia, 5 August 2015)
http://www.rfa.org/english/news/tibet/polluted-08052015161804.html

35 Freedom in the World 2015 (Freedom House, 2015)
https://freedomhouse.org/report/freedom-world/freedom-world-2015#.VgXp7CCqqko

36 Tibet: or, How to ruin a democracy (John Keane, The Conversation, 30 March 2013)
https://theconversation.com/tibet-or-how-to-ruin-democracy-13075

37 North Korea is more accessible to foreign journalists than Tibet is (Max Fisher, The Washington Post, 17 December 2013)
https://www.washingtonpost.com/news/worldviews/wp/2013/12/17/north-korea-is-more-accessible-to-foreign-journalists-than-tibet-is/

38 Religious repression in Tibet (International Campaign for Tibet)
http://www.savetibet.org/wp-content/uploads/2013/06/Religious_Repression_Tibet.pdf

39 See, for example the annual reports from the US Government's Congressional-Executive Commission on China: Annual Report 2014 (Congressional-Executive Commission on China, October 2014)
http://www.cecc.gov/publications/annual-reports/2014-annual-report

40 Tibetans protest new uranium mine citing religious and environmental concerns (Tibetan Centre for Human Rights and Democracy, posted by Canada Tibet Committee, 24 August 2015)
http://tibet.ca/en/library/wtn/13252

41 Mining protester becomes 2nd Tibetan to die in Chinese prison this month (Radio Free Asia, posted by Canada Tibet Committee, 27 July 2015)
http://tibet.ca/en/library/wtn/13228

42 Another Tibetan prisoner dies of torture (Central Tibetan Administration, 23 July 2015)
http://tibet.net/2015/07/another-tibetan-political-prisoner-dies-of-torture/

43 Tibetans detained, beaten for protesting construction near a sacred site (Radio Free Asia, posted by Canada Tibet Committee, 4 May 2015)
http://tibet.ca/en/library/wtn/13167

43 Tibetan women attacked, beaten in anti-mine rally (Radio Free Asia, 2 July 2014)
http://www.rfa.org/english/news/tibet/rally-07022014165303.html

45 Understanding the roots of our ecological crisis: Comparing traditional environmental protection in Tibet with over-consumption in the modern industrial world (Simon Bradshaw, 2007)
http://www.simonbradshaw.net/wp-content/uploads/2011/10/Understanding-the-Roots-of-Our-Ecological-Crisis-small.pdf

46 China may be making lithium the world's most strategic commodity (Investor Intel, 21 September 2015)
http://investorintel.com/cleantech-intel/china-may-making-lithium-worlds-strategic-commodity/

47 Tibet's resource curse (Gabriel Lafitte, China Dialogue, 19 December 2011)
https://www.chinadialogue.net/article/show/single/en/4696

48 Op cit.

49 Unpublished analysis by Gabriel Lafitte.

50 Tibet's resource curse (Gabriel Lafitte, China Dialogue, 19 December 2011)
https://www.chinadialogue.net/article/show/single/en/4696

51 Exposed: Coal mining at the source of China's Yellow River (Greenpeace, 7 August 2014)
http://www.greenpeace.org/international/en/news/features/Exposed-Coal-mining-at-the-source-of-Chinas-Yellow-River/
See also: Illegal coal mine encroaching on nature reserve in north-west China (Jonathan Kaiman, The Guardian, 7 August 2014)
http://www.theguardian.com/environment/2014/aug/07/illegal-coal-mine-nature-reserve-china

52 Exposed: Coal mining at the source of China's Yellow River (Greenpeace, 7 August 2014)
http://www.greenpeace.org/international/en/news/features/Exposed-Coal-mining-at-the-source-of-Chinas-Yellow-River/

53 Five Point Peace Plan: Address to the US Congress Human Rights Caucus (21 September, 1987)
http://www.dalailama.com/messages/tibet/five-point-peace-plan

54 Geography strikes back (Robert D. Kaplan, 7 September 2012, The Wall Street Journal)
http://www.wsj.com/articles/SB10000872396390443819404577635332556005436

54a China and India's border dispute rises to dangerous new heights (Tsering Topgyal, The Conversation, 26 September 2014) https://theconversation.com/chinaandindiasborderdisputerisestodangerousnewheights32125

55 Op Cit.

56 In the high-altitude Himalayas, India works to secure remote border with China as leaders meet (Annie Gowen, The Washington Post, 13 May 2015)
https://www.washingtonpost.com/world/asia_pacific/high-altitude-road-and-more-guards-planned-for-tense-india-china-border/2015/05/12/18befc88-7007-11e4-a2c2-478179fd0489_story.html

57 Annual report to Congress: Military and security developments involving the People's Republic of China 2015 (US Department of Defence)
http://www.defense.gov/Portals/1/Documents/pubs/2015_China_Military_Power_Report.pdf

58 Five Point Peace Plan: Address to the US Congress Human Rights Caucus (21 September, 1987)
http://www.dalailama.com/messages/tibet/five-point-peace-plan

59 Speech on the situation in Tibet (12 June 2012)
http://europa.eu/rapid/press-release_SPEECH-12-439_en.htm

60 China completes controversial nomad relocation in Tibet (Voice of America, 24 January 2014)
http://www.voanews.com/content/china-completes-controversial-nomad-relocation-in-tibet/1837288.html

61 See, for example: The World of Tibetan Nomads (Daniel Miller 2007)
http://www.case.edu/affil/tibet/documents/TheWorldofTibetanNomadsSept14.pdf
Meltdown in Tibet: China's reckless destruction of ecosystems

from the highlands of Tibet to the deltas of Asia (Michael Buckley, 2014)
http://www.meltdownintibet.com/

62 See, for example: Wasted Lives: Analysis of China's campaign to end Tibetan pastoral lifeways (Tibetan Centre for Human Rights and Democracy, 2015)
http://www.tchrd.org/wp-content/uploads/2015/05/Download-Report.pdf

63 Challenges and opportunities for carbon sequestration in grassland systems: A technical report on grassland management and climate change mitigation (Food and Agricultural Organization of the United Nations, 2010)
http://www.fao.org/fileadmin/templates/agphome/documents/climate/AGPC_grassland_webversion_19.pdf

64 Pastoralists: Playing a critical role in managing grasslands for climate change mitigation and adaptation (Food and Agricultural Organization of the United Nations)
http://www.fao.org/fileadmin/templates/agphome/documents/climate/Grasslands_Brief_final.pdf

65 Ibid.

66 Tibetan nomads hold vigil in Chengdu to protect the grasslands (International Campaign for Tibet, 29 January 2015)
http://www.savetibet.org/tibetan-nomads-hold-vigil-in-chengdu-to-protect-the-grasslands/

67 Grasslands of the world (Food and Agricultural Organization of the United Nations, 2005)
http://www.fao.org/docrep/008/y8344e/y8344e00.htm

68 Climate change, not grazing, destroying the Tibetan Plateau (Lei Dongjun, China Dialogue, 21 January 2013)
https://www.chinadialogue.net/article/show/single/en/5621-Climate-change-not-grazing-destroying-the-Tibetan-Plateau

69 Following the herds: Rhythms of Tibetan pastoral life in Amdo (Asian Highlands Perspectives, 32, 1-212, 2014)
http://plateauculture.org/writing/following-herds-rhythms-tibetan-pastoral-life-mdo

70 The world of Tibetan nomads (Daniel Miller, 2007)
http://www.case.edu/affil/tibet/documents/TheWorldofTibetanNomadsSept14.pdf

71 Soil as carbon storehouse: New weapon in climate fight? (Judith Schwartz, Yale Environment 360, 4 March 2015)
http://e360.yale.edu/feature/soil_as_carbon_storehouse_new_weapon_in_climate_fight/2744/

72 A culture endangered: Depopulating the grasslands of the Tibetan Plateau (Tenzin Norbu, 2012)
http://tibet.net/2012/07/a-culture-endangered-depopulating-the-grasslands-of-the-tibetan-plateau/

73 See, for example: "They say we should be grateful": Mass rehousing and relocation programs in Tibetan areas of China (Human Rights Watch, 2013)
https://www.hrw.org/report/2013/06/27/they-say-we-should-be-grateful/mass-rehousing-and-relocation-programs-tibetan
For some recent and accessible accounts of the plight of Tibet's nomads, see: China fences in its nomads, and an ancient life withers (Andrew Jacobs, New York Times, 11 July 2015)
http://www.nytimes.com/2015/07/12/world/asia/china-fences-in-its-nomads-and-an-ancient-life-withers.html
Inside the quiet lives for China's disappearing Tibetan nomads (Rachel Lowry, Time, 4 September 2015)
http://time.com/4006874/tibetan-nomads-china/

74 The displacement of Tibetan nomads, international law and the loss of global indigenous culture (Mark Kernan, Global Policy, 6 March 2013)
http://www.globalpolicyjournal.com/articles/international-law-and-human-rights/displacement-tibetan-nomads-international-law-and-loss-g

75 Depopulating the Tibetan grasslands (J. Marc Foggin, Mountain Research and Development, 2008)
http://www.case.edu/affil/tibet/tibetanNomads/documents/Foggin_J._Marc.pdf

76 Tibet's disappearing grasslands (Jonathan Watts, China Dialogue, 22 September 2010)
https://www.chinadialogue.net/article/3828-Tibet-s-disappearing-grasslands

77 This is part of message sent by group of educated young Tibetans living in eastern Tibet to a Tibetan living in exile, and published by the International Campaign for Tibet.
Storm in the grasslands: Self-immolations in Tibet and Chinese policy (International Campaign for Tibet, 2012)
http://www.savetibet.org/wp-content/uploads/2013/06/storminthegrassland-FINAL-HR.pdf

78 Self-immolation by Tibetans (International Campaign for Tibet, 4 September 2015)
http://www.savetibet.org/resources/fact-sheets/self-immolations-by-tibetans/

79 "They say we should be grateful": Mass rehousing and relocation programs in Tibetan areas of China (Human Rights Watch, 2013)
https://www.hrw.org/report/2013/06/27/they-say-we-should-be-grateful/mass-rehousing-and-relocation-programs-tibetan

80 Op Cit.

81 See, for example: China destroys the ancient Buddhist symbols of Lhasa city in Tibet (Yeshe Choesang, The Tibet Post International, 9 May 2013)
http://www.thetibetpost.com/en/news/tibet/3382-china-destroys-

the-ancient-buddhist-symbols-of-lhasa-city-in-tibet

82 China to build more highways, airports in Tibet by 2020 (Times of India, 26 July 2014)
http://timesofindia.indiatimes.com/world/china/China-to-build-more-highways-airports-in-Tibet-by-2020/articleshow/39065826.cms

83 Tibetans forced from their land to make room for road construction (Radio Free Asia, posted by Canada Tibet Committee, 8 June 2015)
http://www.tibet.ca/en/library/wtn/13194

84 China appropriates Tibetan farmlands in the name of hydropower projects (Tibetan Centre for Human Rights and Democracy, 12 July 2013)
http://www.tchrd.org/china-appropriates-tibetan-farmlands-in-the-name-of-hydropower-projects-3/

85 China bulldozes "illegal" Tibetan settlement, families homeless (Radio Free Asia, posted by Canada Tibet Committee, 11 May 2015)
http://tibet.ca/en/library/wtn/13174

86 The disempowered development of Tibet: A study in the economics of marginalization (Andrew Fischer, 2013)

87 Taming Tibet: Landscape transformation and the gift of Chinese development (Emily Yeh, 2013)

88 Double threat for Tibet: Climate change and human development are jeopardizing the plateau's fragile environment (Nature 512, 240-241, 21 August 2014)
http://www.nature.com/news/double-threat-for-tibet-1.15738

89 Mountains warming faster, say scientists (Newcastle University press office, 23 April 2015)
http://www.ncl.ac.uk/press.office/press.release/item/mountains-warming-faster-say-scientists

90 Tibet: Life on the climate front line (Leslie Hook, The Financial Times, 30 August 2013)
http://www.ft.com/intl/cms/s/2/ee1f3f80-1029-11e3-a258-00144feabdc0.html

91 Wild yaks: Shaggy barometers of climate change (Wildlife Conservation Society, March 2015)
http://www.sciencedaily.com/releases/2015/03/150304104038.htm

91a Chinese Academy of Sciences says grasslands turning to desert (Tibet Third Pole, 7 December 2015)
http://www.thethirdpole.net/2015/12/07/tibetan-plateau-turning-to-desert-says-chinese-academy-of-science/

92 See, for example: Climate change may bring big ecosystem changes (NASA, 14 December 2011)
http://www.nasa.gov/topics/earth/features/climate20111214.html

93 Retreat of Tibetan Plateau glaciers caused by global warming threatens water supply and food security (Institute for Governance and Sustainable Development, 2010)
http://www.igsd.org/documents/TibetanPlateauGlaciersNote_10August2010.pdf

94 Double threat for Tibet: Climate change and human development are jeopardizing the plateau's fragile environment (Nature 512, 240-241, 21 August 2014)
http://www.nature.com/news/double-threat-for-tibet-1.15738

95 Elevation-dependent warming in mountain regions of the world, (Nature Climate Change, 5, 424-430, 2015)
http://www.nature.com/nclimate/journal/v5/n5/full/nclimate2563.html

96 Tibetan glaciers are shrinking at their summits: Ice loss at high elevations threatens water supply for hundreds of millions of people (Nature, 17 September 2013)
http://www.nature.com/news/tibetan-glaciers-are-shrinking-at-their-summits-1.13767

97 Qinghai-Tibet Plateau glaciers shrink 15% in 30 years (Chinese Academy of Sciences, 22 May 2014)
http://english.cas.cn/resources/archive/news_archive/nu2014/201502/t20150217_140705.shtml

98 Area of lakes expands in Qinghai-Tibet Plateau (Chinese Academy of Science, 3 July 2014)
http://english.cas.cn/newsroom/news/201502/t20150217_140749.shtml

99 Op Cit.

100 Tibetan Plateau faces massive "ecosystem shift" (Beth Walker, China Dialogue, 23 October 2014)
https://www.chinadialogue.net/blog/7422-Tibetan-plateau-faces-massive-ecosystem-shift-/en

101 Modelling glacier change in the Everest region, Nepali Himalaya (The Cryosphere, 9, 1105-1128, 2015)
http://www.the-cryosphere.net/9/1105/2015/tc-9-1105-2015.pdf

102 Qinghai-Tibet Plateau glaciers shrink 15% in 30 years (Chinese Academy of Sciences, 22 May 2014)
http://english.cas.cn/resources/archive/news_archive/nu2014/201502/t20150217_140705.shtml

Economics of reducing greenhouse gas emissions in South Asia: Options and costs (Asian Development Bank, March 2013)
http://www.adb.org/publications/economics-reducing-greenhouse-gas-emissions-south-asia-options-and-costs

102a Synthesis report on the aggregate effect of the intended nationally determined contributions (UNFCCC, October 2015)
http://unfccc.int/resource/docs/2015/cop21/eng/07.pdf

103 More grasslands in Tibet could bring climate improvements (University of Gothenburg, August 2015)
http://www.sciencedaily.com/releases/2015/08/150820082340.

htm

104 Wasted Lives: Analysis of China's campaign to end Tibetan pastoral lifeways (Tibetan Centre for Human Rights and Democracy, 2015)
http://www.tchrd.org/wp-content/uploads/2015/05/Download-Report.pdf

105 China to introduce nationwide emissions trading scheme (Philip Wen, The Sydney Morning Herald, 25 September 2015)
http://www.smh.com.au/environment/climate-change/china-to-introduce-nationwide-emissions-trading-scheme-20150925-gjuv7a.html

106 Carbon farming initiative — Savanna burning (Australian Government, Department of Environment)
https://www.environment.gov.au/climate-change/emissions-reduction-fund/cfi/publications/factsheet-savanna-burning

107 Making grasslands sustainable in Mongolia: Adapting to climate and environmental change (Asian Development Bank and the Government of Mongolia, 2013)
http://www.adb.org/sites/default/files/publication/31145/making-grasslands-sustainable-mongolia.pdf

108 Birgit Müller, Helmholtz Centre for Environmental Research
Are nomads a climate-change weathervane (Tom Hart, New Internationalist, 9 September 2015)
http://newint.org/blog/2015/09/09/are-nomads-a-climate-change-weathervane/

109 Full text of Paris Agreement: http://unfccc.int/files/home/application/pdf/paris_agreement.pdf

110 Joint statement by UN Special Procedures on the occasion of World Environment day (5 June 2015)
http://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=16049&LangID=E
See also the work on the Mary Robinson Foundation — Climate Justice:
Zero carbon, zero poverty — The climate justice way (Mary Robinson Foundation — Climate Justice, February 2015)
http://www.mrfcj.org/news/zero-carbon-zero-poverty-the-climate-way.html
Mary Robinson - Climate deal must respect human rights (Megan Darby, Climate Home, 25 March 2015)
http://www.climatechangenews.com/2015/03/24/mary-robinson-climate-deal-must-respect-human-rights/

111 Foreign exchange reserves are assets held by a central bank or other national monetary authority, such as the People's Bank of China, usually in the form of US dollars. China's foreign exchange reserves are over three trillion dollars.
http://www.tradingeconomics.com/china/foreign-exchange-reserves

112 'Historic' AIIB signing marks beginning of new era, China says (Shannon Tiezzi, The Diplomat, 30 June 2015)
http://thediplomat.com/2015/06/historic-aiib-signing-marks-beginning-of-new-era-china-says/

113 With the AIIB the world gets a new banker, and a chance to shape China's view (Hui Feng, The Conversation, 1 July 2015
https://theconversation.com/with-the-aiib-the-world-gets-a-new-banker-and-a-chance-to-shape-chinas-view-42681
See also: Asian Infrastructure Investment Bank: China's Trojan Horse? (Richard Javad Heydarian, The Huffington Post, 3 July 2015)
http://www.huffingtonpost.com/richard-javad-heydarian/asian-infrastructure-inve_b_7717540.html?ir=Australia

113a Tibet is the canary in the coal mine (Richard Geer, Al Jazeera, 10 December 2015)
http://america.aljazeera.com/opinions/2015/12/tibet-is-the-canary-in-the-coal-mine.html

113b PM-in-exile appeals to world leaders for 'free Tibet' (World Bulletin, 4 November 2015)
http://www.worldbulletin.net/asia-pacific/165999/pm-in-exile-appeals-to-world-leaders-for-free-tibet

114 Communist Party leadership outlines 2010-2020 "Tibet Work" priorities at "Fifth Forum" (Congressional-Executive Commission on China, March 2010)
http://www.cecc.gov/publications/commission-analysis/communist-party-leadership-outlines-2010-2020-tibet-work-priorities

115 Major policy meeting on Tibet in buildup to sensitive anniversary (International Campaign for Tibet, 28 August 2015)
http://www.savetibet.org/major-policy-meeting-on-tibet-in-buildup-to-sensitive-anniversary/

116 Op Cit.

117 Op Cit.

For further information on the issues raised in this report please email
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The Hon. Warren Entsch MP
Chair of the Australian All-Party Parliamentary Group for Tibet
Federal Member for Leichhardt & Chair of the Joint Select Committee on Northern Australia
"Tibet's nomads have lived sustainably on the Tibetan grasslands for thousands of years. They are an integral part of the Tibetan Plateau ecosystem and play a vital role in maintaining the health of this crucial environment. The forced relocation of Tibet's nomads by the Chinese Government is both profoundly unjust and environmentally damaging. This report gives a powerful insight not only into the full significance of Tibet in today's world, but why we must finally start listening to those who truly know and understand this uniquely important land – the Tibetan people."

Senator the Hon. Lisa Singh
Senator for Tasmania, Australian Labor Party
Shadow Parliamentary Secretary for the Environment, Climate Change and Water
"Tibet's global significance on a cultural and humanitarian scale is already well-known. What this excellent and timely report from the Australia Tibet Council makes clear is Tibet's importance to the region and Australia in geo-strategic, political and environmental terms. In the context of the United Nation's adoption of the new Sustainable Development Goals and the finalisation of a new global climate agreement this year, 'Tibet: An Environmental Challenge' should be required reading for policy-makers and the general public alike."

Senator Larissa Waters,
Senator for Queensland, Co-Deputy Leader of the Australian Greens and spokesperson on environment and women
"From being the source of Asia's major rivers to its position between the region's two great powers, it is impossible to overstate the environmental and strategic significance of Tibet. This timely report demands that we take a fresh and urgent look at Tibetan environmental issues, including proposals for megadams, mines and the impact of climate change on Tibet's great bodies of ice and vital grasslands. This report encourages us to speak up about the policies that are causing pain and havoc for both the environment and people of Tibet. Ultimately, we ignore these challenges at our own peril."

The Hon. Melissa Parke MP
Member for Fremantle, Western Australia, Australian Labor Party
Former Minister for International Development
"I commend the Australia Tibet Council's efforts to highlight the cultural, environmental and geostrategic significance of the region and the challenges faced. The report 'Tibet: An Environmental Challenge' offers tangible solutions and recommendations to address the serious environmental threats that will have significant global and regional implications."

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