

Occupying Tibet's rivers: China's hydropower 'battlefield' in Tibet

Rare protests highlight extractivist plans risking catastrophic impacts, destruction of precious religious heritage

“Although it is Wontoe - a land locked up in the corner of Derge - that is facing this immediate hardship, in the future, the ones who will have to face the difficulties over generations if this dam gets built will be the land and villages downstream in Tibet and especially the people in mainland China.”

-Chamra Drimey Gyaltsen, A Tibetan-in-exile from Derge

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3D map of Driчу River flowing through Derge in Tibet. Image source: Turquoise Roof. Map development by Paul Franz ©Mapbox ©OpenStreetMap ©Maxar. Imagery overlay ©Planet Labs PBC

EXECUTIVE SUMMARY

Rare protests against the construction of a new hydropower dam in Tibet that risks catastrophic impacts on the world's highest and largest plateau and downstream in China have been met with violent paramilitary reprisals. The planned Kamtok (Chinese: Gangtuo) dam in the sacred mountains of Gëndong threatens the displacement of villages and ancient Buddhist monasteries in the upper reaches of the Drichu or Yangtze river (Jinsha in Chinese).

The protests draw urgent attention to China's extractivist plans that are carving up the Tibetan landscape, risking landslides, earthquakes and food insecurity, and impacting tens of millions living downstream in China, India and elsewhere in Asia. State-owned conglomerates are accelerating the construction of mega dams and associated infrastructure in Tibet despite the inherent dangers of a seismically unstable region where river systems are increasingly unpredictable due to climate change.

For the first time, China's dam-building is now reaching upriver to the sources of Asia's great wild mountain rivers in Tibet in landscapes that were previously among the least disturbed habitats on earth. Tibet is described by Chinese engineers as "the main battlefield of China's hydropower construction",¹ while a Chinese chief engineer warned that the process of constructing a dam in the upper reaches of the Drichu river is like building "high-rise blocks on tofu".

The construction of the Kamtok dam is a central government plan being carried out by Chinese state-owned company Huadian, one of the world's biggest coal-fired carbon emitters which signed a strategic partnership agreement with Germany's Siemens last month and has assets and businesses established in countries involved with China's Belt and Road Initiative.

The plans involve the entire population of the area - monks and lay, old and young – being uprooted and displaced in their thousands from villages and monasteries that have flourished upstream in the sacred mountains of Gëndong alongside the Drichu² or the upper Yangtze River, the longest and largest river on the Eurasian continent.

Paramilitary forces have imposed a lockdown after February protests in the Derge area of Kardze (Chinese: Ganzi) in Sichuan (the Tibetan area of Kham) against the construction of the 1.1 million kilowatts hydroelectric dam.

Even Chinese scholars and Chinese Communist Party (CCP) officials have underlined the importance of monasteries with "invaluable" 14th century CE Buddhist frescoes of "artistic splendour" that survived the Cultural Revolution but are now threatened with demolition and the displacement of hundreds of monks.

Video footage providing a rare glimpse of the situation in the area documented a peaceful gathering of Tibetans outside the county government headquarters in Kardze on 14 February, appealing for dam construction to be stopped. Just over a week later, teams of county officials and police arrived at two monasteries in Wonpotoe Township (Chinese: Wangbuding) to prepare for demolition. Footage sent out of Tibet - despite the extreme danger of doing so - showed the abbot of a monastery and elder Tibetans on their knees, crying and appealing to officials to stop the dam project and not remove them from their land. Other videos show monks being encircled and detained by police. Tibetan protesters were beaten so badly they were injured and hospitalised, and hundreds detained, with some facing criminal charges.

Party officials have now warned Tibetans that the massive hydro project on the upper reaches of the Yangtze - a river that is known downstream as an important cradle of Chinese civilisation - will go ahead regardless. The development reverses an order in 2009 by China's Environment Ministry to Huadian Corp to suspend "illegal" construction of dams in the middle reaches of the Yangtze in Tibet because of environmental concerns.

The construction of the Kamtok dam risks a cascade of adverse consequences both on the plateau and in China, serving as a reminder that China's policies in Tibet - where water is regarded as a 'strategic asset' by the Communist Party state - affect global climate systems already challenged by food and water insecurity involving glacial melting and erratic monsoon cycles. A leading Tibetan professor based in Beijing has revealed data showing that the rivers of Tibet are becoming more and more unpredictable.³

As a storehouse of freshwater and the source of the earth's eight largest river systems, the Tibetan plateau - a global climate change epicentre - is a critical resource for the world's 10 most densely populated nations surrounding it. But China has accelerated implementation of detailed plans to steadily move dam building upriver into steeper terrain.

On a visit to Sichuan last July, Xi Jinping underlined China's priorities in using the Tibetan plateau as major extraction zones for water, electricity and lithium, urging provincial officials "to write a new chapter in advancing Chinese modernization".⁴ The completion of the world's highest altitude high-voltage power grid in 2018,⁵ linked to the construction of a fully electrified high speed rail line from Chengdu in China's Sichuan Province to Lhasa,⁶ demonstrates the CCP's demand for hydropower-based energy resources and plans to intensify infrastructure construction in Tibet.

Now, these long-term plans focus on connecting hydro in the upper reaches of Asia's wild rivers with extraction of solar energy, windpower, hydropower, lithium, copper, gold, silver and molybdenum. China already leads globally in PV (photovoltaic) solar, wind turbines, hydro dam construction and the power grids that connect them to distant industrial users. It also fulfils a nation-building agenda, establishing Chinese uses for Tibetan landscapes and rivers, just as China seeks to break and reshape Tibetan inner landscapes, eradicating a separate sense of identity and history and compelling compliance with Chinese cultural nationalism.

China's plans involve raising captive water levels high enough to lap at the bottom of the dam wall of the next dam upriver, with most of the scheduled construction on the Dri Chu (Jinsha, upper Yangtze). This is a cascade, a series of pondages that reduces a racing mountain river to a chain of man-made lakes, each positioned exactly to butt up against its upriver neighbour. This plan requires dam walls that will be among the highest dam walls worldwide, as much as 300-400 metres high. At worst this risks a chain reaction as dams successively fail, causing the next to fail too, swept away by a tsunami wall of water 12 metres high.

In 2018, construction work on another massive dam in Tibet, the Lawa Batang dam over the Dri Chu river in the Tibetan area of Kham, was held up by a massive landslide, an entire mountain face rushing into the Dri Chu/upper Yangtze with such speed and force that one of the world's great rivers was stopped. Then, as waters banked up behind the natural dam, the dam broke. Thousands of houses collapsed and roads and infrastructure destroyed.

The sheer scale of dam construction heightens the risks. Dam-building raises the water level of rivers which increases the pressure of the water on the ground, which in turn increases the number of geological catastrophes especially since the valleys of the Himalayas are so young, its river still incising. Seismic waves caused by earthquakes can shake dam walls from unexpected angles, turning concrete and rock to tofu in a moment.

Although the hydro dams in the steep valleys of the eastern Tibetan mountains are described as clean and green energy, their construction involves carbon emissions generated from processing and transport of fossil fuel-intensive raw materials. Building the high walls of the dams requires importing vast amounts of cement made by fossil fuel burning, blasting rock from nearby steep valley walls, trucking and compacting those rocks as the fill

comprising most of the weight of a wall intended to hold back the world's great rivers.

As well as affecting people downstream in China, the dam building shift upriver into Tibet also impacts farmers and fisherfolk down river in Cambodia, Vietnam, Thailand, Laos and Myanmar. This is linked to the announcement last year of a major hydro dam near Markham (Chinese: Mangkang) in Kham Sichuan on the Za Chu/Mekong/Lancang Jiang in Tibet built by China's Huaneng, one of the big five state-owned power corporations providing electrification for China.

The announcement of relocation in Derge comes at the same time as monks were being forced to comply with orders to relocate from another monastery in Tsoelho, Qinghai. Similar footage emerged from Tibet of Tibetans appealing to officials against relocation to make way for construction of a new hydropower project that is underway on the Machu (Yellow) River. The massive construction project involves the destruction of the 19th century monastery of Atsok, rupturing the Tibetan community and its spiritual centre. Before issuing orders to relocate, affecting around 15,000 Tibetans, Chinese authorities announced the removal of Atsok Monastery from the list of recognized cultural and historical sites in the county.

Interactive map

Turquoise Roof is also providing our readers with an [interactive map](#) of the region to accompany this report. The map shows key locations in the area that will be immediately impacted by the Kamtok dam, including villages and monasteries, as well as the protest sites described in Part One. The map also shows the known routes of the power lines that form part of the electricity grid in this region, as well as the sites of solar farms, and nearby mines. [Our 3D map](#) is interactive and we encourage the reader to explore the landscape in the impacted area while they read this report. Fresh satellite imagery from Planet Labs captured in April 2024 has been overlaid over the contours of the landscape.⁷ Turquoise Roof is maintaining a watching brief on this issue and readers are invited to contribute new locations impacted by dams being built in this wider region via [this link](#). The map is rendered with Mapbox GL JS v 3.2.0 and the application was coded by Paul Franz. (paulkfranz@gmail.com).

Chinese language summary and strategic guidelines with context

[Turquoise Roof](#) is also providing a Chinese language version of the Executive Summary and detailed recommendations and context by Gabriel Lafitte, [rukor.org](#).

This report is in three parts as follows:

Part One

Tibetan frontline communities, displacement and dam-building. Bold, rare protests against the dam captured on video at great risk result in a lockdown and information blackout. Threats to survival of monasteries with precious Buddhist art and architecture. Resettlement plans outlined as Derge Tibetans warned of consequences of non-compliance. A 'ghetto of barrack-like buildings': life-altering displacement by dams. Killings, imprisonment and suppression of protests.

Part Two

China's extractivist plans in Tibet and the new 'bundling' of energy - water, solar and wind. China's 'clean, green' propaganda versus Huadian corp and the realities of dam construction. From concrete to tofu: the extreme risks of dam construction in Tibet. Kamtok, Batang Lawa and other major new dams on the Tibetan plateau. Landslides and Tsunami: Yangtze and Yarlung Tsangpo. Climate change, monsoons, droughts and floods; new Chinese scientific evidence.

Part Three

Recommendations and strategies. Turquoise Roof and Tibet Watch present a series of strategic recommendations for advocacy and alliance-building to counter China's extractivist plans and the threats these pose to lives, livelihoods and landscapes in Tibet and across Asia. These include:

- Protection of monasteries of Tibetan and global cultural, religious and artistic significance;
- Why US Treasury Secretary Yellen, who has just returned from China, should include hydro dams in Tibet in concern over China's "over-capacity" building;
- How China's dam-building in Tibet directly undermines Xi Jinping's concept of 'ecological civilisation' and Chinese environmental legislation protecting the Yangtze/Driчу river;
- The Derge Kamtok and Batang Lawa hydro dams are on the Central Asian Flyway route taken by vast numbers of migratory birds twice a year - why enforcing the Ramsar Convention on Wetlands matters;
- Working towards effective transboundary water management and the importance of protecting environmental defenders like the Derge protesters;
- How China's hunger for electricity and hydropower directly impacts food security.

Part One: Tibetan frontline communities, displacement and dam-building

Rare protests against hydro dam as officials signal acceleration of construction

On 14 February, hundreds of Tibetans gathered peacefully in front of the county government headquarters in Derge (Chinese: Dege), Kardze (Chinese: Ganzi) Tibetan Autonomous Prefecture in Sichuan (the Tibetan area of Kham) to express their opposition to the construction of the Kamtok dam and their displacement to “resettlement” sites. Many Tibetans held aloft the red Chinese national flag, as if to signal specific opposition to local consequences rather than a direct challenge to Beijing’s rule in Tibet.



Figure 1: Screenshot image of Tibetans of Wonpotoe Township protesting against Derge government's Kamtok hydroelectric dam construction. Image source: Radio Free Asia

In one of the video clips that circulated widely outside the PRC, Tibetans can be heard shouting in Tibetan in unison in one of the videos: “Tsamjok Goel!” “Has to stop!” - referring to the construction of Kamtok⁸ hydropower station and the imminent displacement from Wonpotoe Township, Derge County. A Tibetan, possibly an official, can also be heard saying in response that the county has no power to decide, signalling the top-down nature of policy in Tibetan areas and the high priority accorded to such infrastructure projects in Beijing.

According to Tibet Watch, the dam is expected to relocate 12 villages from both sides of the river; six villages from Jomda County located on the west riverbank, Chage village, Kharsum Do village, Wonpotoe village (汪布顶村), Randen village (然灯村), Laima village (来马村), and Zhuoge village (卓格村), and six villages from Derge County on the east river bank, Shiba village (西巴村), Yachi village (亚且村), Gongjia village (龚加村), Wonpotoe village (汪布顶村), Tashi Dan village (扎西旦村) and Gemai village (各麦村).⁹

The same Tibetan source also added that

proposed relocation and dam construction will affect over 860 Tibetan households from Jomda and Derge County as well as several old monasteries located in the region. Monasteries affected are Yena Monastery in the village of Shiba and Wontoe Monastery in Derge - both of major historic and cultural significance - and Rabten Monastery, Tashi Yargon Monastery, Tashi Margon Monastery, and Githok Monastery in Jomda County.¹⁰ The importance of Wontoe Monastery has been highlighted not only by Chinese scholars and Party institute affiliated Tibetan artists, but also by Party officials in Sichuan.

四川省甘孜藏族自治州德格县自然资源局岗托水电站德格境内移民搬迁规划编制项目竞争性磋商采购公告2952

上传人: tell88 · 上传时间: 2020-09-21

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(一) 项目概述

由于岗托水电站重大基础设施工程计划实施建设,因此涉及到工程实施范围内现状约 4287 人的拆迁并异地选址进行安置。为配合好重大基础设施项目建设,落实保障好现状居民的正常生活需求,本次特启动《岗托水电站德格境内移民搬迁规划编制项目》,共涉及白垭乡约 7 个安置点位实施规划,测量面积约 2.1 平方公里。

本次规划应重视选址的合理性与可行性,充分考虑选址点位的区位和交通条件,生活配套条件,地形地貌等自然环境条件,以及地质灾害情况等综合要素,科学选址。根据安置居民实际需求进行合理的户型设计和户型配比,合理进行用地布局和安置点总平面设计,作好建筑风貌与环境景观规划,作好生活配套设施与市政设施配套规划,以便指导下一步深化设计和实施建设,同时要组织好安置点的产业发展,总体应按照因地制宜、可持续发展的原则进行规划设计。

本项目作为重大基础设施建设的异地安置,具有一定的代表性和示范意义。

(二) 项目要求:

1、服务范围

本项目地处甘孜州德格县,涉及到白垭乡共约 7 个安置点位,完成项目实施规划(涉及相关总规、控规、修建性规划等工作),1:500 地形图测量约 2.1 平方公里。

2、主要服务规范

设计编制主要依据:

- 1) 《中华人民共和国合同法》;

Figure 2: Competitive consultation procurement notice on the Derge domestic resettlement planning preparation project of Kamtok hydropower station

Resettlement plans would divide and separate previously interdependent communities, in which lay and monastic lives are intertwined. Tenzin Choekyi of Tibet Watch said: “The lay community households on the west bank of the river have always been inextricably connected to monasteries on the other side of the river and vice-versa. These Tibetan communities, already divided under Tibet Autonomous Region and Sichuan, face further separation under the dam-induced displacement as they remain at risk of being scattered from their spiritual centres.”

A government procurement document published on 21 September 2020 by the Natural Resource Bureau of Derge County stated that 4287 people in the area would be removed and resettled “due to the planned implementation of the major infrastructure project of Gangtuo Hydropower Station”.¹¹ The procurement document stated: “In order to cooperate with the construction of

major infrastructure projects and ensure the normal living needs of current residents, the “Gangtuo Hydropower Station Dege Domestic Resettlement Planning Preparation Project” has been launched [...], involving a total of about seven resettlement sites in Baiya [Tibetan: Pekar] Township,¹² measuring an area of about 2.1 square kilometres.”

It is not known whether relocation will affect more than 4287 people and whether this number has been updated since 2020, or if it includes Tibetans from both Jomda and Derge county. Tibetans from both counties have a shared history¹³ and see themselves belonging together to the land, despite being ruled separately under jurisdictions created since the Chinese rule that used the river as a boundary.

Tibetan appeals railroaded at second dam site in Qinghai, displacing villages and monastery

Tibetan views and local expert knowledge of the land are similarly being ignored with the ongoing relocation of homes and a monastery to make way for a hydropower station on the Machu, or Yellow, River in Tsolho (Chinese: Hainan) in Qinghai, the Tibetan area of Amdo. Similar footage emerged from the area of local Tibetans prostrating and making emotional appeals for construction and relocation to stop.¹⁴

The relocation of Atsok Monastery in Palkha village of Drakar (Xinghai) county in Tsolho (Hainan) Tibetan Autonomous Prefecture, has now begun as part of the development plans for the Yangkhil (Yangqu) hydropower station, according to Tibet Times and other Tibetan sources. According to official sources, acquisition of a total land area of 80,691 mu (approximately 53 square kilometres) is planned, spanning 22 villages in three counties – including Drakkar – and is expected to affect 15,555 people.¹⁵

Atsok monastery, founded in 1889, is being relocated to a site approximately three to four kilometres away from its current location to a hill in Khyokar Naklo. Before ordering the monks to relocate, Chinese authorities announced the removal of the monastery from the list of recognized cultural and historical sites in the county. Atsok currently accommodates 157 monks after restrictions were imposed in 2021, barring novice monks from enrolment.¹⁶

The Yangkhil hydropower station located at the junction of Drakar county and Mangra (Guinan) county in the Tsolho Tibetan Autonomous Prefecture, Qinghai province, built on the Machu (Yellow) River, is designed to produce 1.2 gigawatts of power.

Local Tibetans and environmental activism in China silenced as dam building accelerates

Tibetan courage in seeking to protect their sacred landscapes and communities is all the more notable in the context of the silencing of any opposition or even moderately expressed critique against the Party's ambitious hydro and infrastructure construction agenda. Peak civil society partnership and advocacy for rivers, against dams, was around 2007, especially in China. After 2008 environmental advocacy was increasingly classified as a security risk, although coalitions of environmental scientists and local communities managed to speak up until 2013, one year after Xi Jinping came to power. In 2013, China's environmental NGOs grouped together to produce a prophetically named 88-page Last Report on China's Rivers.¹⁷

Even as environmental activists are silenced, fears over the future of the great rivers prevails in China, aligning the concerns and prescience of Tibetan protesters with Chinese people. In the PRC, these concerns even arise in the mainstream, with a new television drama series called 'Sunrise of the River' that depicts environmental law enforcers focusing on the Yangtze river downstream as heroes.¹⁸

The acceleration in construction of the dams is in sharp contrast with an order in 2009 by China's Ministry of Ecology and Environment to both Huadian Corp and Huaneng Group to suspend dam-building on the middle reaches of the Yangtze. The Ministry found that both state-owned corporations were acting illegally because they had not received approval of environmental impact assessments. According to the Ministry, the suspension was intended "to warn the two business giants [China Huaneng Group and China Huadian Corporation] which owned many energy-intensive and high polluting construction projects to enhance environmental

management, and urge the businesses belonging to them to strictly follow environmental protection laws and regulations, adjust the industrial structures and perform the due social responsibilities and environmental duties."¹⁹

The same happened relating to dam building in Qinghai. In 2021 permission was granted to build a dam on the Yellow River, displacing Atsok monastery and thousands of local people, after early construction had been deemed illegal by the authorities.²⁰ An official document had described construction of the dam on the Yellow River displacing monks and villagers as illegal in 2010, just over a decade earlier.

But higher-level Party state interests prevailed and in 2011 plans accelerated to begin hydro project construction in the upper reaches of Tibet's wild rivers. At a time when many developed nations have been decommissioning their large dams, China was signalling its intention to continue even after having built around 22,000 large dams or nearly half of the world's total, by the end of the 20th century.²¹

Threats to survival of monasteries with precious Buddhist art and architecture

The monasteries that face submersion are of unique historical and cultural significance with “invaluable” murals that have drawn attention from Chinese scholars and Party officials.

The Buddhist frescoes of Wontoe (Chinese: Wangdui) - just over 70 kilometres from the Derge county seat - are regarded as exquisite works of spiritual art, among the most significant to be found in Tibet, which also narrate the cultural history of the monastery. Yao Ruiyi from the Chinese Academy of Social Sciences presented a study of the Wontoe Monastery's murals at the 8th International Academic Symposium on Tibetan Archaeology and Art in Hangzhou in December 2023.²²

An account originally published in July 2002 on a Sichuan provincial official website highlights the historical and cultural significance of the monastery now under threat. Translated into English by High Peaks Pure Earth,²³ the account

states that based on the proportions of the deity figures, quality of pigments used and style of the paintings, experts in Tibet and the PRC concur that the murals were likely painted during the 14th or 15th century CE.²⁴

Describing a visit to Wontoe, the authors of the account wrote: “The monastery has several old buildings consisting of an assembly hall, a chapel and a deity's room. They house numerous invaluable murals. Khenrab Wangchuk, the monastery's abbot, showed the reporters into the ancient Tara chapel, the oldest room. It was filled with the murals of the Shakyamuni Buddha, the Amitabha Buddha, the five dhyani Buddhas, the Vajradhara Buddha, the Green Tara, the Sixteen Arhats and the various deities of the Mahavairocana mandala. Vast in their subject matter, the artistic splendour of these works was apparent.”



Figure 3: Mural of the Bodhisattva of compassion Chenrezig in Wontoe Monastery. Image source: Gangjong Nyishon website.

The scholars named several professors and well known Tibetan artists who had all “appealed to the concerned religious and cultural departments for the murals’ preservation and further research into their history and artistic value.”²⁵ Wontoe Monastery has also been featured in a Communist Party magazine and highlighted on the Kardze government website as a precious and important example of Tibetan culture.²⁶ The Party magazine sent a reporter to visit Wontoe, accompanied by a local official from the Derge County Buddhist Association, who was full of admiration for the beauty of the Derge scenery and the architecture of the monastery: “In this quiet and peaceful place, we can see smiling lamas and old people with prayer beads in their hands. [...] The murals [showcase] the development and wealth of Tibetan Buddhist art.”

Reflecting Tibetans’ deep connection to the land, the official accompanying the reporter spoke about growing up on the banks of the Drichu River, saying: “I know every plant and tree here very well. In the past, we could only use cowhide boats to cross the river, and there were no tall and majestic bridges. [...] The wood for building houses was transported through the water of the Jinsha River, and the fast-moving river had many twists and turns.” Supporting China’s position on the benefits of development to Tibetans, the official was cited as saying: “I don’t know how many heroes have been sacrificed. Now it is better, and modern equipment is used to benefit the people.”

Wontoe Monastery survived destruction during the Cultural Revolution because local villagers used the main assembly halls as warehousing for storage of livestock food, effectively preserving the historic structure and the Buddhist frescoes.²⁷

Beijing-based Tibetan writer Tsering Woesser, an influential and acclaimed poet, author and chronicler of contemporary Tibet, wrote: “It should be emphasised that of the more than 6,000 monasteries in Tibet, including Amdo, U-Tsang and Kham, due to the military repression of the 1950s and the Cultural Revolution from 1966 to 1976, most of them were totally destroyed and though very few were able to survive, ancient Wontoe Monastery is one of them. This was thanks to the protection of devoted local villagers who used the Hundred Column Hall as a warehouse for storing barley and livestock feed. The monastery’s ancient statues and old thangkas were hidden away in the mountain. The mural paintings were basically undamaged and the main building was not demolished, so it was lucky to be saved.”²⁸

During the period of relative liberalisation that followed the Cultural Revolution, the authorities allowed the monastery that now faces extinction to be restored to life. According to a 1995 history of the monastery, which was formerly Bon, then Nyingma and now the Sakya school of Buddhism, “Under the [...] leadership of Khenpo Tsultrim Tenzin, [in 1983], local people and monks worked together to rebuild the temples, college, and debating yard.”²⁹

The article on the Kardze government website draws attention to the survival of the ancient monastery into the 21st century, saying that it “is very special and well-known far and wide. [...] According to records, although the temple encountered several crises of destruction in history, it was miraculously preserved.”³⁰ Its future survival is no longer certain.

Protests and lockdown in Derge

From 20 February onwards, five days after the initial protest, a series of new video clips emerged from Tibet documenting protests and crackdown in the area. The Derge protests and documentation on video which reached the outside world are rare in Tibet, particularly since 2008 when a crackdown of unprecedented scope and scale was imposed across the plateau in response to hundreds of overwhelmingly peaceful demonstrations, calling for freedom and for the Dalai Lama to be allowed to return.³¹ Sharing video footage outside the PRC risks life-threatening consequences of torture and imprisonment and there are fears of severe reprisals for those who shared the clips.³²

Two clips show protests involving monks from the historic monastery of Yena and laypeople in Shiba village, located approximately 12 kilometres upstream from the dam site.

Some areas of Shiba, as well as Yachi village - located on the east riverbank 20 kilometres north from the dam site - have both been marked as at potential risk of landslides because of the dam construction. The findings were reported³³ after delegation made a visit to Chakra Township,³⁴ a valley adjacent to the sacred mountain, where the planning and design of the dam construction is taking place. The Dege County Water Conservancy Bureau, the Preparatory Office of Gangtuo Hydropower Station Construction Company, Chengdu Survey and Design Institute Co. Ltd., and other departments made the visit on 25 April 2022 on “preliminary exploration and hydropower resettlement of Gangtuo Hydropower Station”.



Figure 4: Screenshot image of a group of workers holding a red banner with yellow font text that reads, “Drichu Kamtok hydropower station survey and design project department. Happy New Year to all staff and families of Chengdu Institute”. Posted on Douyin on 23 December, 2023.

In the video,³⁵ around 20 Tibetans walk behind a team of four officials. The abbot of Yena Monastery walks beside the officials, trying to gain their attention. Clutching mala (prayer) beads, he suddenly raises his hands and sinks down to prostrate before them. It is a statement of sheer powerlessness that even the spiritual leader whom the laypeople revere - a monk who would usually be prostrating to the Buddha or a religious leader - is prostrating to Party cadres who are required to be atheist. The crowd of local Tibetans huddles around as if to protect him, many of them kneeling and in tears. The officials are brought to a halt in front of a gate below a Chinese red flag.

They can be seen raising up both their thumbs to the visiting officials and imploring them to stop the hydro dam construction and displacement. In Tibetan culture, this gesture of raising the thumbs means pleading for their request to be accepted.

Local Tibetans and monks of Shiba village are also seen in another video recorded at night,³⁶ in which a large number of lay Tibetans are wailing uncontrollably as a grey-haired woman in traditional Tibetan dress walks towards the camera, weeping. Two people have their phones' flashlights on towards the crowd whilst a few monks mill around in between them and a barrier tape sealed alongside a police car.

In a third video, also recorded at night, a monk from Yena Monastery is surrounded by a group of monks and laypeople, saying: "We didn't do anything against the Chinese! We didn't break the law, we followed their rules! Why do we have to leave our homes? The monastery was our home for generations. It is our home today [unclear words]. Why are you bringing trouble to these peaceful people? Why are you guys doing this? What is the reason you people are beating us? Why?"³⁷



Figure 5: Screenshot of a group of policemen encircle monks in Wonpotoe Township. Image source: Radio Free Asia

Two other videos³⁸ show mass arrests of monks and a large number of laypeople pleading in tears with raised thumbs to policemen. A group of policemen encircle around a dozen monks, manacle and immobilise them. The monks can be seen being forcefully pushed, dragged, and raising thumbs amid cries of distress. On the audio, someone can be heard in shock, making a reference to the Dalai Lama with the traditional Tibetan phrase “Yeshe Norbu Khen”, meaning “wish-fulfilling gem”.

Between 20 and 22 February, several hundred Tibetans apparently involved in protests were detained, according to Tibet Watch and multiple Tibetan media sources. One woman was beaten until she was vomiting blood and taken to hospital, according to information received by Students for a Free Tibet and Tibet Watch. Numerous reports by exile Tibetan media

describe the police having used water cannons, tasers and Tibetans being violently beaten, with many needing hospitalisation. “One of the monks from Wontoe Monastery was among those who had to be immediately rushed to the hospital because he had been beaten so badly that he could not even speak,” a Tibetan source told Radio Free Asia. “He also had many severe bruises on his body.”

On 28 February, People’s Armed Police marched through a street in Wontoe Township, of which the video was widely shared among exile Tibetans. Nearly 200 police in riot gear can be seen in the video.³⁹



Figure 6: Screenshot image of People’s Armed Police arriving in Wontoe Township to impose military lockdown. Posted on 28 February 2024 on Tibet Times Youtube channel.

The monastery “may soon be dead from the inside”

The area has been locked down and virtually no communications with the outside world are possible. According to Tibet Watch, a senior monk from Yena Monastery, highly respected by locals, is still being held in detention. Despite his gastrointestinal problems, families outside have been barred from giving him medicines and food. Some monks and lay Tibetans who are respected in the community may still be held in detention, while others have been released. Radio Free Asia Tibetan service reported on 25 March that the senior monk administrator of Wontoe monastery and a Tibetan village leader remain in detention and may face criminal charges.⁴⁰

Tibetan writer Tsering Woesser wrote: “So, how have these monks and people who focus on dharma practice and rely on the spiritual life of the monastery suffered in recent days? During the Tibetan New Year [in February], Wontoe Monastery was originally holding a very important gathering of the Ngor group of the Sakya sect, which would bless countless devotees on the 15th day of the month. However, before the religious gathering had even ended, the monastery was empty. Hundreds of monks and hundreds of villagers nearby were beaten, arrested, interrogated, and required to sign to obey any instructions from the authorities. They simply wanted to keep the ancient monastery. If we finally have to compromise on relocation, the ancient monastery with the Hundred Column Hall and a large area of ancient murals will be destroyed, and the monastery after the relocation will be separate from the village, and gradually there will be no source of monastics, and the monastery will soon be dead from the inside.”⁴¹

New evidence of earlier protests to dam construction

Tibetans in both counties - ruled as the Derge kingdom of Kham prior to the Chinese invasion - opposed the plans for the dam when they were first mooted in 2012 and also in late 2023. In an appeal to the local authorities at the time, they wrote: “Building hydropower stations will not only make us homeless, but also damage the environment,” saying that laypeople, monks and lamas in the local monasteries were opposed to the hydro project.⁴² They also revealed that local officials had reneged on their promise that they would not build the dam without the agreement of more than 80% of locals.

Over a decade later, new information obtained by Tibet Watch confirms strong opposition against the plans having taken place again in Jomda county. On 23 October 2023, following the build-up of pressure on local Tibetans to comply with the resettlement during biweekly meetings at either villages or township level, around 100 Tibetans drove together to the Jomda county headquarters in around 30 cars. Around 20 minutes before reaching their destination, they were stopped at Dongphu Township⁴³ by a large number of police.

After some negotiation, only eight or nine representatives were allowed access to speak with the county officials. All others were ordered to return home.

During the meeting, Tibetans argued for a halt to the dam construction and associated resettlement, drawing attention to the pollution and damage to the environment. They explained that the Tibetan villagers, lay and monastic population, and their monasteries have flourished and belong in those lands since ancient times. At the end of the meeting, the representatives were told that the decision had not been finalised and that they would keep them informed of decisions taken, although no such updates have been shared.

Resettlement plans outlined as Derge Tibetans warned of consequences of non-compliance

China has warned Khampa Tibetans of adverse consequences if they do not comply with Party state orders, and states that construction of the dam and relocation will continue regardless of local views.⁴⁴ On 25 February, in advance of the 'Two Sessions' - China's annual meetings of the National People's Congress and of the Chinese People's Political Consultative Conference - in Beijing, Derge County Party Secretary Pema Tashi (Chinese transliteration: Baima Zhaxi) visited the area together with the county-level head of the Public Security Bureau to underline those warnings.⁴⁵

When Derge county officials announced plans for the dam more than a decade ago, they stated that they would "actively cooperate" with Beijing's and Sichuan's province's plans to "accelerate the development of hydropower resources".⁴⁶

Local authorities acknowledged this would not be easy. An official document, 'Thoughts on the Great Leap-Forward Development of Dege County',⁴⁷ referenced the priority of intensifying political control due to strong sentiments of religious and cultural identity in Derge, stating: "The task of stabilisation is heavy. As one of the three major ancient cultural centres in Tibetan areas, Dege has a strong reputation in Tibetan areas. In addition, the five major [Buddhist] sects are gathered in the county, with many temples and monks. It is also bound by the three provinces (districts) of Sichuan, Tibet and Qinghai." Consistent with China's characterization of even moderate efforts to protect Tibetan culture as "splittist" and "criminal", the document stated: "Key areas where separatist groups carry out separatist and sabotage activities face tremendous pressure to maintain stability."

Oppressive measures and reprisals for any form of protest to the Party state are particularly extreme in both Kardze and Chamdo in the context of their long history of resistance to Chinese rule. In official statements, China indicates that it is an "arduous" struggle to maintain control,⁴⁸ an oblique reference to continued loyalty to the Dalai Lama and Khampa Tibetans' strong defence of their Buddhist identity and culture.⁴⁹ Similarly, Chamdo has a particular historic and political significance to China - it is regarded as a "strategic bridge" between the Tibet Autonomous Region and the neighbouring provinces of Sichuan, Yunnan and Qinghai.⁵⁰ China gained control of central Tibet when Chamdo, eastern Tibet's provincial capital, fell to the People's Liberation Army on 7 October 1950.

The 18th division of the People's Liberation Army advanced through Derge in September 1950 and was briefly repelled by Tibetan troops at the Kamtok ferry. The Chinese authorities have now set up a "patriotic education" base here to commemorate the PLA's eventual landing.

Reprisals are particularly tough when there is criticism or demonstrations against infrastructure projects prioritised at the highest levels in Beijing. Plans announced last May for the long-term development of Derge county underline that "social stability", a political term referring to the crushing of dissent and ensuring compliance to CCP policies, is the priority. Referring to intensive Tibetan resistance against China in the 1950s and '60s, and continuing peaceful protests in the region, official plans published on 14 May 2023 stated: "Due to its unique historical background, Dege County has long been at the forefront of the fight against separatism, infiltration, and destruction. Social stability maintenance has always been the primary political task of the people of Derge county".⁵¹

A ‘ghetto of barrack-like buildings’: life-altering displacement by dams

The Tibetan communities of Derge, Kamtok and Batang Lawa have witnessed the ongoing displacement of villages and farming and nomadic settlements in the grasslands over more than two decades, in the name of Chinese government-defined water security, grass volume growth, land degradation repair, ‘poverty alleviation’ and carbon sequestration. The suppression of the Derge protests by Khampa Tibetans underlines China’s drive to enforce urbanisation, displacing even more Tibetans from their lands into resettlement villages, towns and cities, leaving Tibetan landscapes available for extraction of solar energy, windpower, hydropower, lithium, copper, gold, silver and molybdenum.

China’s newly enacted laws specifically protecting the Yangtze and Yellow Rivers have little implementation in the Tibetan watershed source regions, other than as a further rationale for excluding local communities in the name of biodiversity protection.

Chinese sources have confirmed details of thousands of relocations connected to dam construction in Tibet. A report by the International Campaign from Tibet based on Chinese and Tibetan sources detailed the possibility of about 100,000 people linked to the Longpan/Tiger Leaping Gorge dam on the Driчу,⁵² and more than 58,000 displaced due to hydropower projects in Qinghai.⁵³

According to a Chinese source cited by Human Rights Watch, since 2017, authorities have relocated over 11,000 people from seven townships in Gonjo and Markham counties bordering the Driчу River for “poverty alleviation” reasons, according to official figures, though such reports do not link the mass relocation to dam construction.⁵⁴

The Chinese authorities acknowledge “special problems” with resettling Tibetans compared to other areas of the PRC. A research paper published in China stated: “Tibetan areas are rich in hydropower resources and are an important base for China’s West-to-East Power Transmission. However, engineering practice shows that Tibetan areas are different from other areas. The problem of resettlement and resettlement during hydropower project construction is relatively complex and special, which is currently a problem.”⁵⁵

Over a period of 15 years travelling more than a thousand miles across the Tibetan plateau, American author Scott Ezell was a rare Western witness to the exponential progress of multiple dam and mining projects, displacing autonomous Tibetan communities into resettlement zones. “Pristine natural landscapes were transformed into construction zones crowded with lorries, backhoes, and gravel crushers, and the high thin air of the roof of the world became heavy with dust and diesel exhaust,” he wrote of his travels to eastern Tibetan areas of Yunnan, Sichuan and Qinghai provinces from 2004-2019. “Traditional villages were expanded into small cities as thousands of displaced Tibetans were relocated from their earthen homes and ancestral grazing lands to live in pre-fab concrete shells.”⁵⁶

From 2011-2019, Ezell documented the construction of four massive dams along a 200-kilometre stretch of the upper Mekong, where it descends from the Tibetan plateau. The Huangdeng, Tuoba, Lidi, and Wunonglong dams were being built to generate electricity to power cities in eastern China, transforming the river from a free-flowing current to a series of stagnant reservoirs. In 2019 he visited a village that had been a self-contained, traditional community famous for its home-made wine. “But in 2019, Cizong had been turned into a resettlement zone where thousands of displaced Tibetans were concentrated in a ghetto of barracks-like buildings, hundreds of feet long and divided into apartments. The grape fields were gone, paved over, and built upon. There was no land for the new residents to plant gardens or keep animals, just a dense grid of buildings divided by narrow lanes piled with rubble. This and other resettlement zones I saw lacked any vestige of the space, freedom of movement, and autonomy that always defined Tibet [...]”⁵⁷

The Sichuan work report details ongoing resettlement plans, stating: “We will coordinate efforts to promote the migration of farmers into cities [...] Promote urbanisation construction with county towns as an important carrier [...] Continue to build 200 provincial-level top 100 central towns, and towns with a permanent population of more than 50,000 will be planned and constructed as small cities.”⁵⁸

Across China, hydropower projects have displaced millions of people, and numerous reports testify to the ongoing poverty of those relocated.⁵⁹ In Tibet, tens of thousands of Tibetan herders and farmers have been settled despite a growing scientific consensus in China and beyond that indigenous stewardship and herd mobility are essential to the health of the high plateau and help mitigate climate change.⁶⁰ The role of Tibetans, particularly nomads, in preserving the land and its wildlife, and the need for their free movement, has been recognized by the UNESCO World Heritage Committee and international conservation body the International Union for the Conservation of Nature (IUCN), particularly during discussion in 2017 over the status of the Hoh Xil nature reserve, which adjoins the Changthang in the Tibet Autonomous Region.⁶¹

The extractivist ideology pursued by the Chinese government is a human rights as well as an environmental issue, most obviously the civil and political rights of individual Tibetans arrested for voicing opposition. The collective human rights of affected communities are also breached, including the economic and social rights to development, food security and the negotiations that may reach free, prior, informed consent of local communities.⁶²

Derge County has named “open government” as a priority, stating that: “The implementation of open government affairs [is] the key work of the entire township, held a special meeting, organised cadres and workers to seriously study the relevant policies.”⁶³ Yet the villagers most impacted by the carving up of their landscape for heavy infrastructure and power plants have not been briefed or asked for consent.

Despite killings, imprisonment and suppression, courageous protests continue

Over the last decade, Tibetans in Derge and Kardze have courageously voiced their opposition and grievances against infrastructure projects and repressive policies through a series of non-violent actions.⁶⁴

In May 2013, Tibetans submitted an appeal against a tunnelling project linked to road construction in a residential area of Derge Pondha, saying that the tunnels could cause environmental damage as well as damage to their homes. Their appeal was rejected by the local authorities, and after digging for the tunnel began, many houses in the area were damaged, and there are reports that some collapsed leaving families homeless. Only a few of those Tibetans affected were moved or given any compensation. After around 100 Tibetans peacefully protested against the project, paramilitary troops were deployed, detaining most of the protesters in January 2014, according to Tibet Watch information. A few months later one of the tunnels collapsed and, on 26 April 2014, a five-year-old Tibetan boy fell into the hole created by the collapsed tunnel and died.⁶⁵

Also in 2014, troops opened fire on unarmed Tibetans protesting against the detention of a popular village leader called Wangdak in Loshu (Chinese: Luoxu) in Kardze (Chinese: Ganzi). Wangdak had expressed his support for a traditional gathering at the beginning of a local horse festival, in which Tibetans would burn incense and make prayer offerings, after it appeared that official restrictions were likely. At least three Tibetans died of untreated wounds, while two other Tibetans being held in custody died, one after dying by suicide, and the other of untreated wounds.⁶⁶

At least two Tibetans were shot in the head and more than eight others seriously injured after police opened fire at unarmed Tibetans who had gathered for a picnic and to offer prayers for the Dalai Lama's birthday on 6 July 2013 at a sacred mountain in Nyitso, Tawu (Chinese: Dawu/Daofu), Kardze.⁶⁷

On 6 February 2015, Pema Dorjee, a 17 year-old monk from Za Gonsar Monastery in Derge County was arrested by police whilst carrying out a solo protest in Kardze County.⁶⁸ He was heard shouting slogans of "Long Live His Holiness the Dalai Lama" and "Return His Holiness the Dalai Lama to Tibet". Witnesses

report around eight police officers beating him, badly injuring his face. During the 2008 freedom protests, several revered leaders of his monastery had been arrested and the remaining monks were subjected to intense 'patriotic re-education' sessions, ordered to raise the national flag on the monastery, and the local Tibetans to denounce and criticize the Dalai Lama and to sign their names denouncing him as a separatist.⁶⁹

A Tibetan man from Derge now in exile told Tibet Watch that during the Tibetan New Year in 2022, three to four police came to his home, forcibly took him away, and kept him under detention for more than 40 days during which he was beaten and received electric shocks repeatedly. His 'crime', according to police, was that it is illegal to burn juniper incense.

Another Tibetan who arrived in exile in 2023 told Tibet Watch: "I travelled to Damshung (Tib: འདས་གཞི་ལྷོ་ཁྱེད་) from Nyakrong (Tib: ཉག་རྩོད་) while passing through Kardze (Tib: ཀར་ཇེ་མཆོག་), Derge (Tib: ལྷེ་དགོ།), Chamdo (Tib: ཆབ་མདོ།), Nagchu (Tib: ནག་ཆུ།) and then to Lhasa. On the way, you pass through lots of security checkpoints, and they inspect every detail and keep a record of places you are planning to visit and people you are going to meet. Everything, from travel permit, identity card and car details. If they suspect anything, they immediately call the police."

Chinese policies continue to target language, culture and religion at the heart of Tibetan identity. When schools restarted last year after the Tibetan New Year break, the Kardze Prefecture Bureau of Education issued a notice banning the teaching of Tibetan language classes in middle schools.⁷⁰ The notice stated that from 2024, there would be no teaching of Tibetan language classes in Kangding (Chinese: Dartsedo) Zangwen Middle School (康定市藏文中学), Luding Tibetan Middle School (泸定藏文中学), Kardze Tibetan Middle School (甘孜藏文中学), Yajiang Tibetan Middle School (雅江藏文中学) and Derge Tibetan Middle School (德格藏文中学). According to Tibet Watch sources, the notice was sent to all the schools, and students and staff were instructed not to share or post it on social media, under threat of reprisals.

Part Two: China's extractivist plans in Tibet and the new 'bundling' of energy - water, solar and wind

The Kamtok dam is the sixth in a proposed series of 13 on the Dri Chu river. It is known officially as the 'One Reservoir and Thirteen Levels'⁷¹ cascade plan, to be built by Huadian Jinsha River Upstream Hydropower Corporation. It is a domain company of China Huadian Group - one of the five largest state-owned power generation companies currently overseen by its chairman Jiang Yi, also a member of the 14th National Committee of the Chinese People's Political Consultative Conference, which also has assets and businesses in countries involved in China's Belt and Road Initiative.⁷²

The five big state-owned dam building giants, including Huaneng and Huadian, are widely known as the five brothers, 'wuge xiongdì', created out of the 2002 splitting up of a monopolistic state-owned giant, the Guodian, formally the State Power Company of China.⁷³

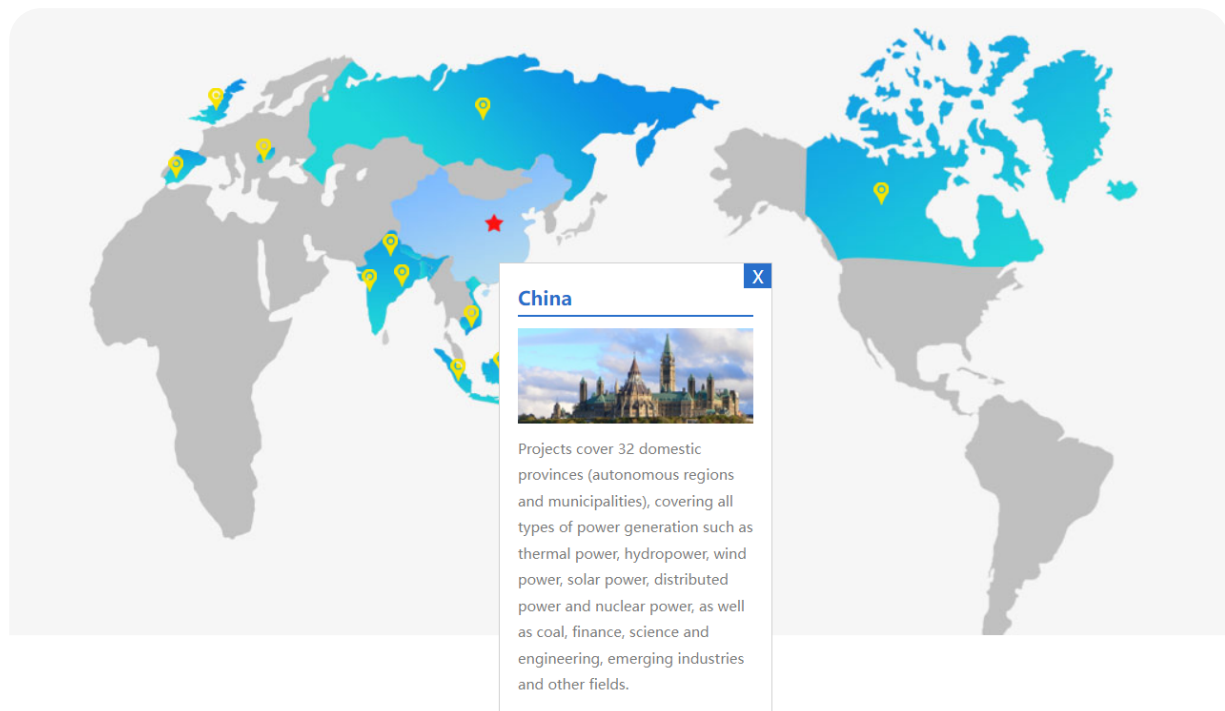


Figure 7: Screenshot taken on 18 April 2024 from China Huadian's official home page showing its presence and projects in the world. Image source: Official website of China Huadian.

Five major hydroelectric dams are already in operation or under construction along the stretch of the Dri Chu river through Derge, with an installed capacity of 8.6 gigawatts. By comparison, the world's most powerful hydro dam, the Three Gorges, lower down the Yangtze River, has a generating capacity of 22.5 gigawatts.

Although it cannot yet be confirmed, and there may be competition among Chinese conglomerates later over where the energy is utilised, the Kamtok hydro project may be linked to China's plans to power the vast copper, gold, silver and molybdenum mine in Tibet at Yulong, west of Derge in Jomda (Chinese: Jiangda) County in Chamdo prefecture, the Tibet Autonomous Region. For years the output from Yulong, which China describes as the world's biggest copper mine, has been constrained by limited sources of power.⁷⁴

Given its location, the Kamtok dam could likely enable, for the first time, an upscaling in production, since extraction also requires energy-intensive rock crushing that enables a sulphuric acid treatment to intensify the concentration when the rock is blasted from the mountainside.

The intensive exploitation of resources from high altitude Tibetan areas of Sichuan – particularly Kardze (Chinese: Ganzi) Tibetan Autonomous Prefecture, the Tibetan area of Kham, and Ngaba (Chinese: Aba) Tibetan and Qiang Autonomous Prefecture - is integral to China's extractivist plans with a particular focus on water, electricity, lithium and copper.

In his January 2024 work report, Sichuan's governor Huang Qiang outlined an ambitious agenda following Xi Jinping's 'inspection tour' of the province in July 2023.⁷⁵ The plan specified that the authorities would: "Accelerate the

implementation of multi-energy complementary power supply projects and interconnected power grid projects, accelerate the construction of 13 hydropower stations, 21 photovoltaic projects, 18 wind power projects [...] Hydropower installed capacity was 97.59 million kilowatts, ranking first in the country."⁷⁶

Sichuan province has ambitions to become the great powerhouse of inland China, production base of all the Fortune 500 top corporations, including the manufacture of electric cars powered by extracting lithium and copper from Tibet. The provincial work report also states: "The largest hard rock single lithium deposit in Asia was discovered in Ganzi [Kardze]". Turquoise Roof has documented that because at least 85% of the PRC's reserves of the critical mineral are to be found in remote mountainous areas of Kardze (Kham), Tibet is crucial to China's efforts to achieve dominance in securing not just lithium, but also a wide range of critical minerals and rare earths in the global race to a decarbonised future.⁷⁷

This means that at provincial and national levels the mining industry and construction of hydropower, solar and wind plants enjoy political protection and allocation of investment capital.

The Tibetan area of Kham, where the Derge protests happened, is today fragmented by PRC boundaries into prefectures of Sichuan, Qinghai, Yunnan provinces and the Tibet Autonomous Region. Kham has long been identified by scientists as one of the planet's biodiversity hotspots.⁷⁸ Compared to the rest of Tibet it is wetter, warmer, capturing the monsoon winds that rise up through deep Himalayan valleys. These are medicine mountains, the basis of a pharmacopoeia that combines herbs and minerals into hundreds of combinations, part of global "intangible cultural heritage".

But now land on the high plateau above the valleys is being seized for solar installations and wind turbines on a scale never before seen. Productive grazing land, owned and skilfully managed by Tibetan pastoralists for thousands of years, is appropriated as state property, allocated to state-owned dam building corporations, power grid builders, solar and wind turbine installation companies.

In the short term those who protest this loss of land, famous as sacred landscapes, are beaten and arrested. In the medium term, these landscapes are depopulated, families removed one by one to distant relocation villages where their customary skills are useless, and no new income sources are available, beyond dependence on state rations.

Until recently, solar and wind power plants were merely bolted onto hydro dam cascades on Tibetan rivers that were already operational, notably the cascade of nine dams on the Ma Chu/Huang He/Yellow River in Tibet. This was a major construction to capture all the kinetic energy of another major river, reducing its flow to a series of man-made lakes, turning an entire river into pondage stocked with non-native rainbow trout for sale in Shanghai, marketed as salmon. Gabriel Lafitte documents the process in a blog on Rukor, writing: "Further downstream, the Ma Chu becomes the Huang He/Yellow River. So the pure water of the high plateau, 'China's Number One Water Tower', must now flow through the economic production zone of the dams, fish farms and hydropower turbines, before it can reach lowland China."⁷⁹

Now the solar/hydro/wind package is inbuilt in the next river to be captured, which is the Drichu/Yangtze (Jinsha) in Tibet. For Beijing, accelerating dam/solar/wind bundle construction is a much-needed stimulus for the economy. It also fulfils a nation-building agenda, establishing Chinese uses for Tibetan landscapes and rivers.

China's master plan for Tibet to step up extraction and become a major exporter of electricity to distant Chinese lowland provinces, supplemented by nearby large scale solar and wind power installations, is imposed from the highest levels of the Party, which is why dissent in Derge has been ruthlessly crushed. Dam sites just below the Tibetan plateau are more accessible and easier to impound, so construction in Tibet has moved upriver only gradually, but steadily.

Recent policy announcements at the highest levels make it clear that wind turbine installation is about to be intensified, especially in remote areas of "waste land", which almost certainly includes Tibet, according to official documents. A PRC-wide campaign, "Thousands of Villages and Ten Thousand Villages Wind Harnessing Initiative" aims to promote the development and utilisation of wind power in rural areas.⁸⁰ This policy announcement explicitly promotes wind turbines as part of the programme of land consolidation, transfer of land to big corporations capable of "reclaiming" unproductive and under-productive lands, and "rural revitalization". While official documents state that the aim is to "empower ten thousand villages", in reality, in Derge, the combined energy projects and associated infrastructure disempowers and displaces villages.

China's 'clean, green' propaganda versus Huadian corp and the realities of dam construction

China claims to lead the global decarbonising push into clean, green technology. But at the same time its carbon emissions have been steadily growing. And the manufacture of all "clean, green" tech - building hydro dams, wind turbines, lithium batteries, solar farms, power grids - requires huge inputs of energy, most of which still comes from coal burning.

China deploys its massive build of hydro dams as proof of its commitment to clean, green, renewable energy; even more so when hydro dams are now coupled - especially in Tibet - with solar and wind power.

China Huadian Corporation (Huadian), the Chinese state-owned conglomerate leading dam building on the Dri Chu in Tibet, has an interest in dominating "clean, green" energy to balance its continuing focus on fossil fuel extraction, which faces a fading future. Huadian is one of the world's biggest coal fired carbon emitters, as a major builder of dams and coal mines in China and South East Asia, and is also a big importer of fossil fuels to be consumed in the PRC.⁸¹

The company is potentially vulnerable to the charge that building a dam plus solar complex in Tibet is greenwashing; it is rated badly by the World Benchmarking Alliance "of insufficient awareness of climate issues". The Alliance states: "Huadian has not set emissions reduction targets, lacks a transition plan and displays weak climate governance but has a high lock-in ratio and increasing coal-fired generation. Major efforts are needed to avoid exposing the company to serious risks in the coming decades."⁸²

Last month, Huadian signed an agreement with German company Siemens Energy, which is much more vulnerable to reputational risks, to deepen cooperation in low carbon energy. In a statement on its official WeChat platform reported by Reuters, Huadian said the cooperation would cover "grid transmission of offshore wind power, green hydrogen and smart technology for power generation."⁸³

Huaneng, another major dam builder and one of China's big five energy corporations, also has expansive international connections. According to official plans it has hired internationally renowned consulting firms including the German multinationals E.ON and RWE, Italian ENEL and Spain's Iberdrola.⁸⁴

Occupying Tibet's rivers

Construction of hydro dams requires huge amounts of diesel fossil fuel, for the blasting, trucking, dumping and compacting of rock from the valley walls to infill the earth-rock dam, plus the heavy use of coal-fired power to make the cement for the concrete walls.⁸⁵ Every aspect of hydro dam making is done with fossil fuel power and risks wrecking ecosystems of valleys renowned for their biodiversity.

Images of dam locations on the Dri Chu river reveal the extent of road and infrastructure construction required to transport heavy equipment into the sites, demonstrating that the damage done by dams is not limited to the rivers. Until now, these areas were among the least disturbed habitats on earth.

Emissions from the still, impounded waters of artificial lakes, as they cool and heat, are also a factor, amounting to one per cent of all global climate heating emissions. Chinese scientists of the Key Laboratory of Ecosystem Network Observation and Modeling in Beijing conclude that: "Half of hydropower reservoirs are incompatible with the low-carbon goal."⁸⁶

In one research paper, a group of Chinese environmental scientists studying a dam in Tibet noted that green evaluation of hydro projects omitted references to damage to the environment during construction, focusing mainly on the operational period. The scientists stated: "A lot of energy and resources are consumed during [hydro dam] construction, and many environmental pollutants, such as sewage, dust, and solid waste, are produced in the construction period. Nevertheless, the green evaluation of hydropower projects mainly focused on the operation period, whereas no research was carried out to evaluate the green level during the construction period, especially for large-scale hydropower projects."⁸⁷

Despite the risks posed by dam construction on the plateau, outlined in this report, China has sought to prevent potential criticism through its "elite capture" of global institutions. For instance, China's powerful power grid and dam industry, headed by senior CCP officials, was a sponsor of the UNESCO International Water Conference in Paris in May 2019.⁸⁸

Leaders of the International Hydropower Association (IHA), representing dam builders globally, recently received the 2023 Chinese Government Friendship Award. Member of IHA board Erik Solheim, former minister of climate and environment in Norway, posted that he was delighted to receive China's "highest honour for foreign experts" at a ceremony at the Great Hall of the People in Beijing, and said: "China's determination to take the path of green and sustainable development is admirable."⁸⁹

As one of the major power generators in China, Huadian has ambitious plans to import Liquefied Natural Gas (LNG) and according to a global gas industry conference, has the largest fleet of operating gas-fired power plants in the country, at 15 gigawatts (GW) by the end of 2018.⁹⁰

Huadian is administered by the State-owned Assets Supervision and Administration Commission of the State Council (SASAC). The company is too strategically important to the Chinese state to be allowed to fail; Fitch Ratings says: "A default would cause disruption to around 7%-8% of China's power generation output and upend the central government's energy transition plan."⁹¹ But it is vulnerable, and faces pressure from Beijing to keep electricity prices low, so as to encourage industrial energy users.

The rush to dam Tibet's rivers by China's giant, polluting conglomerates is known in Chinese as 喜喝泉水 'xi he quan shui', commonly translated as "hydropower rush" but more literally meaning "to occupy the river."⁹²

From concrete to tofu: the extreme risks of dam construction in Tibet

Tibetan protests in Derge urgently highlight the possible cascade of consequences not only on the plateau, but also downstream. A Tibetan from Derge who is now exile said: “Although it is Wontoe - a land locked up in the corner of Dege - that is facing this immediate hardship, in the future, the ones who will have to face the difficulties prolonging from life to generation - if this dam gets built - will be the land and villages downstream, the Tibetan lands and villages, and especially the Chinese people, the people in mainland China.”⁹³

In addition to expressing serious concerns about the cascade effect of dam burst to everyone living downstream of Drichu River and increase in pollution, another Tibetan source also drew attention to the importance of seeing the entire sacred mountain range as an integrated body. He drew attention to the history of the area dating back to the indigenous Tibetan religion of Bon, followed by the evolution of different Buddhist lineages since imperial Tibet, as well as diverse cremation practices carried out to this day by local Tibetans in remembrance of and transmission of their ancestral knowledge and cultural memory.

Tibet specialist analyst Gabriel Lafitte, who has analysed new dam building in detail, says: “The reality is that Tibet is a young land, still rising, its rivers still incising, and seismic waves caused by earthquakes can shake dam walls from unexpected angles, turning concrete and rock to tofu in a moment.”

China’s plans involve raising captive water levels high enough to lap at the bottom of the dam wall of the next dam upriver, with most of the scheduled construction on the Dri Chu (Jinsha, upper Yangtze). This is a cascade, a series of pondages that reduces a racing mountain river to a chain of man-made lakes, each positioned exactly to butt up against its upriver neighbour. This plan requires dam walls that will be among the highest dam walls worldwide, as much as 300-400 metres high.

The sheer scale of the dam construction heightens the risks. Dam-building raises the water level of rivers which increases the pressure of the water on the ground, which in turn increases the number of geological catastrophes especially since the valleys of the Himalayas are so young. Dr. Wang Weiluo, a German-Chinese hydrologist and expert on dam-building at the University of Dortmund, Germany, makes the comparison of the Mohne dam in Germany which was breached during the Second World War by RAF bombers (the ‘Dambusters’). “The resulting floodwave killed at least 1579 people. Here we see a relatively low dam, which when breached released an eight meter high flood wave,” he says. “But dams in Tibet which are 400 meters high would result in unprecedented catastrophe if these were to be breached.”⁹⁴

In May 2008, more than 69,000 people lost their lives in a massive earthquake in Lungu (Chinese: Wenchuan) county in Ngaba (Aba), Sichuan, the Tibetan area of Amdo.⁹⁵ Scientific evidence suggests that the filling of the Zipingpu reservoir of a 152 metre high dam may have activated a dormant fault line near the dam site, in an instance of reservoir-induced seismicity.⁹⁶ The dam holds more than 300 million tons of water behind it and is located less than a third of a mile from the fault that ruptured and 3.4 miles from the epicentre of the Sichuan earthquake. The quake on the eastern borders of the Tibetan plateau which was felt as far away as Beijing and Shanghai, also caused the largest number of geo-hazards ever recorded, including around 200,000 landslides and more than 800 “quake lakes”.⁹⁷ Writing for China Dialogue, Li Xiaomeng, who travelled to the dam soon after the earthquake, said: “It is a miracle that the 156-metre dam withstood the powerful [quake] and averted a flood.”⁹⁸

Kamtok, Batang Lawa and other major new dams on the Tibetan plateau

It has taken China's dam builders decades to get far upriver, and into the Tibetan Plateau, especially on the Dri Chu river, which is much bigger than the already dammed Ma Chu/Yellow River to the north, and the Za Chu/Lancang/Mekong to the west and south. Massive hydro dams have been built across the Yangtze below Tibet, so many that the easiest builds are already built, and now central planners look upriver, into the seismically active terrain of Tibet.

The Kamtok dam/solar/wind/power grid complex is even further upriver, more than 200 kilometres away, from Chinese engineers' last move upstream, the Batang Lawa dam. The Lawa hydropower station being built over the Dri Chu River, between Lhaba (Lawa) Township in Bathang (Batang) County in Kardze (Ganzi) TAP in Sichuan Province and Drupalung (Zhubalong) Township in Markham (Mangkang) County, Chamdo (Changdu), TAR, is a major project that began construction in summer 2023.⁹⁹ Governance of the huge dam is complicated, as it straddles the boundary of two different provinces, Tibet Autonomous Region and Sichuan. The Dri Chu/Jinsha/Yangtze is the border.

The Lawa dam was announced as one of a package of ambitious hydro projects on the plateau announced by Chinese government ministries in 2019.¹⁰⁰ The same official document detailed at least 27 hydropower stations planned on the river that forms the headwaters of the Yangtze (Chinese: Changjiang), including dams across Tibet, along the Yarlung Tsangpo (Eng: Brahmaputra, Ch: Yalu Zangbu jiang), the Machu (Eng: Yellow River, Ch: Huanghe) and the Gyalmo Ngulchu (Eng: Salween, Ch: Nujiang) rivers. They are either under construction or in the planning, along with rail and/or road expressways.

One of the dams included is the Longpan 6000-megawatt dam across the Tiger Leaping Gorge, directly adjacent to the UNESCO protected Tibetan area and World Heritage site of "Three Parallel Rivers" in Yunnan province.¹⁰¹ The "Parallel Rivers" area, where the headwaters of the Dri Chu, Dzachu (Mekong, Lancang Jiang) and the Gyalmo Ngulchu (Salween, Nu Jiang) run side by side in deep canyons, is reputed to be the "gene bank of the world," with about 7,000 plant species.

Close to the centre of the Parallel Rivers area is one of the most sacred mountains of Tibet, Khawa Karpo (Chinese: Meili Xueshan), an important pilgrimage site associated with Padmasambhava. Also known as Guru Rinpoche, Padmasambhava is deeply revered by Tibetans as a central figure in the Nyingma Buddhist lineage, who is said to have been invited to Tibet by the king Trisong Detsen to assist in the founding of the first Buddhist monastery in Tibet. It is acknowledged by the UNESCO World Heritage Committee as: "The last remaining stronghold for an extensive suite of rare and endangered plants and animals, the site is of outstanding universal value."

Notably, China's nomination for UNESCO World Heritage status for the Three Parallel Rivers area actually excluded two of the three great rivers (the upper Dri Chu/Yangtze and Gyalmo Ngulchu/Salween), and only marginally included a section of the Dzachu/Mekong. World heritage experts note this strategic choice; by excluding the rivers, the Chinese government retained the authority to approve dam construction by the major state-owned dam-building corporations without impediment.

Each uphill move of the dam construction is arduous, a major financial and logistical operation. Tibet specialist Gabriel Lafitte of rukor.org writes: “Like a Moon landing, it requires bringing to the site, from far below, all that is needful. The only local ingredient is masses of rock blasted from valley walls, as infill.”

China proudly calls the Lawa dam upriver from the Tibetan town of Batang “the world’s highest panel rockfill dam”.¹⁰² By design the electricity generated is not for the benefit of Tibetans but to export to the coastal industrial powerhouse of Guangzhou. According to official sources it is a central pillar of “the National Water-Wind-Guangzhou Integration Demonstration Base [...] with an installed capacity of 2 million kilowatts, and an average multi-year power generation of 9.089 billion kilowatts.” The river cut-off was completed in November 2021, and the first unit is scheduled to be commissioned for power generation by the end of 2026, according to the same official source.¹⁰³

The Lawa dam and its electricity then sent to Lanzhou is the new model of designating not only the dammable valleys but the surrounding upland rangelands as a wind turbine installation on a huge scale. No longer are solar and wind farms added after hydro dams are complete, this project initiates the integration of wind and hydro.¹⁰⁴

The package of bundling three very different technologies in the hope of a more consistent flow of electricity was proposed in 2018 by scientists of the State Key Laboratory of Hydraulics and Mountain River Engineering, Sichuan University, who struggled to design, on the Dri Chu/upper Yangtze the predictable 24/7 transmission of electricity that big factories need.¹⁰⁵

As part of the process of matching upriver hydro supply to distant urban electricity demand, China is now experimenting with pumped hydro, now being implemented for the first time at scale in Tibet. This involves inserting even more dams equipped with reversible turbines that pump water back upriver into the dam above, in off-peak demand hours, available to rush back down again during peak electricity demand hours of the day.

China announced the first and highest altitude “mixed pumped-storage project” in Nyagchu (Yajiang) County, Kardze, in Sichuan in 2022. The new power station has a total investment of about 8.5 billion yuan (about \$1.23 billion) and relies on the Lianghekou and the Yagen cascade reservoirs.¹⁰⁶ Nearly 2,000 people were due to be displaced by the construction of the Ya Gen power station in Nyagchu, being built over the Yarlung Tsangpo, the upper stream of the Brahmaputra before it flows into Arunachal Pradesh, India. Kardze Daily reported on 7 July, 2015 that “1796 people will be resettled, two towns and one religious activity site will be relocated, and there will be no centralized resettlement sites.”¹⁰⁷

To implement this system, Chinese engineers have sought to locate paired lakes, one higher than the other, close enough to constitute a system for pumping up and rushing down, according to grid demand. They have also identified terrain around existing lakes where engineers could build a reservoir above the lake to pump lake water up; or below the existing lake.¹⁰⁸ Gabriel Lafitte said: “China has fully embraced the concept that when you surround a big hydro dam with solar and wind turbines, you also need to build a smaller dam immediately below the bigger one, as pumped hydro – in effect a giant battery, to even out the hourly gaps between supply and demand.”

A third major new dam in the Tibet Autonomous Region on the upper Za Chu/Mekong was announced in 2023, controlled by the giant power provider, Chinese company Huaneng. The announcement of the latter dam by Huaneng came six days after central leaders issued new plans for ‘National Water Network Construction’.¹⁰⁹

The risks of damming upriver on the Tibetan plateau

Damming upriver in Tibet carries great risks, particularly as the gorges of the wild high altitude rivers are still young and seismically active — but the risks are being ignored by the Chinese government on the “battlefield” of hydropower.

The metaphor used by China’s planners is apt, Gabriel Lafitte points out, in relation to the role of China’s state-owned corporate giant Huadian, responsible for the new dams on the Dri Chu in Tibet. “There are obvious parallels between a military expeditionary force and a hydrodam construction force up into the mountains of Tibet, that has to bring with it everything from diesel fuel to cement,” writes Lafitte. “Staging a military conquest, as China did in eastern Tibet a century ago, or a dam building conquest today, are major exercises requiring detailed planning and long lead times. Huadian has had a decade to prepare, having been chosen in 2012 to conquer the Jinsha, China’s name for the upper Yangtze, in Tibetan the Dri Chu. It took a decade - Xi Jinping’s first decade - before the full assault on the Jinsha was authorised; a decade of not only planning but also dramatically increasing the scope of rising ambition.”

Huadian not only has the engineering muscle to scale the mountains of Tibet, it also has the capital accrued by being a major coal miner not just in China but in the world. The state-owned company operates worldwide, through a maze of subsidiaries designed for maximum financial opacity, and at the forefront of China’s global power projection, whether as dragonhead of Belt and Road, or pushing back the frontier in the mountain rivers of eastern Tibet.

The method of construction of dams on Tibetan rivers is inherently risky. China’s chosen method is called earth-rock fill, which means concrete walls, front and back, but in between the gravitas of the dam is supplied by blasting nearby steep valley walls, then trucking earth and boulders to dump into the gap between the outer and inner concrete walls.¹¹⁰

This raises doubts about long-term stability of this design, especially in areas prone to earthquakes, landslides and glacier collapses, all of which do occur unpredictably in Tibet, sometimes with catastrophic intensity. The most vulnerable part of a hydrodam is the turbines that turn the downhill rush of water released from the dam into electricity. By definition, those turbines are deep underground, below the dam wall, thus extremely vulnerable to earthquakes.¹¹¹ The turbines are by far the most expensive and finely calibrated tech of a hydro dam.

In October and November 2018, Polo (Boluo) Township in Kardze (Ganzi) was hit by two huge landslides, two years after the authorities had announced the county had been connected to the power grid linked to the construction of a large hydropower station.¹¹² Polo Hydropower Station on the Dri Chu River is at the boundary of Jomda (Jiangda) County, Chamdo (Changdu), TAR, and Palyul (Baiyu) County in Kardze, Sichuan Province. The two landslides and subsequent flooding destroyed 100 houses and damaged 1,000 more; Chinese media reported that 6,000 people were evacuated within 24 hours. Construction and climate change are likely to have been among the factors causing the disaster.¹¹³

Chinese geologists have warned that the effects of tectonic activity in the Three Rivers region have heightened the occurrence, frequency and impact of natural disasters, such as earthquakes and mudslides.¹¹⁴

Evaluating the risks of the ‘hydro battlefield’

‘The equivalent of constructing a high rise building on tofu’: damming on silt

The entire Lawa dam sits on fine silt washed down from upriver, 70 metres thick - silt that in a flood year washes away again further downstream. This is acknowledged by Chinese engineers of the state-owned dam builder Huadian. Chief engineer Tian Yinghui was cited by Chinese media as saying: “The power station dam site river has more than 70 metres of deep cover layer of soft foundation, of which more than 50 metres is the weir phase deposition of low liquid limit clay layer, that is, we often say silt. If you want to build a power station with a cofferdam to retain water is equivalent to building a high-rise building on tofu, and there is no precedent in the world to learn from.”¹¹⁵

The solution is to drive piling even deeper, to anchor the entire dam wall, which is 263 metres high, into hard rock. The deepest pile is 71 m deep. A 2023 research report by scientists of the State Key Laboratory of Eco-hydraulics in Northwest Arid Region of China, Xi’an University of Technology points out that building dams on soft silt is increasingly common, as the best sites for dam construction are already built. They collected data on 43 such dams that had deformed.

Landslides and Tsunami: Yangtze and Yarlung Tsangpo

If sitting a hugely heavy dam and lake on 70 metres of silt seems inherently risky, then the risks are also high when silt and rocks washed down from higher up can - at some dam sites on the upper Lancang/Mekong/Za Chu in Tibet and on the Yarlung Tsangpo - form an 'overburden' layer as much as 500 metres thick. This has been a major constraint on construction of big dams in Tibet, although new technologies may perhaps lessen the risk in future according to a 2024 research report, by scientists of State Key Laboratory of Eco-hydraulics in Northwest Arid Region, Xi'an University of Technology, who even tried to design a capability to withstand earthquakes.¹¹⁶

But if there is a major landslide upriver from the dam, a flood of silt may be enough to temporarily block the entire river for days, until banked up water breaks through, sending a deluge far downstream. This happened in 2018 upriver from the Batang Lawa dam.

Baige was a massive landslide, an entire mountain face rushing into the Jinsha/upper Yangtze in 2018 with such speed and force one of the world's great rivers was stopped. Then, as waters banked up behind the natural dam, the dam broke.

Two years later, reviewing this disaster, scientists of State Key Laboratory of Hydraulics and Mountain River Engineering, Sichuan University, detailed "tremendous damage to infrastructure, unfinished hydraulic buildings, roads, and bridges that were built or under construction along the Jinsha River" from an outburst flood of the Baige landslide dam.¹¹⁷

These are serious risks - at worst a chain reaction as dams successively fail, causing the next to fail too, swept away by a tsunami wall of water 12 metres high. The same report stated that more than 3,400 houses collapsed, there was damage to 3.5 thousand acres of farmland, and 120,000 residents were affected, of which 86,000 had to be relocated when two large-scale high-level landslides blocked the mainstream of the Driчу and formed a landslide dam.¹¹⁸

This sudden, unpredictable series of catastrophic landslides was upriver from the Lawa dam now under construction, on land described by the chief engineer as "tofu". The Baige collapse of a mountainside was 200 kms upriver from Lawa, with another scheduled dam, Yebatan, in between. Given the tightly bounded streambeds hemmed in by steep valley walls, and the many earthquakes that can trigger landslides, securing the massive Lawa dam will not be easy.

Climate change, monsoons, droughts and floods

The impacts of climate change, making river flow more uncertain and less predictable, present new risk factors and constraints.

On all the many rivers of Tibet, in whatever direction they flow, peak season is the summer monsoon, firstly, the South Asia monsoon flowing in from the Indian Ocean, then, weeks later, the arrival of the East Asian monsoon flowing in from the Pacific. These two monsoons originate in different oceans with quite different dynamics.

Increasingly, both monsoons have become less reliable, sometimes weakening, occasionally failing to arrive at all, which in turn strengthens westerly winds over Tibet that are no longer blocked as much by monsoon winds.¹¹⁹ Rising ocean temperatures weaken the monsoon winds and the temperature gradient too – the difference in temperatures over land and sea which drives the monsoons.

“This change is recent and no one is sure what happens next, but hydro is no longer seen as a safe bet,” writes Gabriel Lafitte. “The concentration of rain over Tibet (and snow on the mountains above) in summer means that, at best, river flow strong enough to generate a lot of electricity is six months, even if a lot of water is held back in dams, beyond the wet season, and snowmelt persists well after the monsoon recedes. Six months of abundant electricity followed by six months of shortage is not how modern industrial production lines work, there is too much high-tech capital tied up in production lines designed to function every day.”

New Chinese scientific report discovers unpredictability of Tibet's rivers

A 2023 Chinese scientific report, specifically focused on the Dri Chu/Jinsha/upper Yangtze, concluded that droughts on the Dri Chu/Jinsha/Yangtze river basin, “known as China’s largest hydropower base, have both become more frequent, and also more protracted in the dryer season in the last few years.”¹²⁰ The report stated that while over six decades, the river basin has experienced recurrent meteorological droughts, with the upper reaches being the most affected, the frequency of drought in the middle and lower reaches has shown a marked increase in the last 15 years.¹²¹

One of the leading meteorologists closely tracking climate change across Tibet is a Tibetan professor, Lan Cuo.¹²² Gathering evidence of climate trends and likely future trajectory is not easy when there is only a thin base of quantified past monitoring. Measuring of meteorological data began only in the 1960s, supplemented by digging deep into lakebed sediments and tree-rings to understand climate dynamics across deeper time.

Dr Lan Cuo has sought to generate statistically significant, reliable predictors of climate change across a plateau the size of western Europe, requiring an ability to interrogate available data to yield maximum insight into patterns of the interactions between atmospheric rivers, monsoon rains, prevailing wind directions, sunshine, temperature, permafrost, streamflow, snow and glacier melt, and their connections, plus connections between Tibet and global climate trends.

In a condensed presentation of her findings, at Columbia University on 22 February, Dr Cuo, a professor at the Institute of Tibetan Plateau Research at the Chinese Academy of Social Sciences in Beijing, presented detailed evidence that the rivers of Tibet are becoming more and more unpredictable. This is based on rigorous analysis of data from leading teams in installing data monitoring tech far upriver, well beyond where China’s streamflow stations are. Along the Yarlung Tsangpo/Brahmaputra, her team installed a multi-sphere observational network throughout the catchment:¹²³ 34 sets of probes to monitor frozen ground temperatures from 4,500 to 5,200 m elevation (100-m intervals), and two observation systems to monitor water and heat transfer processes in frozen ground.

In order to obtain a deeper understanding of long term rain and snowfall patterns across Tibet, China is undertaking a major scientific push in extending the limited weather monitoring done since the 1960s by drilling into lake beds. Scientists hope to generate measurements of weather in Tibet over the past 4000 years. This research is part of a major drive to quantify all aspects of the plateau, under the auspices of the well funded Second Comprehensive Scientific Expedition to Qinghai-Tibet Plateau, now publishing many reports.¹²⁴

The results of this scientific expeditionary push are not reassuring, as there has been a drying trend across Tibet over thousands of years, reversing in this century to increasing rain and snow, especially in northern Tibet. While the official China Meteorological Administration speaks positively of the new wetter trend, as signalling a Tibetan climate closer to China’s, the increase in rain and snow comes with increases in unpredictability and extreme weather. This is very much in line with the observations of meteorologists worldwide. Despite China’s best efforts to generate data in order to demonstrate to the public that what can be measured can be managed, the data generated most recently is disturbing.

Gabriel Lafitte writes: “The Yarlung Tsangpo drains the entire north face of the Himalaya, so it should be no surprise that interactions between winds, snow, permafrost soils, glaciers, evaporation, erosion all affect streamflow and assessments of suitability for hydro dams. Chinese dam planners and exiled Tibetans have assumed China can and will dam the Yarlung Tsangpo and its major tributaries, at will. Thus far, one big dam, Zangmu, near the town of Tsethang, is operational, though Zangmu was mooted as one of several dams in cascade. The more we know, the more complex those simple dam site designations become.”

Dr Lan Cuo points out: “The hydrological processes in this high-elevation basin are highly sensitive and susceptible to changes in the climate system (e.g., Indian summer monsoon and elevation-dependent warming. We currently have a very limited understanding of the variations in precipitation, glacier coverage, frozen ground, and vegetation caused by climate change, and their effects on runoff processes.”¹²⁵

The algorithms of Tibet's future dams

Chinese engineers grappled for years over how to harness the power of Tibet's water. They sought to answer the question of how to maximise electrical output from a river that for millions of years has kept pace with tectonic uplift by incising ever deeper valleys and gorges. And how to design a natural environmental flow to harness its gravity flow for human purposes, to reduce its complexity to the end of electricity generation for far distant industrial users? These were not simple questions given Tibet's topography, and some promising dam sites positioned on riverbeds where silt had deposited, tens of metres thick - not the right foundation for bearing the weight of millions of tonnes of rock, concrete and impounded water.

Experts at the School of Hydropower and Information Engineering, Huazhong University of Science and Technology, Wuhan, devised a unique algorithm in an attempt to do so in 2015.¹²⁶ They settled on the unusual metaphor of a multi-population ant colony as one specific algorithm to design long-term scheduling of large cascade hydropower stations on the Drichu river (LSLCHS).

But the predictive capabilities of algorithms depend on the reliability of historic data, which was sparse on the upper Yangtze, as China's water monitoring stations were further downriver. The research was carried out in a rapidly shifting landscape, with climate change making the monsoons less predictable and more variable.

Gabriel Lafitte poses the key question of whether this new data and circumstances could be a tipping point for central leaders in Beijing, to defer further spending on big dams in Tibet? Might the hydro boom in Tibetan rivers slow down, even pause, until the climate trend and streamflow reliability are better understood? In the context of China's pressing energy needs, Lafitte also raises the question of whether Chinese leaders might regard Xinjiang as a more reliable and cheaper source of (coal-fired) energy. In the meantime, the lives, livelihoods and irreplaceable Buddhist culture and landscapes of Kham Tibet hang precariously in the balance.

Part Three: Recommendations and strategies

Turquoise Roof and Tibet Watch present a series of strategic recommendations for advocacy and alliance-building to counter China's extractivist plans and the threats these pose to lives, livelihoods and landscapes in Tibet and across Asia. These include:

- Protection of monasteries of Tibetan and global cultural, religious and artistic significance;
- Why US Treasury Secretary Janet Yellen, who has just returned from China, should include hydro dams in Tibet in concern over China's 'overcapacity' building;
- How China's dam-building in Tibet directly undermines Xi Jinping's concept of 'ecological civilisation' and Chinese environmental legislation protecting the Yangtze/Driчу river;
- The Derge Kamtok and Batang Lawa hydro dams are on the Central Asian Flyway route taken by vast numbers of migratory birds twice a year - why enforcing the Ramsar Convention on Wetlands matters;
- Working towards effective transboundary water management and the importance of protecting environmental defenders like the Derge protesters;
- How China's hunger for electricity and hydropower directly impacts food security.

The Chinese government's extractivist plans pose threats to lives, livelihoods and landscapes in Tibet and across Asia. There are a range of options open to governments, international rights and environmental bodies. This section will explore several key advocacy themes and provide targeted recommendations for action.

Protecting the artistic and spiritual treasures of Tibetan monasteries threatened with submersion

Acclaimed Tibetan writer Tsering Woeser has urged the international community to “advocate for the protection of cultural diversity and the human rights of indigenous Tibetans”, saying that Tibetans “sincerely hope that lamas will use their vast influence in the world to protect the homes of thousands of devoted followers.” Many well-known Tibetan Buddhist leaders who are supported by many Chinese followers have visited Wontoe Monastery, a place of great significance for the Sakya school of Tibetan Buddhism. “It is worth understanding the value of this spiritual treasure house and its cultural heritage that deserves to be preserved in the world,” Woeser writes.¹²⁷

Even Chinese scholars and CCP officials have underlined the importance of monasteries with “invaluable” 14th century Buddhist frescoes of “artistic splendour” that survived the Cultural Revolution but are now threatened with demolition and the displacement of hundreds of monks.

- International institutions including UNESCO and Buddhist communities worldwide should act urgently to prevent the demolition of monasteries with “invaluable” 14th century CE Buddhist frescoes of “artistic splendour” as highlighted not only by Tibetan monks but also scholars and Party officials.

Over-building hydro dams affects global economy - addressing China's overcapacity

On a visit to China in April, US Treasury Secretary Janet Yellen expressed concern that China's chronic “overcapacity”, in many industries owned by the state, or favoured by state subsidies, not only distorts China's economy but the global economy, when China offloads excess production at prices that drive competitors out of business.¹²⁸ These concerns were echoed by German Chancellor Olaf Scholz in a meeting with Xi Jinping later that month.¹²⁹

Hydropower dam construction is in effect overcapacity construction, because, on Tibetan rivers, flow sufficient to turn turbines is at most six months in a year. According to analysis of existing dams, electricity generated in peak streamflow summer monsoon months is routinely sold cheaply, subsidising distant factories, while much of the electricity generated in the summer monsoon peak months is wasted.

- In addition to raising human rights and ecological concerns around the dam, Secretary Yellen and other international governments should name the Derge Kamtok and Batang Lawa dams in Tibet as overcapacity of international concern. Secretary Yellen should persist in pressing China to desist from financing and subsidising overcapacity in hydro dam construction. If China is unwilling

to curb this state-sponsored overspend, Secretary Yellen can initiate further sanctions to follow the likely sanctions the US is due to impose on China for its state subsidies of electric cars.

- Lobsang Yangtso, a Tibetan environmentalist and advocate for the International Tibet Network, adds to this point: “It may be the right time to sanction China for causing a negative impact on the glaciers and having an impact on other countries, not only on Tibet. Regardless, global leaders should place increasing pressure on the Chinese government and other governments who are creating a negative impact on the water sources as well. At the same time, it's important to make the polluters themselves accountable.”

Holding Huadian, Huaneng and international partners to account

Investors worldwide rely on ratings agencies for advice on which are the best companies to invest in. Of the top ratings agencies, Fitch is explicit that it gives Huaneng and Huadian a high rating because they implement CCP policy, and are too big to be ever allowed to fail. Assessing Huadian and Huaneng Group's "status, ownership and control by the state" as "Strong", Fitch notes that both companies are 90 percent owned by China's central State-Owned Assets Supervision and Administration Commission (SASAC). Fitch notes that SASAC appoints the companies' senior management and injects additional capital into the company. Fitch also notes broad central government control over Huadian's "operation, strategy and core management" and that Huadian is "strategically important to China's energy strategy and power supply. A default would cause disruption to around 7%-8% of China's power generation output and upend the central government's energy transition plan."

Gabriel Lafitte notes that this "blatantly political investment rating is irresponsible, and completely out of keeping with how Fitch and other top rating agencies assess corporate investments in other countries", adding that as a result of ratings such as these, Huaneng and Huadian have significant shareholders

among conservative investors such as the superannuation and pension funds of teachers, health workers, public servants in wealthy countries. "Wealth managers in these funds need to seriously consider reputational risk triggered by the protests of communities colonised and exploited by Huaneng, and disinvest. If wealth managers want to keep their jobs, they should act, ahead of investor repudiation."

Huadian's cooperation agreement with German multinational Siemens has also invited media attention and is likely to be a focal point for challenging international involvement in exploitation of the Tibetan plateau's water resources.

The dangers of dam building on the middle reaches of the Yangtze were already recognized in 2009 by China's Environment Ministry when it stated that Huadian's construction was 'illegal', a ruling that was later superseded. Dam building on the upper reaches of the Yangtze carries even more risk.

Targeting loopholes in Chinese legal protections

China legislated in 2020 to protect the entire Yangtze river, from the highlands of the Tibetan Plateau to the Pacific Ocean near Shanghai. Text in an early draft of this law that proposed restricting further hydro damming on the upper Yangtze was ultimately rejected, resulting in a law that in its current form gives different levels of protection for upstream and downstream; the urban, industrialised downstream is now strictly protected from industrial pollution, encouraging the most heavily polluting industries to migrate upriver. This necessitates new sources of electricity to power them, as well as transferring pollution risks to the Tibetan plateau.

China's Yangtze Protection Law continues to classify the entire river according to instrumental extractive use. This was first embedded in the 1959 Yangtze regulations, and in the State Council 1990 Executive Report on Plan for Comprehensive Utilisation of the Yangtze River Basin, which strongly emphasised a "plan for comprehensive utilisation, including development and utilisation of water resources, flood control, waterlogging control, hydropower generation, irrigation, navigation, water and soil conservation, river channel regulation on the main stream of the middle and lower reaches of the Yangtze River, south-to-north water transfer, aquaculture, city layout, water supply, water resources protection and environmental impact assessment, tourism and so on." The Jinsha/ Dri Chu in Tibet was singled out for intensive development.

The Asian Development Bank drew attention to the serious pollution, habitat loss, deforestation, over exploitation of natural resources and industrialization of the Yangtze river and its basin, stating in 2021 that "failure to systematically curb ecosystem and environmental degradation will pose serious barriers to achieving green, inclusive development in line with the PRC's vision for achieving an 'ecological civilization'."

This is central to China's plans for western China, which privilege the cities of Chengdu and Chongqing as major industrial hubs, relying on water, hydroelectricity and raw materials sourced from nearby Tibet. Although the 2020 Yangtze Protection Law is presented as national interest superseding provincial elites, the interests of Sichuan province, and Chongqing, a big "municipality" under direct control from Beijing, have renewed the extractivism of previous Yangtze plans of 1959 and 1990.

The law in its current form greatly restricts any opportunity for Tibetan communities impacted by dam construction to appeal to the authorities.

But the collective economic and social rights of the Tibetan communities displaced by the Derge Kamtok and Batang Lawa hydro dams should be respected, and enforced, as they are for Chinese citizens downriver. On the river parallel to the Yangtze - the upper Mekong/Za Chu in Tibet - it is the lower riparians of Laos, Thailand, Cambodia and Vietnam who are also threatened by the dam builders of the upper riparian watershed, in Yunnan and now in Tibet.

Protecting biodiversity and the Central Asian migratory route

Both the Derge Kamtok and Batang Lawa hydro dams are on the Central Asian Flyway route taken by vast numbers of migratory birds twice a year, in autumn flying from Siberia to India; in spring flying north back to Siberia.

The Central Asian Flyway is protected by the UN Convention on Migratory Species. Further upriver, north of both dams, are the Changshagongma Wetlands, awarded global protection status, at China's request, in 2018, by the Ramsar convention on wetland protection.

This protected wetlands in Serishul (Dzachuka, Chinese: Shiqu) county in Kardze (Ganzi), Sichuan (the Tibetan area of Kham), is one of the region's biodiversity hotspots. It provides important habitats for a large number of rare and threatened species, such as the globally endangered alpine musk deer, Pallas's fish eagle, snow leopard, Chinese mountain cat and white lipped deer. The site is also an important stopover and breeding ground for many migratory birds such as the black-necked crane and ruddy shelduck, and it plays a significant role in regulating the local climate, conserving

water, controlling floods and mitigating climate change.

Electrocution of migrating birds, alighting on power grid wires transmitting as much as one million volts, is a real danger. Likewise, rotating wind turbines, positioned on hilltops for maximum exposure to wind, are also a danger to birds.

- Impacts of the Derge and other dams in Tibet on biodiversity and migrating birds should be raised with Ramsar Regional Initiatives and the Ramsar convention secretariat, which next meets in June 2024. The Ramsar Convention on Wetlands, Convention on Biodiversity, Framework Convention on Climate Change, UNESCO World Heritage, IUCN, UN Environment Programme, should arrange an inspection of areas on the Central Asian Flyway that are officially protected, and areas in need of protection. Their report and recommendations should be publicly available.

Green energy infrastructure and food security in Tibet

Tibet's environment, agriculture and by extension its food security are dependent on Chinese government policy; all rural land in China belongs to the Party state.

The state-sponsored push to develop the western half of the People's Republic of China - "Develop the West (xibu da kaifa)" - was announced by Jiang Zemin in 1999. For the past 25 years, this long-term campaign to industrialise the hub cities of the west, notably Chengdu and Chongqing, has seen Tibetan landholders, especially pastoralist 'nomads' forcibly displaced from their pastures and into urban settlements.¹³⁰ At the same time, land has been allocated to mines, railways, highways, urban infrastructure and most recently for the construction of hydro dams and other infrastructure crucial to the Chinese government's decarbonisation efforts, including solar arrays and wind turbines. Until recently this displacement was done in the name of poverty alleviation, the repair of degraded land, water provisioning and wildlife biodiversity protection and the provision of "safe and suitable housing" for rural Tibetans.¹³¹

This need for Tibetan land, including for the construction of electricity and hydropower infrastructure, has directly clashed with Tibet's food security, which has been diminishing for decades, as displacement of nomads and farmers from their pastures has steadily intensified while Han workers have been deployed to Tibet through government population transfer.

In 2010, UN Special Rapporteur on the right to food Olivier de Schutter called for an end to China's policies of displacement and relocation in Tibet, saying that they jeopardised food security and degraded the environment.

A 2022 study of adult Tibetans living near the Yarlung Tsangpo river, in what has long been Tibet's breadbasket cropping heartland, found: "The dietary intake of a large sample of Tibetan adult population living in agricultural counties of Tibetan Autonomous Region is alarmingly insufficient [...] Young Tibetan adults aged 18-30 years are particularly vulnerable to micronutrient shortfalls and currently facing the risk of nutrition-insecurity-related dietary inadequacy. The respondents who belong to the elderly category (≥ 51 years of age) are facing the risk of 'double burden of malnutrition' characterised by the coexistence of undernutrition, including micronutrient deficiencies and overweight or obesity."¹³²

The displacement of hundreds of thousands of Tibetans to make way for energy infrastructure has compromised Tibet's food security and increased its reliance on food trucked in, over great distances, from lowland factories.

The importance of effective transboundary water management - and defending the defenders

The creation of effective transboundary water management, specifically by forming river basin organisations, is at the heart of any solution.

In a White Paper published at an event organised by the International Water Management Institute, Lobsang Yangtso of the International Tibet Network writes: “For instance, the Brahmaputra River should have an international treaty organisation to facilitate formal information sharing, collaboration, joint scientific research, and assessments. Second, there should be a strategic alliance among environmental organisations in downstream countries to support comprehensive data sharing. Inclusion of local people in decision-making processes, respecting their traditional knowledge, and adopting a rights-based approach that empowers frontline communities are crucial.

“Human rights and environmental issues are interconnected. Recent UN Human Rights reports highlighted the imprisonment of Tibetan environmental defenders. Collaboration and support for environmental defenders across the Himalayan region are essential for protecting their work and promoting environmental protection.”¹³³

Recommendations

- Construction of the Kamtok (Gangtuo) dam should be halted as it involves unacceptable risk not only in Tibet but downstream in China and directly undermines Xi Jinping's concept of 'ecological civilisation' and Chinese environmental legislation protecting the Driчу/Yangtze river.
- Tibetan frontline resistance to the Kamtok hydrodam construction to protect the sources of the Eurasian continent's longest and largest river of Driчу/Yangtze is in the interests of the Chinese as well as Tibetan people. They should not be penalised for peaceful appeals to protect the upper reaches of the Yangtze and their cultural and religious heritage and landscape.
- The 2020 Yangtze Protection Law should be revised to provide upriver residents of Driчу with equal protection to those downriver, and integrate Tibetans' ecological knowledge and reverence for local sacred mountains in land-use planning, political decision-making, and environmental, social and cultural impact assessment.
- International institutions including UNESCO and Buddhist communities worldwide should issue public statements of concern and act urgently to prevent the demolition of monasteries with "invaluable" 14th century CE Buddhist frescoes of "artistic splendour" as highlighted not only by Tibetan monks but also scholars and Party officials.
- Despite alarming evidence to the contrary, China claims to have already fulfilled all the Sustainable Development Goals agreed to in 2015. UN Sustainable Development Goal #2: "By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment. By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality." In Tibet, China's export driven food production policy, combined with increasing loss of productive land for dams and solar farms, should be independently monitored. UN food security experts should be allowed full unfettered access to Tibet and their reports made public.
- Clearance of Tibetans from their lands, whether in the name of hydro dams, solar arrays, water tower protection, biodiversity protection all add up to loss of land rights, loss of independence and livelihoods, which have steadily encroached on Tibetans and their customary skilled livelihoods for at least 25 years. China's policies are not only threatening one of the world's last systems of sustainable pastoralism, but Chinese, Tibetan and Western scholars have pointed out that settling nomads runs counter to the latest scientific evidence on lessening the impact of grasslands degradation, which points to the need for livestock mobility in ensuring the health of the rangelands and mitigating negative warming impacts. The urgent situation of displacement for dangerous dam projects calls for a full assessment by independent experts of the impacts of China's frontier development policies on Tibetan lands.
- Allow UN special experts on human rights full, unfettered access to Tibet to conduct human rights assessments, including, but not limited to, the Special Rapporteur on adequate housing, Special Rapporteur on the situation of human rights defenders, Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment and the Special Rapporteur on the right to food.
- Climate change over the Tibetan Plateau intensifies risk, extreme weather, loss of productivity, danger of malnutrition and loss of food security. Coupling climate research with nutrition and land use research should engage the UN Sustainable Development Goals system with the Intergovernmental Panel on Climate Change.

To international governments

- Urge the Chinese government to immediately halt the Kamtok dam and directly challenge China's extractivist plans that are carving up the Tibetan landscape, risking landslides, earthquakes and food insecurity, and impacting tens of millions living downstream in China, India and elsewhere in Asia.
- Urge China to ensure that no further construction of dams and extraction projects take place on the Tibetan plateau without the implementation of robust measures to secure the free, prior and informed consent of the surrounding community.
- Engage in dialogue with the exile Tibetan authorities, the Central Tibetan Administration, and the exile and diaspora communities of Derge County on China's discourse of right to development and poverty alleviation.
- Impose restrictions on domestic companies from entering into cooperation agreements with Huadian, Huaneng and other state-owned enterprises engaged in activities that will displace Tibetans from their homelands, noting that both Huadian and Huaneng were in 2009 told to stop construction of other dams in the middle reaches of the Yangtze by China's environmental ministry, an order that was later superseded.
- Raise concerns with Chinese government counterparts about the building of dams across the Tibetan plateau driving overcapacity and having negative impacts on regional water supplies, food security and ecology.
- Seek to undertake a fact-finding visit in Derge County to establish the situation on the ground.
- Press China to permit visits by United Nations human rights Special Procedures to Tibet to assess the impact of China's policies on Tibetans.

To United States government and US Treasury Secretary Yellen

- Name hydro dam construction on the upper Yangtze as a state-sponsored increase in overcapacity and make explicit reference to this in any further sanctions in response to Chinese government subsidies for electric cars.

To the German government

- Urge Siemens to halt further cooperation with China Huadian Group so long as the Kamtok (Gangtuo) dam project remains active

To UN human rights bodies

- Request meaningful and unfettered access to Tibet for Special Procedures Mandate holders to assess the human rights situation on the ground, including to Derge County, detention facilities and affected monasteries in the area.
- Urgently engage with the current situation in Tibet and the implications of massive dam construction in the upper reaches of the Yangtze.

To UNESCO

- Issue an urgent call for the monasteries and wider cultural heritage of Derge County to be respected and protected
- Call for a halt to the Kamtok dam

To Siemens

- Terminate its cooperation with Huadian on human rights and environmental grounds

To pension funds

- Review whether they have investments in Huadian and Huaneng and if so, dump those shares on ethical grounds

Endnotes

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8 གླུ་ཐོག་ཆུ་གླིང་ལ་ཆེགས། 岗托水电站, Gangtuo Hydropower Station

9 This information is from one Tibetan source, although names of villages and monasteries have been confirmed by a number of other Tibetan sources.

10 Also see Tsering Woesser blogpost, translated into English by High Peaks Pure Earth, <https://highpeakspureearth.com/wontoe-monastery-survived-the-cultural-revolution-but-now-faces-the-disaster-of-hydropower-development-by-woesser/>

11 岗托水电站德格境内移民搬迁规划编制项目需求论证公示;21 September 2020; <https://xunbiaobao.baidu.com/biddingDetail?id=354467672c6255db-cff4691d7418992dec716dbd&source=seo>

12 ངེ་མར་ཁང་། 白垭乡

13 See 'The Rise of Gonpo Namgyal: The Blind Warrior of Nyarong' by Yudru Tsomo, and 'The History of Drigue Yena Pal Tashi Lhatse Monastery' by Gelek Phuntsok accessible at The Buddhist Digital Ressource Centre: <https://library.bdrc.io/show/bdr:W1KG3381?s=%2Fshow%2Fbdr%3AMW1K-G3381%3Fuilang%3Dbo%open-viewer>

14 A video of the appeals was posted by Tsering Woesser, although it is unclear when the footage was taken.

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Institute of Environmental Science and Technology, Dalian Environmental Protection

Volunteers Association, Green Stone Environmental Action Network, Greenovation

Hub, Wild China Film. The 'last report' is at: <https://archive.internationalrivers.org/sites/default/files/attached->

[files/final_rivers_report_20140218_small.pdf](#) with an English summary.

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34 Jagra Town (Gongya) 龚埸镇 Gōngyǎ Zhèn ལྷ་གཡ་རྫོང་རྫོང་།; A source also told Tibet Watch that the sacred mountain between the dam site and its planning and design base in Chakra Township was already being dug through a westward tunnelling project towards Drichu. The eyewitness in exile reported that during his pilgrimage around 2007 to the the sacred mountain of Dri Nyendong Dorje Lodoe (འདྲི་ལྷ་འདྲེན་འཛོལ་རྫོང་ལྷ་གྲོ་ལྷ་ལྷ།), he saw oil-like discharge at the junction of the tunnel and Drichu, and attributes it to the sacred mountain, despite being revered by thousands of pilgrims visiting in summer and water, having been "disembowelled" by extractive private companies.

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81 Technically fossil fuels are not imported by the Huadian subsidiary set up specifically to extract energy from Dri Chu/Jinsha, but it is done by Huadian nonetheless.

82 <https://www.worldbenchmarkingalliance.org/publication/electric-utilities/companies/china-huadian-corporation/>

83 Reuters, 27 March 2024, <https://www.reuters.com/business/energy/chinas-huadian-siemens-energy-agree-strategic-partnership-2024-03-27/>

84 The state-owned Assets Supervision and Administration Commission of the State Council stated on 19 February 2013 that Huaneng had hired the consulting firms to assist in "benchmarking work" and had proposed to complete various tasks including involvement in management, "industrial upgrading and international expansion" towards rebuilding Huaneng as a "world class enterprise". It is not known if the international firms have a role with specific projects such as dam construction in Tibet. Source: <http://www.sasac.gov.cn/n4470048/n9369363/n9481897/n9482270/c9483140/content.html>

85 'Environmental Impacts of Dams', International Rivers Network, <https://www.internationalrivers.org/environmental-impacts-of-dams>

86 Mingxu Li, Carbon intensity of global existing and future hydropower reservoirs, *Renewable and Sustainable Energy Reviews*, Volume 162, July 2022, 112433

87 The scientists were studying the Wudongde dam on the Yangtze, below the current Lawa dam build, operational since summer 2021. Liu, L. et al. An Attempt to Evaluate the Green Construction of Large-Scale Hydropower Projects: Taking Wudongde Hydropower Station on the Jinsha River,

China as an Example. *Sustainability* 2022, 14, 194. <https://doi.org/10.3390/su14010194>

88 International Campaign for Tibet, 30 May 2019, <https://www.savetibet.eu/damming-tibets-rivers-new-threats-to-tibetan-area-under-unesco-protection/>

89 https://www.linkedin.com/posts/international-hydropower-association_activity-7160270665357361152-Txes/

90 From a 2019 global gas industry conference: <https://www.gti.energy/wp-content/uploads/2019/10/50-LNG19-04April2019-Zhou-Xizhou-paper.pdf> Since consumers in all rich countries now pay much more for gas, it could be argued that China's greed for gas is a major factor, with Huadian playing a leading role.

91 Fitch ratings states: "The Long-Term Issuer Default Rating on China Huadian Corporation Ltd. is one notch below the China sovereign's (A+/Stable), based on Fitch Ratings' Government-Related Entities Rating Criteria. This reflects the strong likelihood of government support, underpinned by the company's critical role in safeguarding China's energy security and carrying out the government's energy strategy as a big-four central government-owned power generator. [...] Huadian is strategically important to China's energy strategy and power supply. [...] The big-four generators collectively contributed nearly half of the country's power supply in 2022." <https://www.fitchratings.com/research/corporate-finance/china-huadian-corporation-ltd-26-06-2023>

92 Andrew C Mertha, 'China's Water Warriors: Citizen action and policy change', Cornell, 2008. Cited by Gabriel Lafitte in a longer briefing.

93 Chamra Drimey Gyaltsé, a Tibetan from Derge now in exile speaks at an online panel discussion, Understanding Dege Protests, organised by Tibet Forum Jawaharlal Nehru University on 4 March 2024, <https://www.facebook.com/tibetforumjnu/videos/1189911585324155>

94 Dr Wang Weiluo was speaking in the film 'Struggle for Tibet', a documentary originally shown on German TV, written and directed by: Shi Ming, Thomas Weidenbach for WDR and NDR, in collaboration with Arte. See International Campaign for Tibet report, 'Blue Gold from the Highest Plateau: Tibet's water and global climate change', 8 December 2015, <https://www.savetibet.org/new-report-reveals-global-significance-of-tibet/>

95 International Campaign for Tibet, 13 May 2008, <https://savetibet.org/thousands-killed-as-earthquake-hits-tibetan-areas/>

96 According to multiple scientific sources. For instance, according to five scientists in an article in *Geophysical Research Letters*: "Many have speculated on the role played by the Zipingpu Reservoir, impounded in 2005 near the epicentre, in triggering the earthquake. This study evaluates the stress changes in response to the impoundment of the Zipingpu Reservoir and assesses their impact on the Wenchuan earthquake. We show that the impoundment could have changed the Coulomb stress by 0.01 to 0.05 MPa at locations and depth consistent with reported hypocenter positions. This level of stress change has been shown to be significant in triggering earthquakes on critically stressed faults. [...] We thus suggest that the Zipingpu Reservoir potentially hastened the occurrence of the Wenchuan earthquake by tens to hundreds of years." 'Did the Zipingpu Reservoir trigger the 2008 Wenchuan earthquake?' Shemin Ge, Mian Liu, Ning Lu, Jonathan W. Godt, and Gang Luo, *GEOPHYSICAL RESEARCH LETTERS*, VOL. 36, L20315, doi:10.1029/2009GL040349, 2009, published 28 October 2009, <https://www2.pc-progress.com/Images/Personal/NLU/Publications/NLJ53200903.pdf>. In a further paper, Wei Tao, Timothy Masterlark, Zheng-Kang Shen, Erika Ronchin concluded: "Wenchuan earthquake was likely triggered indirectly by reservoir impoundment." 'Impoundment of the Zipingpu reservoir and triggering of the 2008 Mw 7.9 Wenchuan earthquake, China', 16 September 2015, <https://doi.org/10.1002/2014JB011766>

97 Fan, Xuanmei; Hsein Juang, C; Wasowski, J; Huang, Runqiu; Xu, Qiang; Scaringi, Gianvito; Westen, C.J.; Havenith, Hans-Balder (May 5, 2018). "What we have learned from the 2008 Wenchuan Earthquake and its aftermath: A decade of research and challenges" (PDF). *Engineering Geology*. 241: 25–32. Bibcode:2018EngGe.241...25F. doi:10.1016/j.enggeo.2018.05.004. S2CID 134786927. Archived (PDF) from the original on February 15, 2024. Retrieved December 28, 2023. Also, Xu, Chong; Xu, Xiwei; Yao, Xin; Dai, Fuchu (May 3, 2013). "Three (nearly) complete inventories of landslides triggered by the May 12, 2008 Wenchuan Mw 7.9 earthquake of China and their spatial distribution statistical analysis". *Landslides*. 11(3): 441–461. doi:10.1007/s10346-013-0404-6. ISSN 1612-510X. Fan, Xuanmei (April 6, 2017). "Characteristics and classification of landslide dams associated with the 2008 Wenchuan earthquake" (PDF). *Geoenvironmental Disasters*. 4 (1): 12. Bibcode:2017GeoDi...4...12F. doi:10.1186/s40677-017-0079-8.

98 14 July, 2008, <https://chinadialogue.net/en/energy/2210-the-zipingpu-dam-after-the-quake/>

99 By the National Development and Reform Commission (NDRC).

100 National Development and Reform Commission 2019 list of "green industry" projects, specifying hydropower projects officially approved and

authorised for construction, February 14, 2019, in Chinese at: http://www.ndrc.gov.cn/gzdt/201903/20190305_930083.html?tdsourcetag=s_pcqq_aiomsg&from=timeline&isappinstalled=0. Cited by International Campaign for Tibet, 30 May 2019, <https://www.savetibet.eu/damming-tibets-rivers-new-threats-to-tibetan-area-under-unesco-protection/>

101 See 'Heritage Dammed: Water Infrastructure Impacts on World Heritage Sites and Free Flowing Rivers': Civil Society Report to the UNESCO World Heritage Committee and Parties of the World Heritage Convention'. Draft released on May 3 2019 by the Rivers without Boundaries International Coalition (RwB) and World Heritage Watch, containing contributions from 25 CSOs, experts and affected communities around the world and posted online at: <http://www.transrivers.org/pdf/20190430%20Heritage%20Dammed%20Report%20Draft.pdf>

102 Chinese social media post, 17 June 2023, <https://mp.weixin.qq.com/s/ODuHpJOETclthD3wQ8VIKw>

103 A video of the dam shows construction work in progress, including earth moving vehicles adorned by patriotic red flags: <https://www.youtube.com/watch?v=CBBPOngJ2fM>

104 CCTV footage and commentary: <https://www.youtube.com/watch?v=bThBxC6nxNs>

105 Yanmei Zhu, et al, Complementary operational research for a hydro-wind-solar hybrid power system on the upper Jinsha River, *Journal Of Renewable And Sustainable Energy* 10, 043309 (2018)

106 According to the State Council on 4 January 2023, "The Lianghekou mixed storage-power station is the first pumped-storage project in Sichuan. Its construction laid a solid foundation for building of the Lianghekou Hydropower Station-centered water, wind and solar complementary green and clean renewable energy demonstration base. It is also a model of the integrated development of a water, wind and solar energy-based power project. [...] The power will then be sent to other regions, which will drive the coordinated and centralized development of the water, wind and solar energy of the Yalong River basin." http://en.sasac.gov.cn/2023/01/04/c_14740.htm

107 Chinese state media report, 'Announcement on Environmental Impact Assessment Information of Yalongjiang Second Hydropower Station in Yalong, Sichuan Province', July 7, 2015, http://paper.kbcmw.com/html/2015-07/07/content_73579.htm

108 See Gabriel Lafitte, 'Pumping Tibet', posted on 8 July 2018, https://rukor.org/pumping-tibet/#_ftn1

109 This was announced jointly by the CCP Central Committee and the State Council, both arms of the Party state. https://www.gov.cn/zhengce/202305/content_6876214.htm cited by Gabriel Lafitte in his blog, posted on 19 June 2023, <https://rukor.org/kham-electrified/>

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112 In 2016, the Chinese state media announced that it had "successfully connected the county to the power grid." (April 21, 2016, 'Electricity officially generated at Tibet's Boluo hydropower station', <http://m.eng.tibet.cn/news/1461218051161.shtml>)

113 Tibetan analyst and researcher Tempa Gyaltsen Zamlha believes that the landslides were caused by a number of factors and specifically references excessive construction work, road-building and possible tunnelling in the area. Further details and sources in the article 'Landslides and floods in Tibet: what is happening and why?' posted on December 3, 2018, by the Tibet Environmental Conservation Network at: <http://www.tibetnature.net/en/landslides-and-floods-in-tibet-what-is-happening-and-why/>

114 Lui Jianqiang, March 2011, 'China and the world discuss the environment, at fault on the Nu River', *China Dialogue*, <https://www.Chinadiologue.net/article/show/single/en/4174-At-fault-on-the-Nu-River>

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116 Fei Wang et al, 'Dynamic responses of a bituminous concrete core rockfill dam on layered overburden under seismic wave input', *Computers and Geotechnics*, Volume 166, February 2024, 106017

117 Bin-Rui Gan et al, Flood Routing Process and High Dam Interception of Natural Discharge from the 2018 Baige Landslide-Dammed Lake, *Water* 2020, 12, 605; doi:10.3390/w12020605

118 The report stated: "At 10 PM local time on October 10, displaced material with a volume of approximately 23.5 million m3 moved downward quickly, reaching the river channel and forming a landslide dam with a maximum storage capacity of approximately 290 million m3. At 5 PM on

November 3, 2018, [three weeks later] a secondary landslide of approximately 2.5 million m3 on the same bank slope obstructed the Jinsha River again, forming a higher dam with an estimated maximum lake volume up to 770 million m3. The lake began to overflow at 10:50 AM on the 12th, when the volume was approximately 5.5 million m3. Although an artificial spillway was built to discharge the lake at a relatively low water level, the outburst flood ultimately caused a total loss of 1.343 billion yuan for the power stations in the upper reaches of the Jinsha River with the collapse of more than 3,400 houses and damage to 3.5 thousand acres of farmlands. In addition 120,000 residents were affected, of which 86,000 were urgently transferred [relocated]."

119 The East Asian Monsoon carries moist air from the Indian Ocean and Pacific Ocean to East Asia, affecting approximately one-third of the global population, and influencing the climate of China, Japan, Korea, Taiwan, the Philippines, mainland Southeast Asia and Vietnam.

120 Lu Zhang et al, Linkages between Meteorological and Hydrological Drought in the Jinsha River Basin under a Changing Environment, *Water* 2023, 15, 3644. <https://doi.org/10.3390/w15203644>

121 The scientists concluded that: "The frequency of hydrological drought in the JRB [Jinsha River Basin] has been on the rise over the past six decades, with a particularly notable increase observed in the last two decades. Furthermore, a noticeable upward trend has been observed in the duration of these hydrological droughts. The propagation durations from meteorological drought to hydrological drought exhibited noticeable seasonal differences in the JRB. The transmission duration during the flood season was shorter, whereas in the dry season, it was more protracted."

122 Chinese transliteration

123 Consisting of 12 stations with custom-built weighing automatic rain/snow meters and temperature probes to obtain elevation-dependent gradients; 9 stations with soil moisture/temperature observations at four layers (10, 40, 80, 120 cm) covering Alpine meadow, grasslands, shrub, and forest to measure vegetation (biomass and vegetation types) and soil (physical properties) simultaneously.

124 Highlights are published on the Chinese Academy of Social Sciences website: https://english.cas.cn/Special_Reports/Highlights_of_2020_Top_12_Achievements_in_CAS/Second_Comprehensive_Scientific_Expedition_to_Qinghai_Tibet_Plateau/

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126 Chao Wang et al, Long-term scheduling of large cascade hydropower stations in Jinsha River, China, *Energy Conversion and Management* 90 (2015) 476–487

127 <https://highpeakspureearth.com/wontoe-monastery-survived-the-cultural-revolution-but-now-faces-the-disaster-of-hydropower-development-by-woeser/>

128 Treasury Secretary Yellen's remarks and a guide to the concept of over-capacity can be found here <https://www.reuters.com/graphics/CHINA-USA/TRADE/zdvxneaaxv/>

129 <https://www.scmp.com/news/china/diplomacy/article/3259321/germanys-china-shock-scholz-leaves-beijing-others-raise-alarm-about-waning-economic-honeymoon>

130 <https://www.hrw.org/report/2013/06/27/they-say-we-should-be-grateful/mass-rehousing-and-relocation-programs-tibetan>

131 Ibid.

132 Chen-ni Zhou, Mo Li, Ran Xiao, Fang-jie Zhao and Fu-suo Zhang, Significant Nutritional Gaps in Tibetan Adults Living in Agricultural Counties Along Yarlung Zangbo River, *Frontiers in Nutrition*, April 2022

133 The White Paper, published at <https://savetibet.org/wp-content/uploads/2024/04/White-Paper-Final.pdf>, covered the proceedings of a panel discussion session organized by the International Water Management Institute at World Water Week in Stockholm, Sweden on 24 August 2023. The event was supported by the U.S. Department of State, the International Tibet Network, the Mountain Resiliency Project, and International Campaign for Tibet.

