



A TALE OF TWO RIVERS

The revival of hydrological cycles towards a new Yellow River Origin national reserve

COLOPHON

MSC 3/4 | Urbanism
Master thesis graduation report
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Transitional Territories 22’-23’
Inland, Seaward

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DYAL THAK. (n.d.). photograph. Retrieved from <https://www.kinbykin.com/personal-projects/dyal-thak/>.



གནམ་གྱི་དྲིལ་མའི་སྒྲུབ་པ། སྒྲིང་བཞའི་སྤྱིང་པོ། གངས་རི་འཕྱུང་འཁོར་གྱི་ར་
བ། ལུ་པོ་ཆེན་པོ་བཞའི་མགོ་ལ། ལྷང་པོ་གཞུང་གསུམ་གྱི་སྒྲང། གངས་ཉ་སེ་ཤེལ་གྱི་
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ཁྱེའི་རྗེ། རུང་རྩོག་ཆགས་ཀྱི་རྩེན་དུ། ལྷ་ལས་ཁྱེའི་རྗེར་གཤེགས་སོ།།

在中天之下、大地之背、四大洲之心，雪山怀抱之中，
四大河之源、三大溪之首，在冈仁波齐的水晶宰堵波旁、
玛旁雍措的绿松石曼陀罗上，在高峰与净土之地，直立
行走之人王为了生鬣之牲畜，从天帝之国来作人间之王。

Beneath the center of the sky, on the back of the earth, at the
heart of the four continents, enclosed by snowy mountain
ranges, at the source of the four major rivers, the head of the
three great streams, at the crystal stūpa of Mount Kailash, the
turquoise maṇḍala of Lake Manasarovar, in the land of high
peaks and pure earth, the lord of men who walk upright, for
the sake of animals with manes, from the godly state he came
as the lord of men.

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Abstract

The thesis starts with the launch of two national projects in the source of yellow river, which is on top of Tibet Plateau, the most fragile and delicate ecosystem on the earth, is endangering the region. The sky river project, an external imposition that aims to turn the region into a huge landscape machine and the Nation Park plan, an internal separation that denies the indigenous relationship with their land.

My project serves as the negotiation process that gradually brings the land back to its people, respecting their traditional knowledge and engaging local cultures towards a autonomous national reserve of their own through the building of a resilient ecosystem, dynamically maintaining of its unity and actively sustaining its vibrancy that can deal with the future hydrological cycle in multi-scale.

It weaves a tale of an ambitious national environmental initiative in a century where the clarion call for sustainability rings louder than ever. It explores the intimate entanglements of indigenous communities with their ancestral lands, and grapples with the question of how they can harmoniously align with the nation's aspirations. This narrative unfolds against the backdrop of a world in dire need of sustainable practices, as it bears witness to the profound bonds that tie indigenous peoples to their territories and deliberates on the means to synchronize these ties with the pulsating rhythm of the nation's dreams.

Motivation

This is my second year studying in the Netherlands, and as I look back on my experiences in China, I can't help but find everything fascinating. Having lived in China for 23 years, I thought I had become accustomed to the incredible speed at which things were accomplished. From construction projects being completed in a matter of weeks to the seamless delivery of packages within days, regardless of the distance involved, efficiency, punctuality, and convenience seemed to be ingrained in every aspect of life.

However, amidst this seemingly flawless system, there were certain aspects that continued to astonish me. One such example was the creation of an entire district, specifically designed for the convenience of working individuals commuting between their homes and Beijing on a daily basis. It was intended to be a bustling hub of activity, a place where people could live and work without the need for long and tiring commutes. But to my surprise, I discovered that this district remained eerily empty in the mornings, earning the nickname "sleep city." It was a stark reminder of the complexities and challenges faced in urban planning and the dynamics of population movement.

With discussing more with my foreign friends, I astonishing encountered a range of other puzzling situations in today's China. The rapid development and urbanization often left me questioning the long-term sustainability of such endeavors. I became more aware of the need for comprehensive planning, consideration of environmental impacts, and the importance of community engagement in decision-making processes. My time in the Netherlands has provided me with a fresh perspective on these issues, allowing me to reflect on the contrast between different approaches to urban development and social dynamics.

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Revisit Build autonomy in eco-system Loss of chineseness Dilemma of China's ecological conservation interspersed within Western contexts China’s land policy and its endeavor towards land preservation Review policies Vision towards a Autonomous nature-people park General • Expected outcomes	Risk analysis Towards a new park paradigm GIS-based technical route Spatial domains -Different altitudes • Temporal domains -Seasonal changes Identify risks Seasonal distribution of rainfall • Temporal domains Overlap result of high-risk zones Synthesis map	Design strategy Watershed unit based spatial planning - New paradigm units respecting natural attributes • - Impart programs to activate land ownship Grazing as terraforming landscape - Learn from transhumance behaviour • - Grazing as terraforming tool Recovery plan	Detailed Design Design framework Levels of design Yak economy 3 Sites Zoige wetland ecosystem -Section, plans, strategic phasing -Technical purifying units, atmosphere rendering • Watershed economic feasibility Cainaihai farmland ecosystem -Section, plan -Diagram • Watershed economic feasibility Madoi permafrost ecosystem -Section, plan • Watershed economic feasibility Project Conclusion	Conclusion Graduation project reflection Conclusion Bibliography	

SKY RIVER PROJECT 天河项目

The burgeoning consumption of intensive agricultural production and industrial activities led to fears over its future scarcity due to climate change in Himalayas. Thus, Chinese government decide to implement water precipitation enhancement technology to manipulate water flow trans-boundary especially in the region of Three Rivers Origin on Tibet Plateau, which contains the headwaters of three great rivers of Asia.

A recent project supported by Chinese government aims to supply the flow of river through weather modification. The state-owned aerospace corporation is embarking on a plan that would see tens of thousands of fuel-burning, cloud-seeding chambers dispersed across the Tibetan Plateau in an attempt to increase rainfall in the region.

According to Xinhua News Agency on 5 November 2018, the 8th Academy of China Aerospace Science and Technology Group (CAST) reported it has officially launched the development of the Tianhe Project satellite and rocket. It is expected to realize trans-regional air water transfer and build an “air corridor” of South-to-North water diversion Project.¹

Fig. 1 Newspaper report : China starts development of “Tianhe Project” satellite rocket, plans to change Tibetan Plateau climate



Citations

¹ Jin Gaxu (n.d.). The 24 hours domestic essentials: Chinese scientists put forward the conception of “Tianriver project”. The 24 hours domestic essentials: Chinese scientists put forward the conception of “Tianriver project” - Xinhua net. Retrieved January 19, 2023, from http://www.xinhuanet.com/politics/2016-09/11/c_129276933.htm

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³ Wang, G., Zhong, D., Li, T., Zhang, Y., Meng, C., Zhang, M., Song, X., Wei, J., & Huang, Y. (2018). Study on sky rivers: Concept, theory, and implications. Journal of Hydro-Environment Research, 21, 109–117. <https://doi.org/10.1016/j.jher.2018.09.003>

Sky River Project is based on trans-regional model of atmospheric water to solve arid and water-scarce ecological environment for the Northwest development. The research team of Chinese scientist Wang Guangqian, president of Qinghai University, found that there is a stable and orderly water vapour transport channel from the atmospheric boundary layer to the troposphere.

A special river is recognized and it is called Sky river. It’s flowing over our heads. Clearly, there is something in the air- in science we call it atmospheric water.

Atmospheric water is a long, narrow, and transient corridor of strong horizontal water vapor channel that transport water and energy around the globe. It’s the area most likely to perpetuate but still in the water vapour form. They can grow to 2,000 miles long, 500 miles wide. An average AR can carry 25 times as much water vapor as the Mississippi River flows into the Gulf of Mexico all over the world.

While previous studies of atmospheric rivers have focused on water vapour transport and its short-term performance in extreme weather events, Wang and his colleagues have focused on the “long-term configuration infrastructure” of atmospheric rivers so that they might

Fig. 2 Visualization of atmosphere river, while it’s actually invisible <https://www.scientificamerican.com/article/better-atmospheric-river-forecasts-are-giving->

China's 'Sky River' Will Be The Biggest Artificial Rain Experiment Ever



be “fully integrated into water management systems”.³ If an atmospheric river describes a phenomenon that can be directly observed through a combination of remote sensing and ground-based radar measurements, then a sky river is a calculation - a constructed model - explicitly designed for new forms of utilization and extraction, facilitating water resource management, and possibly establishing national ownership claims.

In order to capture these water vapour, more than 500 cloud seeding furnace(fig.0-3), meteorological rocket were installed at Tibet Plateau—the water tower of Asia. The cloud seeding furnace, a basic metal shell on a short base, encloses a high-performance combustion chamber that uses military rocket engine technology to burn silver and potassium iodide compounds. These stoves are installed on high ground, strategically located at high elevations, where upward winds transport chemical exhaust into the clouds above, triggering rainfall. The stove is the only physical embodiment of the meteorological project that can be seen.



Citations

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According to a Qinghai Daily report in September 2016, the “Sky River Project” has established three ground control stations in Dari County, Guoluo Prefecture, located in the hinterland of the three rivers origin. “The three bases will increase precipitation by 2.5 billion, 200 million, and 120 million cubic meters respectively, and realize cross-basin water transfer of about 5 billion cubic meters in the medium and long term, alleviating the shortage of water resources in the Yellow River and some inland rivers.”

Should all go according to plan, the net result will be increased rainfall along a region extending for 620,000 square miles, or 1.6 million square kilometers. That’s practically the size of Alaska, and about three times the size of Spain.

Although the State Council issued a press release in December 2020 confirming the importance and priority of the Sky River project for the development of an advanced weather modification plan with so-called breakthrough technologies by 2025, evidence of the Tianhe-1 satellite being operational has not been found online.⁴

“Many scientists question the Tianhe Project: Why did the fantastical Project begin” reported by Sina News questions the science behind the project. Professor Lu from College of Meteorology and Oceanography, National University of Defense Technology said that “This is a very ridiculous project. First, it has no scientific basis, and second, it is technically unimplementable. I don’t know why it was approved.” Most comments and feedback from various scientific fields held unsupportive attitudes towards this geo-engineering project.

Academician Wang Guangqian, the project leader, said in a subsequent reply,

“We don’t want to just write theoretical articles, we want to write papers on the earth. We worked for 10 years to keep the Yellow River flowing. We want to do this for 10 years to see if we can find a new way to solve the water shortage in the Yellow River.”

The Tianhe Project’s implementation and future are not yet completely settled, but it is a typical act of geographical reimagining that brings a new understanding of atmospheric circulation. It occupies a space with no clear border agency by expanding the scope of rapidly available natural resources.

CONTEXT

Cloud: from natural occurrence to resources

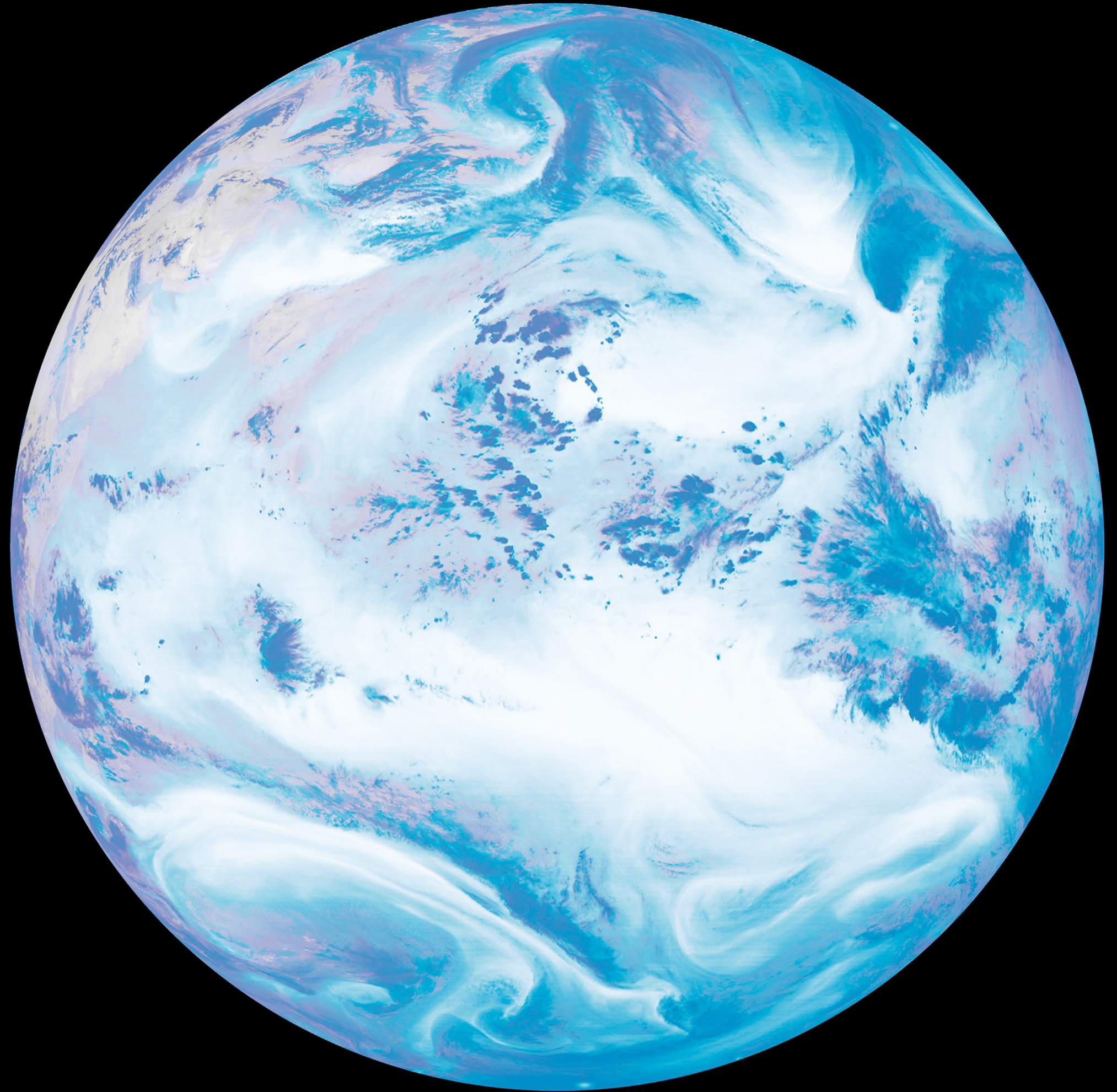
Taming weather in Anthropocene

Technical intervention in response to climate “disasters”

- Indigenous community

This chapter introduces the larger global background where the Sky River Project operates., through which the conflicts are revealed and the motivation unfolds. The expanding human exploitation of resources has far reached into space and marginalized the indigenous community from a modern point of view called ‘development’.

01.



01 CONTEXT

CLOUD:FROM NATURAL OCCURRENCE TO RESOURCES

Taming weather in Anthropocene

Humans, as products of nature, have changed from being the result of natural evolution to being the cause in the process of evolution¹.The era in which humans became the new creation of a ‘geological force’ that transformed the global climate and biosphere - did not just begin with the Industrial Revolution².Perhaps the Anthropocene actually began with the beginning of a civilization that actively intervened in the climate and landscape to create or adapt the atmosphere to meet their needs - that is as far as humans moved from hunting and gathering to settlement and agriculture.

Taming weather and adjusting it pushes the liberation of human society from nature, and in particular from the elusive and omnipresent dimension of nature that is like air and rainfall. In the realm of weather, men invented the first air-conditioning machine back in 1902, with architecture as medium to separate man from nature, and since then man has been learning how to regulate the air, environment.

As far as in the last century, architects had discovered how to endure the cold weather and harsh heat from the outside with the famous ‘Crystal Palace’ built in London for the great exhibition of



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² Paul Crutzen,“The Geology of Mankind,” Nature 415 (2002): 23. Will Steffen, Jacques Grinevald, Paul Crutzen, and John McNeill, “The Anthropocene: Conceptual and Historical Perspectives,” Philosophical Transactions of the Royal Society A 369 (2011): 842–867.
³ Fig.1-1 Wikipedia contributors. (2022, October 28). Planetary boundaries. Wikipedia. https://en.wikipedia.org/wiki/Planetary_boundaries

Fig. 1-1 The Crystal Palace built by Joseph Paxton for the Great Exhibition, London, 1851.

1851 by Joseph Paxton- the first cast-iron and flat-glass structure of its size. (fig.1-1) The Crystal Palace offers the pleasure of being ‘outdoors’ without the discomfort of bad weather or seasonal temperatures.

Today the world is warming. But human tolerable temperatures are becoming more standardised than they were centuries ago, from the tropics to the colder zones, people are staying indoors at 28 degrees Celsius. even as they begin to turn our “external” world into a climate-controlled internal environment.

Resources depletion expansion in height with technology

Can clouds be designed? Can air be seen? As human civilisation developed, people have far extended upwards into space and downwards into the ground for resources, restricting habitat into buildings, skyscrapers, and a room with closed windows isolated from the outside temperature, and distinguished from other creatures. Humans attribute the progress of modern civilization to the severance between nature and culture, mirroring the human dream of relentlessness and reproducing spatial configurations and social regulations with artificial automated landscapes.

Instead of vacuum, space between the surface and the sky is filled with microscopic particle vibrations, water vapor waves, radio signals and cosmic rays, buzzing drones and high-altitude operations. The vibrations of natural phenomena, the radio waves of communications networks and the real-time monitoring of the earth’s surface by drones occupy the same space.

Geoengineering, the alchemy of today, reproduce the absolute authority of human agency by treating nonhumans as objects to be normalized and processed in bulk.

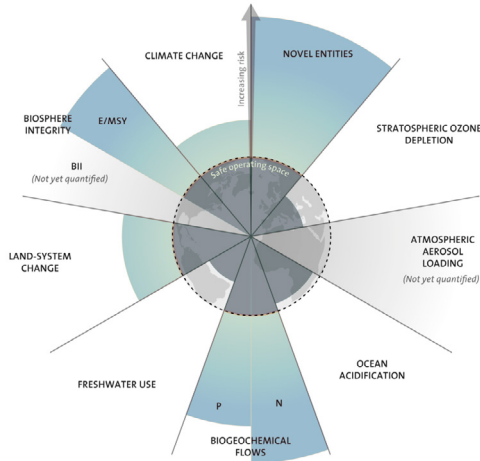


Fig. 1-2 Planetary boundaries, blue indicates boundaries that human has “crossed”, grey indicates a “safe” state within the boundaries (data for 2022)

01 CONTEXT

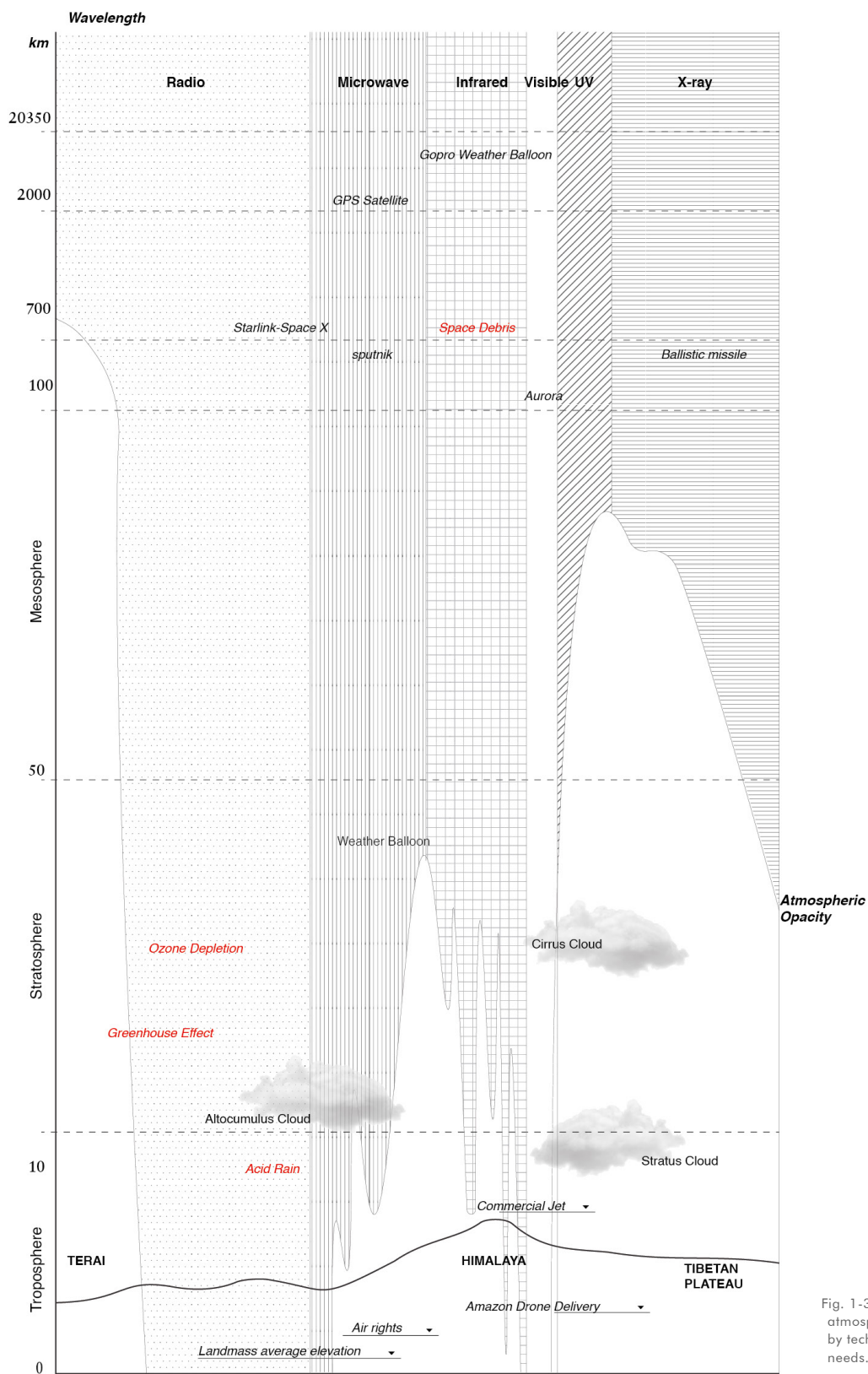


Fig. 1-3 Diagram shows the “invisible” atmosphere realm has been occupied by technologies provides our daily needs.

Technical intervention in response to climate “disasters”

‘The great crystal palace - a hugely forward-looking architectural style of the 19th century (which was soon to be copied again and again around the world) - had prepared the material for a centralised, experience-oriented, mass capitalism that would broadly absorb the external world into a completely precisely calculated internal space’.

Capitalism treats nature as something external to society and as something that can be used for economic growth and capital accumulation. They separate climate phenomena from the changes they make to the atmosphere.

In response to the natural “disasters” posed by the accumulation of human exploitation, geo-engineering are proposed to lower global temperatures through either injections of aerosols into the stratosphere (Hulme, 2012) or reducing tropical meteorological influence (Klima and Morgan, 2012). Proposals are expanding its scale and ambition for the next phase of geo-engineering.

These efforts demonstrate a belief that human technology can tame the weather and its associated climate system. This belief is reflected in the practice of ecological modernization in the meteorological dimension. Scholars have coined the term ‘Anthropocene’ to denote the current time when humans can, intentionally or unintentionally, have a significant impact on the Earth’s geology, ecosystems and atmospheric systems (Castree, 2014a , Castree, 2014b).

Citations

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01 CONTEXT

Indigenous community

Development in the anthropocene speeds up the notion of human as an entity “reduces the mosaic of human activity in the web of life to an abstract, homogenous humanity”.(Jason W. Moore, 2016) Under the background of homogenization caused by the concentration of means of production, indigenous community are currently the poorest and the most vulnerable communities in the world (Hall & Patrinos, 2012).

Characterized by increasingly marginalized and disempowered, indigenous communities around the world seem to encounter similar recurring dilemmas concerning the enunciation of socio-spatial identities and the assertion of rights against states and corporations (Barnerjee, 2000).

Their habitat is often rich in natural resources because they know how to inghahabitat with nature, but this also becomes a reason for their deprivation and led to conflicts. Minority and indigenous populations worldwide face pressure from ranchers and plantation growers who want their land, but in China, the lack of voice and climate change migration is unique.

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Fig. 1.4 Women wearing traditional Tibetan costumes waiting to perform on the Tibetan Plateau in Yushu County, Qinghai, China, on on July 25, 2015. Kevin Frayer—Getty Images

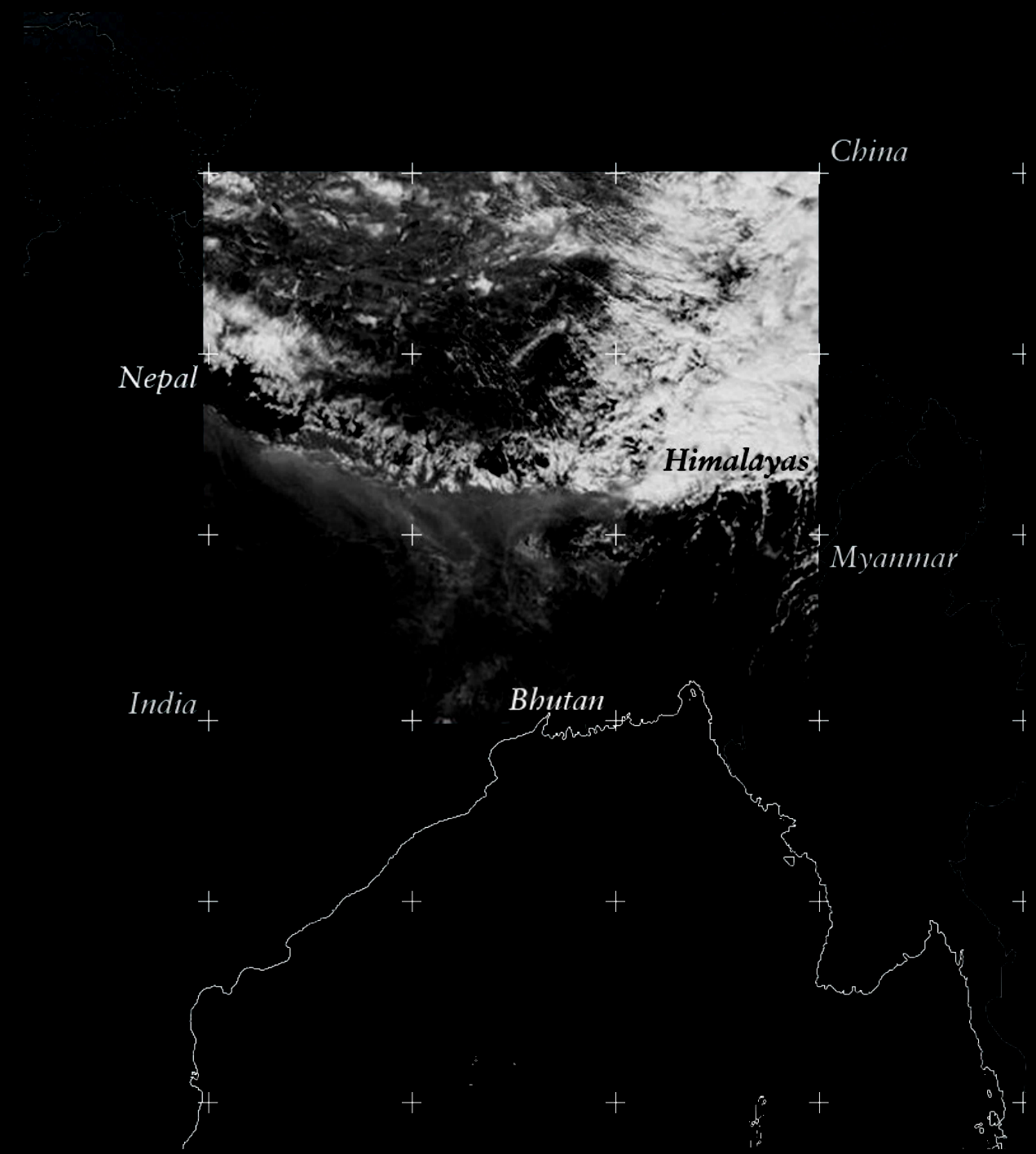


Fig. 1-3 Image shows there's intimate and self-evident relation between the land and the atmosphere in the earth's natural state

PROBLEM FIELD

Yellow River

Yellow River`s thirst

- Importance Human and industry along river stages
- Scarcity Drains and flooding of Yellow River

A hydraulic engineering history

- Taming the Yellow Dragon
- Mega-infrastructure construction

Extension of hydraulic engineering to sky

Discovery of Sky River and its simplification

- Importance Bring monsoon seasonal changes
- -Risk Extreme weather+flood

Tibet plateau as intersection

Crucial Intersection: Three Rivers origin on Tibetan Plateau

- -Importance Fragile alpine ecosystem

National Park

Autonomous region

- The establishment of China`s first national park:
- -Exlusion by ecological regulations

Problem Statement

Problem statement sumup

- Project Framing

02.



02 PROBLEM FIELD

.1 YELLOE RIVER`S THIRST

Water Scarcity and inconsistent distribution of Yellow River

Do you not see the Yellow River come from the sky,
Rushing into the sea and never come back?
—Poet Li

Yellow river is called the mother river of China as it’s the birth-place of early China civilization and its flow sustain for thousands years to held the prosperous development for the whole nation. Over 150 million people living with Yellow river, supporting more than 60 cities and 14%GDP of the whole nation.¹ Its basin area is 752,443 km² in total (almost 18 Netherlands) that accounts for 8% of China`s total area.

The name of yellow river comes with its natural attrobutes that the water carrys silt which gives the river its yellow-brown color. This also reflects the severe soil erosion caused by human activities such as deforestation and overgrazing.

- Temporal and spatial uneven distribution

China faces a severe water shortage on a per capita basis due to insufficient water resources and uneven distribution across the country.(fig.2-1) In china, temporal and spatial distributions of precipitation are highly non-uniform, with 60–80% of rainfall concentrated in the monsoon season. And for the water resources per captia , Chinese owned only one forth compared to the global average.

Yellow river has a high sediment load, and as a result, its capacity to hold water is limited. Additionally, the river’s water resources are subject to high levels of human use, including irrigation and industrial development, which further reduces the amount of water available.

- Incosistent with water needs

Then 84% of national water resources is located in southern China, as can be told by this map, Yellow and Yangtze river are 2 main rivers in China that feeds 80% of the population.

While most of the water intensive argricultural concentrated in the northeast plain and yellow river basin which produce most of the country`s food and concentrate most of the population, the area is actually short of water resources. With only 2 percent of national water resources, the basin generated 14 percent of Chinese grain production and 14 percent of the country`s GDP in 2000.

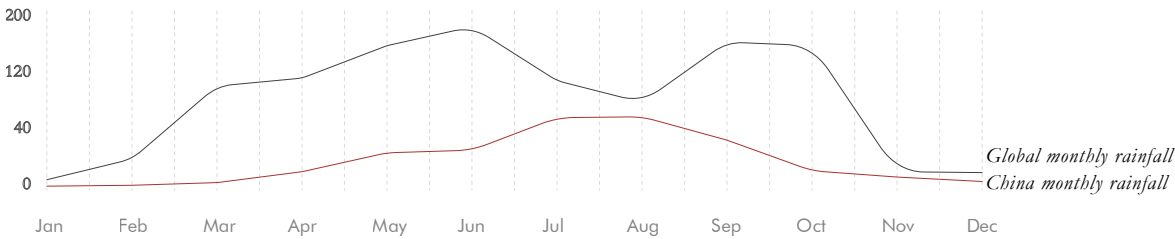


Fig. 2-1 Comparison of the global monthly rainfall with Chinese, with a significant decrease in almost every month and especially concentrated in summer monsoon season

Citations

¹ YRCC. Planning report of the Yellow River Basin [in Chinese]. (Yellow River Water Conservancy Press, 2013).
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02 PROBLEM FIELD

Drains and flooding of Yellow River

It`s the fourth longest river on planet, but its flow ranks only 112th in the world. With only 2% of the national water resources, it`s feeding 420 million people.

Yellow River is a highly dynamic river.

Since records were first kept in 602 BCE, there have been 1500 floods on the Yellow River, resulting in the death of millions of people.

Unlike in federal countries like the United States, there is essentially no divergence between national- and sub-national water resource legislation, and those elements of provincial- and county-level government concerned with water resources are formally subject to central bureaucratic supervision and direction (Shaanxi Province General Office 2008). However, as water scarcity has increased in the Yellow River Basin, inter-jurisdictional disputes and conflicts have assumed greater importance, and significantly constrain the central government’s ability to deal with these problems.

Citations

Jan 26. (n.d.). The politics of thirst. Belfer Center for Science and International Affairs. Retrieved February 2, 2023, from https://www.belfercenter.org/publication/politics-thirst

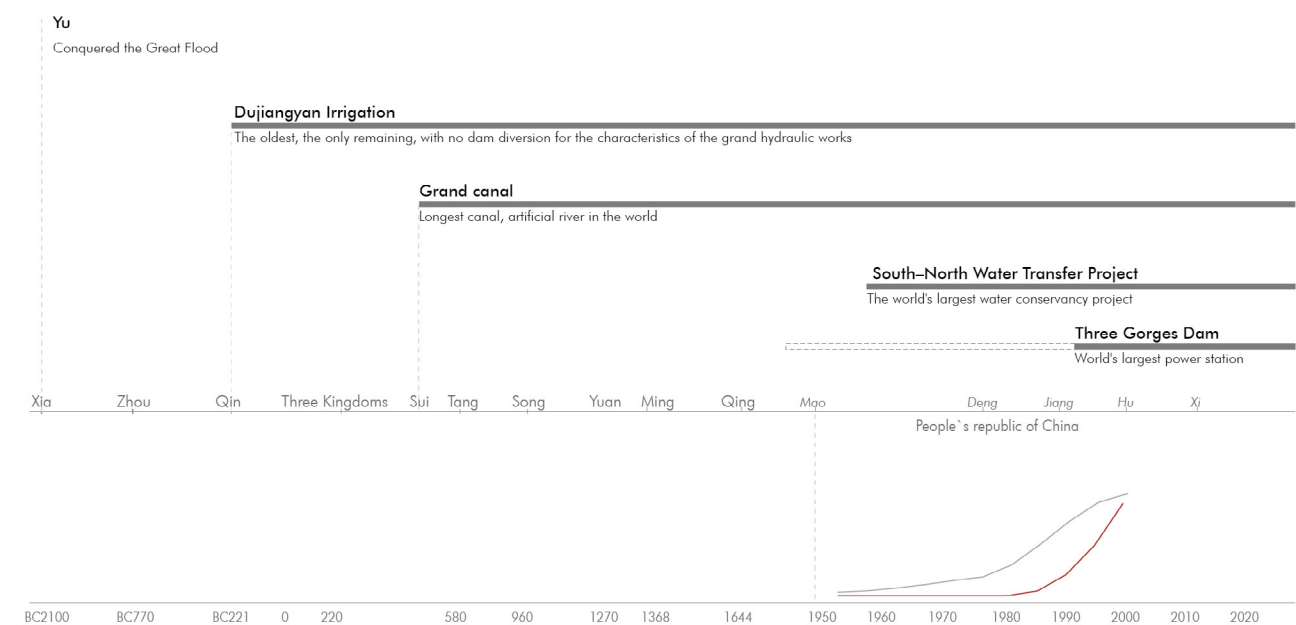


Fig. 2-2 Politics and dynasties over the Yellow River

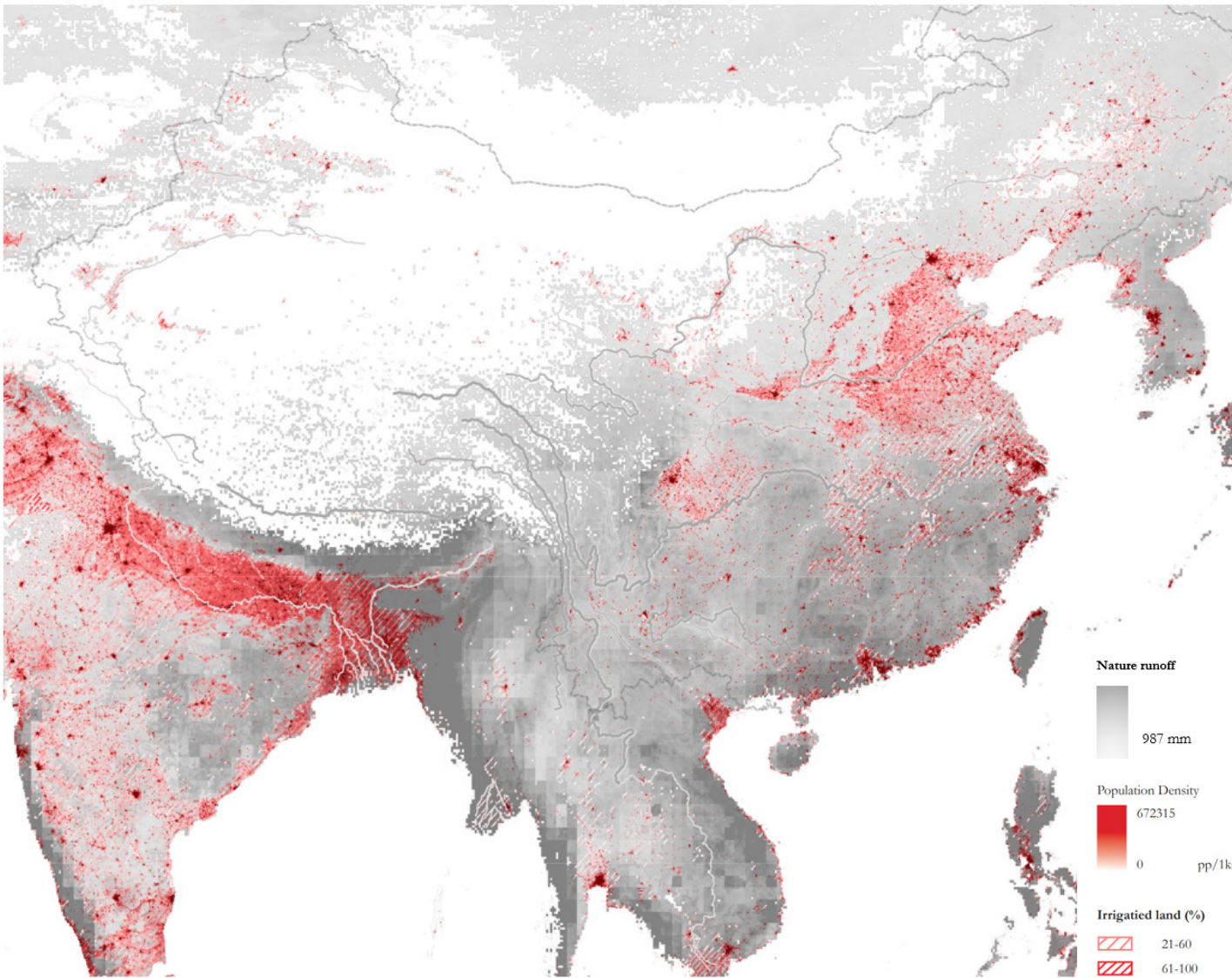


Fig. 2-2 Major irrigation land for agriculture and population density inconsistent with natural runoff , Chinese urban areas and people mainly concentrates in the down steam of majoror rivers along coastline, in contrast to the irrigated land where the heavy argriculture is practiced and produced in Northern China

02 PROBLEM FIELD

A HYDRAULIC ENGINEERING HISTORY

Taming the Yellow Dragon

Lack of participatory and comprehensiveness

As in the time-combed line of the Tianhe project in the diagram below, the whole process has been almost entirely circumscribed by several laboratories, from the start of the weather modification project in 2015 when the trials began, the establishment of the laboratory and the publication of the paper, to the official landing and the start of the preparatory work for the project in 2018. ¹

The whole process is conducted under the Science and Technology Team without any sensorship from ecologist, water expert or local resident. There are also few Tibetans involved. Against this backdrop, it is also hard to argue that the project’s decision was sufficiently fair and comprehensive.

Citations

¹ Meteorologists criticize the “Tianhe River Project” for rushing ahead despite doubts: _ Science > News -the paper. (n.d.). Retrieved January 23, 2023, from https://www.thepaper.cn/newsDetail_forward_2658478

Citations

¹ Chien, S.-S., Hong, D.-L., & Lin, P.-H. (2017). Ideological and volume politics behind Cloud Water Resource Governance – weather modification in China. *Geoforum*, 85, 225–233. <https://doi.org/10.1016/j.geoforum.2017.08.003>

Institutionalize weather control and conflicts

It is important to note that despite the lack of a legal basis, artificial weather has been institutionalised. In 2015, the China Meteorological Administration even issued an official document to regulate the workflow of event-based meteorological services.¹

In February 2009, Beijing used artificial rain to bring snow after a four-month drought. The “modified” snowfall lasted for about three days, but led to the closure of 12 major roads, 15 of which caused significant traffic disruption and inconvenience. A man-made snow-storm in November 2009 caused losses of more than 50 million yuan and 40 deaths, as well as traffic accidents, flight delays, class cancellations and extensive tree damage (Smit, 2015). Similarly, in Qinghai, weather modification to combat drought caused problems for shepherds when heavy rains injured their livestock. This lopsided distribution of benefits has drawn attention, sparking a moral debate about whether state actors should be more cautious when considering measures to alter the weather or climate, and who should be held responsible for the unintended adverse consequences of changing the weather?



02 PROBLEM FIELD

- Mega-infrastructure construction to secure water safety

China’s hydrology is a legacy of central and local water management plans and contemporary consumerism and industrialisation fluid relationships that link the country to global markets. Historically, the North China Plain was a region of intensive agricultural production and population growth, and the Yellow River was the main stage of China’s water projects. In the past 30 years, from the Maoist years, rapid urban growth, agricultural intensification and industrial boom has utilized every drop of water in Yellow River for irrigation and hydroelectric generation.¹

China’s successive leadership has been always fascinated with this world’s most silted river. Various understandings of water flow have been the backbone of state organization, linking the stability and fate of dynasties and other power structures to their ability to establish and maintain specific labor arrangements and control along rivers.

From 1989, the downstream of Yellow River has been severely engineered to control flood and protect coastal development. (fig.2-3) The delta became shorter and belnder against southeast direction, a new peninsula had formed to the north. These low- and no-flow periods are a huge problem in the lower reaches of the river and the delta.

Citations

¹ An extensive account of the thousand-year-old history of the Yellow River can be found in David A. Pietz, The Yellow River: The Problem of Water in Modern China (Cambridge: Harvard University Press, 2015).

image source: NASA. (n.d.). World of change: Yellow river delta. NASA. Retrieved January 20, 2023, from <https://earthobservatory.nasa.gov/world-of-change/YellowRiver>



Fig. 2-3 The lower reaches of the Yellow River have been artificially redirected to suit the development of coastal areas (left: 1995, right: 2020)

- South to north water diversion project

*The more the river was changed and controlled, the more it pushed back, requiring ongoing intervention and tying the political destiny of the ruling class to negotiations with the river in the valley.*¹

In order to optimize the allocation of water, china has built more than 20 thousands of the dams and reseviors mostly in the basin of Yangtze river. Years ago, the government launched The south to north water diversion project was proposed to divert water from south to north annually to transfer 50 billion cuberic meters of water which is almost same amount of Yellow river runoff.

Citations

¹ The Avery Review: Prologue to the Sky River. The Avery Review | Prologue to the Sky River. (n.d.). Retrieved January 20, 2023, from <https://www.averyreview.com/issues/53/prologue-to-the-sky-river>

Abbott, B.W., Bishop, K., Zarnetske, J.P. et al. Human domination of the global water cycle absent from depictions and perceptions.

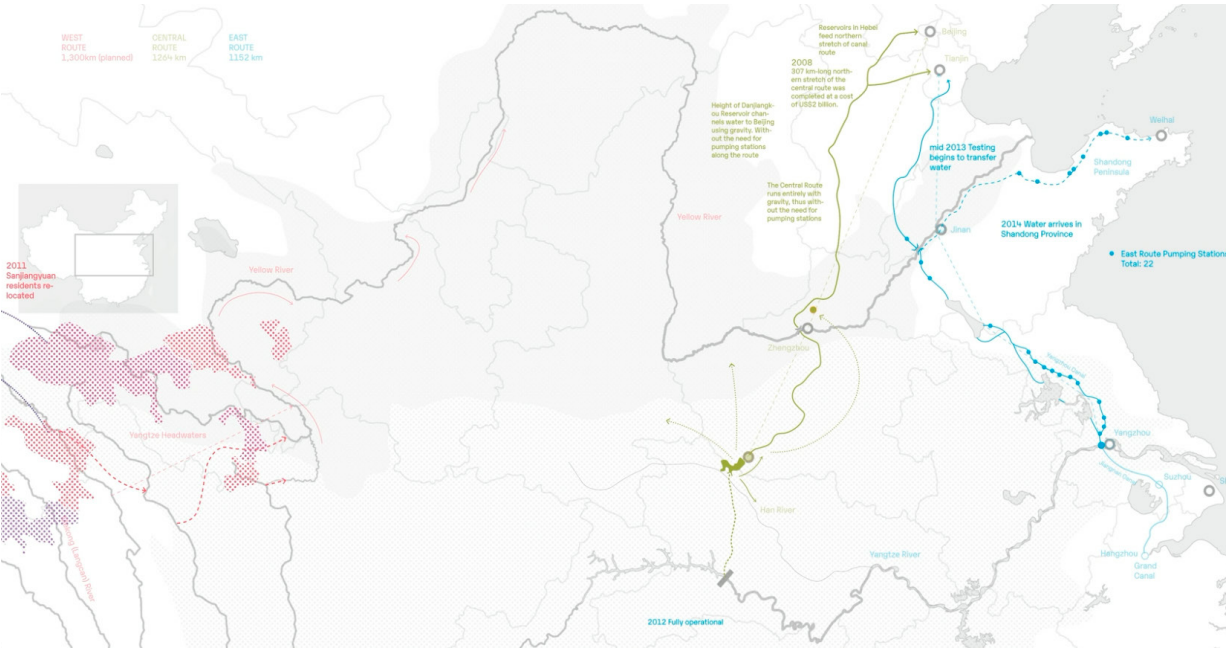


Fig. 2-4 Diagram of South-to-north Water diversion project

02 PROBLEM FIELD

.2 EXTENSION OF HYDRAULIC ENGINEERING TO SKY

Discovery of Sky River and its simplification

Sky River project is meant to implement artificial rain over 5.5 million square kilometers above the Tibet Plateau – more than 1.5 times the total size of India. It mainly aims ‘to maximize the ecological benefits of the Qinghai-Tibet Plateau and promote the economic-social development of the whole country, especially the North.’

Sky River, or atmosphere river in science, is a long, narrow, and transient corridor of strong horizontal water vapor channel that transport water and energy around the globe. It’s the area most likely to perpitiate but still in the water vapour form. ¹

At any given time, a single one can carry a greater flux of water than Earth’s largest river, the Amazon River. They contribute to 22% of the total global runoff but also bring extreme meterological events to places. ²

The initiator of the project, Academician Wang, and his team visualize the distribution of rivers in the sky in their paper “Study on Sky Rivers”.(fig. 2-5) The diagram portrayed the huge, unstable and elusive atmospheric phenomenon in a linear structures or fractures across the Earth’s atmospheric continuum: a clear departure from the more conventional representations of atmospheric rivers.

As when unpredictable natural world becomes quantifiable and is simply modelled, in an act of reduction it loses its elusiveness and

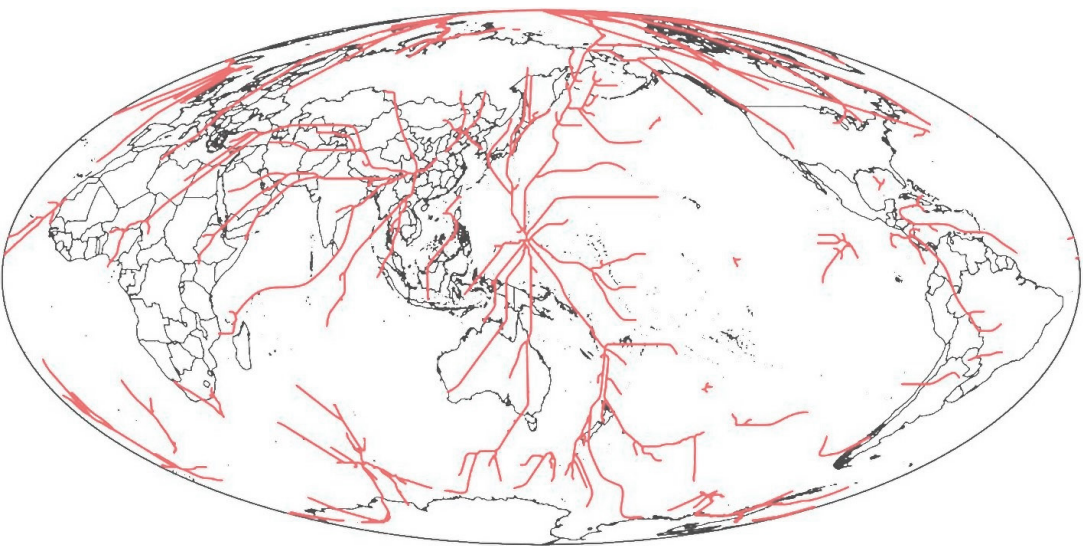


Fig. 2-5 The distribution of Sky River around the globe.

Citations

¹ Natalie Wolchover, “A World Without Clouds,” Quanta magazine, February 25, 2019
² Paltan, Homero; Waliser, Duane; Lim, Wee Ho; Guan, Bin; Yamazaki, Dai; Pant, Raghav; Dadson, Simon (2017-10-25). “Global Floods and Water Availability Driven by Atmospheric Rivers”.
Image source: “Study on Sky Rivers: Concept, Theory, and Implications,” by Wang Guang-qian et al., 2018.

Citations

¹ Thapa, K., Endreny, T. A., & Ferguson, C. R. (2018). Atmospheric Rivers Carry Non-monsoon Extreme Precipitation Into Nepal. *Journal of Geophysical Research: Atmospheres*, 123, 5901–5912. <https://doi.org/10.1029/2017JD027626>Thompson, D. W. J., & Wallace, J. M. (1998).
² Liu, J., Röhland, K. M., Chen, J., Xu, Y., Chen, S., Chen, Q., ... & Smol, J. P. (2017). Aerosol-weakened summer monsoons decrease lake fertilization on the Chinese Loess Plateau. *Nature Climate Change*, 7(3), 190-194.
³ Zavodoff, B.L. Greenhouse gases strengthen atmospheric rivers. *Nat. Clim. Chang.* 11, 904–905 (2021). <https://doi-org.tudelft.idm.oclc.org/10.1038/s41558-021-01181-9>

becomes controllable, rationalize and abstract, while the complexity of sky rivers with the rest of the atmosphere system is ignored. The attention of Academician Wang is self-evident, as is said in his paper, the “long-term configuration infrastructure” of atmospheric rivers so that they may be “fully brought into the water resources management systems.”

The overabundance of atmospheric rivers

The Himalayan mountains, which act as a geomorphic barrier to air advection, cause a large amount of upward precipitation of warm and moist air from the Indian Ocean to the center of the Tibetan Plateau advection, thus strengthening the formation of the Asian monsoon. According to research(Thapa, 2018), atmosphere river contributes to over 70% of the total extreme rainfall in Nepal during non-monsoon seasons.

Asian monsoon is a significant weather pattern that affects a large portion of the population in Asia. By bringing vital rainfall to agricultural regions, its seasonal timing plays an important role in the planting and harvesting of crops. This region is typically dominated by an Asian monsoon climate (Liu et al., 2017). The mean annual precipitation is approximately 468 mm, with more than 70% of the annual precipitation falling during the summer monsoon season between June and September.

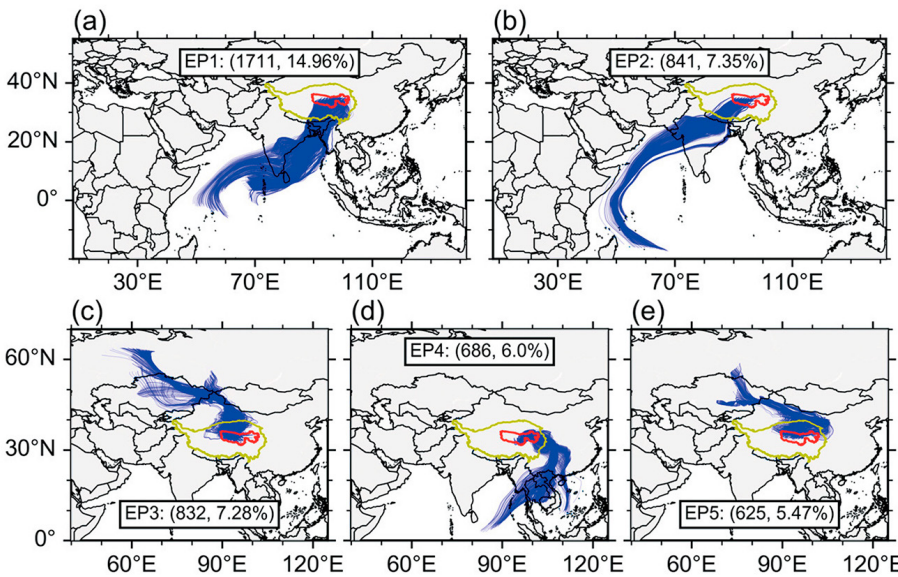


FIG. 5. HDBSCAN algorithm results for the EP events. Clusters are labeled as EP1, EP2, ..., EP5. Values in parentheses indicate the numbers of paths from the same cluster and their percentages in total moisture paths (the same holds in Figs. 6 and 7).

Fig. 2-4 In the troposphere above the Sanjiangyuan [the Source of the Three Rivers] area [outlined in red] of the Qinghai-Tibet Plateau [outlined in yellow], a confluence of sky rivers meets [moving blue body]. From Zhang Yu et al.’s “Major Moisture Pathways and Their Importance to Rainy Season Precipitation over the Sanjiangyuan Region of the Tibetan Plateau,” *Journal of Climate* 32, 20 (2019): 6837-6857.

- More precipitation in monsoon season

With the artificial rain triggered, the chance to rain in monsoon season will be raised to a certain percentage while in the dry season, the chance to rain is still relatively low as there will be no possible vapor to condense in the first place.

The seasonal hydrological patterns will be especially important in the project afterwards as its natural rythm needs to be studied and designed with.

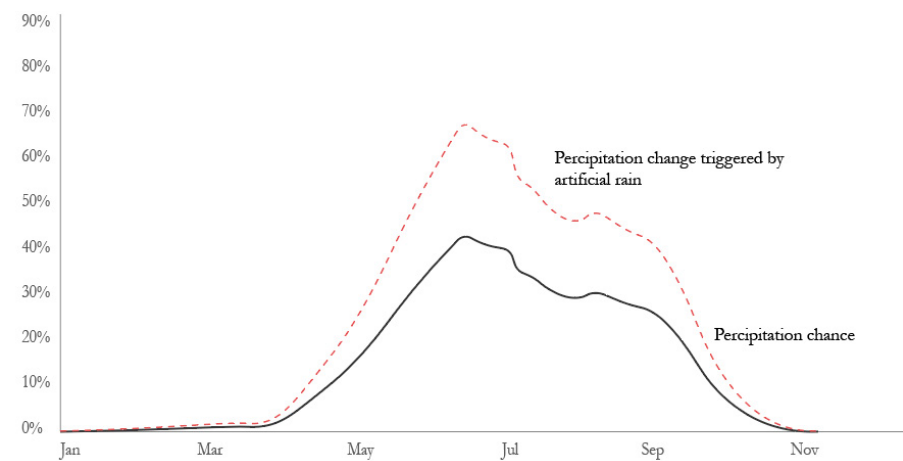


Fig. 2-4 Daily chance of precipitation in Tibet Plateau and its raised change triggered by artificial rain project.

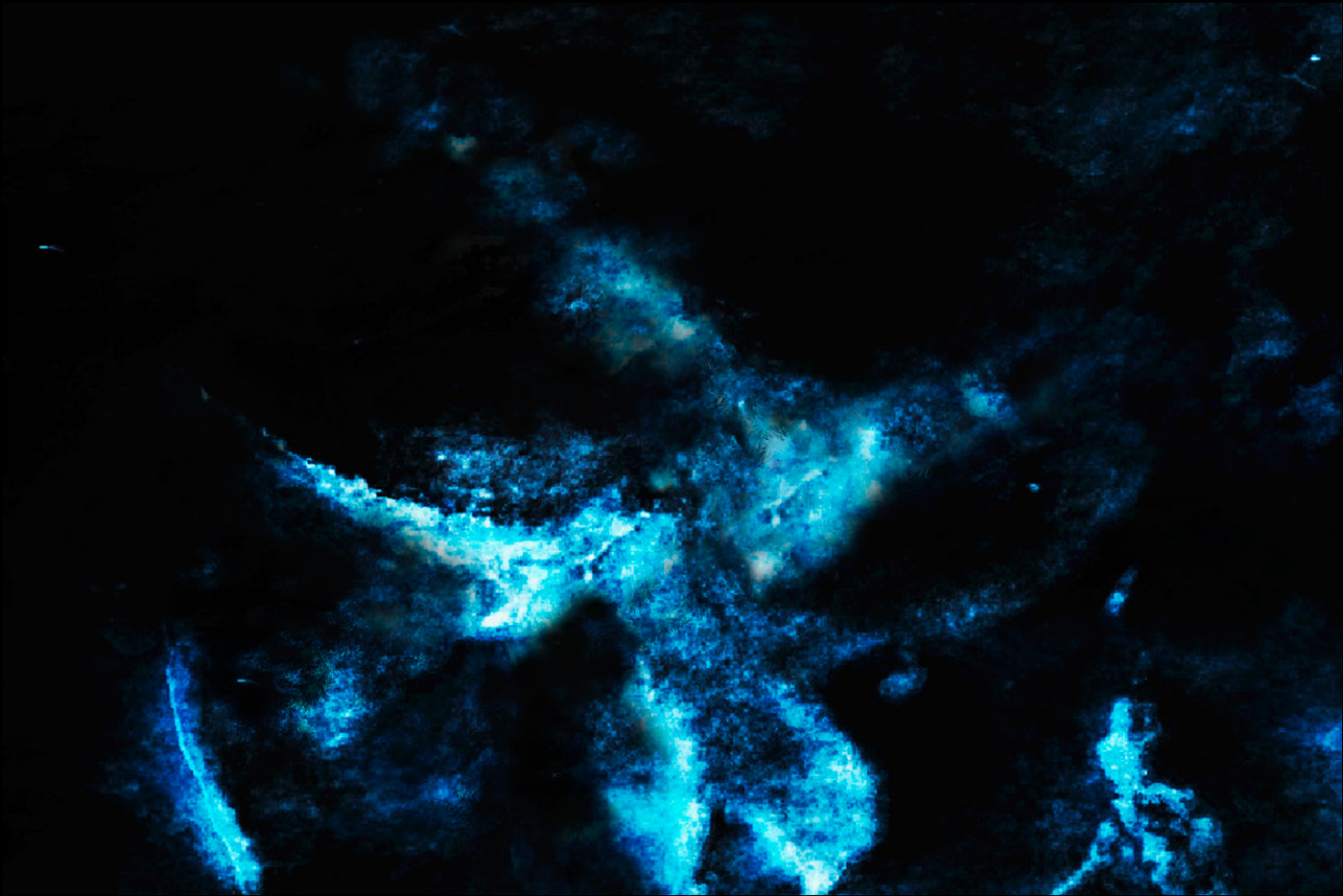
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Fig. 2-7 Catastrophic river flooding along California's Russian River.



02 PROBLEM FIELD

.3 TIBET PLATEAU AS INTERSECTION

- Crucial Intersection: Three Rivers origin on Tibetan Plateau

Here is where the rivers of the earth meet the rivers of the sky.

The intersection vertical zone where the projection of Sky river on earth meets the Yellow River Source region is on *Tibet Plateau*(Chinese: 青藏高原). Starting from a bigger picture. The resource of Asian great rivers, top of the world with elevation from 2000-4000 metres. Its tens of thousands of glaciers and other geographical and ecological features serve as a “water tower” storing water and maintaining flow. It is sometimes termed the Third Pole because its ice fields contain the largest reserve of fresh water outside the polar regions.

The crucial intersection zone for this Sky river and Yellow River became the place where the geographical fantasy starts. Its perhaps most renowned topographic setting atop the Qinghai–Tibet Plateau—the highest plateau in the world protects itself from being exploited too much from human beings. The plateau has an average elevation of 4000 m above sea level and an area of about 2.6 million km2, stretching approximately 1000 km north to south and 2500 km east to west. Framed alongside adjacent mountain ranges, this area is sometimes referred to as the ‘Third Pole’ or the ‘Roof of the World’ (Qiu 2008). ¹

The name of the Three Rivers region is self-evident, with three major rivers flow through more than 20 provinces and autonomous regions in country, and their basins cover more than two-thirds of China.

Nearly half of the total water volume of the Yellow River comes from the source of the three rivers, which lays a crucial foundation for why the place is emphasized.

Citations

¹ Qiu, J. (2008). The third pole. *Nature*, 454(7203), 393–396.

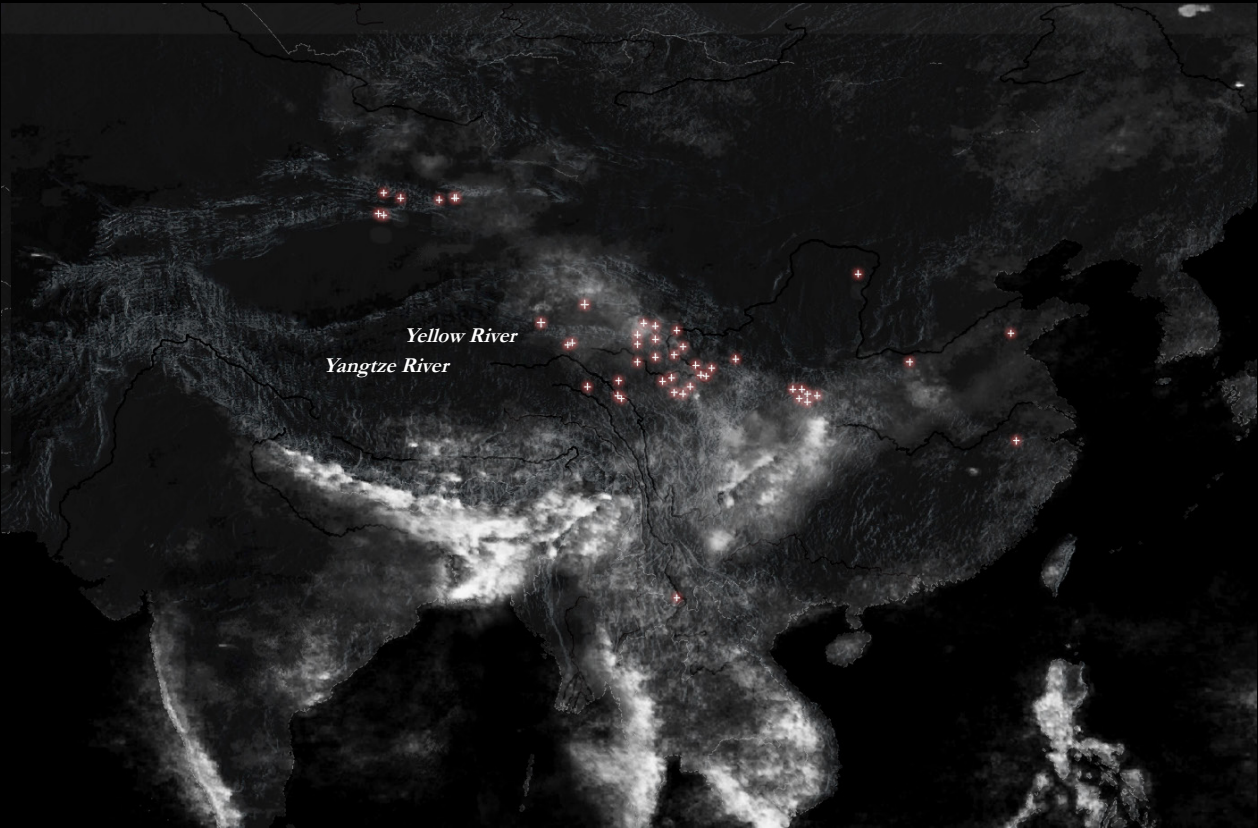


Fig. 2-5 The cloud seeding locations and the atmospheric river above China, the loations of the machines are under the atmospheric river but with fewer precipitation, and are overlap with the sources of 2 main rivers in China



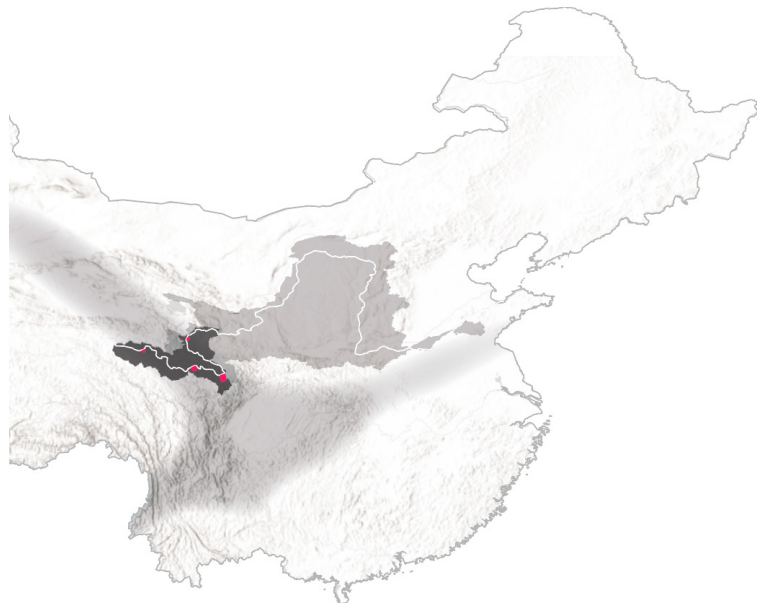
Fig. 2-8 Predictive cloudscape with the impact of machines

Sky River, or atmosphere river in science, is a long, narrow, and transient corridor of strong horizontal water vapor channel that transport water and energy around the globe. It's the area most likely to perpetuate but still in the water vapour form. ¹

At any given time, a single one can carry a greater flux of water than Earth's largest river, the Amazon River. They contribute to 22% of the total global runoff but also bring extreme meteorological events to places. ²

The initiator of the project, Academician Wang, and his team visualize the distribution of rivers in the sky in their paper "Study on Sky Rivers". (fig. 2-5) The diagram portrayed the huge, unstable and elusive atmospheric phenomenon in a linear structures or fractures across the Earth's atmospheric continuum: a clear departure from the more conventional representations of atmospheric rivers.

As when unpredictable natural world becomes quantifiable and is simply modelled, in an act of reduction it loses its elusiveness and becomes controllable, rationalize and abstract, while the complexity of sky rivers with the rest of the atmosphere system is ignored. The attention of Academician Wang is self-evident, as is said in his paper, the "long-term configuration infrastructure" of atmospheric rivers so that they may be "fully brought into the water resources management systems."



- Fragile alpine ecosystem

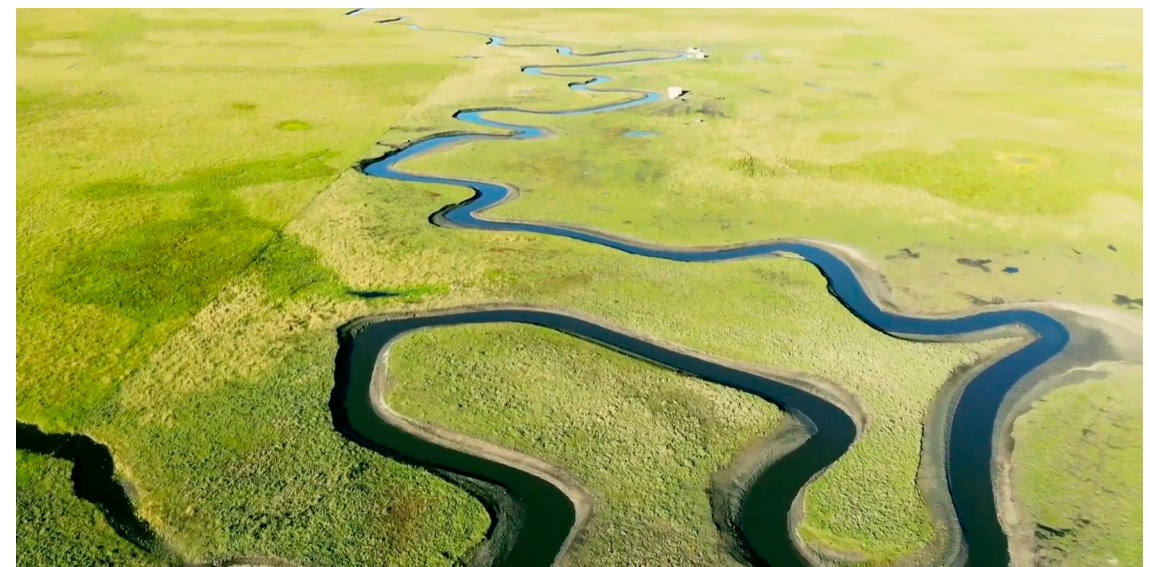
Tibet Plateau is the most sensitive area in the world to climate change and human activities. The ecosystem is collapsing 2 times faster than rest of the world due to climate change.

Tracing back to the depths of years, it was originally a sparsely populated or even uninhabited natural kingdom. Before human beings set foot in, this area was also a plateau meadow area with rich water and grass, dotted with lakes, and a large number of wild animals and plants. The pure land of life, or "Pure Land of Ultimate Bliss" in Buddhist words.

In the last century, climate change has largely disturbed ecosystems here. From the drying up of rivers and lakes, the melting of permafrost, the degradation of grassland vegetation, the flooding of plateau rats to the melting of glaciers, these symptoms are actually just different manifestations of a disaster. As a result, a vicious cycle leading to the continuous deterioration of the natural ecology of the Sanjiangyuan area, a "domino effect" that is in a state of collapse at any time has been formed.

Citations

¹ NASA. (n.d.). World of change: Yellow river delta. NASA. Retrieved January 20, 2023, from <https://earthobservatory.nasa.gov/world-of-change/YellowRiver>



02 PROBLEM FIELD

.4 NATIONAL PARK

- Autonomous region

An autonomous administrative territory is a subnational administrative division or internal territory of a sovereign state that has a degree of autonomy—self-governance—under the national government.¹ China’s ethnic autonomy is a basic state policy and a basic political system for practicing people’s democracy. The level of the administrative division is the same as that of a province, a municipality directly under the Central Government or a special administrative region.

In total, Chinese is composed of 56 ethnic groups, 55 minorities and the dominant Han.² Among them, Chinese Han is composed of 93% of the population. Hence, *ethnic minorities* (少数民族 in Chinese) in China, with 7% population, are the non-Han Chinese population. There are 5 autonomous counties where the ethnic minority groups are concentrated.

Three rivers origin is located in Qinghai province, located in western China and northeast of the Qinghai-Tibet Plateau. Named after China’s largest inland saltwater lake - Qinghai Lake. As of the end of 2017, Qinghai’s population was 5.98 million, with ethnic minorities accounting for 47 percent.

The large minority population accounts for why there almost every region is considered as autonomous prefecture except for its provincial capital, Xining. The rest six autonomous prefectures occupy the vast land and owns the origin of Yellow river source region. (fig.2)

However, in the past few years, the national conflicts are more seen within states, rooted between states and minority groups who demand rights to preserve their territories and identities.³ The tensions are partially due to the territorial changes and the inevitable development in the concept of nation-states which desires for homogeneity and unification.

Land reform, cultural aggression and authoritarian environmental policies in ethnic areas are non-negligible conflicts that the Chinese government is facing with minority people without truly understanding and respecting their own autonomy in all areas of political, economic, cultural and social life.

Citations

¹ Wikipedia contributors. (2023, February 3). Autonomous administrative division. Wikipedia. https://en.wikipedia.org/wiki/Autonomous_administrative_division

² Chinese Ethnic Groups, Ethnic Groups in China. (n.d.). China Discovery. <https://www.chinadiscovery.com/ethnic-minority-culture-tour/ethnic-minorities-in-china.html>

³ Positive experiences of autonomous regions as a source of inspiration ... (n.d.). Retrieved February 5, 2023, from <https://assembly.coe.int/nw/xml/XRef/X2H-Xref-ViewHTML.asp?FileID=10177>

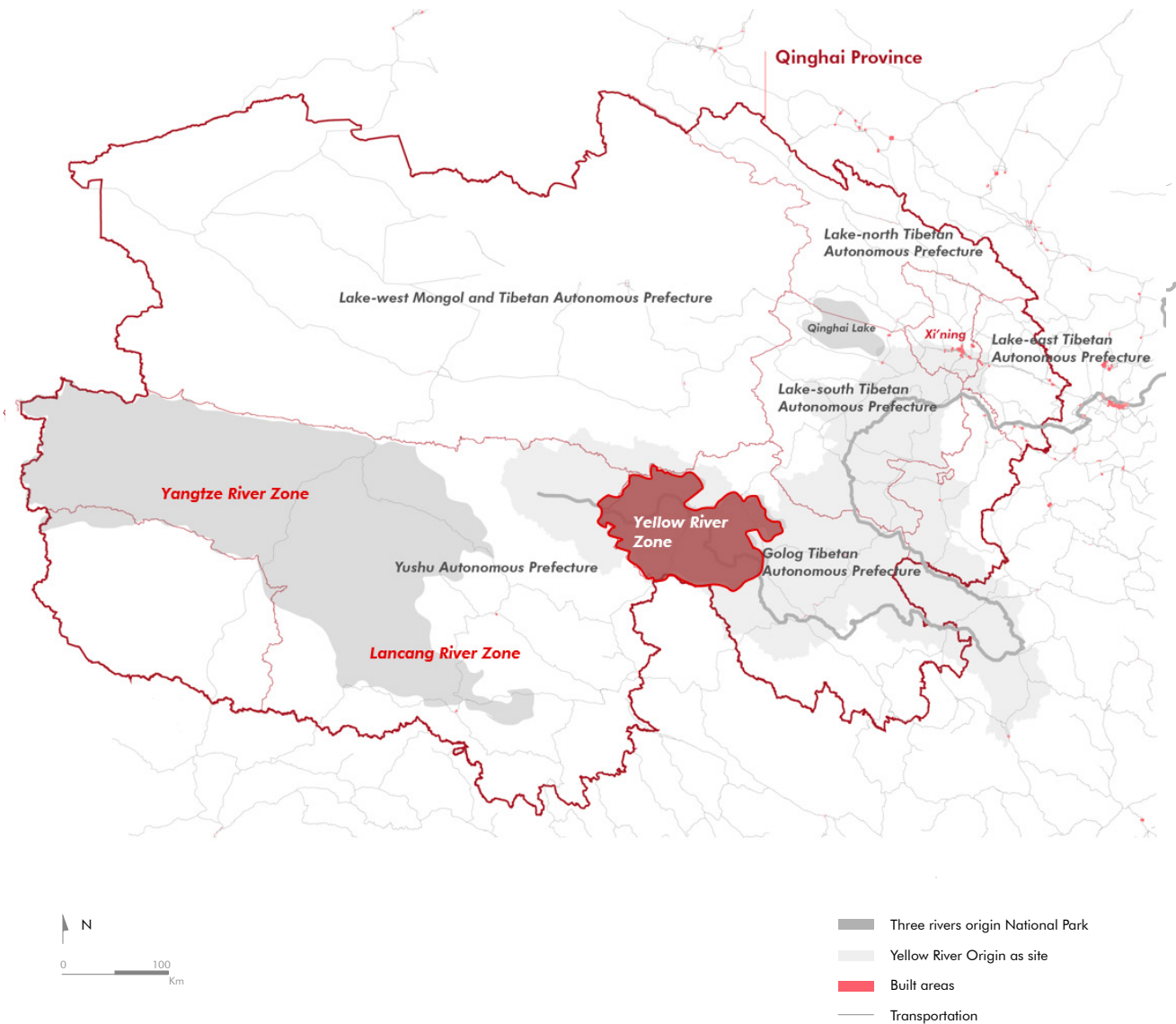


Fig. 2-4 Qinghai consists of 8 regions, of which 2 are cities, with provincial capital city Xining. The rest six autonomous prefectures occupy the vast land and owns the origin of Yellow river source region.

The establishment of China`s first national park: Three Rivers Origin Park

The Three Rivers Source National Park, located in Qinghai Province, China, is an important natural reserve and ecological security barrier. Renowned for its stunning natural landscapes and rich biodiversity, the park is a sanctuary of unparalleled beauty.

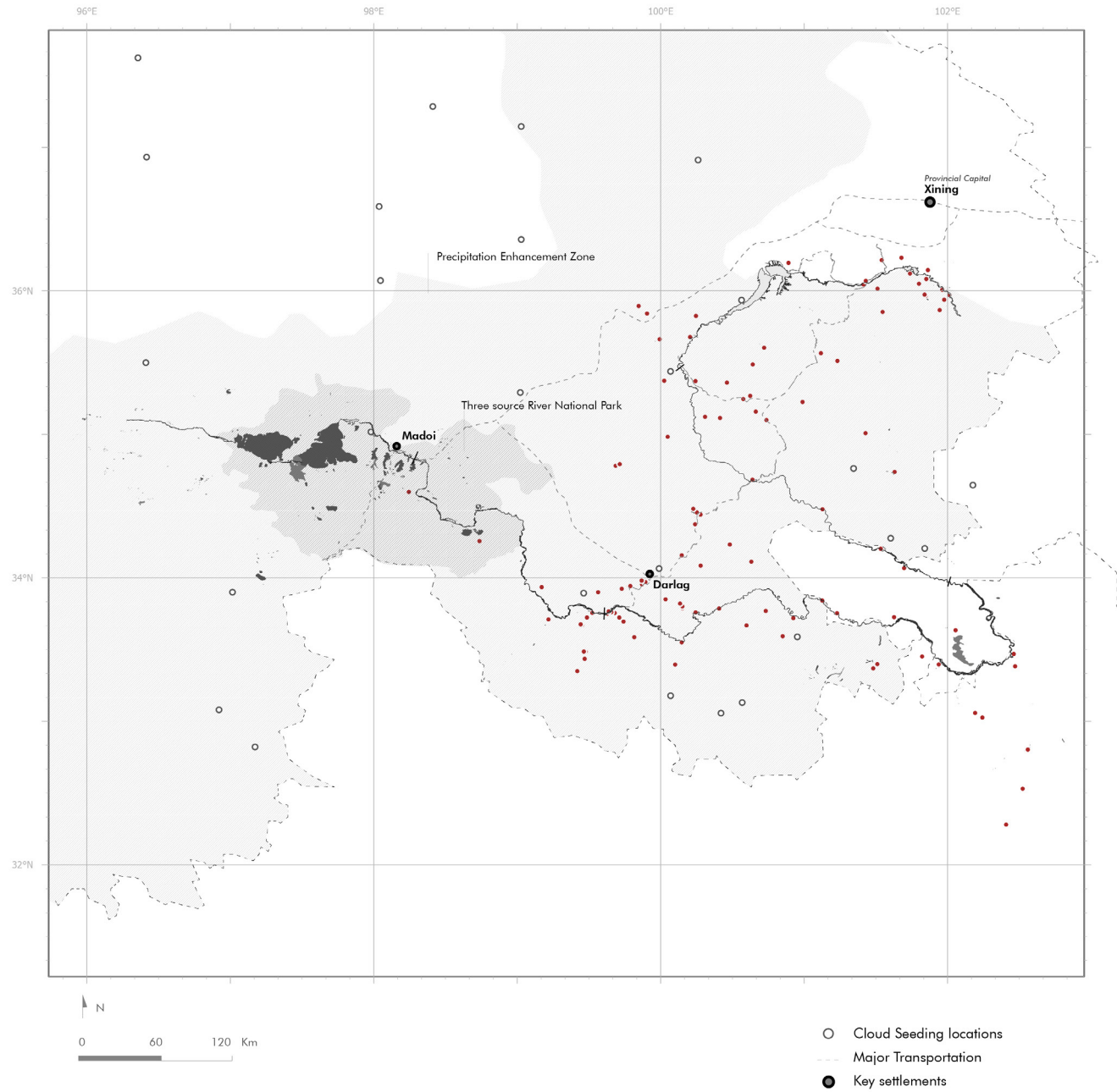
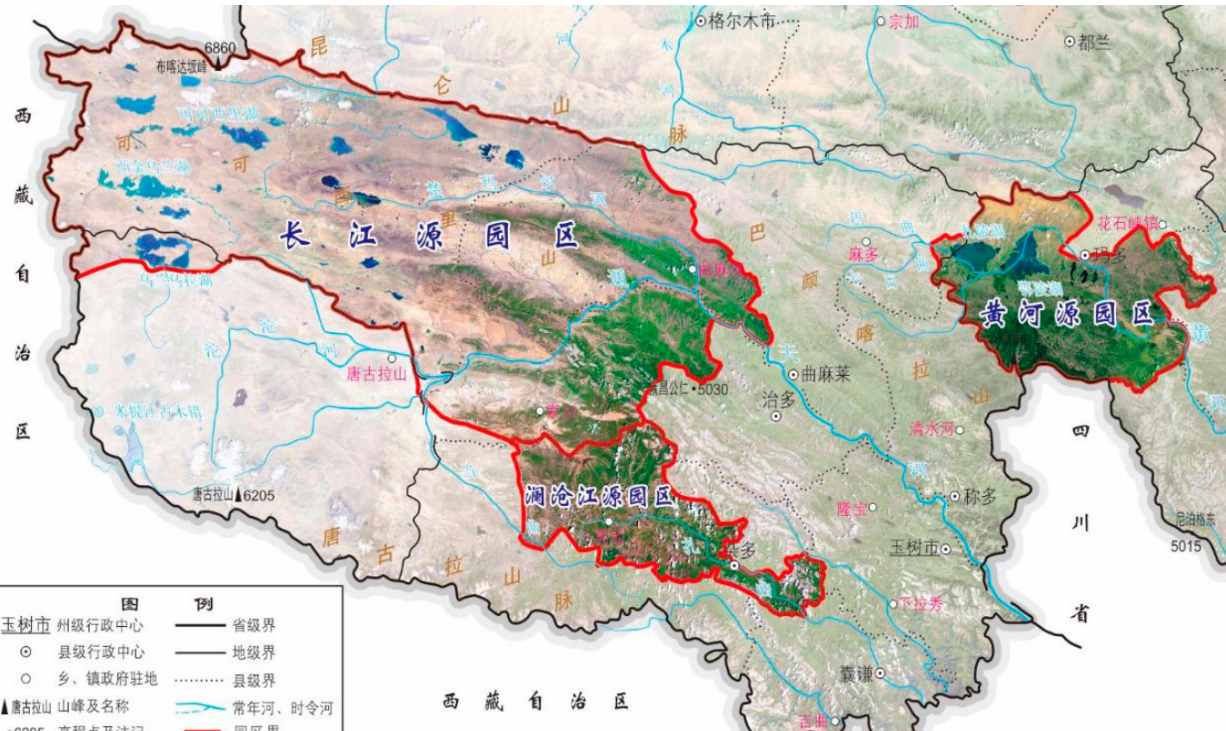
The park is home to the headwaters of three major rivers in China: the Yangtze, Yellow, and Lancang (Mekong) Rivers. These rivers originate from the vast plateau region, providing the park with an abundant water resource. Magnificent snow-capped mountains, expansive grasslands, crystal-clear lakes, and pristine forests make up the awe-inspiring natural scenery of the park.

The Three Rivers Source National Park is not only a significant ecological reserve in China but also one of the world`s biodiversity hotspots. It harbors numerous rare and endangered species, including Tibetan antelopes, giant pandas, and snow leopards. The park boasts diverse vegetation, ranging from alpine meadows to wetlands and coniferous forests, providing valuable habitats for a variety of flora and fauna.

In addition to its natural landscapes and biodiversity, the park is rich in cultural heritage and history. It is home to several ethnic groups, including Tibetans, Tujiia, and Mongolians, who have preserved their traditions and unique ways of life. Visitors can experience the warm hospitality of the local communities, indulge

Citations

¹ Natalie Wolchover, "A World Without Clouds," Quanta magazine, February 25, 2019
² Paltan, Homero; Waliser, Duane; Lim, Wee Ho; Guan, Bin; Yamazaki, Dai; Pant, Raghav; Dadson, Simon (2017-10-25). "Global Floods and Water Availability Driven by Atmospheric Rivers".
Image source: "Study on Sky Rivers: Concept, Theory, and Implications," by Wang Guang-qian et al., 2018.



in authentic ethnic cuisine, and enjoy traditional music, dance performances, and handicrafts.

As a national park, the Three Rivers Source is dedicated to ecological conservation and sustainable development. The park management takes measures to protect and restore the ecosystems, encourages local community involvement in conservation efforts, and promotes sustainable ecotourism. This not only safeguards the precious natural resources and cultural heritage but also provides visitors with a unique travel experience.

The Three Rivers Source National Park attracts tourists and researchers alike with its abundant natural landscapes, biodiversity, and distinct cultural heritage. Whether exploring natural wonders, experiencing ethnic cultures, or engaging in ecological research, the park offers unforgettable experiences and valuable learning opportunities for all.



Exlusion by ecological regulations

Chain of national parks will be formally launched in 2020, including Three-River Source National Nature Reserve, in which all human presence, from local people to nomadic pastoralism, is categorized as a threat to be excluded. The region will so to be ‘no man`s land’.

A ‘pristine ecology’ in the depopulated Tibetan region is hoping to be achieved by Chinese government by capturing carbon . Excluding grazing animals to grow more grass and increase biomass, and in the process gaining praise and global carbon credits for China - the largest carbon emitter on the planet.

The mobility of Tibetan pastoralists, always moving on to avoid depleted pastures, is itself a response to an unpredictable climate. This mobility has been forcibly restricted through a succession of strategies, starting with compulsory collectivisation, followed by the allocation of land use rights to individual households, while preventing traditional seasonal rotations. As compulsory fencing and compulsory stocking ratios further undermine the traditional pastoral system, the state is increasingly blaming nomadic communities for the diminishing land allocations available to them, which are no longer sufficient to sustain their herds. This vicious circle is now approaching its final spiral. Since the beginning, the nomadic way of life and the policies of the Chinese government have been driven by a different approach to climate change. Tibetan herders are now being cleared from their land in the name of environmental protection, ignoring the skills and wisdom accumulated over centuries in managing the vast and challenging space of the Tibetan plateau.

Chinese regulation on land is very different from the other countries in the world, that all land is owned by collectivities or by the state. There`s no privately owned land in China which proves to be efficient in China`s economic growth.

“Land finance” allows local governments to develop their economies and is one of the main sources of revenue for local governments, as land finance accounts for approximately 60% to 70% of local government budgets.

Citations

¹ Tibet: Nomads caught between climate change and government ‘conservation’. Minority Rights Group. (2022, December 6). Retrieved January 23, 2023, from <https://minorityrights.org/programmes/library/trends/trends2019/tibet/>

Citations

¹ NASA. (n.d.). World of change: Yellow river delta. NASA. Retrieved January 20, 2023, from <https://earthobservatory.nasa.gov/world-of-change/YellowRiver>

-Indigenous knowledge underestimated

Yet the impacts on Tibetans themselves, numbering some 6 million people and occupying almost 2 per cent of the planet’s land, attract far less attention. Instead the focus is almost entirely geopolitical, on global impacts and global responses: actual Tibetan land managers are absent, even though they make land-use decisions daily in a climate that has always been highly variable, requiring great skill in living with uncertainty.

Although Tibet is the most inhabited of cryospheres, it is also out of bounds to international media and human rights activists. As a result, the experiences of local communities at the frontline of climate change are neither heard nor acknowledged. In the absence of Tibetan voices, the significance of rapid warming is argued by states, scientists and geoengineers, all seeking global results.

Their religion adhere to the integrity and originality of the natural ecology. Shepherders are not allowed to eat any meat other than the cattle and sheep they raise themselves. The fish in the river, the birds in the forest and the deer on the mountain are all sacred and inviolable. No shouting is allowed on the mountains, and no disturbance is allowed on the rivers. Sky burials are prevalent, while earth burials are taboo, and people are advised to “bring nothing from birth, but not from death”.



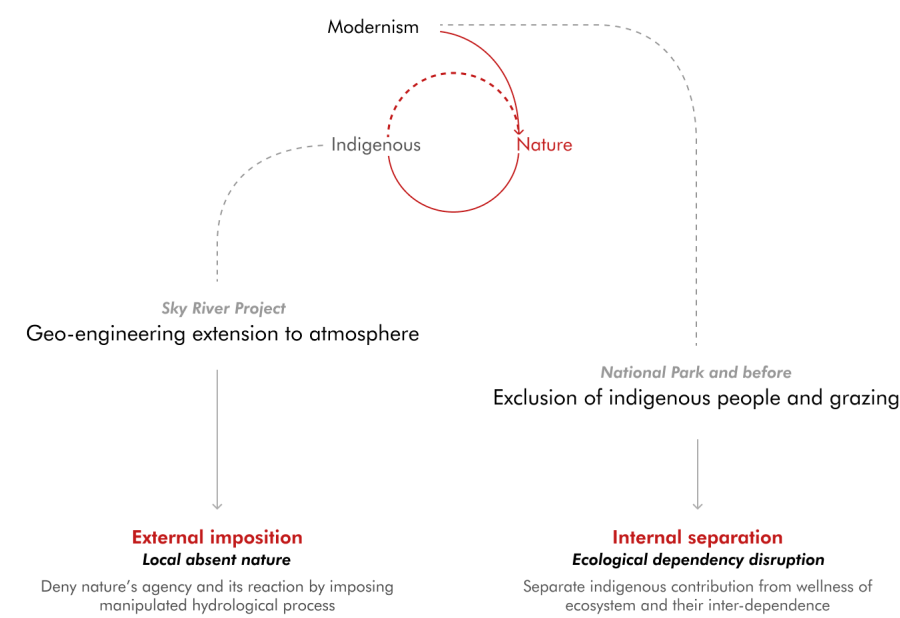
Fig. 2-4 Shot from China Global Television Network Documentary series, Journeys in Nature: Sanjiangyuan series. (n.d.).

02

PROBLEM FIELD

.5

PROBLEM STATEMENT



Sky River Project:

The source of Yellow River is shrinking despite the efforts of endless infrasturcture built on the river ever since the last century. The dry up of the River largely disrupts the downstream and its food securi-ty for the nation.

The discovery of Sky River and its possible ways for utilizing its ex-ceeding rainfall gives government theoritical foundation to launch the ‘Sky River’ project. It is far from certain that the enthusiasts for geo-engineering, on a scale never seen before, can demonstrate that the Sky River Project will be effective, especially at a time when rain is already increasing due to climate change.

National Park:

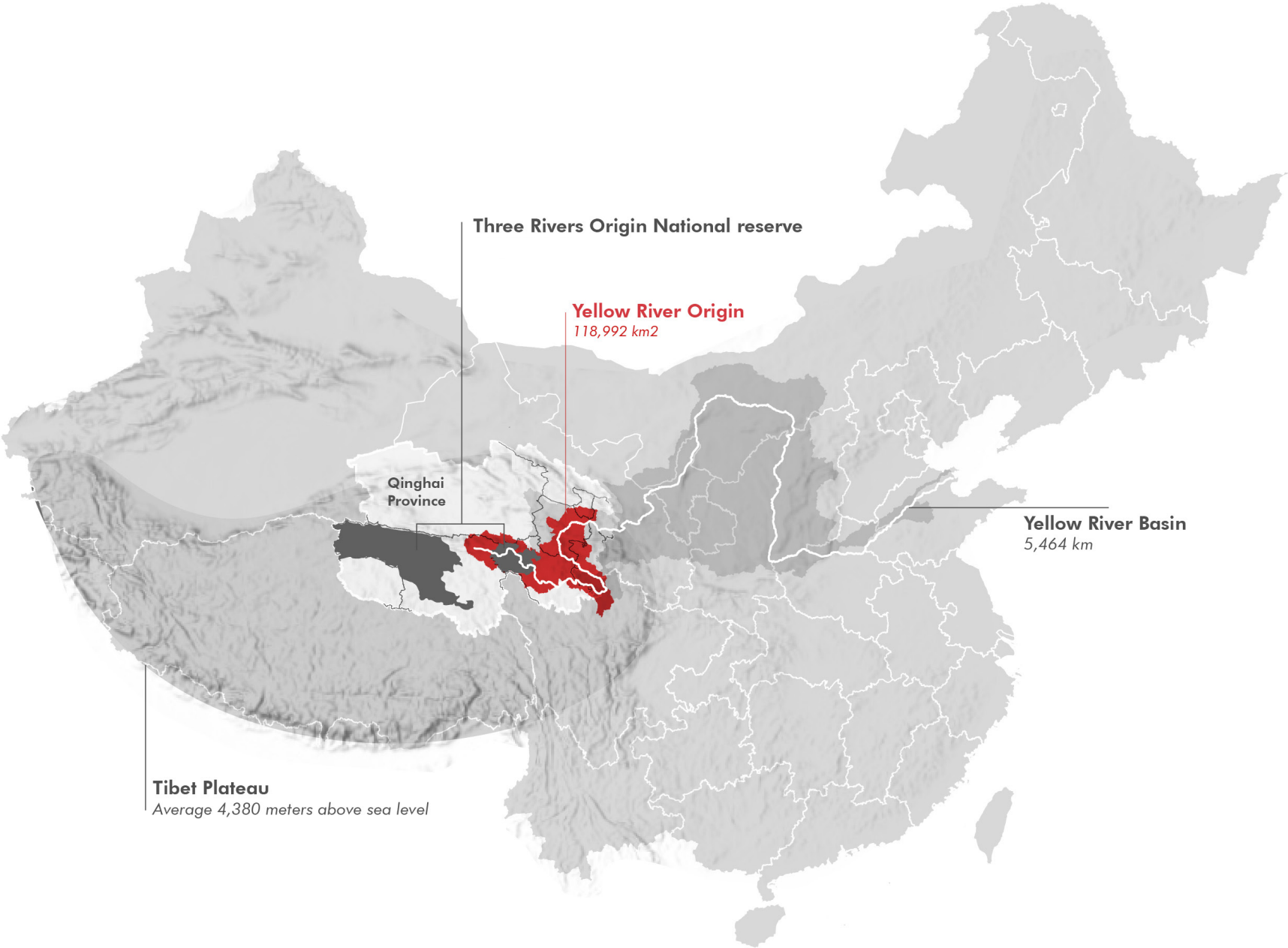
In the name of combating climate change, relieving water stress, displaced pastoralists – recast in official discourse as voluntary ‘ecological migrants’ – are now resettling in urban fringe settle-ments. China’s long-standing land tenure, and the marginalised voice of ethnic minorities, made this project so smooth that the cre-ation of a political system of weather became common in China.¹

The ecological denpendancy is deined, and there`s no limit on human goals and their ways to reach the goals. Dependency appears as a source of anxiety and threat or as a further techno-logical problem to be overcome. Describing and whitewashing the indigenous place as “pure nature” tends to be not so much a way to overacknowledge the contributions and workings of nature as a way to underacknowledge the human activities and social relations involved and the extent of prior ownership or human construction.

Citations

¹ Tibet: Nomads caught between climate change and government ‘conservation’. Minority Rights Group. (2022, December 6). Retrieved January 23, 2023, from <https://minorityrights.org/programmes/library/trends/trends2019/tibet/>

Three rivers origin is being turned back to “no man`s land” under climate change crisis, but with world`s largest artificial rainfall pro-ject implanted, the place is becoming a giant landscape machine with an unpredictable future.



A multiscalar project

It's first important to illustrate the framing scopes in this large-extent multiscalar project.

The project begins with the

Starting from the engaging with notions of returning,the project will deploy the urban and territorial project as the crucial field of knowledge production across four scales.

[ANALYSIS]

Territory - Sky River and Yellow River region Analysis the territorial hydrological cycle and its impact on the national scale.

[DESIGN]

Regional - Three Rivers Origin

Identify different geomorphic characteristics and re-identify its natural identity

Local - Villages

Identify risks and potential in different domains ecologically and socially
Return to the state of its natural capital (vegetation, weather, animals) and design with native

Micro - Local spaces

Revive traditional setting of a village, and people's cultural activities
Construct gradually a resilient and revival landscape that can nourish economic, social and ecological system for the long-last rural civilization

RESEARCH FRAMEWORK

Research question

How to envision a **dynamic territorial park** capable of **ecologically and socially nourishing** the Yellow River Source basin responding to **future accelerated hydrological cycle** as a **resilient, collaborated and adapted alpine ecosystem?**

questions - research fields

Research framework

This chapter introduces the larger global background where the Sky River Project operates., through which the conflicts are revealed and the motivation unfolds. The expanding human exploitation of resources has far reached into space and marginalized the indigenous community from a modern point of view called 'development'.

03.



What constitutes the current fragile territorial form of Yellow Source origin?

How can regional interventions outcome a revival territorial form?

What are the impact of different domains interacting with the hydrological system and what are the changes they have caused?

How will the weather manipulation technology or increasingly human control over land change the status quo?

How to envision a dynamic territorial park
capable of ecologically and socially nourishing
the Yellow River Source basin responding to future accelerated hydrological cycle
as a resilient, collaborated and adapted alpine ecosystem?

How can a returned practice help to deal with future risks?

How can strategies help region to return?

What`s the voice of local people and how do they see their future?

What will be the ecological risks according to future seasonal hydrological patterns?

How to incorporate traditional indigenous knowledge to the ecologically inclusive design?

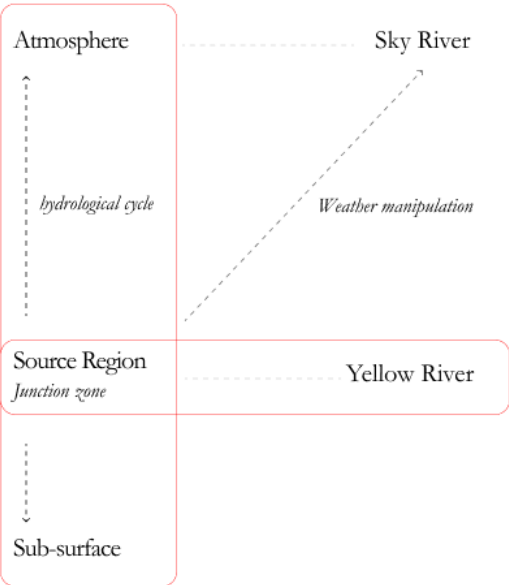
How can the change of territorial form preserve the water from sky river and sustain to supply the yellow river region?



03 RESEARCH FRAMEWORK

Research question

How to envision a dynamic territorial park capable of ecologically and socially nourishing the Yellow River Source basin responding to future accelerated hydrological cycle as a resilient, collaborated and adapted alpine ecosystem?



Sub-research question

Analysis based

1. What constitutes the current fragile territorial form of Yellow Source origin?
2. What has been changed ecologically and socially that leads to today`s situation?
3. How will the weather manipulation technology or increasingly human control over land change the status quo?

Problem based

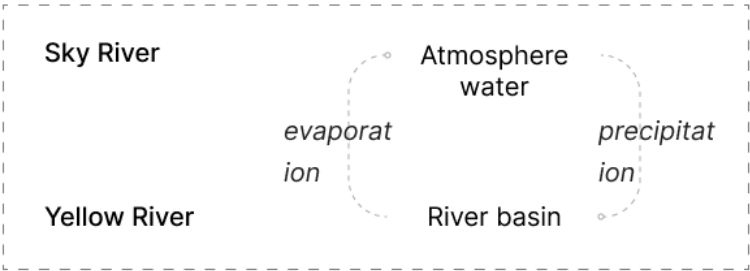
1. What will be the ecological risks according to seasonal hydrological patterns?
2. What are the impact of different domains interacting with the hydrological system and what are the changes they have caused?
3. What`s the voice of local people and how do they see their future?
4. What cause them silent?

Design-based

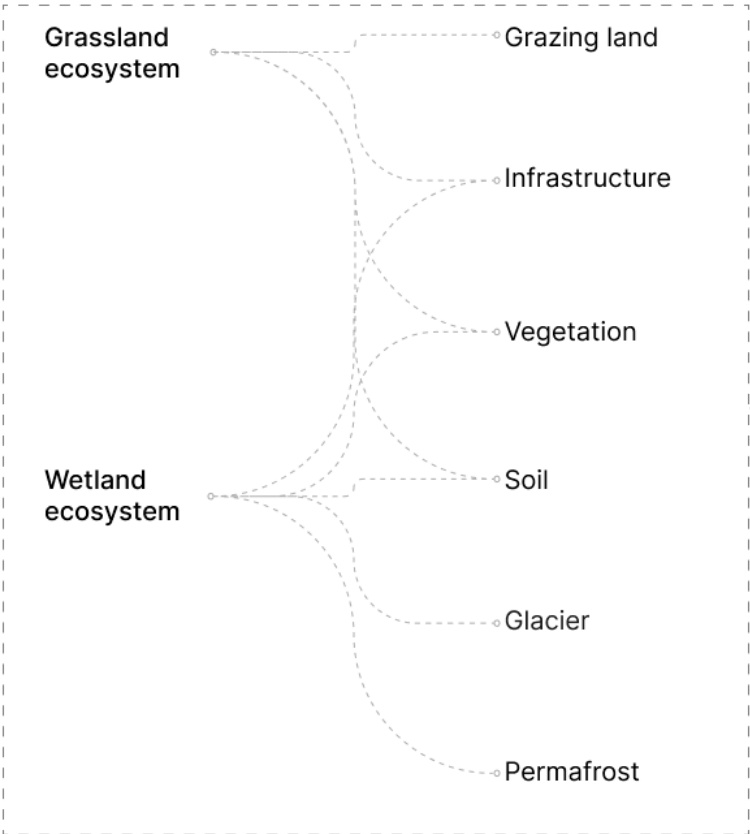
1. How can a returned practice help to deal with future risks?
2. How to diversify the narrative in this field so as to provide new productive economic activities for marginalized groups and beautify natural capital?
3. How to incorporate traditional indigenous knowledge to the ecologically inclusive design?
4. How can local interventions outcome a revival territorial form?
5. How can the change of territorial form preserve the water from sky river and sustain to supply the yellow river region?

Research fields

Whole region



Yellow river source



Fields of action

Hydrological cycle

+ temporal change
seasonal, annual changes
+ spatial change
altitude change

Domains

Risk Potential

03 RESEARCH FRAMEWORK

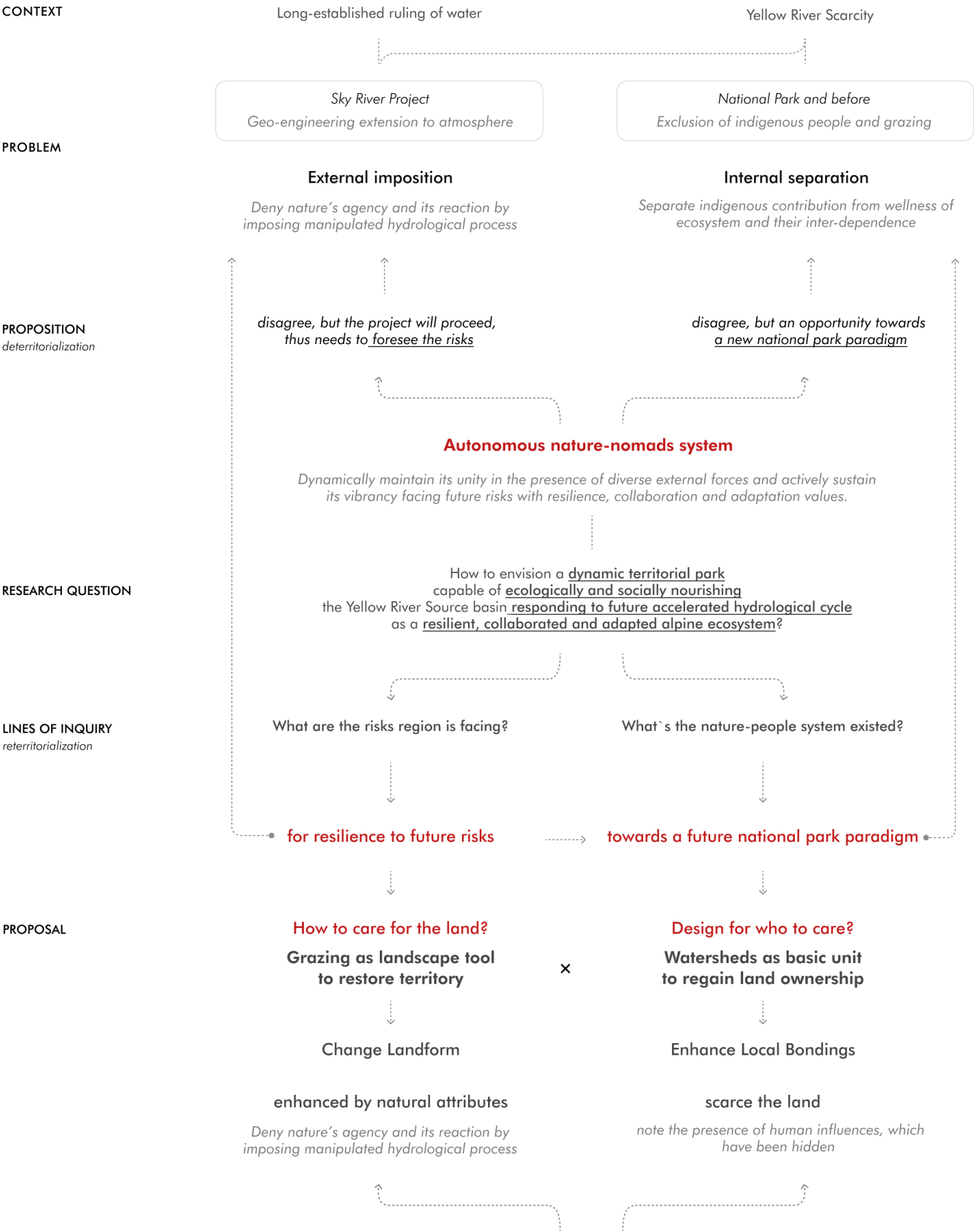
The whole report is conducted under the following strcture.

As analysis the status quo brought by cloud seeding machine and foresee its unpredictable future is also an important part of this report, the report will be divided into three parts.

The first part contains the introduction, context, problem field, methodology and lines of inquiry. The purpose is to look at how clouds and rain, traditionally considered as nature, have been manipulated and tamed step by step from the perspective of the Anthropocene, ultimately becomes part of the mega-infrastructure.

The second part is Revisit. Purpose is to determine the position of the paper, that is to remove the technical control on the site and revisit the site with non-human-centered perspective.

The third part is mainly about how to re-valueate the natural capital to restore and sustainable development based on the characteristic industry of local planting and animal husbandry, starting from the return to the natural state of the hydrological cycle. At the same



METHODOLOGY

Inquiry framework

Conceptual framework

Theoretical framework

Thesis framework

Outcomes

This chapter introduces the larger global background where the Sky River Project operates., through which the conflicts are revealed and the motivation unfolds. The expanding human exploitation of resources has far reached into space and marginalized the indigenous community from a modern point of view called 'development'.

04.



DYAL THAK. (n.d.). photograph. Retrieved from <https://www.kinbykin.com/personal-projects/dyal-thak/>.

04 METHODOLOGY

OVERVIEW & STATEMENT

The whole process shows how a new logic——hy-geo-logics is fantasized through an act of geological reimagination. The more striking point lies in that the project has intensified our division with nature. As Bruno Latour questioned modernism in his works, that our sciences emphasize the subject-object and nature-culture dichotomies, whereas in actuality, phenomena often cross these lines.¹

The indigenous community was deeply connected with the nature before modernism altered completely their connection with the ground. The disruptive process comes into being when modernism erasing from the map locals who have inhabited before the advent of state organization and geologically urbanized the population with ecological immigration. These indigenous peoples are officially “urbanized” simply because they have been forced to change their habitat through ecological migration. Nature were reproduced being given meaning and implies a political message that is not neutral.² In this sense, human is more geological than biological, habitat is more political than spatial.

People are forced to leave their biological habitat simply because of 2 reasons, insufficient labour force and the position that they are viewed as enemies of the environment. Technological intervention represents for the state`s will and the apparent possibility of rapid ecological restoration. In China, speed is everything. At the high cost of time, capitalism and national politics together determine what is efficient, and nature becomes the subject to regulation.

The end of the pastoralist and traditional land-use in Tibet is in sight. As climate change becomes a core rationale for depopulating rural Tibet, displaced pastoralists – recast in official discourse as voluntary ‘ecological migrants’ – are now resettling in urban fringe settlements. Climate change, and the government’s response, privileging grass and water over customary livelihoods, may soon succeed in closing huge areas to productive use, ending a strategy that has made Tibet habitable for thousands of years.

Citations

¹ Into Latour and his philosophy. Parliament of Things. (2019, October 16). Retrieved January 21, 2023, from <https://theparliamentofthings.org/parliament-parlement-van-de-ding-en-noordzee-ambassade-bruno-latour/>

² Latour, B. We Have Never Been Modern. Cambridge: Harvard University Press 1991.

³ Lefebvre, H. (1977). Reflections on the politics of space. In R. Peet (Ed.), Radical geography (pp. 339–352). London: Methuen and Co.

⁴ Roger LeB. Hooke; On the history of humans as geomorphic agents. Geology 2000;; 28 (9): 843–846. doi: [https://doi.org/10.1130/0091-7613\(2000\)28<843:OTHOHA>2.0.CO;2](https://doi.org/10.1130/0091-7613(2000)28<843:OTHOHA>2.0.CO;2)

⁵ Lidström, Susanna, Simon West, Tania Katschner, María Isabel Perez-Ramos, and Hedley Twidle. 2015. Invasive Narratives and the Inverse of Slow Violence: Alien Species in Science and Society. Environmental Humanities 7 (1): 1–40.

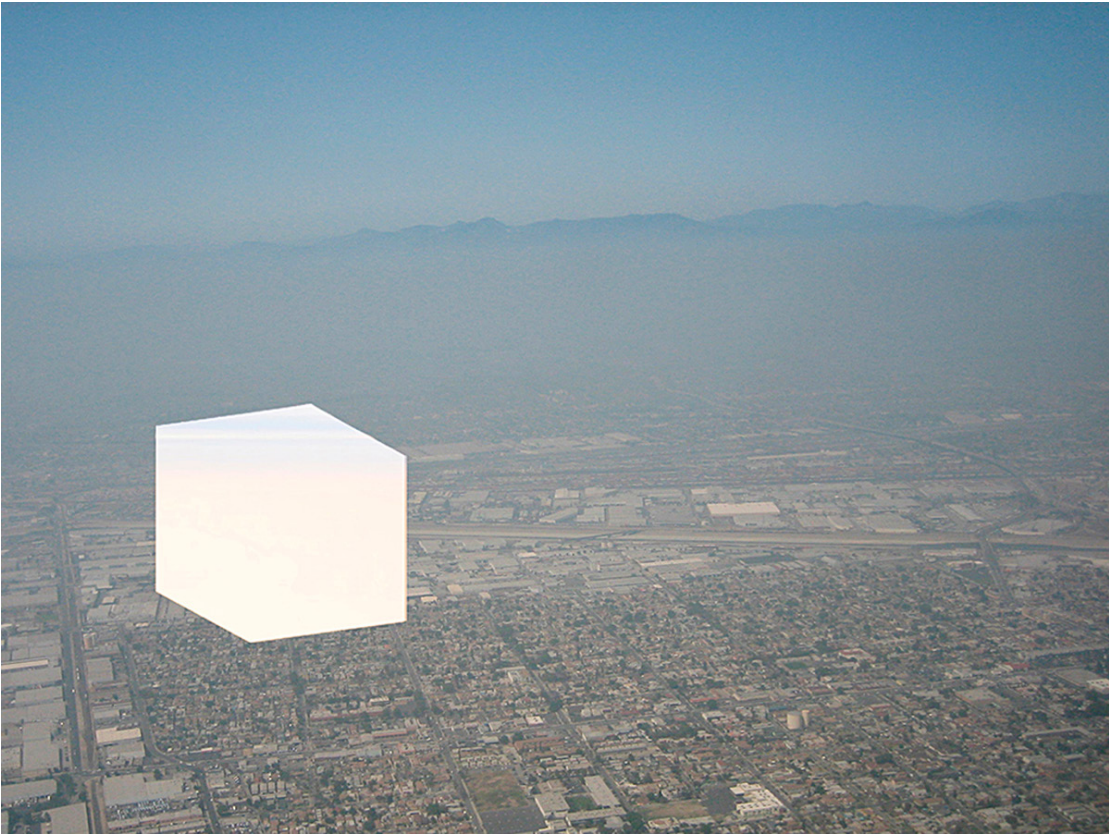


Fig. Amy Balkin, Image from ‘PUBLIC SMOG,’ 2004 – ongoing. (Courtesy: the artist)
This work proposes that the atmosphere be declared a UNESCO World Heritage Site. Advanced petrocapi-talism is reshaping the atmosphere and acknowledging that it is indeed somehow the heritage of humanity. The piece also asserts at the same time that the atmosphere should be seen as the way of the commons, the commons we all depend on for the continued existence of humanity.

While exceeding rainfall is inevitable either because of climate change or environmental technology, future steps are required to secure the hydrological loop.

As urban designer, I don`t agree with the Sky river project because it encourages an ongoing dominance under human-nature pluralism and exaggerate future disturbance of ecosystem.

However, as long as ruling regime continues, the project will proceed in one way or another.

The notion of autonomy is here to empower the agent of nature to act, in response to future risks and potentials.

Therefore, I propose the notion of Autonomy to empower and re-construct the human-nature interconnectedness as a resistance to anthropogenic dominated hydrological cycle and towards a 21st-century new National Park paradigm.

Here by resistance, it means to retain the water for nourishing the Yellow River, sustain water for the dry season, utilize water for desertification grasslands, and discharge the water that may flood or thaw the permafrost.

That is to say, an autonomous eco-system naturalizes where the water will flow and by flowing, in its natural status, it reaches its optimal reciprocity with other nature elements and supports the re-distribution of water that may combat with the external pressure.

04 METHODOLOGY

.1 INQUIRY FRAMEWORK

In the dominant forms of modern culture, nature is treated under-recognized in terms of its necessity of agency and contribution of “labour”. They serve as background to make real work and achievement possible, rather than achievement itself.

Dependancy is deined, and there`s no limit on human goals and their ways to reach the goals. Dependency appears as a source of anxiety and threat or as a further technological problem to be overcome.

The Nature–Society divide encourages divisive thinking in viewing nature as a separate entity¹; and, specifically, divisions between groups of people² that effectively serve as boundaries without considering the social, cultural, and economic dynamics that are intimately intertwined with it. The cheapening of Nature, made possible by artificially separating us humans and societies from it and the broader web of ecological life that sustains us, makes Capitalism possible (Patel and Moore 2017).

A reframe of human-nature reciprocity from the re-territorialization of land requires a shift of viewing nature not as a reified object, as something to be mastered by instrumental reason through science.

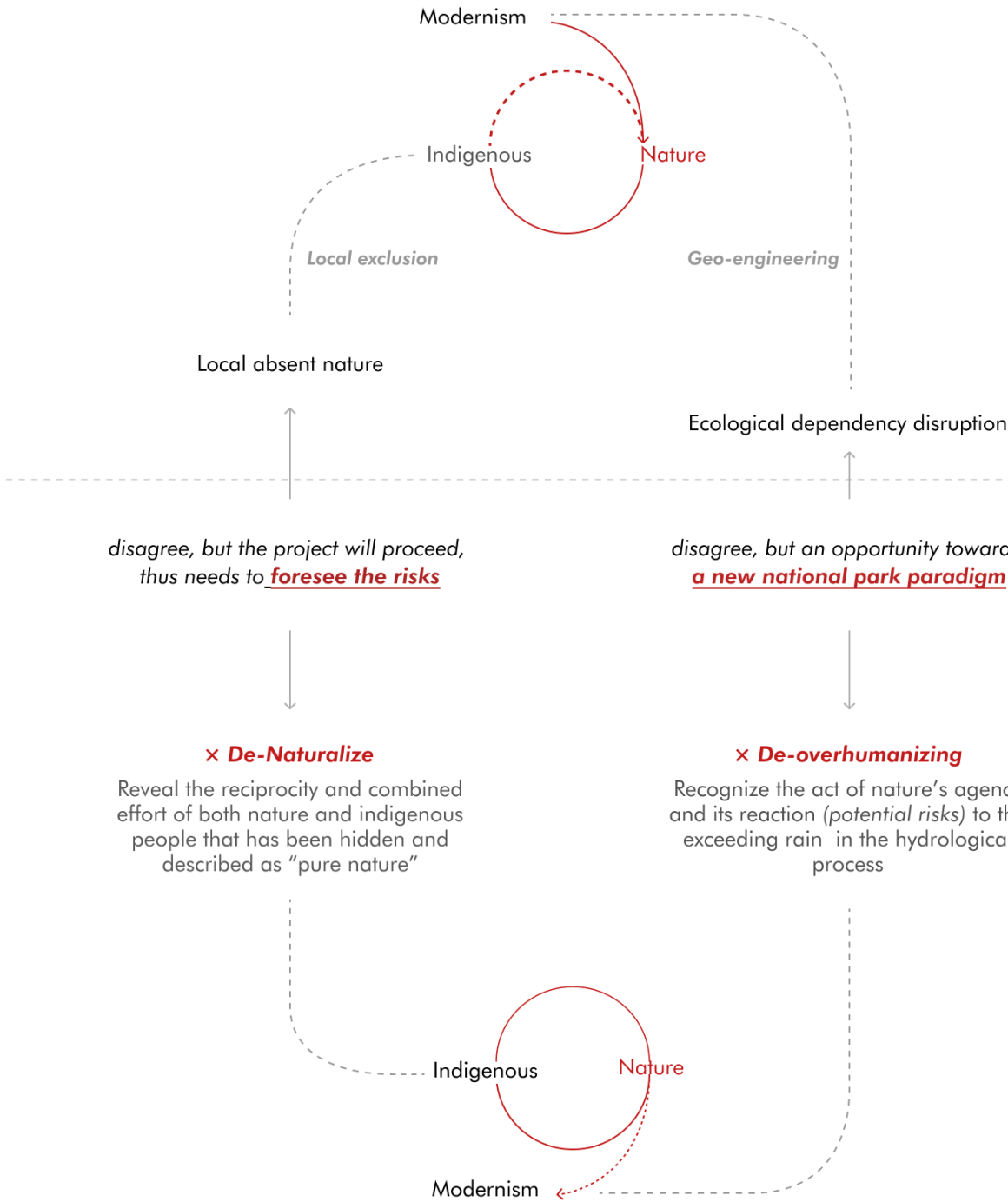
Labeling something as nature tends to be less an acknowledge-ment of nature’s contributions and operations, and more a means to downplay the human activities and societal relations implicated, and the extent of prior ownership or human fabrication. In such contexts, it may be necessary to de-naturalize, to mitigate or enhance the focus on nature, and highlight the often-concealed influence of human activity - though this seldom negates the influence of nature entirely.

Two parallel lines will be conducted under futher discussion. Understand where are we standing, to forsee the risks, towards a holistic integrity of sociocultural practices, a new paradigm.

Citations

¹ Lidström, Susanna, Simon West, Tania Katzschner, Maria Isabel Perez-Ramos, and Hedley Twidle. 2015. Invasive Narratives and the Inverse of Slow Violence: Alien Species in Science and Society. *Environmental Humanities* 7 (1): 1–40.

² Roger LeB. Hooke; On the history of humans as geomorphic agents. *Geology* 2000;; 28 (9): 843–846. doi: [https://doi.org/10.1130/0091-7613\(2000\)28<843:OTHOHA>2.0.CO;2](https://doi.org/10.1130/0091-7613(2000)28<843:OTHOHA>2.0.CO;2)



04 METHODOLOGY

.2 CONCEPTUAL FRAMEWORK

The term “nature” is by no means self-evidently clear. This project is based on rethinking nature and calls for the recognition of the autonomy of nature. This project is rooted in a reevaluation of our relationship with nature and is a clarion call for acknowledging the autonomy of nature. The concept of autonomy is inspired by the region’s administrative name: the Autonomous Prefecture. This project invites us to reflect on the inherent independence of nature, and the ways in which we can respect and preserve its intrinsic values, even as we interact and coexist with it in our daily lives.

It’s crucial to clarify that autonomy does not equate to independence.¹ As Jack Turner eloquently states, “Although autonomy is often mistaken for radical separation and total independence, the autonomy of systems (and, in my view, human freedom) is enhanced by interconnectedness, complex iterations, and feedback loops — that is, by influence” (1996:113)². This suggests that nature’s autonomy, far from implying isolation, is actually strengthened by its interdependencies within the broader system.

The primary objective is to acknowledge the prevailing anthropocentric perspective which treats nature as distinct and subordinate to humanity. Subsequently, it’s important to uncover the oppressive and hazardous roles nature is forced to play under this paradigm. By doing so, we can pave the way for reimagining the symbiotic relationship between humans and nature, recognizing the potential roles nature could assume in partnership with humanity when given the autonomy it deserves.

Citations

¹ Escobar, A. (2018). Designs for the pluriverse: Radical interdependence, autonomy, and the making of worlds. Duke University Press.
² Systems approaches to managing change: A practical guide. (n.d.). Scholars Portal.

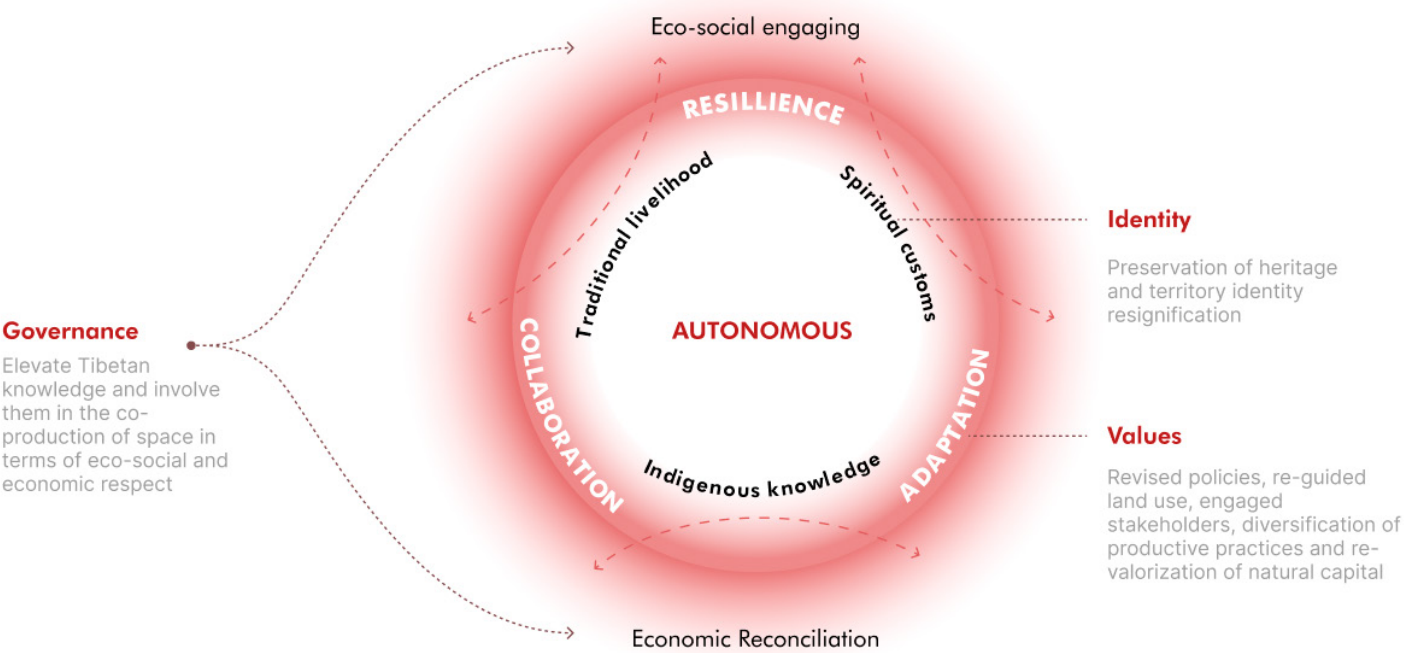


Fig. Framework for the new national park paradigm

04 METHODOLOGY

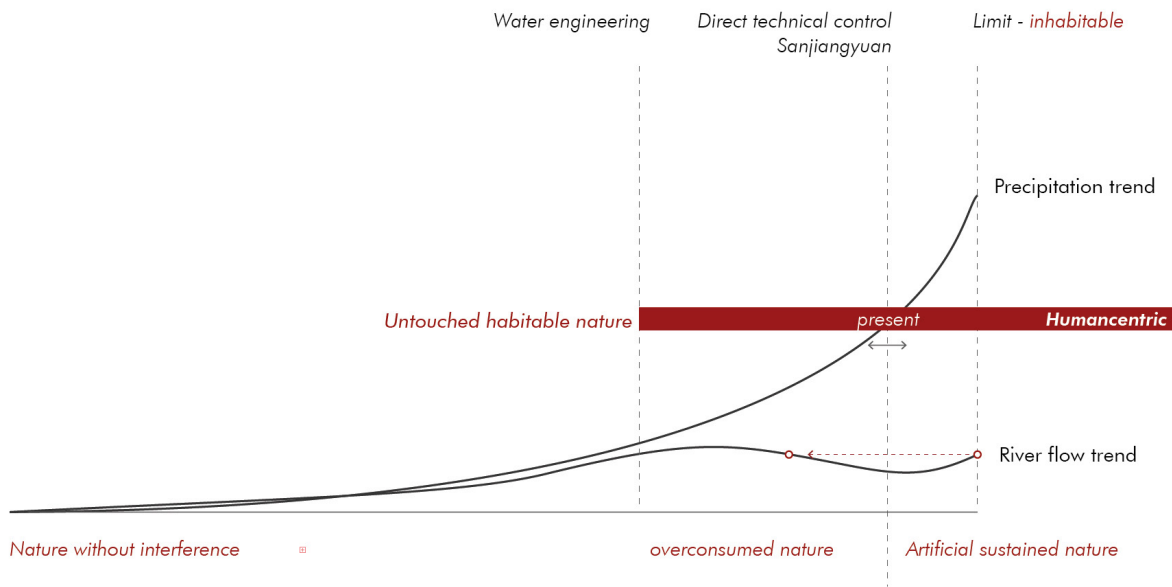
.3 THEORETICAL FRAMEWORK

A RETURN FOR THE FUTURE

After years of engineering on Yellow River with endlessly exploiting every single drop of it for future development, the water have dried up. To rapidly recover from yesterday`s draining, the future of Sanjiangyuan is fulfilled with human endeavors where the geo-engineering is taken place to supply the water needs and hopefully, create a new artificial ecology.

Standing from the status quo, the project is faced with 2 fortunes: to artificially sustain the flow of river as an ecological functional territory, or to return to its nature status where we call it habitat. China`s dividend of increased river flows due to glacier melt will turn to deficit when the glaciers are gone. That will take most of this century, it seems, far away enough for little immediate concern, and perhaps compensated for by increasing precipitation

As an urban designer, one of our missions is to find a balance between the grand narrative of the territory and the local habitat, finding possibilities that suit the local and respect nature. We want to see a world that is reviving with heterogeneous possibilities, and we want to see the Yellow River flowing consistently comes from a healthy ecosystem rather than another territory that is cold and devoid of people.



Citations

- ¹ Raffestin, C. (1980), Pour une géographie du pouvoir, Paris.
- ² Easterling, K. (2016). Extrastatecraft: The Power of Infrastructure Space. Verso.

Citations

- ¹ Into Latour and his philosophy. Parliament of Things. (2019, October 16). Retrieved January 22, 2023, from <https://theparliamentofthings.org/parliament-parlement-van-de-ding-en-noordzee-ambassade-bruno-latour/>
- ² Latour, B. We Have Never Been Modern. Cambridge: Harvard University Press 1991.
- ³ Patel, Raj, and Moore, Jason W. 2017. A History of the World in Seven Cheap Things: A Guide to Capitalism, Nature, and the Future of the Planet. Berkeley: University of California Press. <https://doi.org/10.1525/9780520966376>
- ⁴ Uneven Development: Nature, Capital, and the Production of Space
- ⁵ Smith, N. (2020). Uneven development: Nature, capital, and the production of space. University of Georgia Press.
- ⁶ Heilbroner, R.L. 1974. An inquiry into the human prospect, New York: Norton.
- ⁷ Gilley, B. (2012). Authoritarian environmentalism and China's response to climate change. Environmental politics, 21(2), 287-307.

Unique and unconventional vision

Theoretical framework is very important for the report. As there`s lack of observational data and scientific research on the site, to fully understand the unique alpine ecological system and Tibetan minority people needs a lot of data and articles to testify each other. The design and research on Three Origin Region is also few enough to see just how neglected the region is.

Authoritarian Moderism

To start with, the discovery and implementation of "Sky River" project itself mark the human-centric view of treating nature, that is to separate nature completely from human.¹ In **We Have Never Been Modern (1991)** Bruno Latour criticizes the distinction between nature and society inevitably cheapen nature and see it as something could be trade for. Under contemporary capitalism, industrial society is entirely premised on the ideology of taming and exploiting nature.

The critiques of such questioning modernism also encourages divergent thinking in other areas, such as which parts of "nature" should be protected or allowed to die (Biermann and Anderson, 2017)and divisions between populations (Patel and Moore 2017).³ In Neil Smith`s book **Uneven Development: Nature, Capital, and the Production of Space(2008)**, he links this phenomenon more deeply to capitalism with theory of unevenly geographical development featuring the production of nature and politics of scale.

Under the government and capitalist-led ecological assessment, the Three Rivers Region is assessed as requiring a strong ecological development to compensate for the developmental pollution brought by other (lower Yellow River) regions. And as a result no effort was spared to invest heavily in ecological migration, as they believed that the aborigines were also responsible for the environmental pollution and defined the city as a better place to go.

Such a distribution of the environment is virtually impossible to achieve in other parts of the world. Heilbroner is the first to articulate **authoritarian environmentalism** in 1974 as a result of "an absence of inhibitions with respect to the exercise of power" and limits on the freedom of speech.⁷ The state holds near absolute power in terms of budget allocation and party cadres` personnel management. Under authoritarian environmentalism, the goal of environmental policy is to maintain state legitimacy and consolidate state power through selective modernization discourses and advanced technologies.

04 METHODOLOGY

Habitat to Territory

The fact that Three Rivers Origin is so primitive and yet so advanced lies in the division between nature and human, implying the regional shift from habitat to territory. It needs us to re-evaluate the concept of what it means to be a territorial land. The concept of **territory** coined by Raffestin defined as geographical system to link individual with others by means of mediators (instruments, techniques, representations etc). Viewing from the perspective of urbanist, a creative nature-based framework need to be introduced to make it feasible in the grand narrative of the Chinese Territory but also into vernacular habitable land.

A return

The notion of “critical zone” proposed by Bruno Latour is a call for reimagination for the world we live in. Instead of a two-dimensional map-like area, the ‘critical zone’ is characterised above all by its thickness. The critical zone engages all inhabitants in the same narrative of interconnected entities in which the human multiform actions are everywhere intertwine extending from the seabed to the stratosphere. The notion of zone was to entail an attention that all species are one community, to know what is happening and the necessity to be cautious, in this small symbiotic space that one careless mistake could throw the balance of nature out of whack here.

Citations

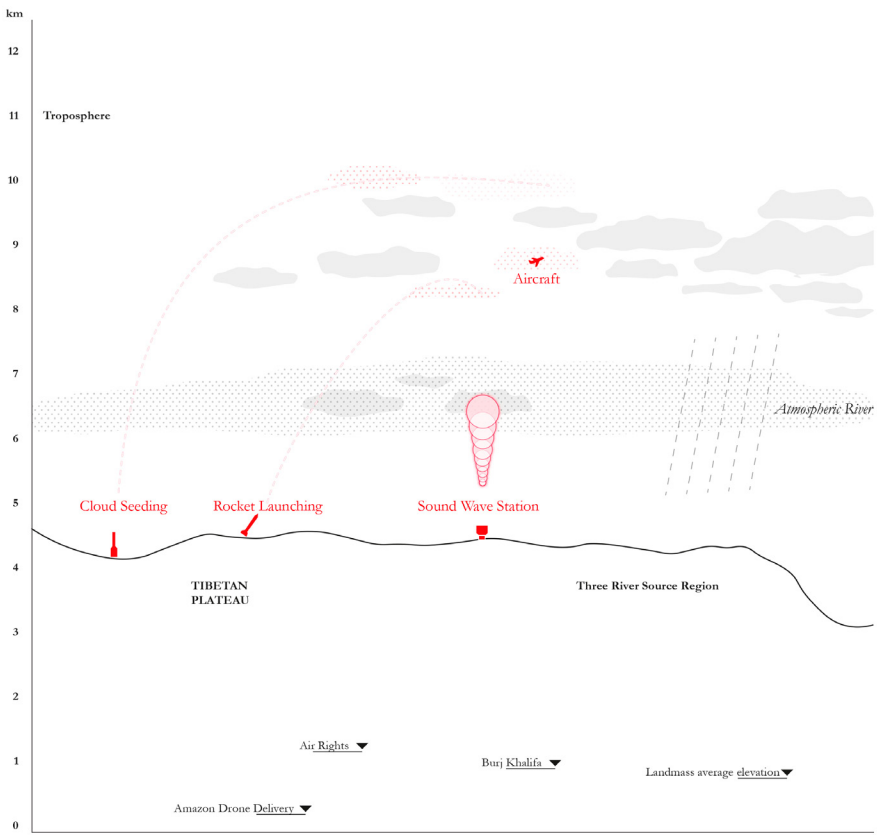
¹ Raffestin, C. (1980), Pour une géographie du pouvoir, Paris.
² Easterling, K. (2016). Extrastatecraft: The Power of Infrastructure Space. Verso.
³ Hallett, P. (2020). From the Critical Zone to decision support tools for China's agriculture. <https://doi.org/10.5194/egusphere-egu2020-21791>



Fig. The cattle sky contrasts sharply with the mangled inside and the apparently unsuitable telecom poles (cr. Francisca Mejia)

The development of human society has always been in resistance to the earth’s matters, such as marble digging and woodworking, and the desire for consumerism has fundamentally driven human’s contend against matter. Agency has always been seen as the privilege of human consciousness and being different from nonhumans. In fact, as early as in the last century, philosopher Serres has proposed a **natural contract** (Le Contrat Naturel,1990) to be negotiated between natural matters and its inhabitants which offers new socio-political perspective to shift from the ecological paradigm of “saving nature” from subject’s perspective to “symbiosize” with nature.

Cloud seeding stoves, mobile rocket launchers, satellites, these fictional instruments that claim the map are but part of the national infrastructure. Keller Esaterling desicribed in her book **Extrastatecraft: Infrastructure Space** how the entanglemnts of infrastruc-ture, politics and space comes into being. It’s a double-edged sword. On the one hand, they give indigenous communities more convenient life choices, while on the other hand, they give importance and greater access to later scrutiny and infiltration.In the design part, it’s crucial to design vernacular infrastructure that being interior for locals.



History has shown time and again that reconciliation between the two cultures can only be achieved by following the central theme of Chinese, Mongolian and Tibetan culture: living in harmony with nature. In the **Tao Te Ching** (c. 2500 BC), Lao Tzu wrote down for future generations the way to live in harmony with nature: “Tao Fa Nature”. “Nature” refers to the autonomous, self-contained state of things. “The Tao creates and nurtures all things, but the Tao does not dictate to all things, but follows and conforms to the “nature” of all things. This reveals the character of the entire universe and encompasses the fundamental properties of all things in heaven and earth, that is, everything in the universe follows or follows the laws of ‘nature’.

The westerner dominated knowledge system diminish other information created by indigenous ways of knowing. But the Indigenous ways of thinking usually. The depth of their knowledge rooted in the long inhabitation of a particular place offers lessons that can benefit us as we strive to co-exist with every creature of this planet in a sustainable way.

Citations

¹ Tzu, L. (1996). Tao Te Ching (A. Waley, Trans.). Wordsworth Editions.
² Absolon, K. (2019). Indigenous Wholistic Theory: A Knowledge Set for Practice. First Peoples Child & Family Review, 14(1), 22-42. Retrieved from <https://fpcfr.com/index.php/FPCFR/article/view/370>



Fig. Tao Te Ching,



04 METHODOLOGY

.4 METHODS

Method description

Literature review

- 1. Regarding scientific backgrounds of the alpine ecosystem and the natural hydrological feature. Analysing ecological conditions corresponding to the atmospheric river towards nested atmosphere-earth loop.
- 2. Anthropological essays on nomads and steppe social systems. There is scientific research on the interdependence between the Tibetan population and the grassland system in Tibet.
- 3. Policy documents related to the authorization of water rights and how it get extend to the weather legalization for regulating rainfall in national level.
- 4. Lines of Inquiry, critical mapping:
Develop a new cartography analysis of mapping air to reveal and be critical about its legible geographical meaning. To analysis the past, present and future of Tibetan ecosystem with its people under the impact of climate change. The impact of atmospheric phenomena on human settlements and relationships will provide a neces-sary social dimension to my research.
- 5. Documentary, interview, local articles about the living conditions in site. To get an comprehensive and deep understading for the Tibetan people and how they are relate with their habitat.
- 6. Data collection
Visulizations of data helps to analysis the natural capital`s relationships with each other and their influence under the exceeding precipitation. It also helps to predict the future trends under the weathering technology.
- 7. Case studies
Selection of specific sites that can showcase the current risks and potential under future hydrological distribution and would potentially be suitable for interventions.

Outcomes

Design the region in notion of a return for the future.

- 1. Overall scientific and descriptive analysis of Sky River project
- 2. A summary of the past development of natural resources in Tibet
- 3. Overall view/documentation of the actual state of the area (Atlas of accumulation)
- 4. Predictions of the artificial rainfall project do to the alpine ecosystem
- 5. Vision and design for the area(re-identify, return, revive)
- 6. Interventions of seasonal changes, altitude changes and scale changes
- 7. Documentary of local people`s attitudes and thinking

CONTEXT

Long-established ruling of water

Yellow River Scarcity

PROBLEM

Sky River Project
Geo-engineering extension to atmosphere

National Park and before
Exclusion of indigenous people and grazing

External imposition

Deny nature's agency and its reaction by imposing manipulated hydrological process

Internal separation

Separate indigenous contribution from wellness of ecosystem and their inter-dependence

PROPOSITION
deterritorialization

disagree, but the project will proceed, thus needs to foresee the risks

disagree, but an opportunity towards a new national park paradigm

Autonomous nature-nomads system

Dynamically maintain its unity in the presence of diverse external forces and actively sustain its vibrancy facing future risks with resilience, collaboration and adaptation values.

RESEARCH QUESTION

How to envision a dynamic territorial park capable of ecologically and socially nourishing the Yellow River Source basin responding to future accelerated hydrological cycle as a resilient, collaborated and adapted alpine ecosystem?

LINES OF INQUIRY
reterritorialization

What are the risks region is facing?

What's the nature-people system existed?

for resilience to future risks

towards a future national park paradigm

PROPOSAL

How to care for the land?

Grazing as landscape tool to restore territory

Design for who to care?

Watersheds as basic unit to regain land ownership

Change Landform

Enhance Local Bondings

enhanced by natural attributes

Deny nature's agency and its reaction by imposing manipulated hydrological process

scarce the land

note the presence of human influences, which have been hidden

CONCLUSION

New national park paradigm

Lines of Inquiry



Lines of Inquiry

lines of inquiry - domains - Micro scale

Matter

Hydrological cycle-2 scales

- Seasonal peaks, extreme precipitation-soil erosion
evaporation→transpiration

Topos

Wetland ecosystem

- Wetland degradation on different altitudes
more precipitation→flood dwelling flooding

Habitat

Grassland ecosystem

- Release CO2 & Nitrogen, transhuman
permafrost in different seasons→soil change

Geo-politics

Governance of Yellow river -2 scales

- Central governance , use of land
(city, agriculture, economy)

Three phases

- Composition
The current situation/problem
- Alteration
Human activity influence
- Limit
More rainfall

From an initial reading of the territorial compositions, alterations, and limits through four lines of inquiry (matter, topos, habitat, geopolitics), the projects unveil neglected worlds, things, systems, processes, and sacrificed zones.

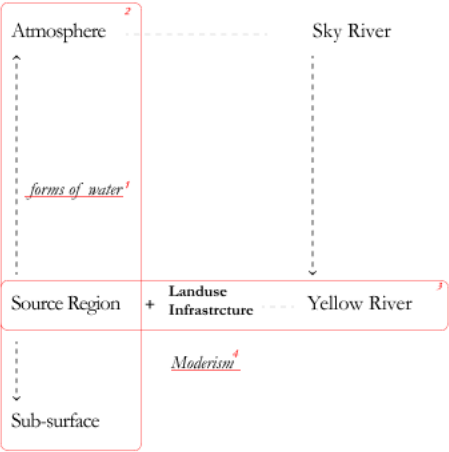
05.



05 LINES OF INQUIRY

lines of inquiry - domains - Micro scale

Grassland Ecosystem	Grazing land	Revoke Tibetan nomads grazing <i>The behavior of nomadic herding has changed to captive herding</i>
	Infrastructure	Construction <i>Flooding lands, burden of water system, reduce biodiversity</i>
	Vegetation	Earlier and shorter growing season <i>Flooding lands, burden of water system, reduce biodiversity</i>
	Glacier	Retreating <i>supply the river flow, but will stop in 30 years</i>
Wetland ecosystem	Permafrost	Thawing <i>mostly discharge in spring and winter with meltwater</i>
	Soil	Release CO2 and Nitrogen <i>More wetland, less marshland;</i>



05 LINES OF INQUIRY

MATTER

As human civilization developed, people have far extended upwards into space and downwards into the ground for resources, restricting habitat into buildings, skyscrapers, and a room with closed windows isolated from the outside temperature, and distinguished from other creatures. Humans attribute the progress of modern civilization to the severance between nature and culture, mirroring the human dream of relentlessness and reproducing spatial configurations and social regulations with artificial automated landscapes. Geoengineering, the alchemy of today, reproduce the absolute authority of human agency by treating nonhumans as objects to be normalized and processed in bulk.

Tibet is warming 3 time faster than the rest of the world. The “greenhouse effect” leads to a rising in temperature and precipitation. In some places, the amount of evaporation is even more than ten times that of precipitation, which directly causes streams to stop flowing, lakes to dry up, and groundwater levels to drop.

Much of the Tibetan Plateau – an area the size of Western Europe – is a permafrost zone, but the permafrost itself is now melting fast, which not only releases methane into the atmosphere but also drains away frozen soil water into the deeper earth. Permafrost melt greatly affects the many wetlands of Tibet, drying them out in spring before the summer rains arrive, in the process compromising habitat for migratory species.

The exceeding rainfall would cause waterlogged stress, which may submerge partially or completely the plants. It forms a barrier that restricts the oxygen that decrease metabolism such as photosynthesis and respiration (Banach et al., 2009). It will also cause the solid ice in soil to melt that degrade permafrost. The plants cannot sustain the salinization of the soil, causing more evaporation of bare soil into the air.

05 LINES OF INQUIRY

MATTER

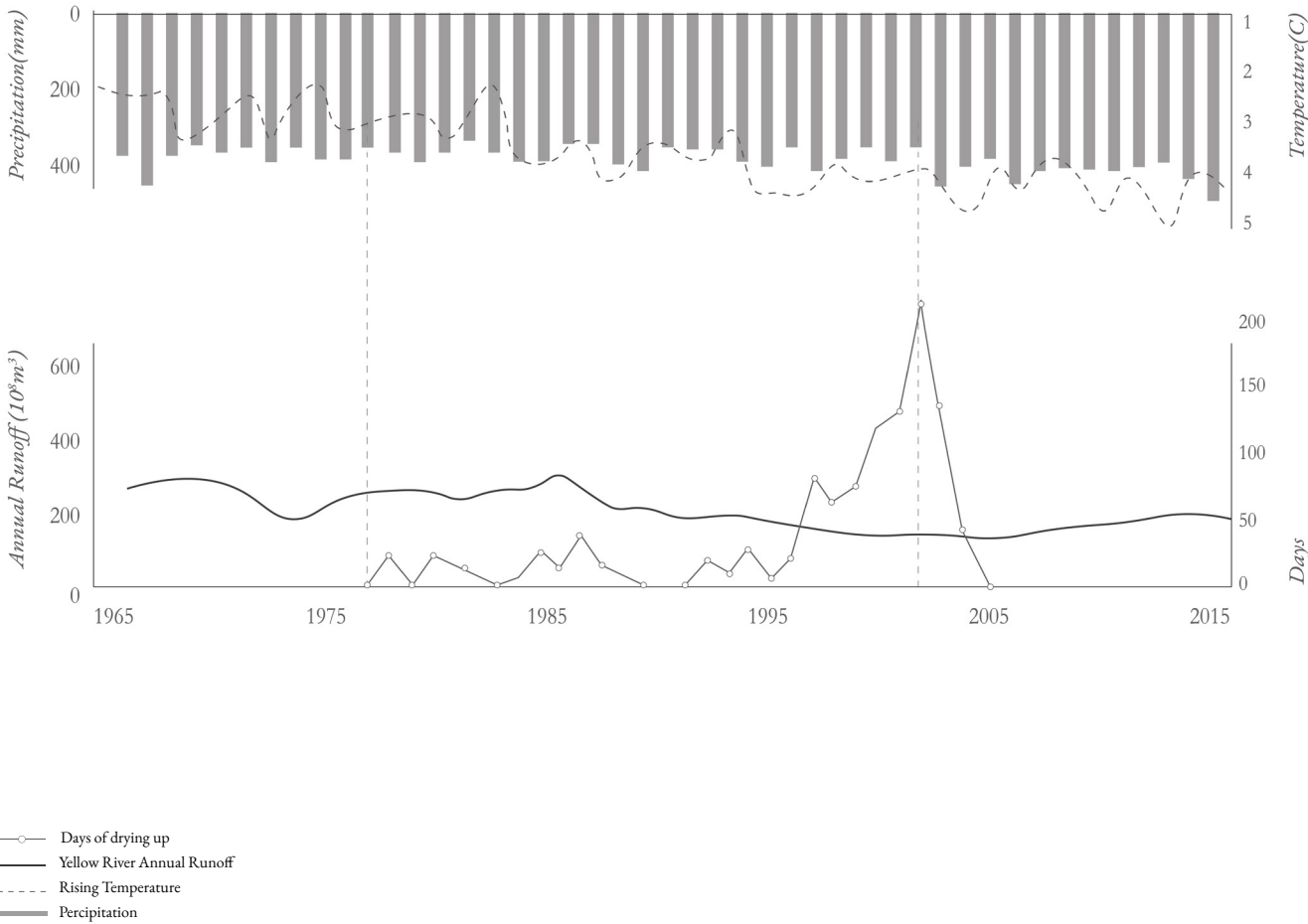
Composition-drying up of Yellow River and abundance of Sky River

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From 1972 to 1996, 19 times of flow interruption were recorded. The runoff measured at Lijin Hydrology Station, the lowest reaches of the Yellow River, was less than 1m³/S. What is this concept? That is to say, when the Yellow River is out of flow, it can fill less than 53 water dispenser buckets per second.

It can be seen how depleted the water source is in the lower reaches of the Yellow River during the cut-off period. The situation is very severe for such a large volume of the Yellow River. The most serious cut-off reaches as far as Kaifeng City, Henan Province, which is 683Km long, and accounts for more than 80% of the length of the lower reaches of the Yellow River (below Huayuan Estuary, Zhengzhou City).

While at the same time, the rising temperature is causing more moisture in the air, generating more and are responsible for 90 percent of the movement of moisture from the tropics toward the poles. The abundance of sky river has a bigger possibility to cause severe and extreme weather condition.



05 LINES OF INQUIRY

MATTER

Alteration- exceeding rainfall degrade permafrost

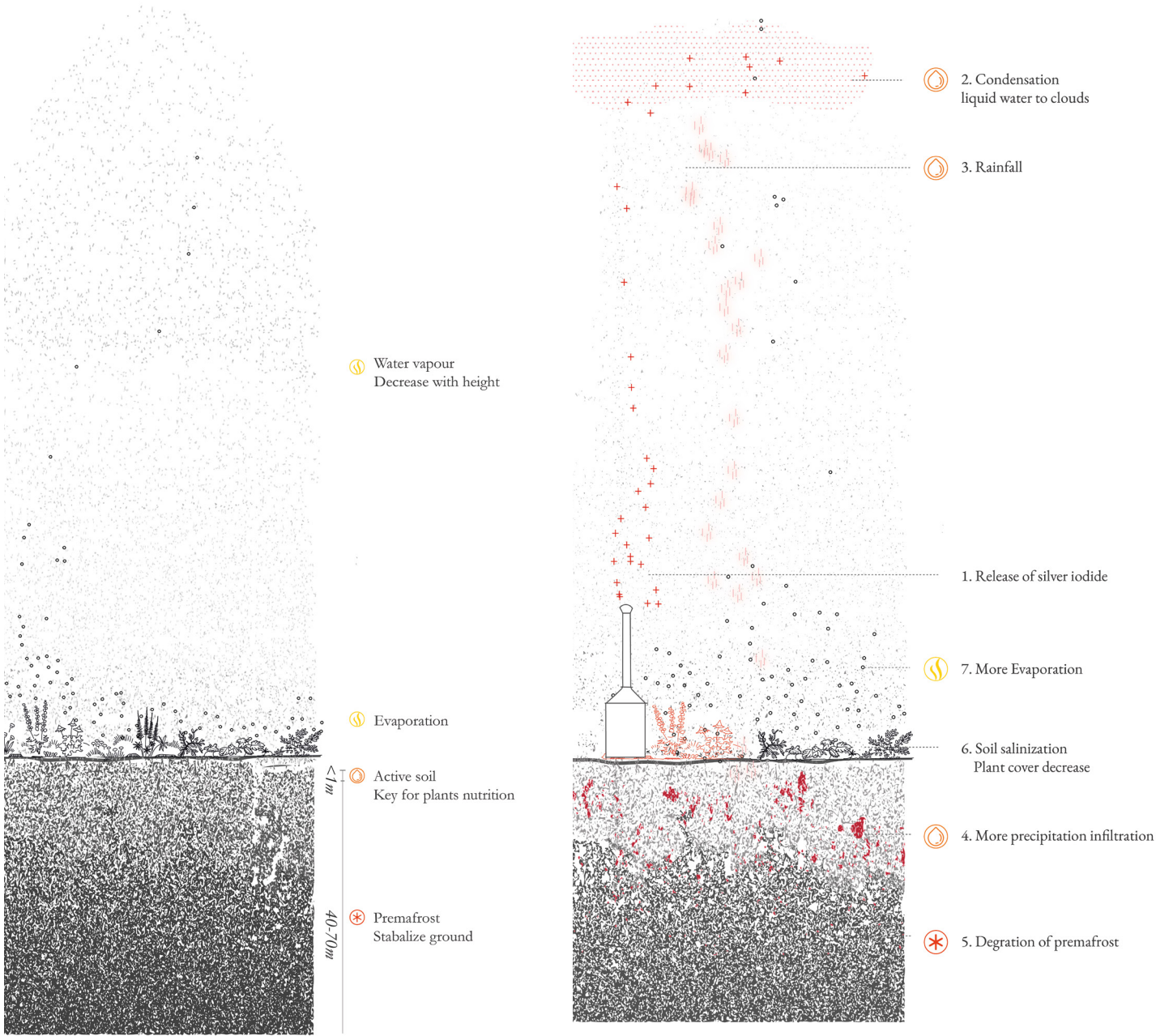
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Citations

¹ Chu, Xiaojing, et al. "Dual effect of precipitation redistribution on net ecosystem CO2 exchange of a coastal wetland in the Yellow River Delta." *Agricultural and Forest Meteorology* 249 (2018): 286-296.

² Banach, Katarzyna, et al. "Differences in flooding tolerance between species from two wetland habitats with contrasting hydrology: implications for vegetation development in future floodwater retention areas." *Annals of botany* 103.2 (2009): 341-351.



05 LINES OF INQUIRY

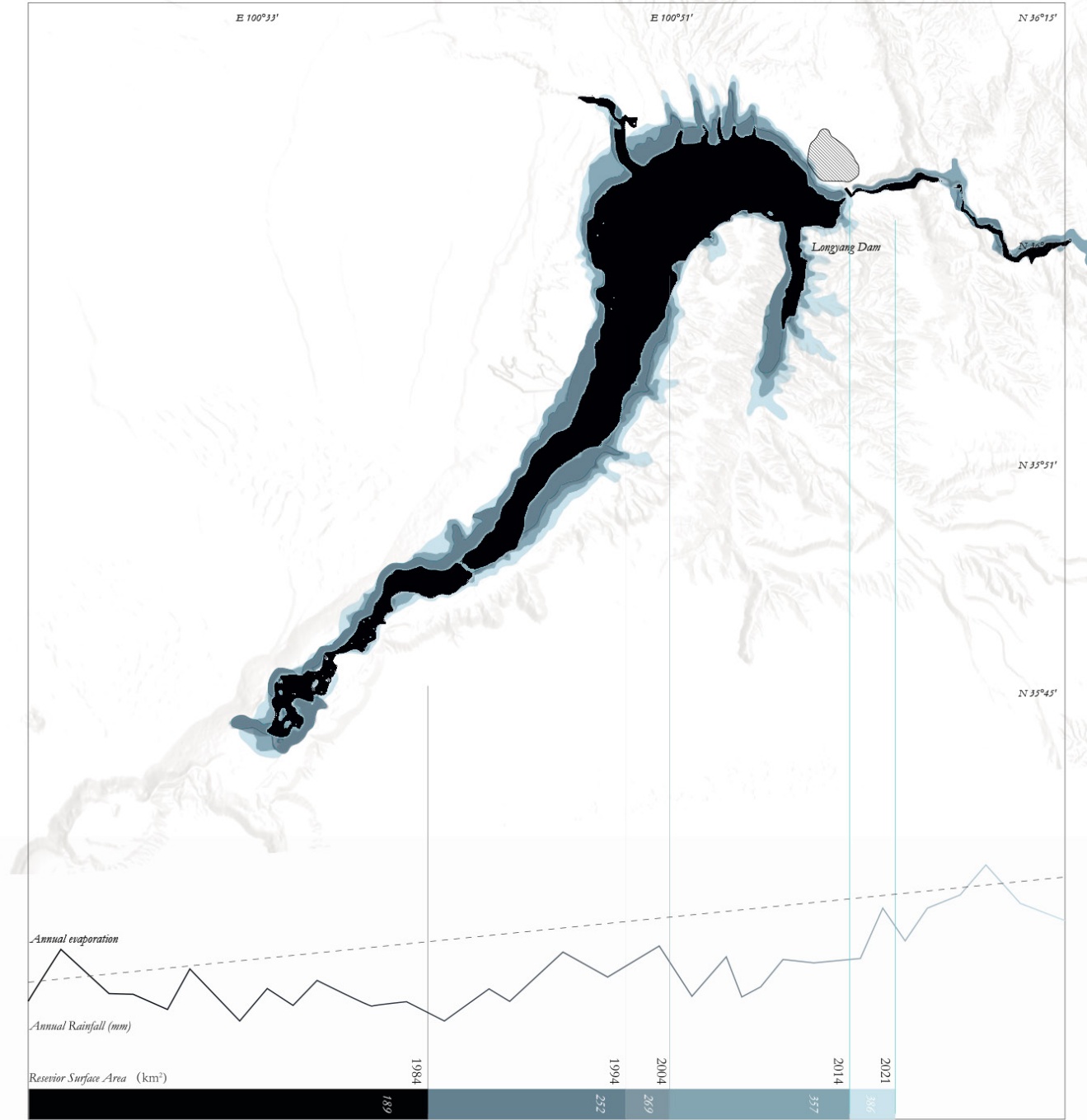
MATTER

Limit- overflow risks

Yellow river flow mainly comes from the melt-snow of glacier and groundwater. It is estimated that in an average year, 63% of runoff in the source region of the Yellow River comes from precipitation, 26% from groundwater, and 9% from meltwater (Lan et al. 2010a, b; Liu et al., 2009). Changes in discharge reflect the combined effects of changes in precipitation and evaporation, while the contribution of meltwater is mainly caused by seasonal snowpack trends and climate change.

The map is based on the water capacity every year of a large reservoir. The increasing rainfall has already largely make the water overflow and impact the village living aside it.

Fig. 5-1 Shot from China Global Television Network Documentary series, Journeys in Nature: Sanjiangyuan series. (n.d.).



05 LINES OF INQUIRY

TOPOS

The Upper Yellow River is situated along the edges and atop the Qinghai-Tibet Plateau, the world's highest plateau, with an average elevation of 4,000 meters above sea level and spanning approximately 2.6 million square kilometers. This region contributes around 56% of the total runoff but only 10% of the sediment load for the entire river basin. Rivers within the Upper Yellow River Basin serve as significant global examples of how rivers react to tectonic uplift and incision prompted by the Tibetan Plateau.

This session presents a "journey through the Upper Yellow River," offering insights into the diverse river types and evaluating the factors that influence these patterns. The topography of the Upper Yellow River Basin is characterized by the gentle relief of the plateau, which consists of three primary elements— the geologically determined flatlands in the headwater regions, the extensive basin fills found within the Zoige wetlands and the steep drops in valleys.

Environmental suffering (i.e. desertification, grassland degradation and run-off reduction) is leading to the ecological degradation of the region, severely affecting local herdsman and the surrounding communities (e.g. Sichuan Basin and the Upper Yellow River).

Ruoergai Swamp (Zoige) at the eastern margin of the Qinghai-Tibet Plateau in the Yellow River Source Zone is the world's largest plateau peat wetland. It has shrunk greatly since the 1950s. Hundreds of kilometers of ditches were dug in Ruergai, Hongyuan, and Maqu counties to quickly drain wetlands and expand the pastureland available for grazing. In total, 50.5 kilometers of ditches have been dug, converting an additional 0.22 square kilometers of peatland to grassland and resulting in the drainage of approximately 2,000 square kilometers of peatlands, or over 43% of the total peatland area.

Degradation of alpine meadows in the headwater region of the Yellow River has been reported since the early 1980. The various views on degradation ranging from land sliding, climate change to overgrazing.

05 LINES OF INQUIRY

TOPOS

Composition-artifical ditches speeding up draining

This session offers insights into the diverse river types and evaluating the factors that influence these patterns. The topography of the Upper Yellow River Basin is characterized by the gentle relief of the plateau, which consists of three primary elements— the geologically determined flatlands in the headwater regions, the extensive basin fills found within the Zoige wetlands and the steep drops in valleys.

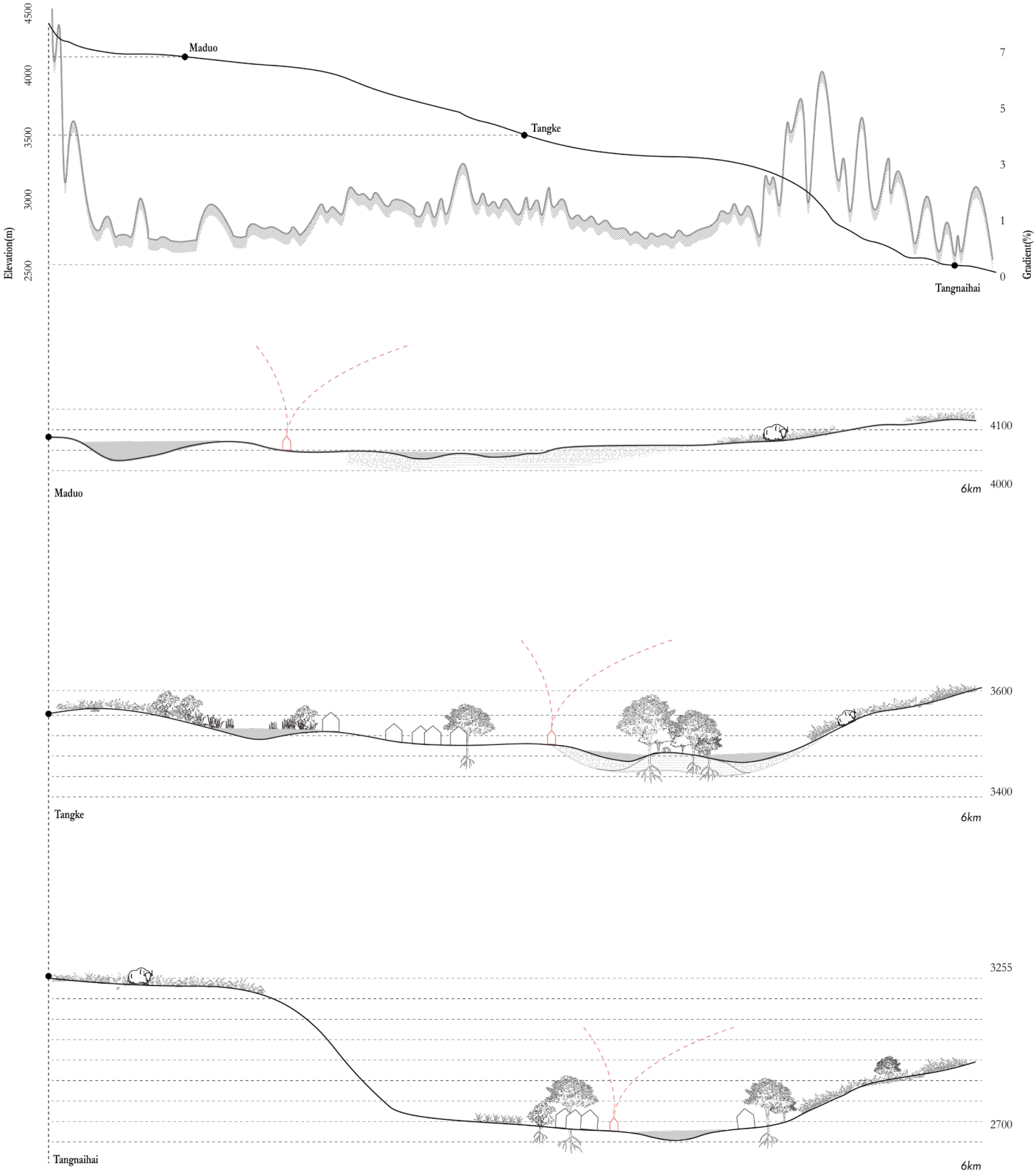
Citations

¹ Chu, Xiaojing, et al. "Dual effect of precipitation redistribution on net ecosystem CO2 exchange of a coastal wetland in the Yellow River Delta." *Agricultural and Forest Meteorology* 249 (2018): 286-296.

² Banach, Katarzyna, et al. "Differences in flooding tolerance between species from two wetland habitats with contrasting hydrology: implications for vegetation development in future floodwater retention areas." *Annals of botany* 103.2 (2009): 341-351.

³ Chu, Xiaojing, et al. "Dual effect of precipitation redistribution on net ecosystem CO2 exchange of a coastal wetland in the Yellow River Delta." *Agricultural and Forest Meteorology* 249 (2018): 286-296.

Fig. 5-2 Shot from China Global Television Network Documentary series, Journeys in Nature: Sanjiangyuan series. (n.d.).



05 LINES OF INQUIRY

TOPOS

Alteration-artifical ditches speeding up draining

Ruoergai Swamp (Zoige) at the eastern margin of the Qinghai–Tibet Plateau in the Yellow River Source Zone is the world’s largest plateau peat wetland. A case study of this swamp shows that it has shrunk greatly since the 1950s. Environmental suffering (i.e. desertification, grassland degradation and run-off reduction) is leading to the ecological degradation of the Ruoergai peatlands, severely affecting local herdsmen and the surrounding communities (e.g. Sichuan Basin and the Upper Yellow River).

In 1966, Zoige County had a large number of marsh wetlands. However, most of these wetlands disappeared by 2000, particularly in the northeast part of the county.(2013, Bai)

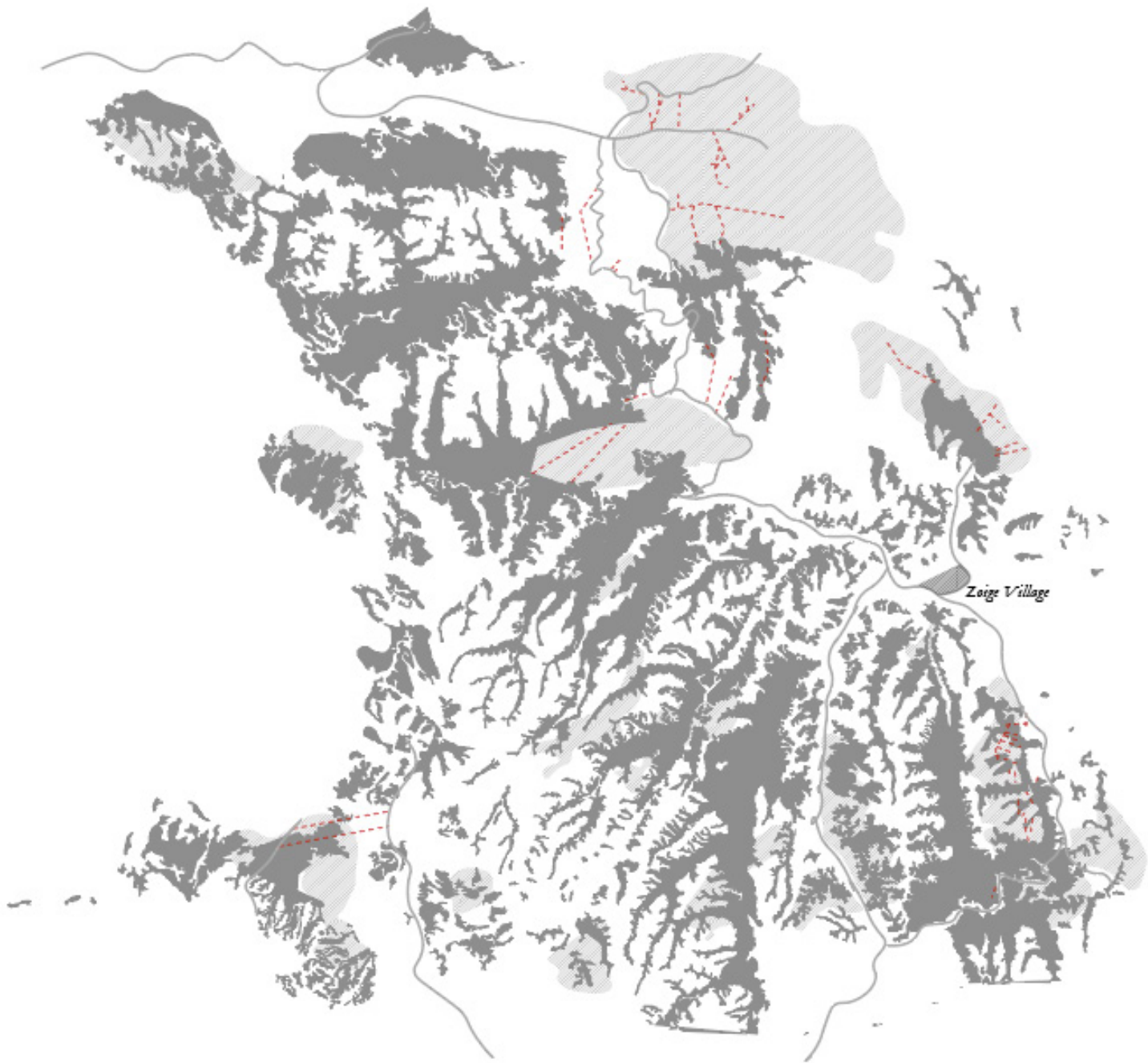
In the 1960s-1990s, hundreds of kilometers of ditches were dug in Ruoergai, Hongyuan, and Maqu counties to quickly drain wetlands and expand the pastureland available for grazing. In total, 50.5 kilometers of ditches have been dug, converting an additional 0.22 square kilometers of peatland to grassland and resulting in the drainage of approximately 2,000 square kilometers of peatlands, or over 43% of the total peatland area.(2016, Gao)

Citations

¹ Bai, Junhong, et al. "Effects of alpine wetland landscapes on regional climate on the Zoige Plateau of China." *Advances in Meteorology* 2013 (2013).

² Gao, Jay. (2016). "Wetland and Its Degradation in the Yellow River Source Zone." 10.1007/978-3-319-30475-5_10.

³ Bai, Junhong, et al. "Effects of alpine wetland landscapes on regional climate on the Zoige Plateau of China." *Advances in Meteorology* 2013 (2013).



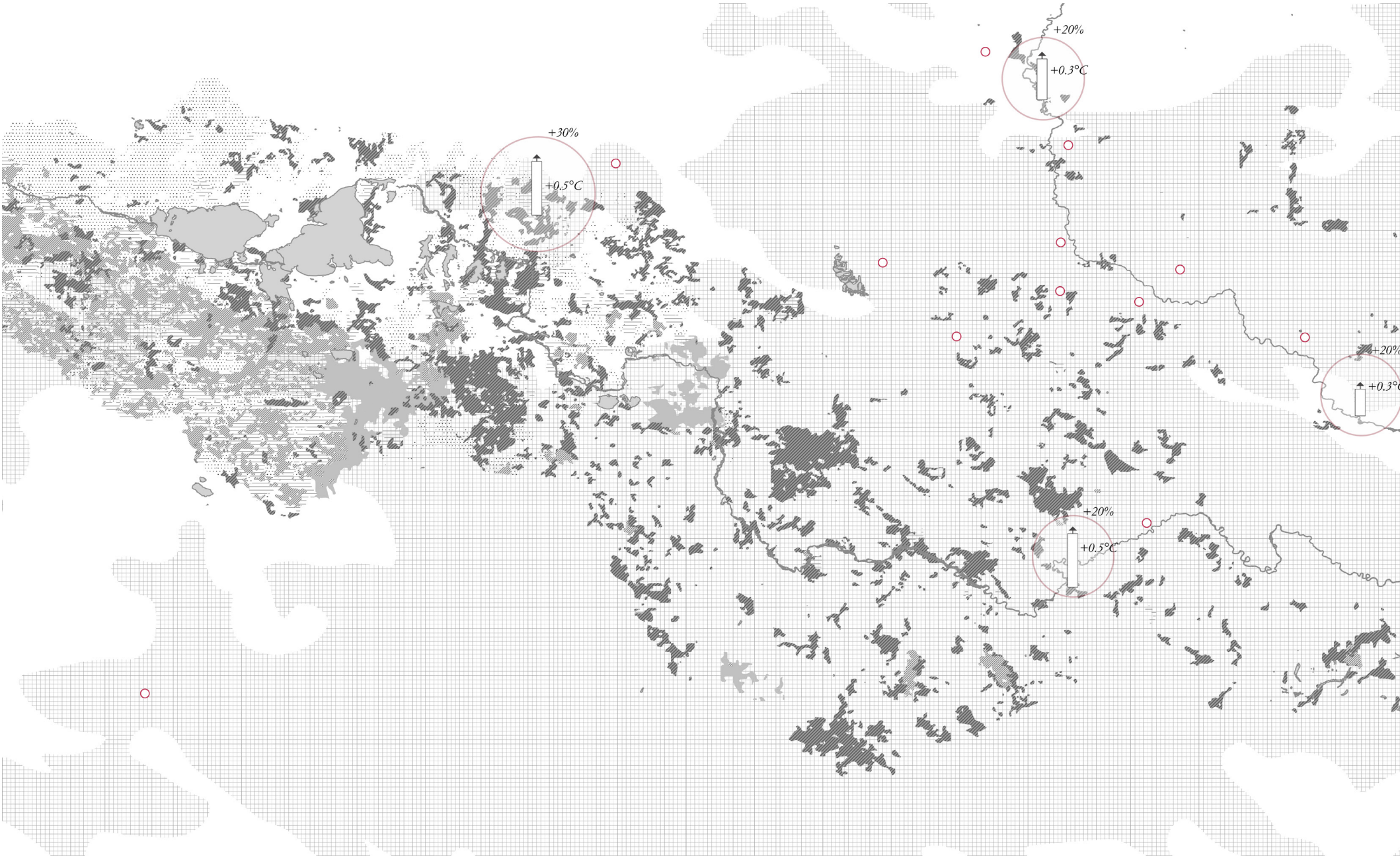
■ Degraded grassland
■ Wetlands
— Artificial Ditches
— River

05 LINES OF INQUIRY

TOPOS

Limit

Degradation of alpine meadows in the headwater region of the Yellow River has been reported since the early 1980. The various views on degradation raging from land sliding, climate change to overgrazing.



- Severe Landscape fragmentation
- Normal Landscape fragmentation
- Desertification
- Low landscape coverage
- Cloud seeding stoves
- Temperature rising in past 20 years

05 LINES OF INQUIRY

HABITAT

This session presents the ecogenesis of cultural habitats and ecosystems in the study of Tibetan pastoral cultures. Chinese culture evolved from animist views of the world, which hold that everything is an integral part of open living systems sustained by living water. Tibet Plateau has the largest pastoral land in the world with 300 million hectares in total, comprised mostly of alpine meadow (44.6 %) and Alpine-steppe (28.8 %). Grazing livestock combined with growing barley are the economic base of Tibetan farming systems.

The efficiency-dominant modernism from the western world disrupts and revises the ancient Chinese view and grazing activities are thus, associated with land degradation and soil erosion. Dari County, located in the upper reaches of the Yellow River Source, is one of the counties with the most serious grassland degradation in the Three-river source region. The quality of the alpine meadow has been declining continuously from the mid-1970s to 2000, and the total area of degraded grassland is about 429,000m², accounting for 29.39% of total area.

But is grazing the only, or even the main factor that leads to environmental degradation? The traditional grazing pastoral activities are only conducted with the natural rhythm. Natural resources at different altitudinal belts are grazed according to its condition-whether it's healthy enough to hold the seasonal activity.

And this natural rhythm which has been followed for hundreds of years, has been interrupted and artificially affected with the delay or advance of seasons. Biomass production increased in spring due to a warming-induced earlier onset of plant growth, but decreased in autumn due mainly to increased water stress. Plants grew faster but the fast-growing period shortened during the mid-growing season.

It directly leads to reduction in the number of pastures in use and 10 villages (83.3% of the total) experienced a decrease in the number of stops made during the annual migration. The average number of pastures used in rotation in the villages investigated decreased from 6.2 to only 3.9, and the average number of stops made during annual migration decreased from 8.3 to 5.8.

The reduction of pasture has led to an increase in grazing pressure. Many herders had to graze in pastures that could not support more animals. This has great relevance for South Asia, and not just in the Himalayan areas. Countries around the globe either criminalised mobile indigenous grazing communities, or forced them into sedentary lifestyles. Regimes continued many such policies, to the detriment of both the environment and indigenous groups.

05 LINES OF INQUIRY

HABITAT

Composition : transhumance on grasslands

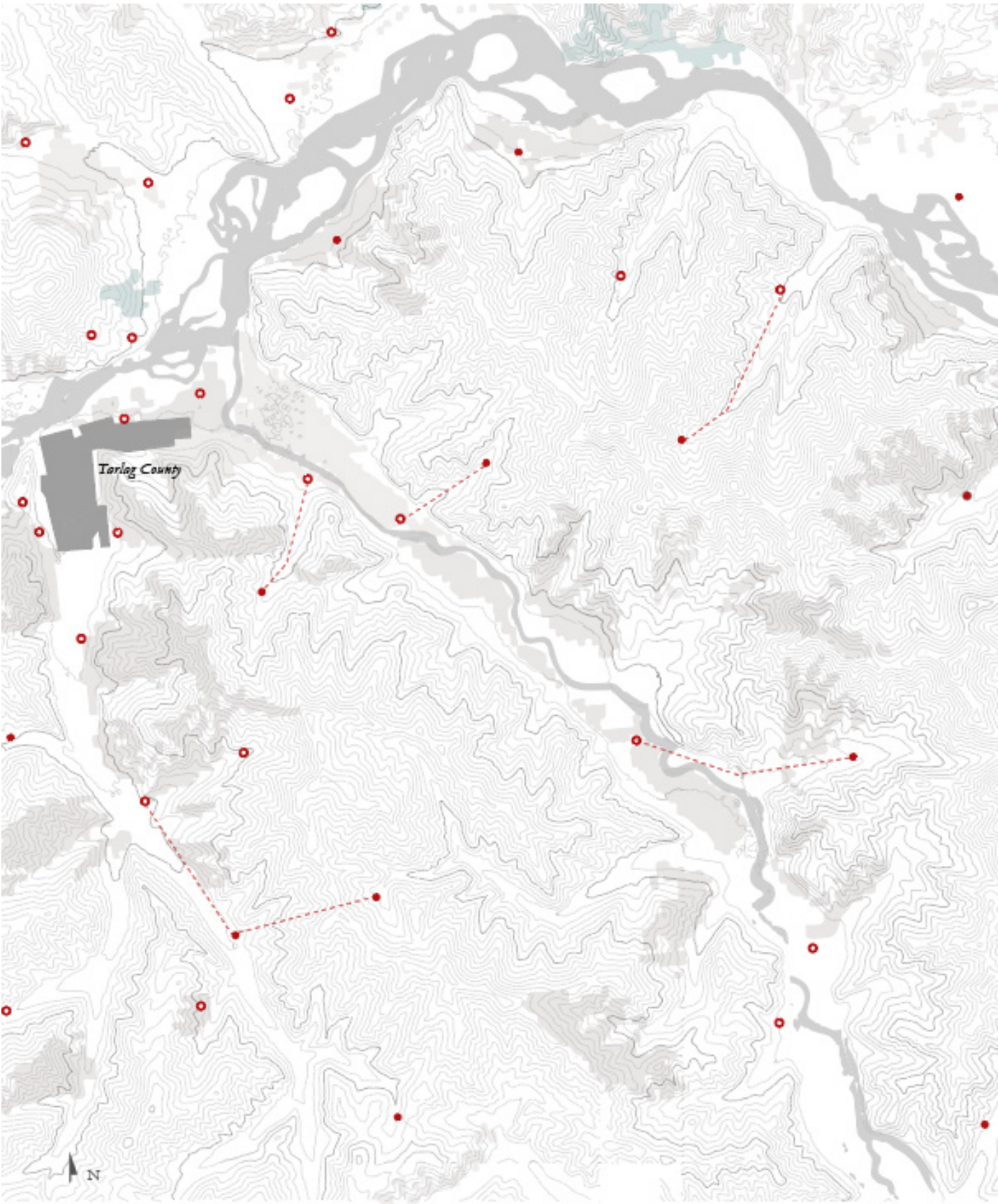
Tibet Plateau has the largest pastoral land in the world with 300 million hectares in total, comprised mostly of alpine meadow (44.6 %) and Alpine-steppe (28.8 %). 1 Dari County, located in the upper reaches of the Yellow River Source, is one of the counties with the most serious grassland degradation in the Three-river source region. The quality of the alpine meadow has been declining continuously from the mid-1970s to 2000, and the total area of degraded grassland is about 429,000m2, accounting for 29.39% of total area.

Dari County herdsmen generally graze in valley, where the degradation is more serious. The degradation mostly occurred in the sunny slope and gentle slope of the mountain at lower elevation. Since the mid and late 1970s, the area of alpine shrub, marshy meadow and alpine sparse vegetation has been declining.



Citations

Data for image:
¹ Xu Xinliang, Liu Jiyuan, Shao Quanqin. Spatial distribution data set of grassland degradation in the headwaters of three Rivers in Qinghai Province. Resources and environment science data registration and publication system (<http://www.resdc.cn/DOI/>), 2018. The DOI: 10.12078/2018062101
² National, B. (2013). The resident site distribution data of the Heihe River Basin. National Tibetan Plateau/Third Pole Environment Data Center.



- Grazing point
- Individual settlement
- Grassland degradation
- Grassland segementation
- - - Grazing route

05 LINES OF INQUIRY

HABITAT

Alteration: transhumance with natural rhythm

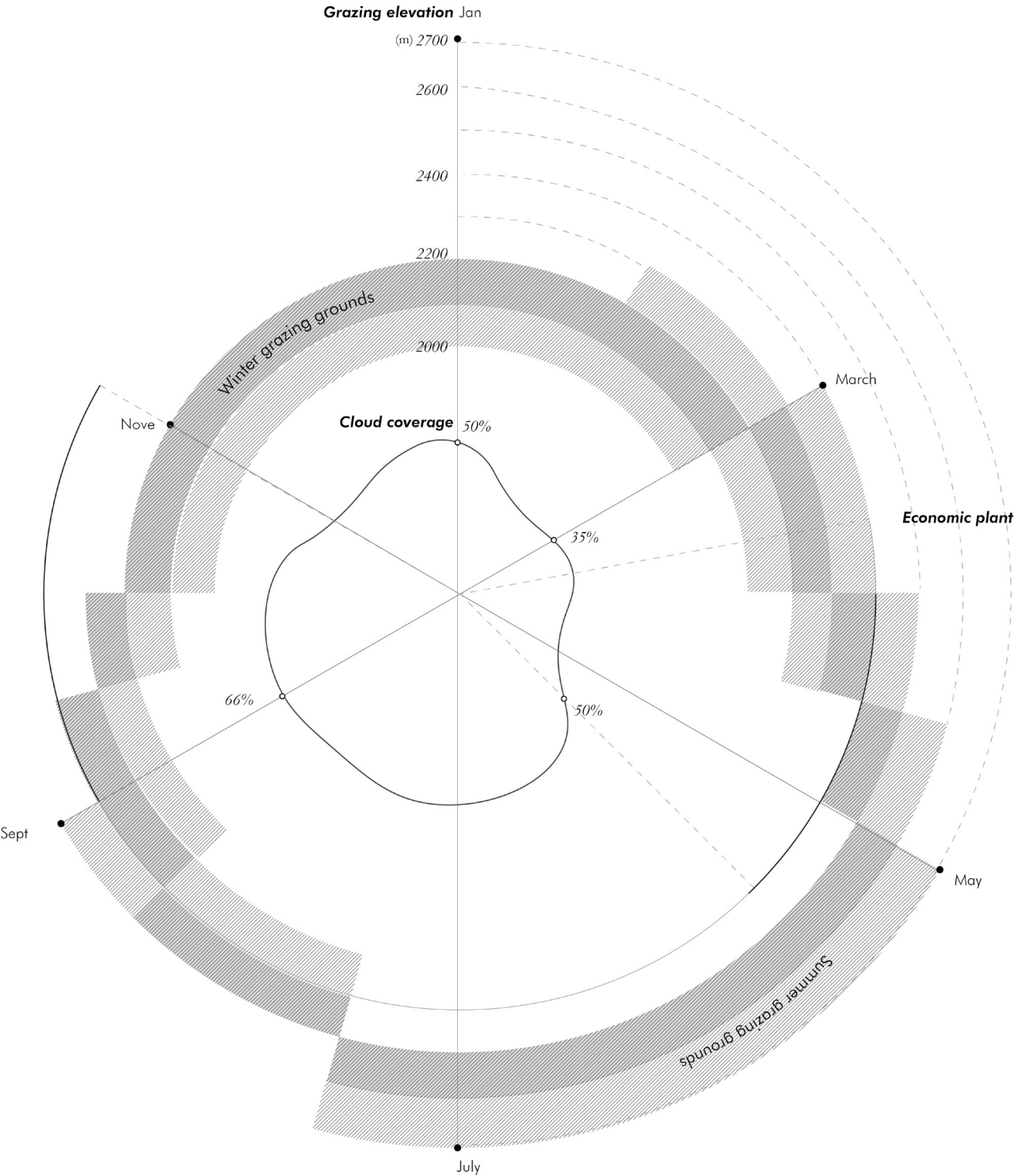
Seasonal migration to make use of natural resources at different altitudinal belts is a basic feature of Tibetan-style transhumance.

In this production system, resources in alpine areas are often underused, while low-elevation resources are seriously overused. Carrying capacity calculated according to resources available at different elevations is often misleading. Instead, low-elevation shrubs and the capacity to provide supplements in wintertime are the bottleneck in successful livestock production.

In the Sanjiangyuan region, the first day of snow cover is gradually delayed(3.5 days every 10 years), while the last day of snow cover is gradually advanced (12 days every 10 yers).

Citations

¹ Spatiotemporal dynamic characteristics of snow cover from 1980 to 2019 in the Three-River-Source region and its response to climate change
CHEN Longfei,1,2, ZHANG Wanchang,1, GAO Huiran1,2



05 LINES OF INQUIRY

HABITAT

Limits : decrease in rangelands affected by climate change

Biomass production increased in spring due to a warming-induced earlier onset of plant growth, but decreased in autumn due mainly to increased water stress. Plants grew faster but the fast-growing period shortened during the mid-growing season.

Degradation of grassland were results of early onset of summer and rapid melting of snow, early greening, early flowering/maturing of vegetation and the appearance of new plant species in the rangelands.

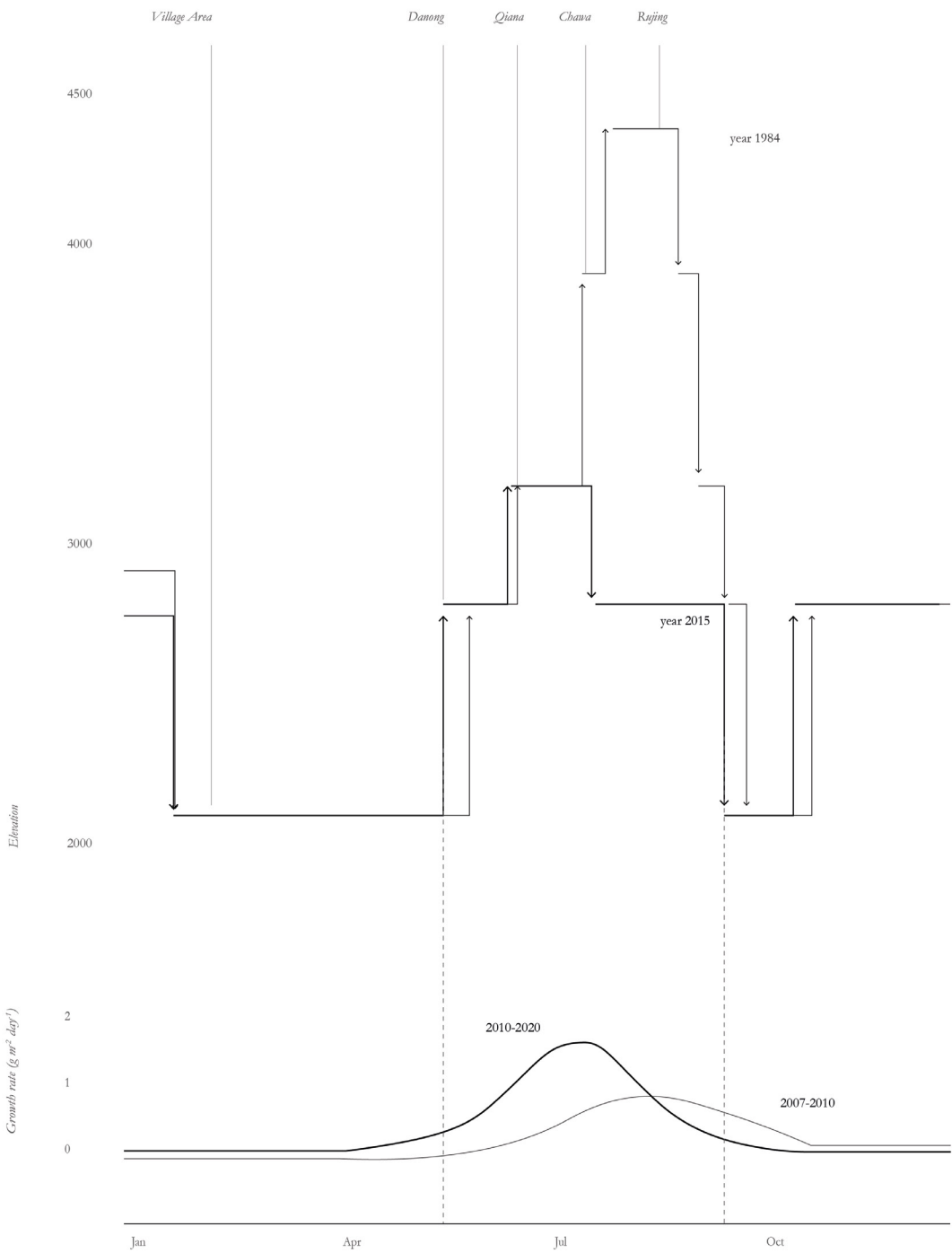
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Citations

¹ Abbott, B.W., Bishop, K., Zarnetske, J.P. et al. Human domination of the global water cycle absent from depictions and perceptions.

image reference:
¹Wang H, Liu H, Cao G, Ma Z, Li Y, Zhang F, Zhao X, Zhao X, Jiang L, Sanders NJ, Classen AT, He JS. Alpine grassland plants grow earlier and faster but biomass remains unchanged over 35 years of climate change. *Ecol Lett*. 2020 Apr;23(4):701-710. doi: 10.1111/ele.13474. Epub 2020 Feb 12. PMID: 32052555; PMCID: PMC7154776.
² Shaoliang, Y., Ning, W., Peng, L., Qian, W., Fusun, S., Geng, S., & Jianzhong, M. (2007). Changes in livestock migration patterns in a Tibetan-style agropastoral system. *Mountain Research and Development*, 27(2), 138-145. <https://doi.org/10.1659/mrd.0832>

Fig. 5-3 Shot from China Global Television Network Documentary series, Journeys in Nature: Sanjiangyuan series. (n.d.).



- Decrease of pastures in use
- Tranhumance grazing route in 2015
- Tranhumance grazing route in 1984
- Growing season of grassland
- Grassland growth rate in 2010-2020
- Grassland growth rate in 2007-2010

05 LINES OF INQUIRY

GEOPOLITICS

China's approach to territorial space planning adheres to the overarching national objectives and the principle of "serving the interests of the majority of people." With this national guidance, each region, city, and province has its own distinct functional role within the country's larger framework. Occupying vast lands and contributing to less than 1% of the Yellow River's population and GDP, Qinghai has long been regarded as an ecologically preserved area.

Chain of national parks will be formally launched in 2020, including Three-River Source National Nature Reserve, in which all human presence, from local people to nomadic pastoralism, is categorized as a threat to be excluded. The region will soon to be 'no man's land'.

From the perspective of the herdsmen communities living in the upper reaches of the Yellow River, the primary purpose of the basin is to graze their ponies, yaks, sheep, goats and cattle. To support their efforts, they invoke the gods with a daunting mix of religious precepts, spiritual practices and cultural forces. This has been going on for thousands of years.

Moving them into cities has ostensibly improved the urbanization rate and modernization level of China, but in fact it has left their cultural customs behind. Many Tibetans are not adapted to the urban life style or even can't speak Chinese. Unable to integrate into urban life, they have formed a great pain in their past and present identities

Yet the impacts on Tibetans themselves, numbering some 6 million people and occupying almost 2 per cent of the planet's land, attract far less attention. Instead the focus is almost entirely geopolitical, on global impacts and global responses: actual Tibetan land managers are absent, even though they make land-use decisions daily in a climate that has always been highly variable, requiring great skill in living with uncertainty.

05 LINES OF INQUIRY

GEOPOLITICS

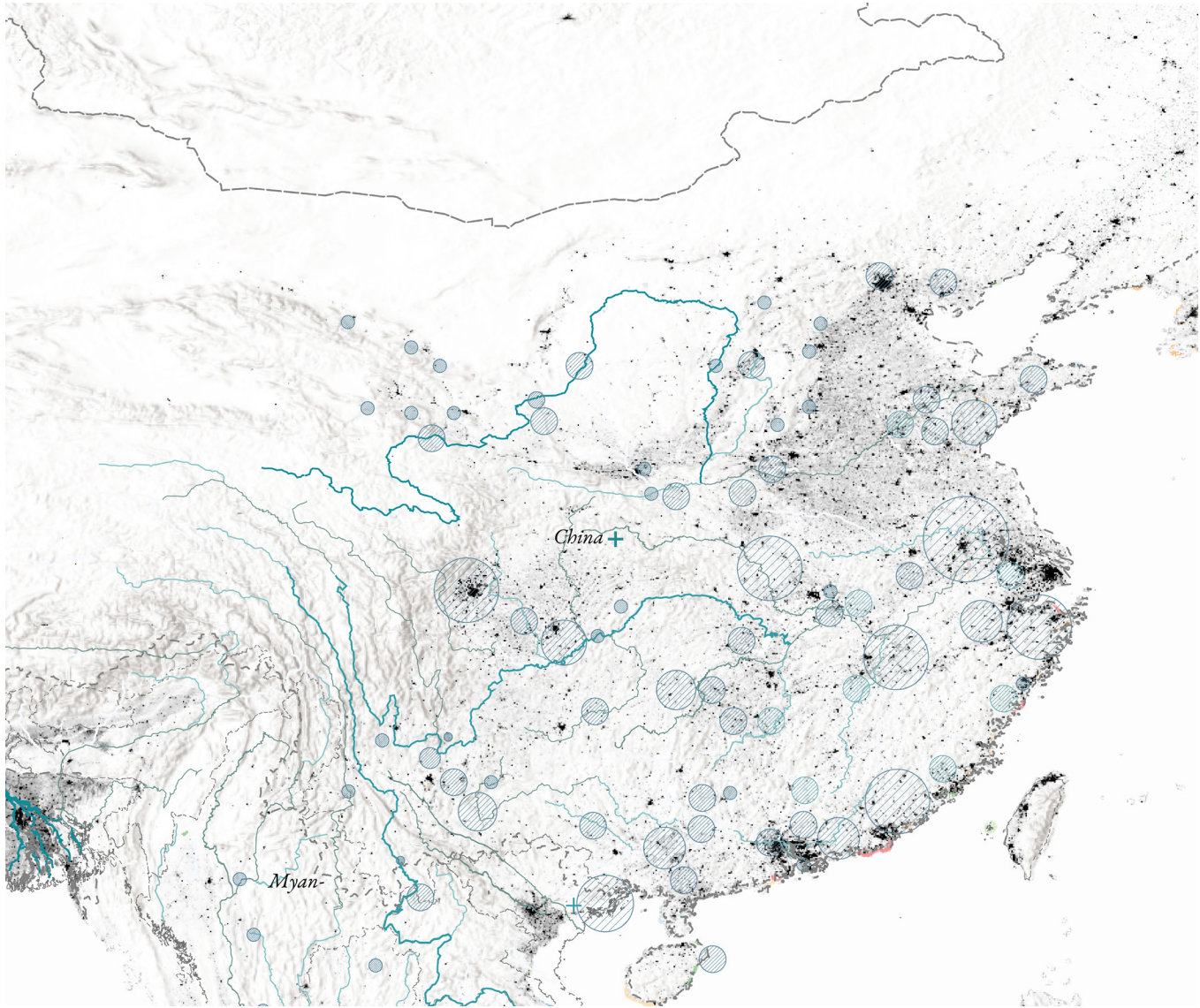
Composition: Uneven extraction

With more than half of Yellow River`s water flow flowing out of Three Rivers Origin, only less than 1 percent of the Yellow River dwelling people inhabit the vast lands. They`ve evolved for thousands of years for this particular terrain and have extraordinary lung capacity, but that doesn`t stop them from contributing less than 1% of GDP. Thousands of DAMS have been built on the lower Yellow River to extract and store water from the upper reaches.

Citations

¹ https://www.hrw.org/report/2013/06/27/they-say-we-should-be-grateful/mass-rehousing-and-relocation-programs-tibetan#_ftn32

Fig. 5-4 Shot from China Global Television Network Documentary series, Journeys in Nature: Sanjiangyuan series. (n.d.).



05 LINES OF INQUIRY

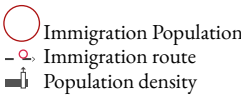
GEOPOLITICS

Alteration: moving out

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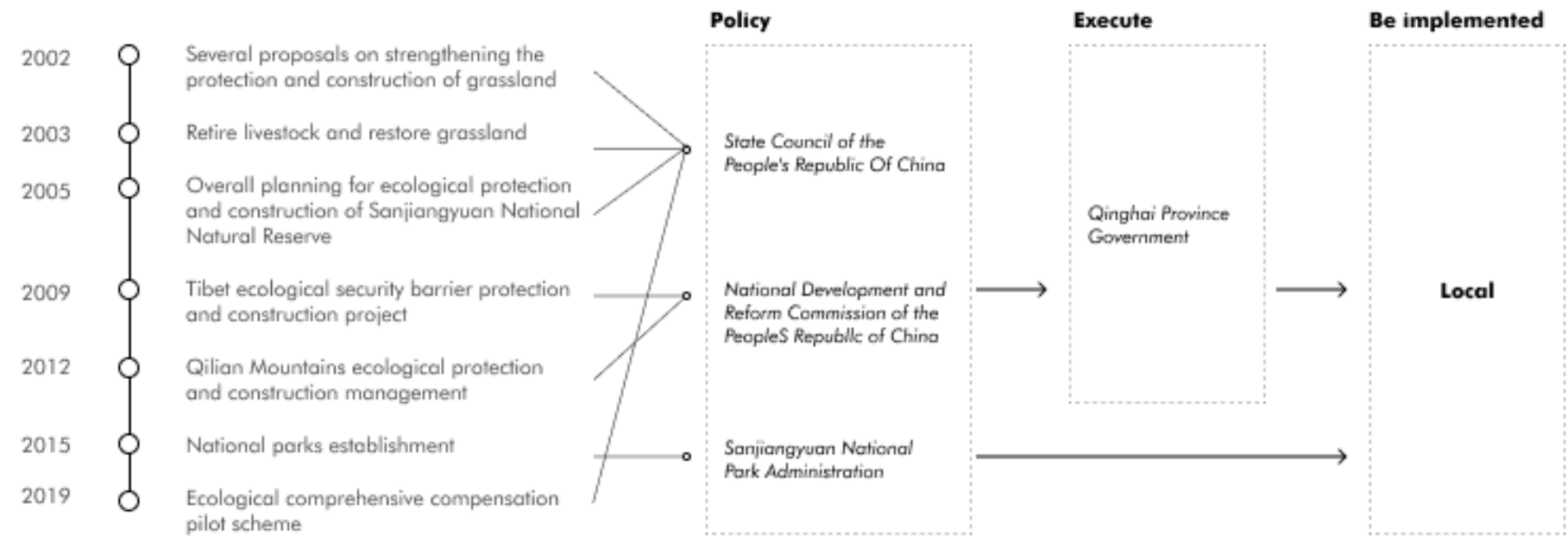
05 LINES OF INQUIRY

GEOPOLITICS

Limits: absence of Tibetans in decesion making

In China, the land is not privately owned but the “collective” property. Village committee officials exercise, in the collective’s name, effective control of land and land use rights.

Yet the impacts on Tibetans themselves, numbering some 6 million people and occupying almost 2 per cent of the planet’s land, attract far less attention. Instead the focus is almost entirely geopolitical, on global impacts and global responses: actual Tibetan land managers are absent, even though they make land-use decisions daily in a climate that has always been highly variable, requiring great skill in living with uncertainty.



Citations

¹ https://www.hrw.org/report/2013/06/27/they-say-we-should-be-grateful/mass-rehousing-and-relocation-programs-tibetan#_ftn32



Fig. The “Ecological Migration” policy: many new resettlement villages are being built across the Tibetan plateau.

REVISIT

Build autonomy in eco-system

Loss of chineseness

- Dilemma of China's ecological conservation interspersed within Western contexts
- China's land policy and its endeavor towards land preservation

Review policies

Vision towards a Autonomous nature-people park

- General
- Expected outcomes

During the first phase of design, the problem analysis of the status quo, literature review and lines of inquiry provide a scientific background for this mysterious place on roof of the world. A mission for urban designers is to bring equality and create places for local. For this reason, it's important to collect as many information about people living on Tibet Plateau.

Although it's not feasible for me to go back during the graduation project, I attempt to restore the local conditions by interviewing local people, scholars in Tibetan cultures, NGOs that help restore the Tibetan environment; documentary of Tibetan Plateau and Three Rivers Origin; research of the Chinese folks.

Experiences of local communities at the frontline of climate change needs to be heard and acknowledged. No one should make decisions in the absence of Tibetan voices.

06.



06 REVISIT

The examination of the technological anthropogenic ways of engaging into environment were shown with series of monographs, the exceeding precipitation, the indigenous people be dispossessed of habitat, the shrinking river and wetlands, are reflected in the Three Rivers Origin, highlighting power asymmetries and fuelling the exploration of alternatives. Rather than an object, the territory becomes a subject among other subjects, and space becomes an agent of socioecological change.

China's desire to recreate 'original ecology' in depopulated Tibetan landscapes is explicitly intended to grow more grass and increase biomass by excluding grazing animals, thus capturing carbon and in the process earning China – the planet's biggest emitter of carbon – accolades and global carbon credits.

It is naive to believe that carbon will only be subservient to our desires. Isn't our human wishful thinking that state will and negotiation, that as long as technological civilization is advanced enough, it will be enough to stop runaway global warming and the largest species extinction event since the extinction of the dinosaurs? Nature is not tradable. We cannot negotiate, rationalize or abstract the world we live in or simply print more air or rainfall.

We are so immersed in the logic of economics, the logic of trade and the logic of abstraction that we have forgotten how we relate to each other.

We now breathe in the remains of dinosaurs that haunt our imagination and that foretell the fate of countless species. As Thom van Dooren writes so beautifully, the disappearance of a species is the disappearance of thousands of years of accumulated knowledge. In the midst of this disruption, it seems vital to maintain creativity.

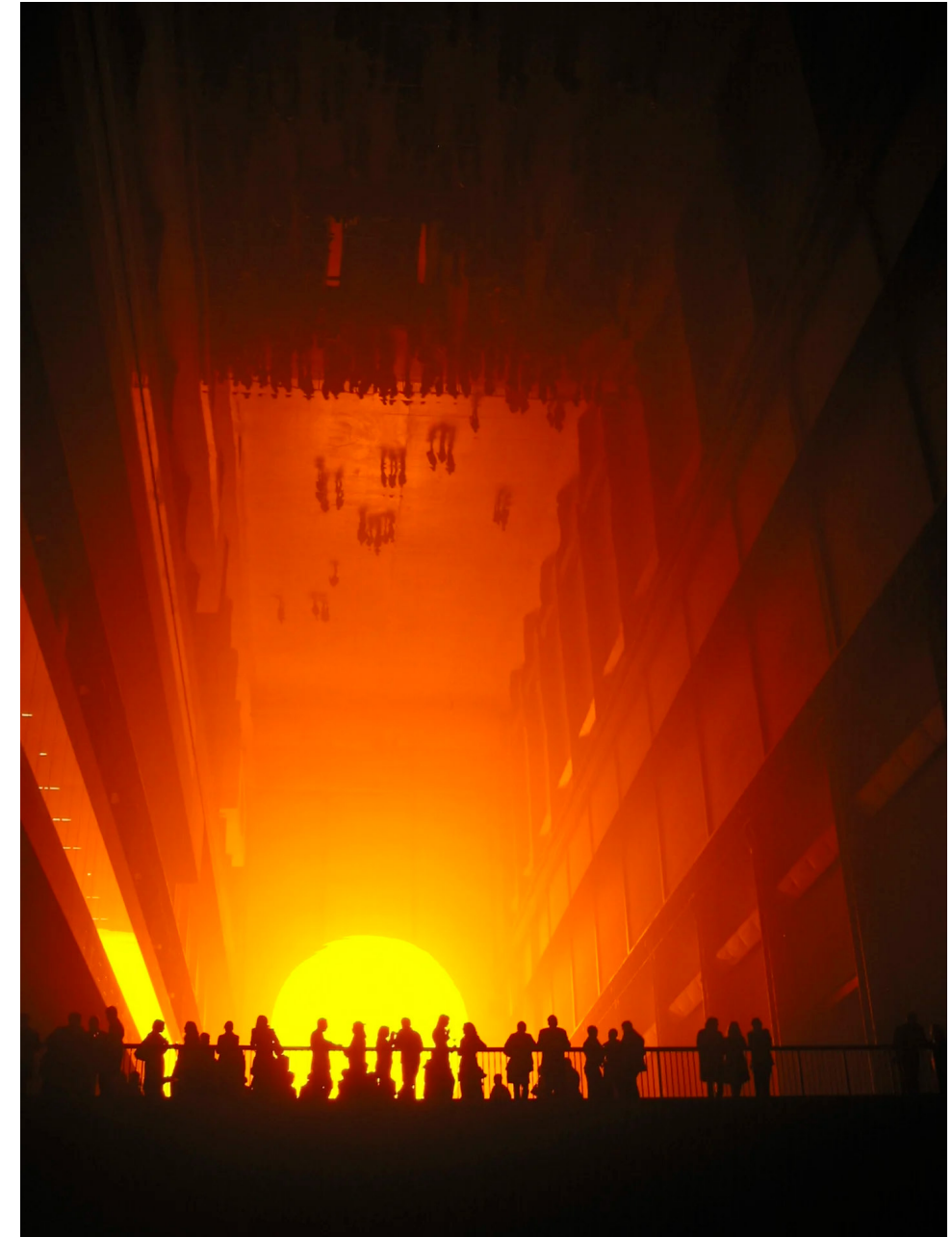


Fig. 6-2
The weather project, 2003
Tate Modern, London, 2003
Photo: Tate Photography (Andrew Dunkley & Marcus Leith)

06 REVISIT

.1 BUILD AUTONOMY IN ECO-SYSTEM

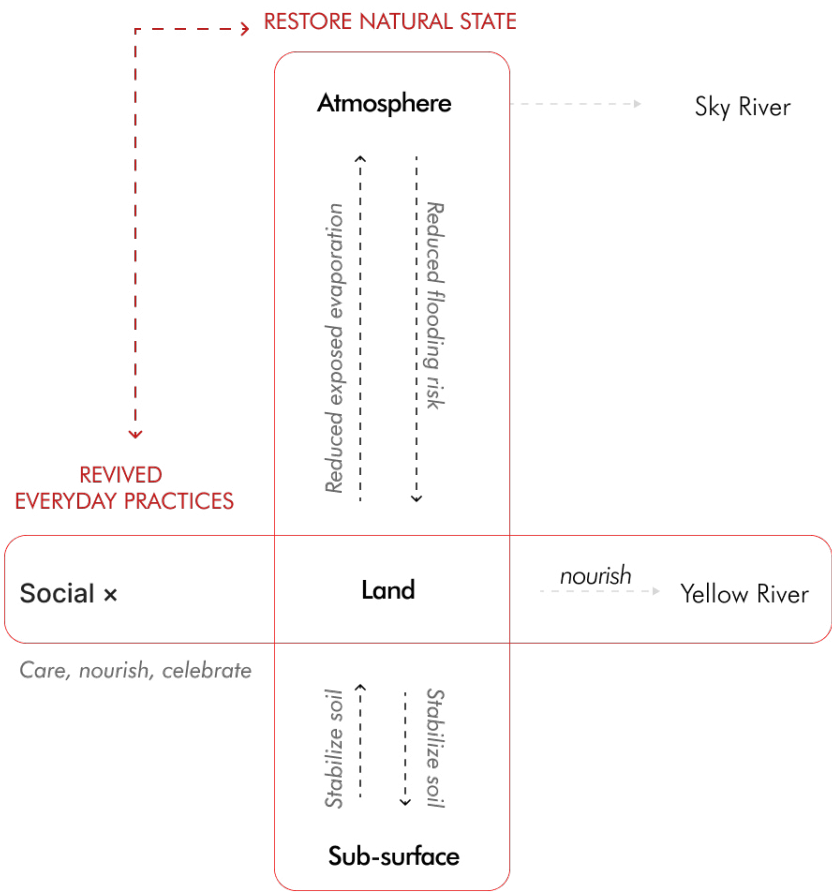
The design of the territorial project is understood as a possibility to explore Three Rivers origin as a field of de-anthropogenic critical zone, by returning to the healthy hydrological cycle and reviving territorial form of the region.

Together, these external forces accelerate, interrupt, and alter the hydrological cycle in their accumulation process. The notion of autonomy is here to empower the agent of nature to *act*, in response to future risks and potentials.

While exceeding rainfall is inevitable either because of climate change or environmental technology, future steps are required to secure the hydrological loop. Here by securing, it means to retain the water for nourishing the Yellow River, sustain water for the dry season, utilize water for desertification grasslands, and discharge the water that may flood or thaw the permafrost.

That is to say, an autonomous eco-system naturalizes where the water will flow and by flowing, in its natural status, it reaches its optimal reciprocity with other nature elements and supports the re-distribution of water that may combat with the external pressure.

Hence, a framework for the restoration, resilience and adaptation of nature-body is essential. Respecting the autonomy of nature does not mean avoiding interaction with or influence on them. What respect for autonomy requires is that one not dominate or control the other.



06 REVISIT

.2 LOSS OF CHINESENESS

The dilemma of China's ecological conservation interspersed within Western contexts

Within the realm of prevailing cultures - be it Western or "modern" - the inherent agency and "labour" of nature is often overshadowed, typically relegated to a mere backdrop against which human endeavours and accomplishments take center stage, rather than being recognized as an achievement in its own right.

The issues China faces are intricate and delicate. I often find myself envisioning this grand nation as a celestial dragon, soaring swiftly through the azure skies, while beneath its radiant scales, a multitude of 1.4 billion hearts beats in a rhythm as patient and enduring as the ancient land itself, steadily advancing through a muddy abyss.

As China's footprint expands assertively beyond its borders, I invite you to dive into the realm of landscapes shaped by the influence of Chinese development, aid, and expertise in transnational contexts. Gleaned from the crucible of China's internal evolution, lessons from the epoch-spanning Western Development campaign and recent 2015 national park reforms offer a prism through which to view the burgeoning potential of Chinese-led initiatives in socially and ecologically fraught frontiers, often overlooked by urban-centric perspectives.

With a populous base as vast as the Yangtze, wealth and resources dispersed as unevenly as the rugged terrain, and education levels as diverse as its multitude of dialects, China's metamorphosis is a dance of delicate steps on a tightrope of challenges. Since the transformative reforms of 1949, China has been imbibing Western thought and technology as swiftly and relentlessly as the Yellow River's flow.

These advanced tools have been mirrored on a majestic scale, yet the march of Chinese thought seemed to have paused at the threshold of the last century. Beneath the dazzling armour of productivity and execution, lie the intricate weave of a nation's contradictions, the silent echoes of historical compromises, and the whispered sacrifices of its regions.

All these currents converge towards one direction - a nation's unyielding ambition and pride that refuses to be relegated to the shadows. Everything must advance in unison, regardless of the means, like a dragon ascending towards the heavens in a gust of wind.

China's land policy and its endeavor towards land preservation

China's land policy structure are very different from else of the world. In China, land is either owned by the state or by rural collective economic organizations. Individuals and businesses can obtain land-use rights, but they cannot own land outright.

Although China has adopted some centralized conservation approaches, they are often inefficient and inflexible due to the lack of effective participation mechanisms and integration. Policy implementation suffers from weak rule of law, unclear land tenure and a disconnect between the government and scientific research and management implementation.

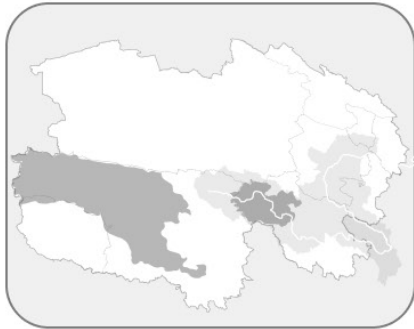
However, the development model prevailing in China seems to adhere to classical modernization theories and is rooted in an authoritarian approach. Unfortunately, conservation values, policies, and practices are not well integrated in China, with systemic barriers such as weak rule of law, unclear land tenure, top-down government power, and the disconnect between scientific research and management implementation.

A sustainable future for pastoral areas will not be achieved without the full participation of stakeholders. Common goals need to be achieved through joint management arrangements with local communities as key partners, rather than simply legislating desired behaviour. Conservation-oriented government policies such as shengtai yimin Chinese (生态移民) threaten not only the livelihoods and community structure of local pastoralists, but also regional stability, as quote-driven migration is combined with high unemployment and loss of hope.

To achieve sustainable development, cooperation and consultation between local communities and national managers need to be promoted through community-based approaches to environmental management. This requires a combination of traditional Chinese environmental values with modern science and international management practices to achieve more effective environmental protection. Furthermore, the sustainable development of pastoral areas requires full consideration of the interests and participation of local communities, direct cooperation with pastoralists, the promotion of social and economic well-being, and the preservation of cultural values. In this way, more equitable, sustainable and economical measures can be achieved while meeting local and national development goals.

.3 REVIEW POLICIES

1 THREE-RIVER SOURCE NATIONAL NATURE RESERVE



Launched in **2020**
Covers an area of **120,000 km²**
In the core protected area, human activity includes grazing is prohibited, includes eco-migration of the villages. Only open to scientific research, investigation, monitoring.
Alleviate the shortage of water resources in the Yellow River and some inland rivers.

2 SKY RIVER PLAN



By **2018**
500 Stoves are installed in the slope regions of Tibet, Xinjiang and other areas.
Affect the areas of more than **1600,000 km²**
Increase precipitation by **320 Million m³**
Alleviate the shortage of water resources in the Yellow River and some inland rivers.

3 FENCED GRAZING & FIXED GRAZING

National Grassland Protection Construction and Utilization Thirteenth Five-Year Plan*



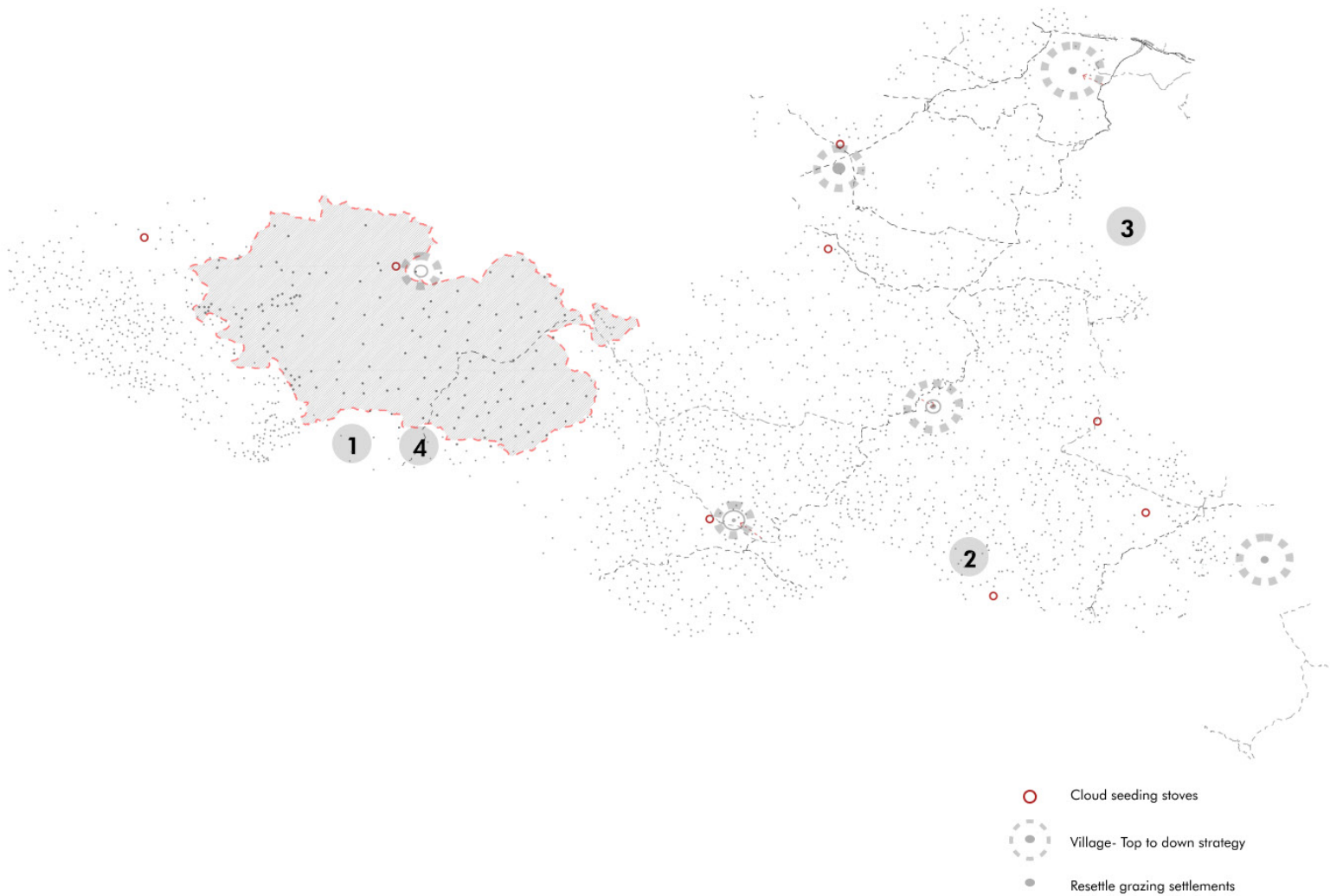
By **2011**
15,000,000 Hectares of grazing land and its livestock are separated by grid of wire fences to households. Compulsory and fixed fencing undermine the traditional pastoral system preventing traditional seasonal rotations.
On the one hand, local herders questioned the fencing ban did not bring about the recovery of pasture, on the other hand, ecological experts said, because the free migration of wild animals is restricted, the spread of grass seeds on the grassland reproduction is also affected, and ultimately hurt the integrity of the grassland ecosystem.

4 RESETTLEMENT POLICY

Comfortable Housing policy



By **2012**
280,000 people had to be relocated, some nearby and others at a great distance.
China began implementing ecological migration in 2000, and about 7 million farmers in the western region alone had to migrate to escape poverty. In my project, it only concerns the national park extent.



06 REVISIT

.4 VISION TOWARDS A AUTONOMOUS NATURE–PEOPLE PARK

VISION

My project serves as the negotiation process that gradually brings the land back to its people, respecting their traditional knowledge and engaging local cultures towards a autonomous national reserve of their own instead of restricted zoning land use.

The goal is to build a resilient ecosystem, dynamically maintain its unity and actively sustain its vibrancy that can deal with the future hydrological cycle in multi-scale.

AIMS

The project examines and recognizes the natural capital of Three Rivers Origin in the process of atmosphere-land hydrological system.

The project constructs a dynamic and adaptive revived territorial form based on micro local interventions by respecting the role of nature capital and rethinking of the indigenous knowledge as a return to Yellow River's healthy flow in future hydrological patterns.

OUTCOMES

Design possible scenarios and possibilities for the region through nature based solutions, taking into account theory of complex systems and system thinking in order to achieve a dynamic equilibrium that acknowledges the landscape eco-services, socio-cultural value, local identity and collective agency

RISK ANALYSIS

Towards a new park paradigm

GIS-based technical route

- Spatial domains -Different altitudes
- Temporal domains -Seasonal changes

Identify risks

- Seasonal distribution of rainfall
- Temporal domains

Overlap result of high-risk zones

Synthesis map

07.



07 RISK ANALYSIS

.1 TOWARDS A NEW PARK PARADIGM

The 21st-century new national park paradigm needs an autonomic and resilient new framework that evolves with the eco-dynamics as well as inherits the identity of the local routines.

To start designing it is crucial to define what will be the atmosphere river and surface water interaction in the future, what relationship they have with each other and with the human and non-human forms that inhabit them. Hydrological morphology is investigated by mapping out different states of water in different temporal and spatial domains that contributes to the possible risks and potential. Flooding, soil erosion and thawing are identified as most important hazards in the regio. Through the combined analysis of GIS and AHP evaluation, a multi-criteria decision-making method which integrates several features/conditioning factor, they are reclassified into different risk-suspicious zones.

Local elevations are overlapped with risk-zones as they ecologically and socially affect water distribution and, as a result, socio-economic activities such as animal husbandry and plateau planting. They outline the nomadic travel routes, which is crucial in understanding the spatial elements of indigenous productive life and how it's coincide with these risk zones.

Disagree, but the project will proceed, thus needs to foresee the risks

Disagree, but an opportunity towards a new national park paradigm

De-overhumanizing

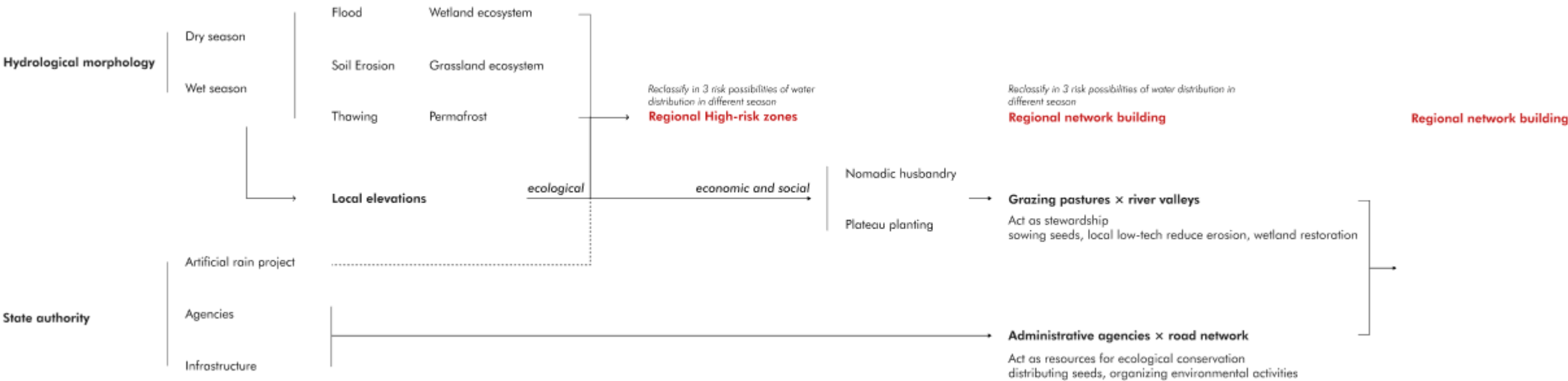
De-naturalize

Identify the risks

Nature-based Multi-scalar system

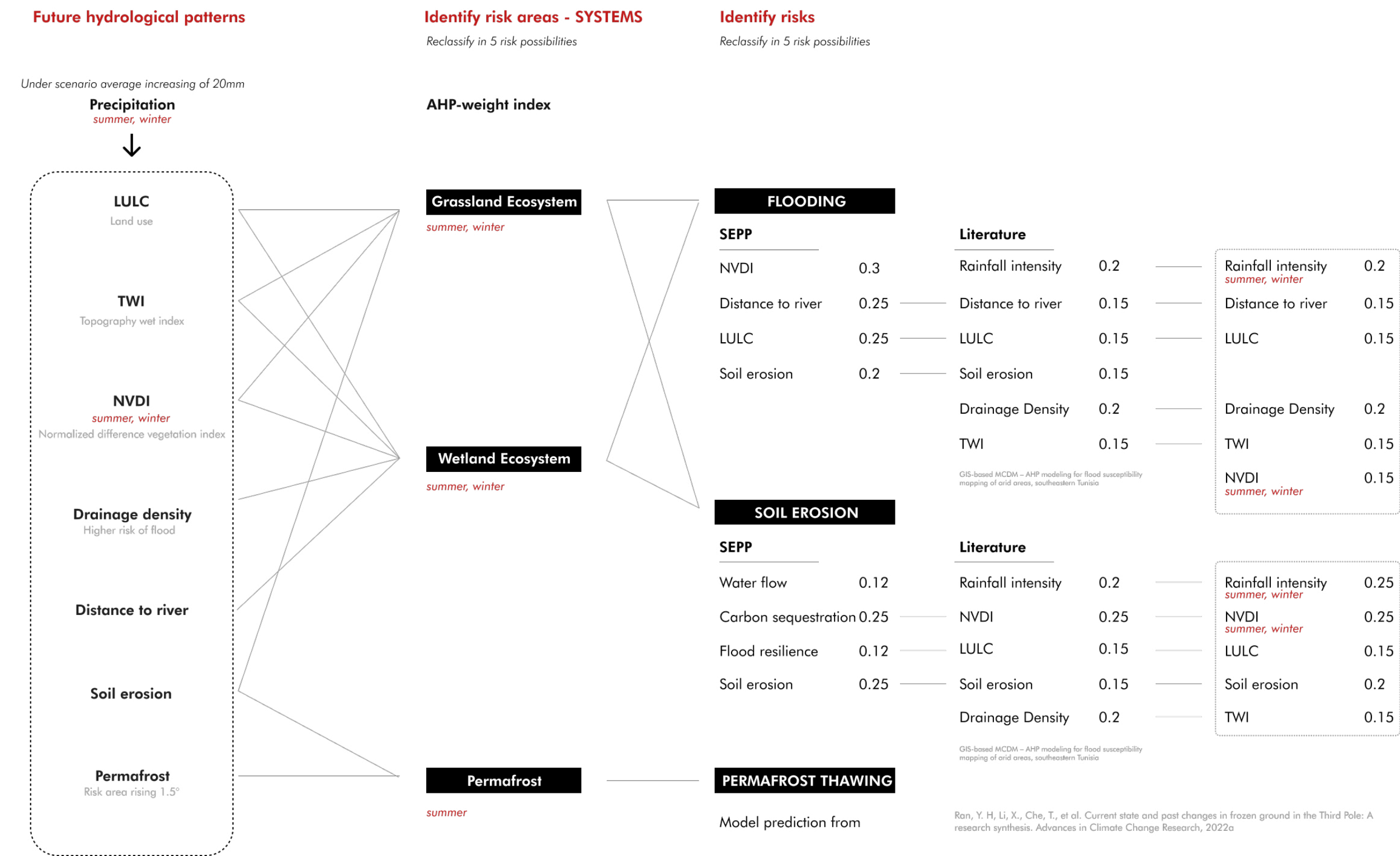
How to care for the land?

Design for who to care?



07 RISK ANALYSIS

.2 GIS-BASED TECHNICAL ROUTE



08 DESIGN STRATEGY

FUTURE HYDROLOGICAL PATTERN

In order to propose a synergetic strategy for managing water resources, it is important to have a good understanding of the future hydrological cycle. This can be estimated by calculating the percentage of atmospheric water resources that are not converted to rain, as well as the amount of precipitation that is expected at each location in the future.

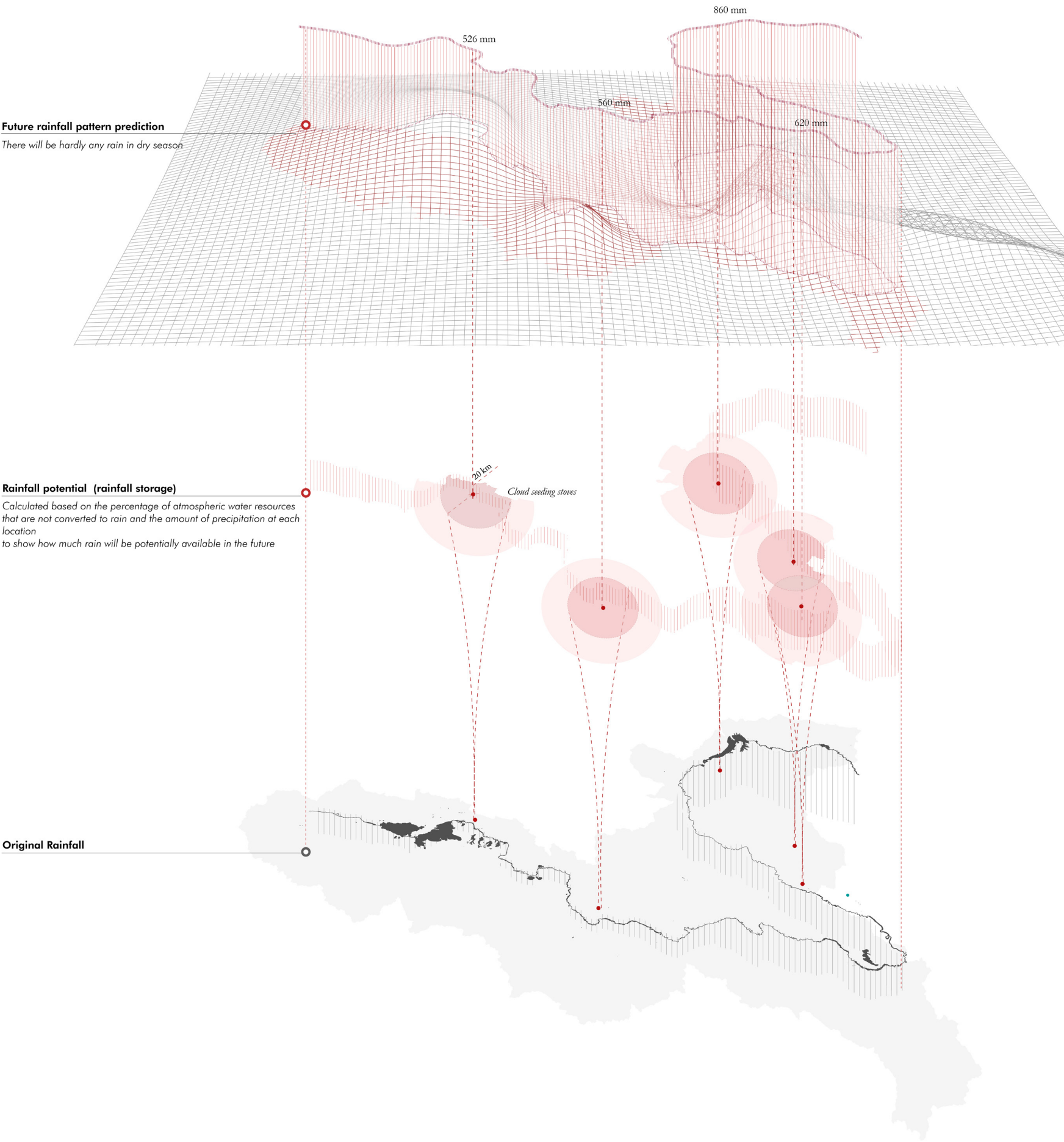
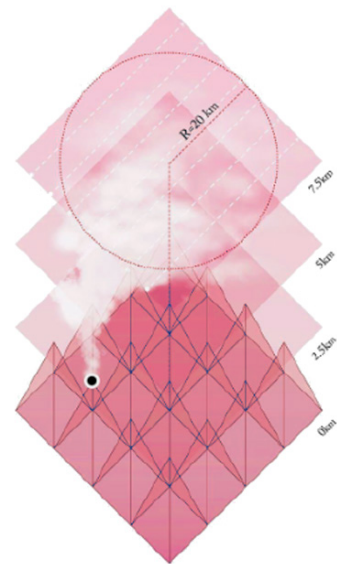
By using this information, it is possible to estimate how much rainwater will be potentially available in the future, which is critical for developing effective water management strategies. This can help identify areas where water flooding and soil erosion may be an issue, and develop appropriate interventions to ensure that water resources are managed in a sustainable and equitable manner.

By understanding these potential changes, the proposed plan can take proactive measures to mitigate their impacts and ensure that water resources are managed in a way that supports both human and ecological needs.

Citations

¹ 姚秀萍, 谢启玉, 黄逸飞, 2022. 中国三江源地区降水研究的进展与展望 [J]. 大气科学学报, 45 (5) : 688-699.
Yao X P, Xie Q Y, Huang Y F, 2022. Advances and prospects on the study of precipitation in the Three-River-Source Region in China [J]. Trans Atmos Sci, 45(5):688-699.

Smoke Stove Diagram



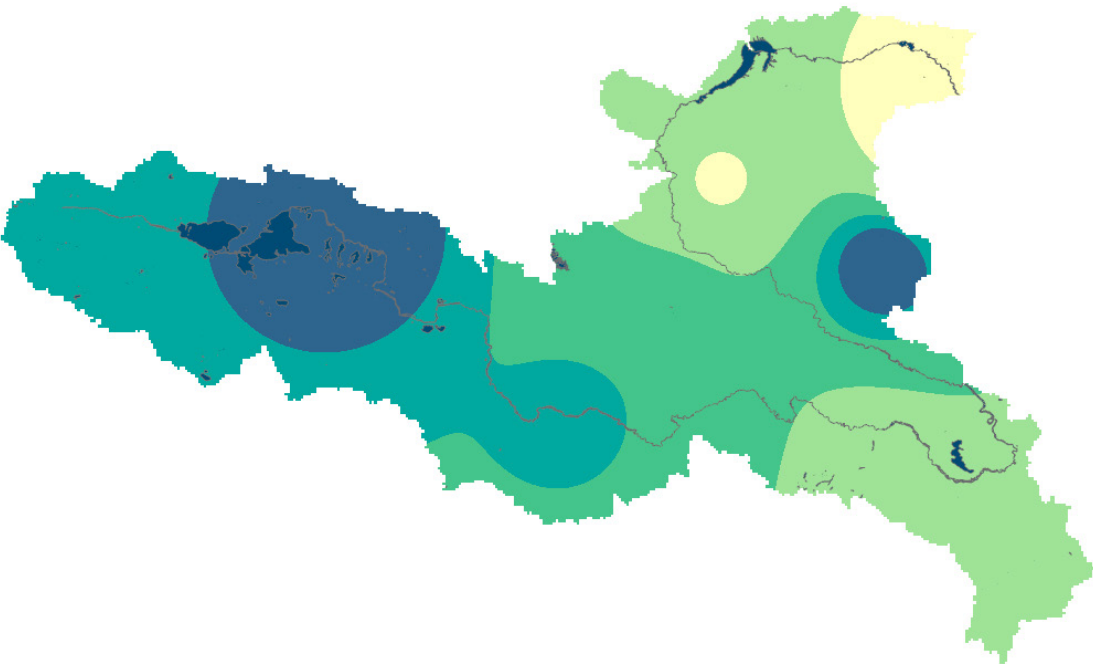
07 RISK ANALYSIS

3. IDENTIFY RISKS

Seasonal distribution of rainfall

In each village, the date for the start of summer migration depends on the availability of fodder resources at higher elevations, and coincides with the time for planting corn, buckwheat, and potatoes that falls between May and early June. The time for returning from summer pastures is regulated so that the animals do not return to the village center before the end of the autumn harvest in September and early October. The herders usually determine the number of days for each stay, based on the availability of fodder resources at each specific site.

According to the research(Ning, 2022), the overall precipitation and evaporation have been increased and will continue to increase in the near future, not only more solid water becomes liquid water (e.g., melting glacier/snow) but also more liquid water becomes the gaseous one (e.g., ET). The hydrological cycle will be much more intense on Tibet Plateau than on rest of the world, and more easily affected by the climate change.



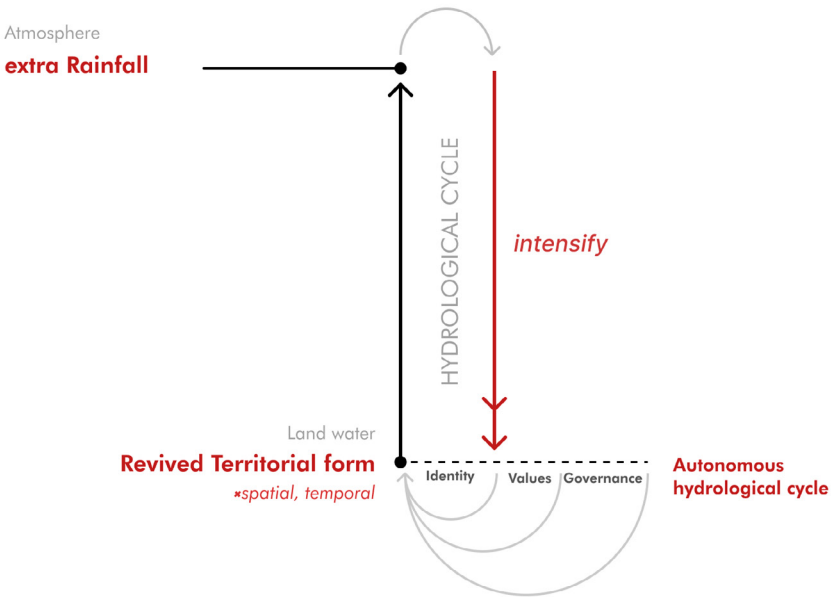
Citations

¹ Yao X P,Xie Q Y,Huang Y F,(2022).Advances and prospects on the study of precipitation in the Three-River-Source Region in China[J]. Trans Atmos Sci,45(5):688-699.
² S. (2022). Master plan of Sanjiangyuan National Park (China, Qinghai Province, Sanjiangyuan National Park Administration). Qinghai: CPC Qinghai Province.

The risk assessment will be placed to foresee the future risks that serve as the grounding for synthesis, inspiring and negotiating change in eco-services, sociocultural value, local identity, and collective agency.

Before the risk assessment, indicators and weight levels for my future risk assessment were researched by reviewing the technical literature and also by referring to the now established three-tier system of ecosystems in the Three Rivers Origin National Park.

In my evaluation system I determined the risk level of soil erosion and flooding in the whole base with the help of the evaluation factors of Sanjiangyuan National Park. The technical literature mostly boased on the analysis of GIS estimation for flooding risk zones



07 RISK ANALYSIS

FLOOD

SEPP		Literature			
NVDI	0.3	Rainfall intensity	0.2	Rainfall intensity	0.25
Distance to river	0.25	Distance to river	0.15	Distance to river	0.15
LULC	0.25	LULC	0.15	LULC	0.15
Soil erosion	0.2	Soil erosion	0.15		
		Drainage Density	0.2	Drainage Density	0.2
		TWI	0.15	TWI	0.15
				NVDI	0.1

GIS-based MCDM – AHP modeling for flood susceptibility mapping of arid areas, southeastern Tunisia

Citations

¹ S. (2022). *Special plan for ecological protection of Sanjiangyuan National Park* (pp. 98-110) (China, Qinghai Province, Sanjiangyuan National Park Administration). Qinghai: CPC Qinghai Province.

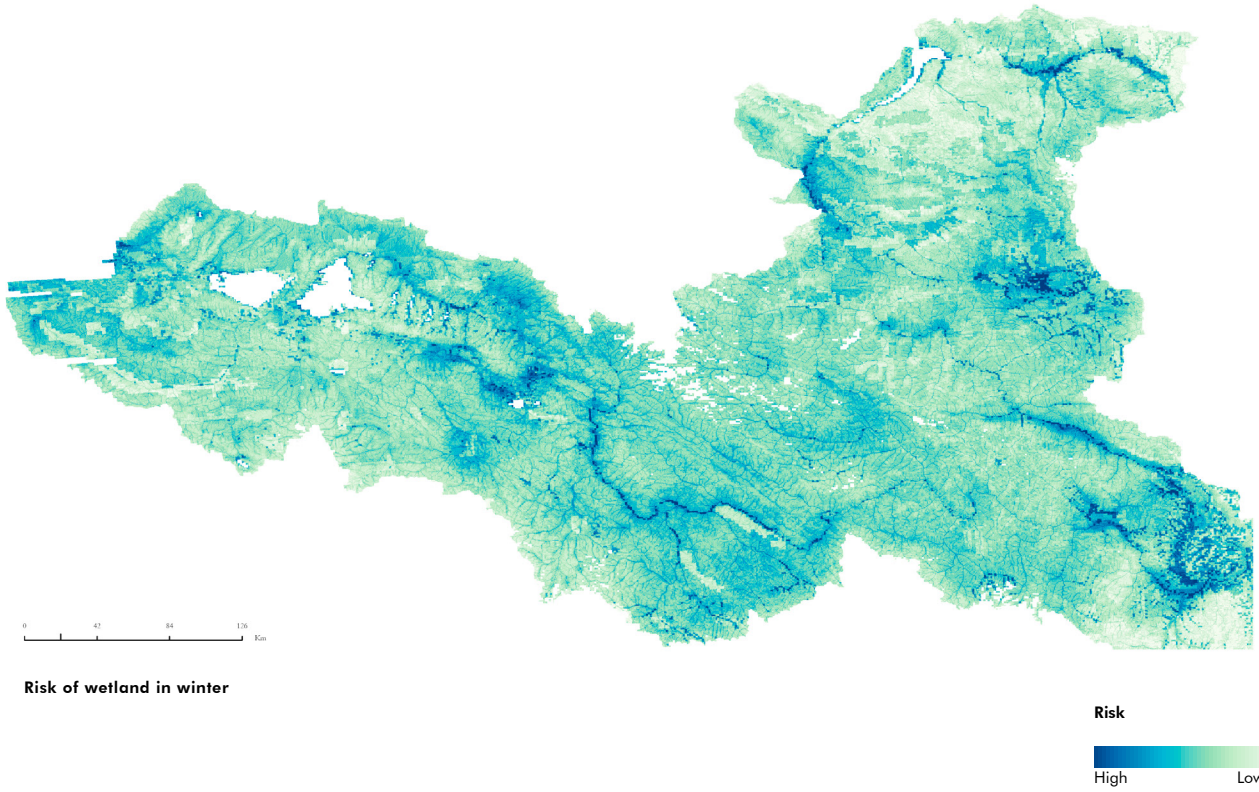
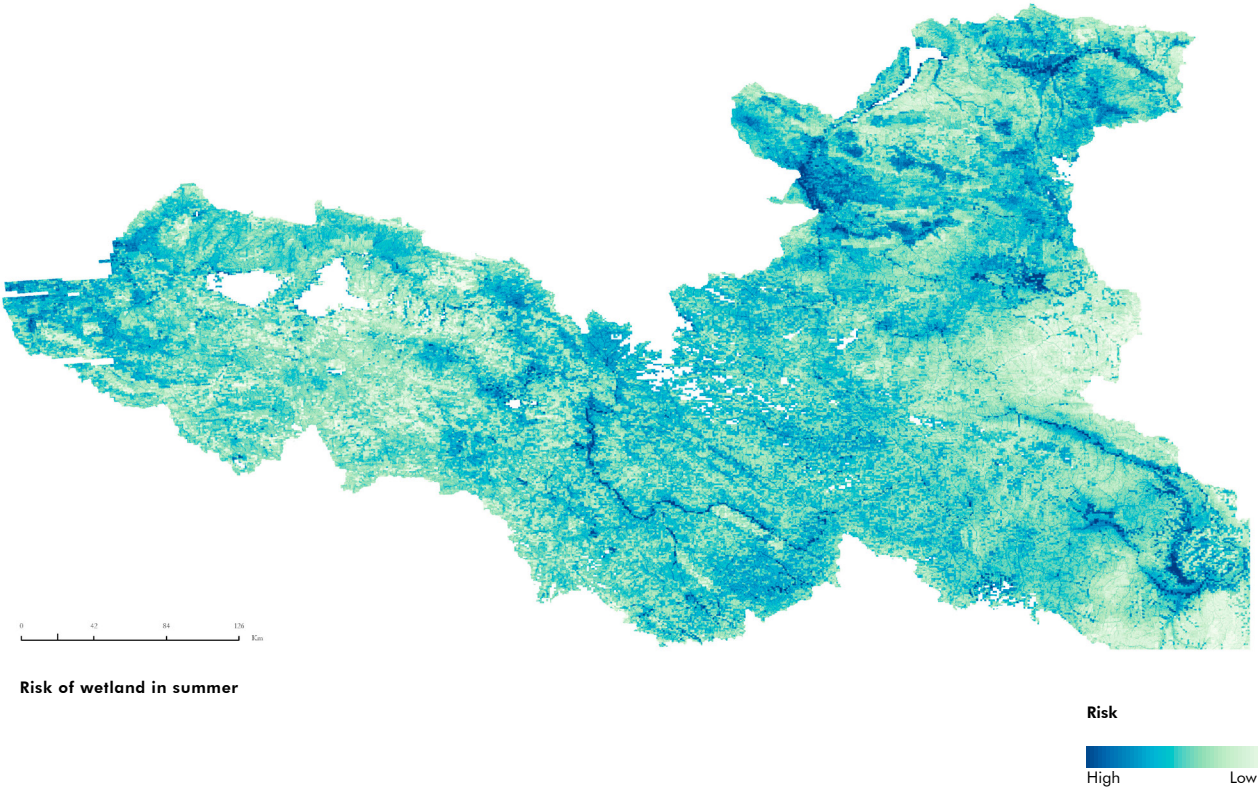
² S. (2022). *Master plan of Sanjiangyuan National Park* (China, Qinghai Province, Sanjiangyuan National Park Administration). Qinghai: CPC Qinghai Province.

³ Seejata, Kamonchat & Yodying. (2018). Assessment of flood hazard areas using Analytical Hierarchy Process over the Lower Yom Basin, Sukhothai Province. *Procedia Engineering*. 212. 340-347. 10.1016/j.proeng.2018.01.044.

⁴ Souissi, D., Zouhri, L., Hammami, S., Msaddek, M. H., Zghibi, A., & Dlala, M. (2019). GIS-based MCDM – AHP modeling for flood susceptibility mapping of arid areas, southeastern Tunisia. *Geocarto International*, 35(9), 991-1017. doi:10.1080/10106049.2019.1566405

Flood risk assessment is a risk rating required under the combined effects of future global warming and the Sky River Project. By referring to the now established three-tier system of ecosystems in the Three Rivers Origin National Park. The current assessment evaluates ecosystem service susceptibility of river network.

The particularity of Sanjiangyuan ecological region lies in the heterogeneity of precipitation between different seasons. The hydrological morphologies vary between the wet and dry seasons; as a result, two mappings are produced for combined 6-criteria flood risk evaluation.



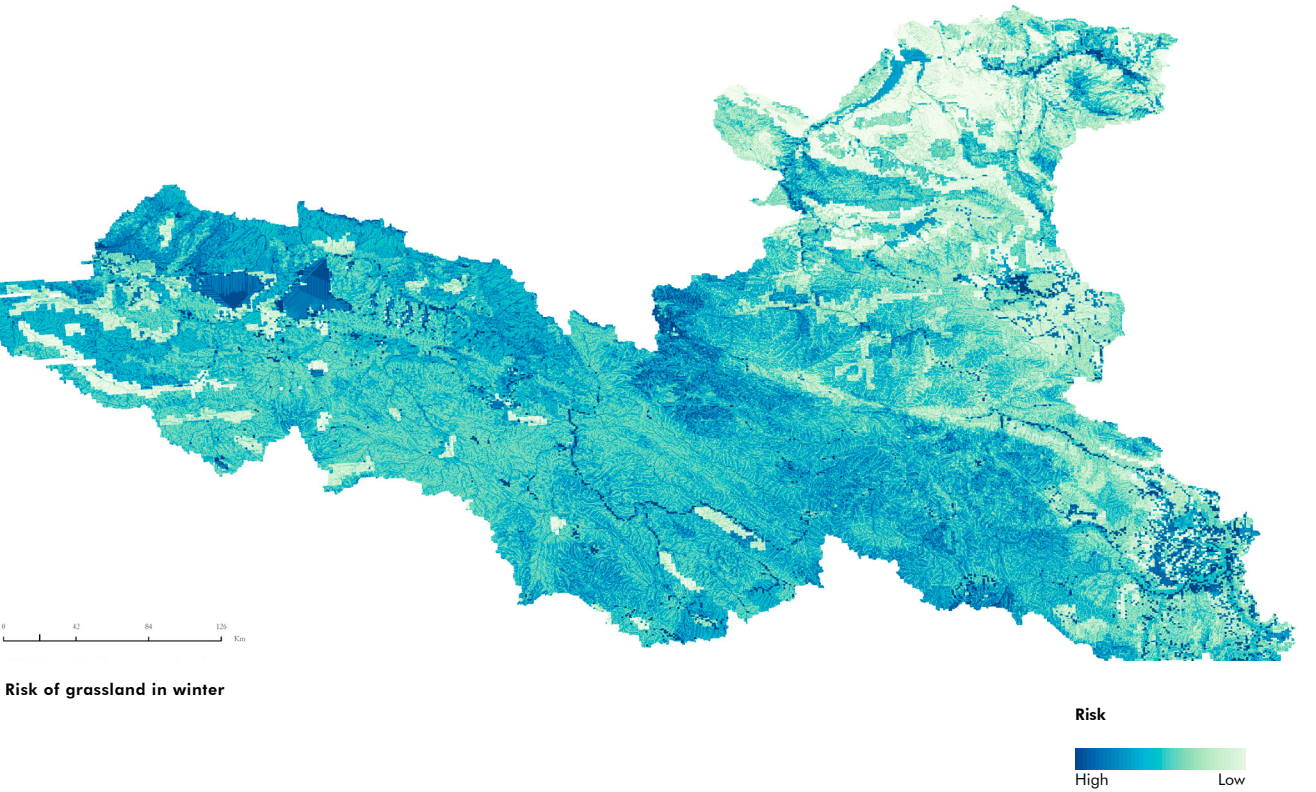
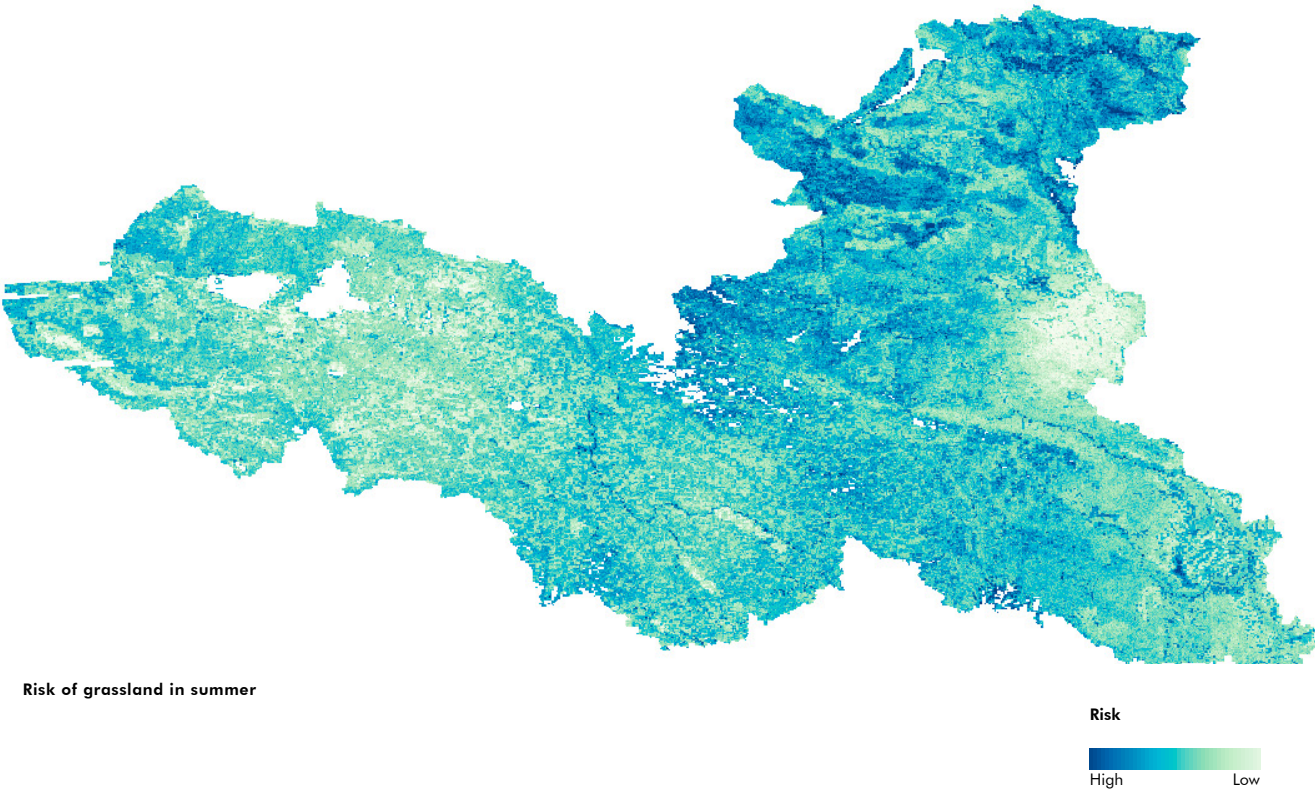
07 RISK ANALYSIS

SOIL					
SEPP			Literature		
Water flow	0.12		Rainfall intensity	0.2	Rainfall intensity <i>summer, winter</i> 0.25
Carbon sequestration	0.25		NVDI	0.25	NVDI <i>summer, winter</i> 0.25
Flood resilience	0.12		LULC	0.15	LULC 0.15
Soil erosion	0.25		Soil erosion	0.15	Soil erosion 0.2
			Drainage Density	0.2	TWI 0.15

GIS-based MCDM – AHP modeling for flood susceptibility mapping of arid areas, southeastern Tunisia

The lack of water will cause vegetation degradation and soil drying up, incapable of reproduce in the coming spring.

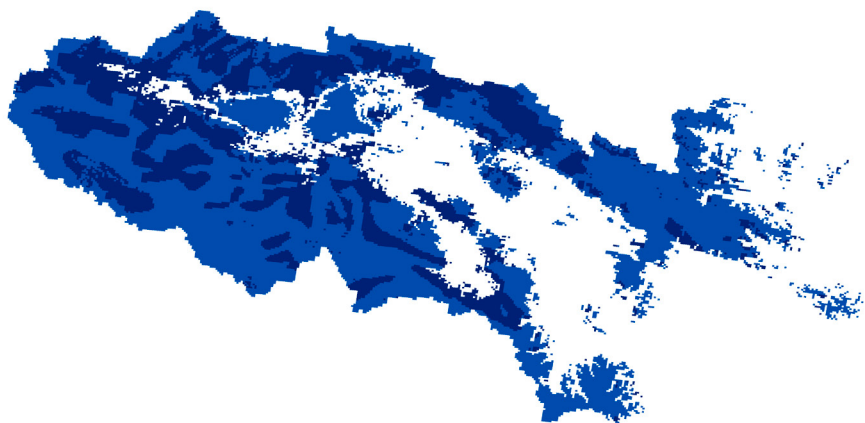
The snow depth and length of snowing days are shrinking. The landslide may happen where the soil is unstable and can be easily washed by the rainfall.



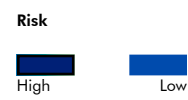
07 RISK ANALYSIS

PERMAFROST THAWING

Model prediction from



Risk of permafrost in summer



Citations

¹ S. (2022). *Special plan for ecological protection of Sanjiangyuan National Park* (pp. 98-110) (China, Qinghai Province, Sanjiangyuan National Park Administration). Qinghai: CPC Qinghai Province.

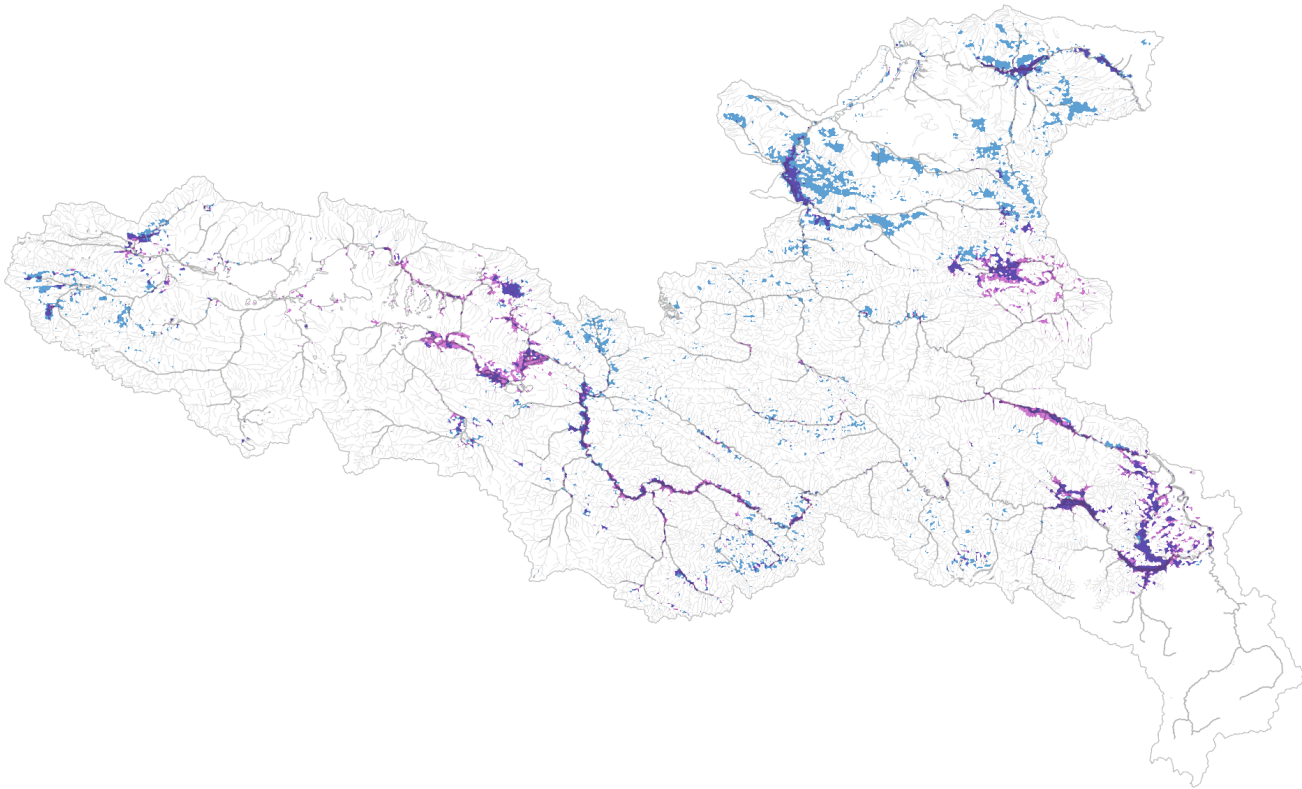
² Ran, Y. H, Li, X., Che, T., et al. Current state and past changes in frozen ground in the Third Pole: A research synthesis. *Advances in Climate Change Research*, 2022a

³ Ran, Y. H, Li, X., Cheng, G.D., et al., 2022b. New high-resolution estimates of the permafrost thermal state and hydrothermal conditions over the Northern Hemisphere. *Earth Syst. Sci. Data* 1–27, <https://doi.org/10.5194/essd-2021-83>.

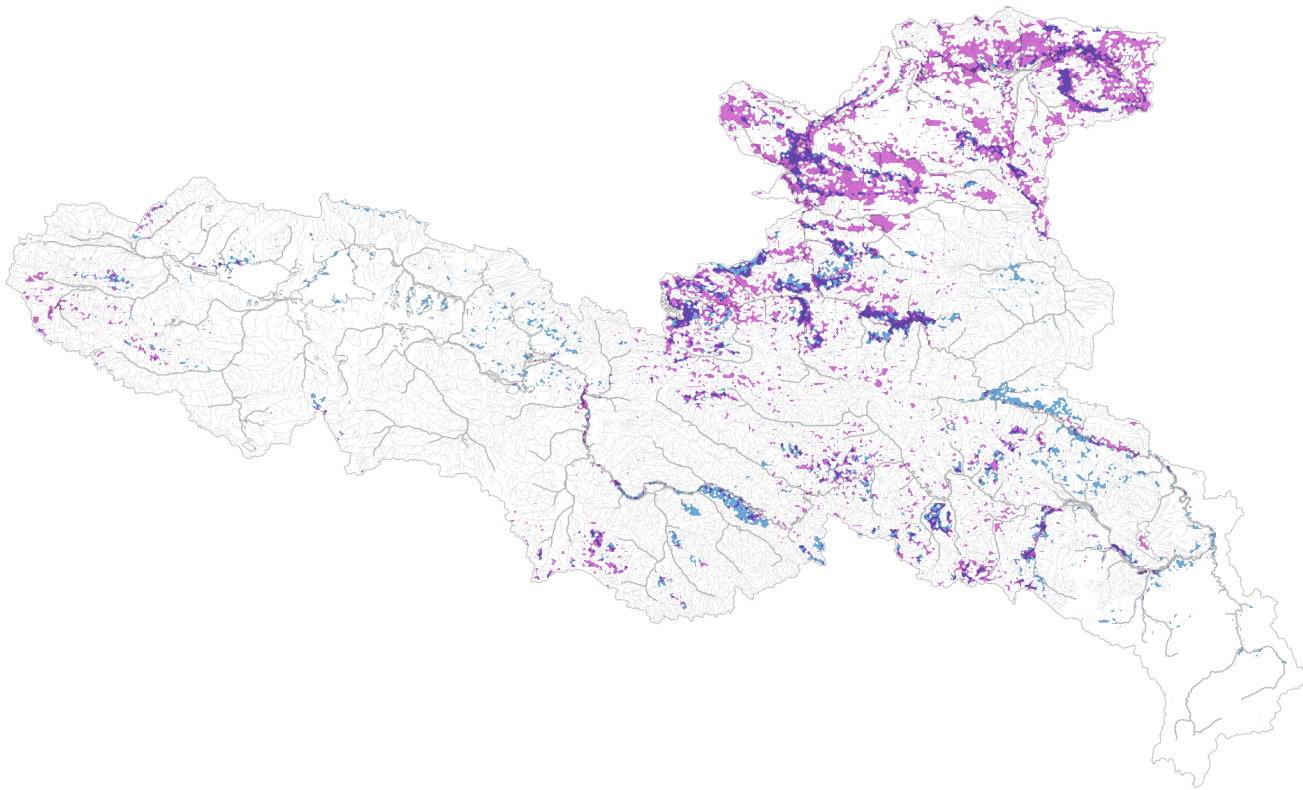
⁴ Wang, B.Q., Ran, Y.H., 2021. A decade dataset of soil maximum freezing depth with 1-km resolution from 1961 to 2020 in Northwest China. *Advances in Earth Science* 36, 1137–1145 (Chinese).

Water in winter stays in the form of ice and liquid underground where there`s permafrost. It could also cause the land to collapse if the ice in permafrost melts.

.4 OVERLAP RESULT OF HIGH-RISK ZONES



High Risk zones of wetland in summer and winter



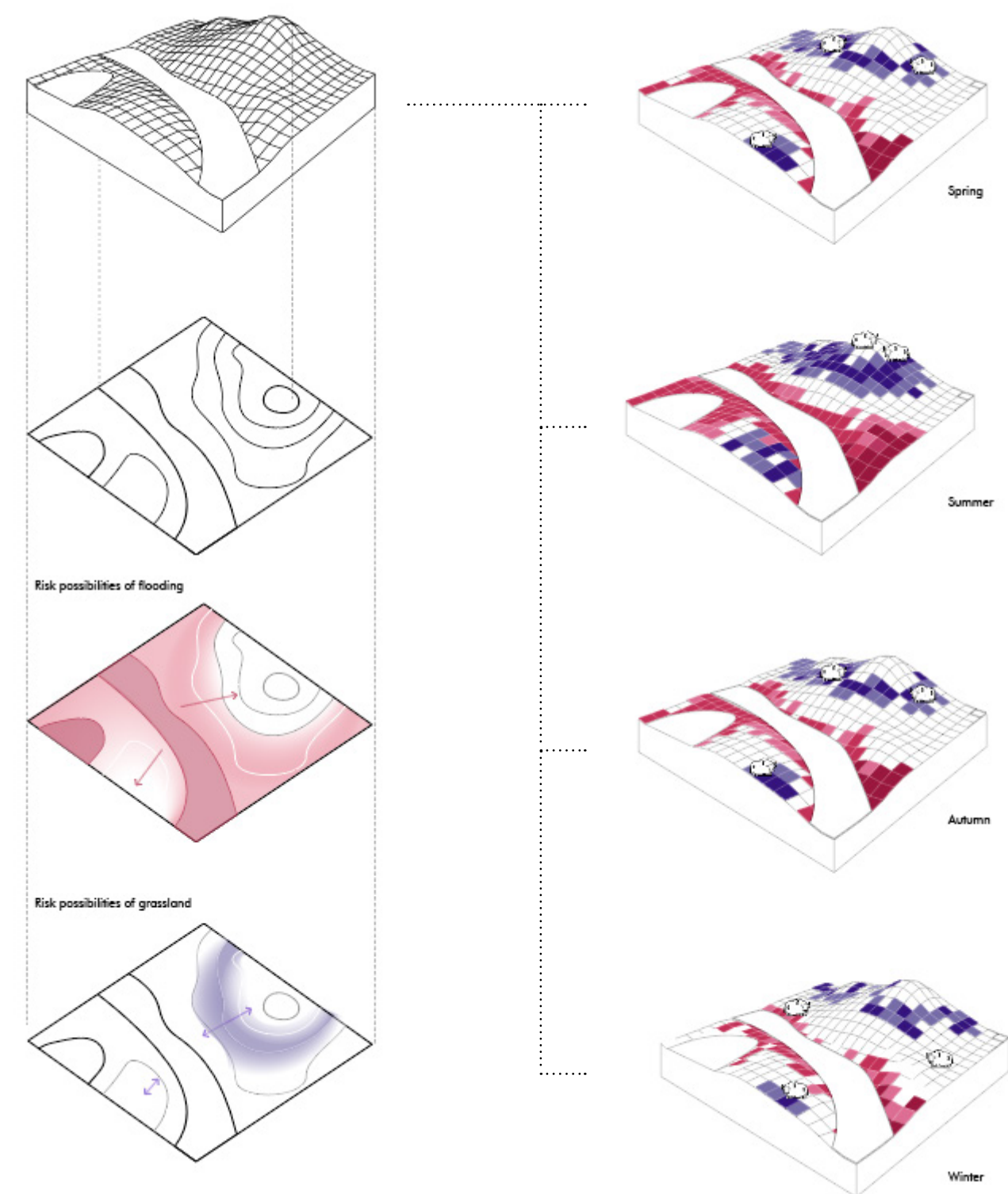
High Risk zones of grassland in summer and winter

07 RISK ANALYSIS

OVERLAP RESULT OF HIGH-RISK ZONES

Transhumance with high-risk zones

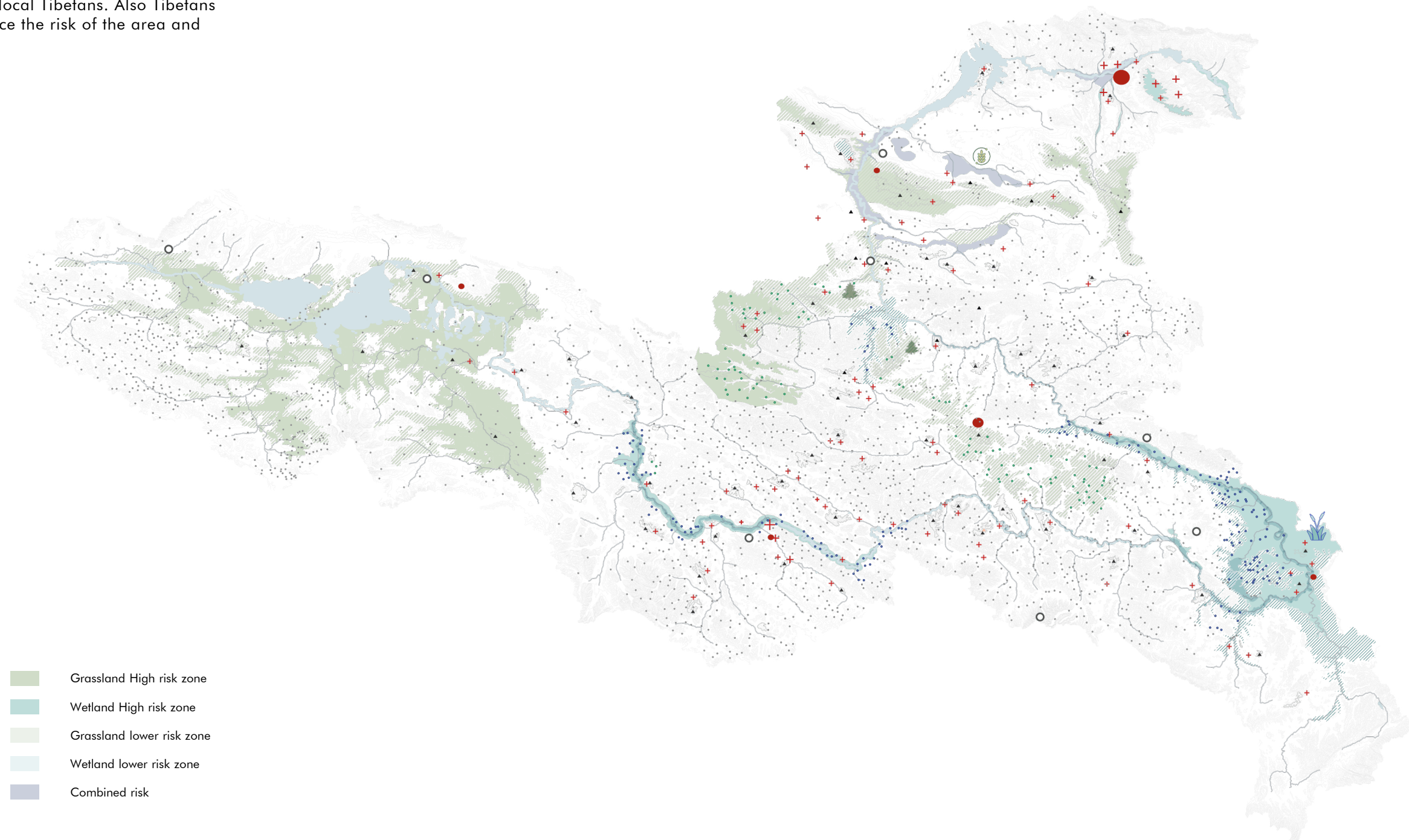
The overall result will be overlapped with regional elevatons. This is to make sure that the grazing activities will be taken place in the specific latitude of the region while risks happen.



07 RISK ANALYSIS

.5 SYNTHESIS MAP

The following maps synthesize high-risk areas as well as specific elevations for grazing activities, thereby identifying those areas as having an impact on the activities of local Tibetans. Also Tibetans can use their activities to in turn reduce the risk of the area and resist the Sky River program.



DESIGN STRATEGY

Watershed unit based spatial planning

- New paradigm units respecting natural attributes
- Impart programs to activate land ownship

Grazing as terraforming landscape

- Learn from transhumance behaviour
- Grazing as terraforming tool

Recovery plan

08.



08 DESIGN STRATEGY

.1 WATERSHED UNIT BASED SPATIAL PLANNING

New paradigm units respecting natural attributes

Using a watershed as a planning unit instead of traditional zoning methods is an approach that can offer numerous benefits due to the way it aligns with natural ecological boundaries. Traditional zoning often divides land based on human-centric factors without considering natural environmental factors. However, watershed-based planning takes into account the interconnectedness of ecosystems and recognizes the importance of maintaining these natural systems for both ecological and human health.

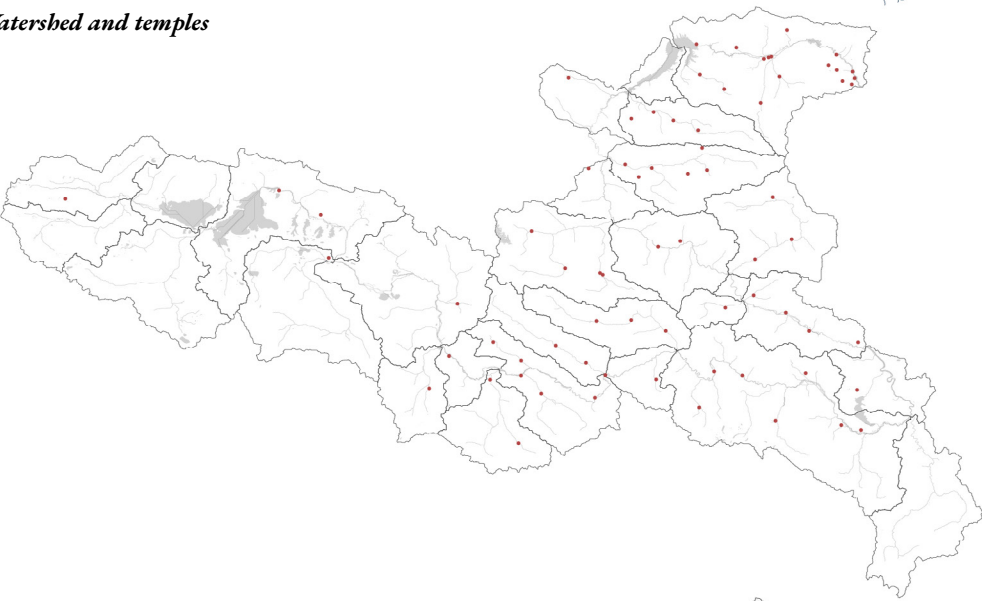
Autonomy of nature can be re-generated with the watershed networks that align with natural attributes as well as resilience both socially and ecologically.

It encourages the butterfly affect brought by the grazing activity and local communities. It`s only their combined effect that performed in each singel unit can ultimately terraforming the region and regain land autonomy.

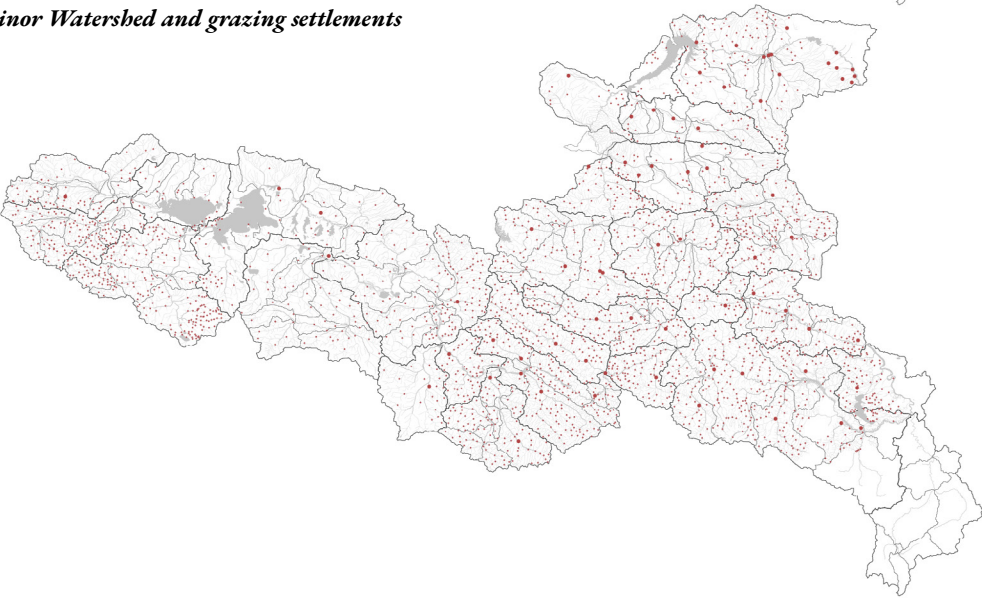
River network



Watershed and temples



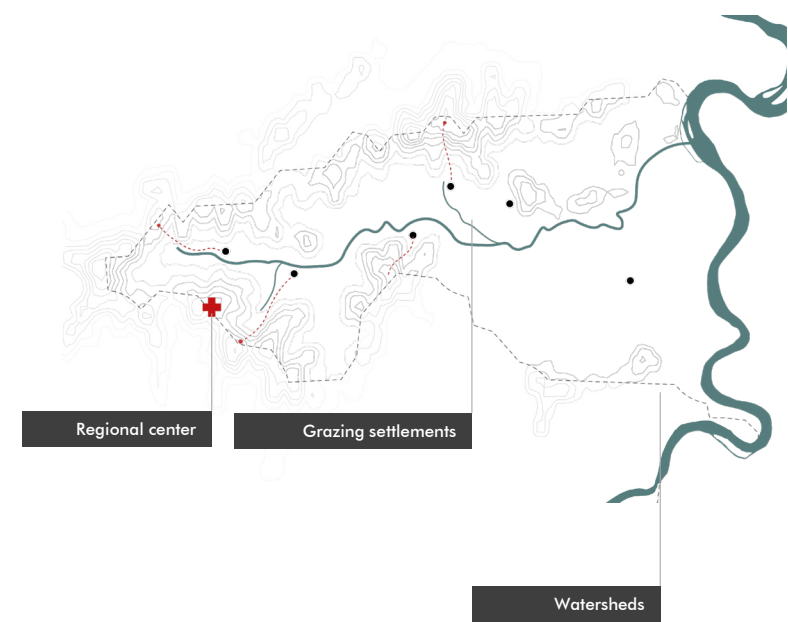
Minor Watershed and grazing settlements



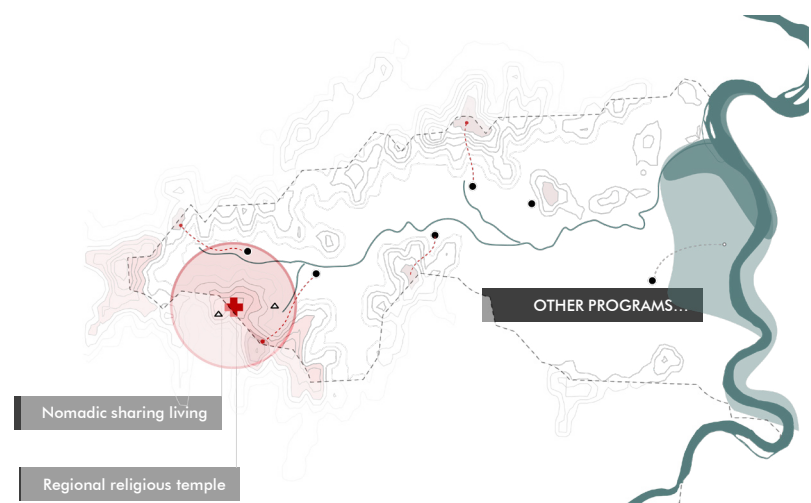
08 DESIGN STRATEGY

WATERSHED UNIT BASED SPATIAL PLANNING

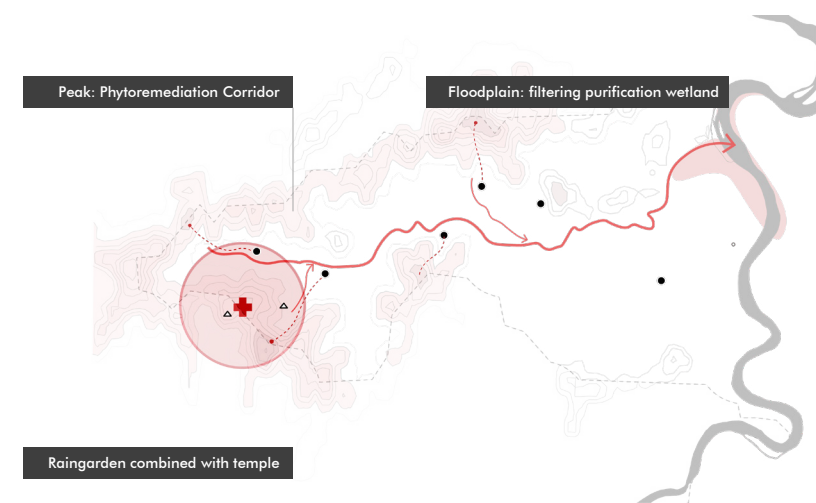
Impart programs to activate land ownship



1 ESTABLISH WATERSHED-BASED UNIT
Watershed-based planning takes into account the interconnectedness of ecosystems and recognizes the importance of maintaining these natural systems for both ecological and human health.



2 EMBED INDIGENOUS ORIENTED PROGRAMS
Embedding indigenous-oriented programs such as education, policy making, research and living functions in these and other areas can contribute to a more inclusive, equitable, and sustainable indigenous environment.



3 RAINWATER STORAGE & PURIFICATION SYSTEM
The system helps to purify the potentially chemical-polluted artificial rainfall and help locals to be accessible to clean water sources.

08 DESIGN STRATEGY

.2 GRAZING AS TERRAFORMING LANDSCAPE

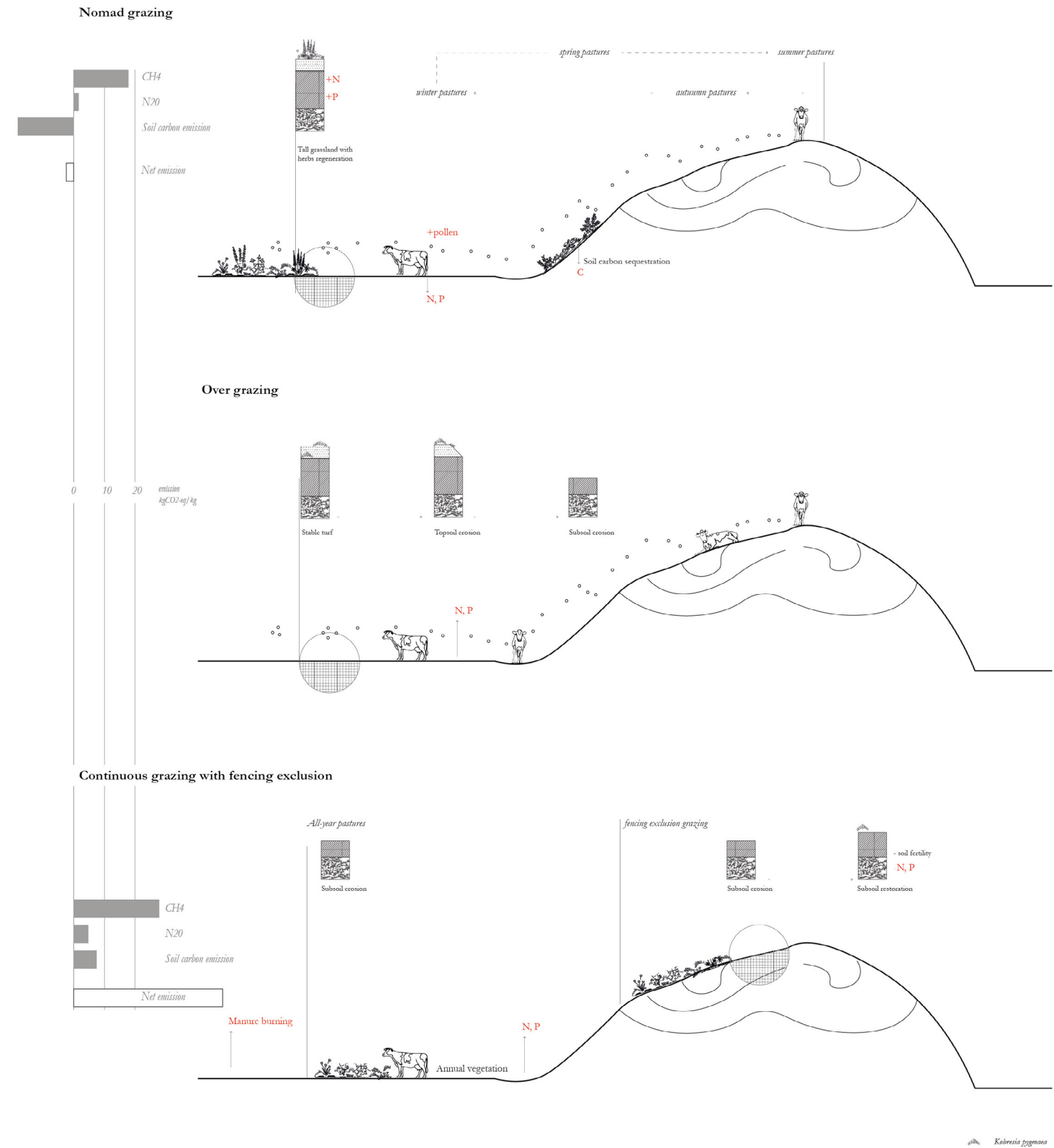
Learn from transhumance behaviour

Transhumance is a traditional practice of managing livestock by moving them between different grazing grounds based on the seasons, typically linked with changes in elevation. This migration is primarily driven by changes in temperature and the availability of fresh pasture and water.

In the summer months, as temperatures rise, pastures in the lower elevations can become too hot and dry for livestock, and the availability of fresh grass can decrease. To compensate for this, herders move their livestock to higher elevations, where temperatures are cooler, and fresh pasture is more abundant. This movement is not only beneficial for the livestock but also allows the lower-elevation pastures to recover and regenerate.

As the season changes to winter, and temperatures drop, these higher elevation pastures can become too cold, and may be covered with snow, making grazing difficult. As a result, livestock are moved back down to the lower elevations, where temperatures are milder, and fodder is more accessible.

Overall, the transhumance system is a way of adapting to the seasonal variability in climate and pasture availability associated with changes in elevation. By aligning livestock movements with these seasonal changes, herders can ensure a more constant supply of fresh pasture for their animals, while also minimizing the environmental impact of grazing.

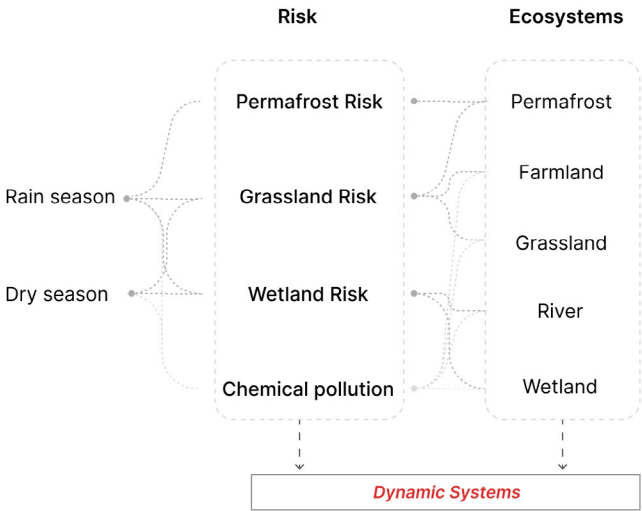


08 DESIGN STRATEGY

Risk Regional

Identify risk and potential of water distribution in different season

Viewing grazing as a powerful landscape tool to ecologically and socially can foster a sense of stewardship and ownership that can support long-term sustainability.



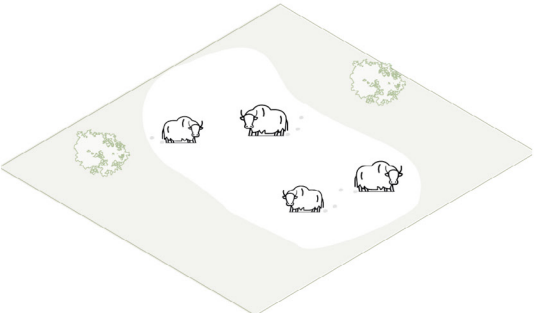
Grazing as terraforming tool

After determining the risk possibility of different levels of each ecosystem, we seek a productive way to restore the local ecology by means of rotational grazing, rest grazing and grazing.

Permafrost Anti-thawing grazing

Rotational grazing with the plantation of high quality forage and grain

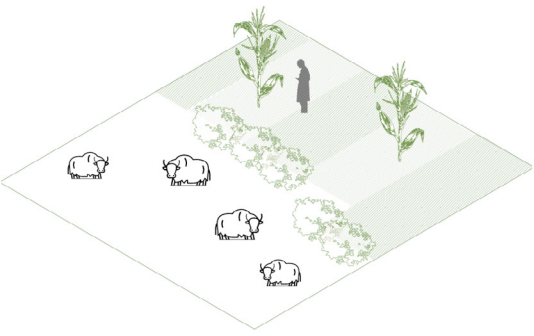
G1



Integrating Crop-livestock Production

Rotational grazing with the plantation of high quality forage and grain

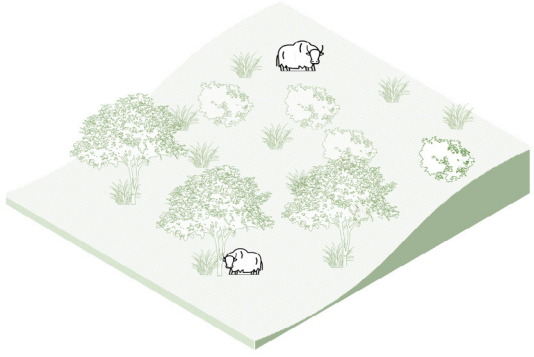
G2



Maintaining grassland diversity

Yaks, being selective grazers, can help maintain the diversity of plant species in the ecosystem by preventing the dominance of a few species.

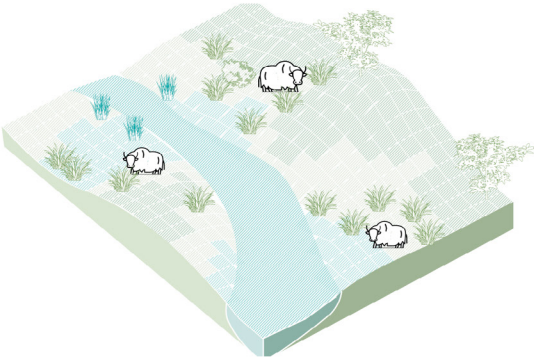
G3



Lowering flooding risk

Help discharge the exceeding flooding water while grazing in the certain location

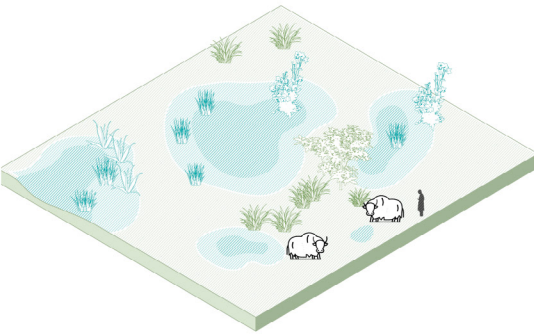
G4



Integrating Wetland vegetation-livestock restoration

The wetland ecosystem is envisioned to be complementary along with the grazing activity to support the restoration and long-term health of the wetland while also supporting the livelihoods of local communities who rely on grazing for their own economic sustainability.

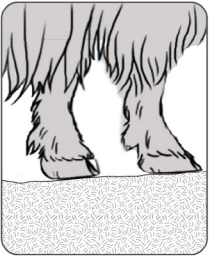
G5



Yak ecology

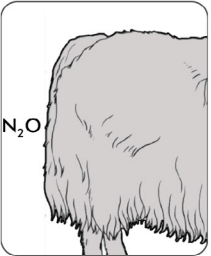
Yaks are well-suited to grazing in high altitude, cold and rugged terrain, and they have many helpful abilities that make them important to Tibetan grazing.

Movement & Compression



Yaks helps to widely spreads the seeds and compress them through movement to enable the restoration of vegetation.

Fertilize vegetation/crops



Yaks can help cycle nutrients within the ecosystem through their grazing and manure deposition, which can enhance soil fertility and support the growth of other plants.

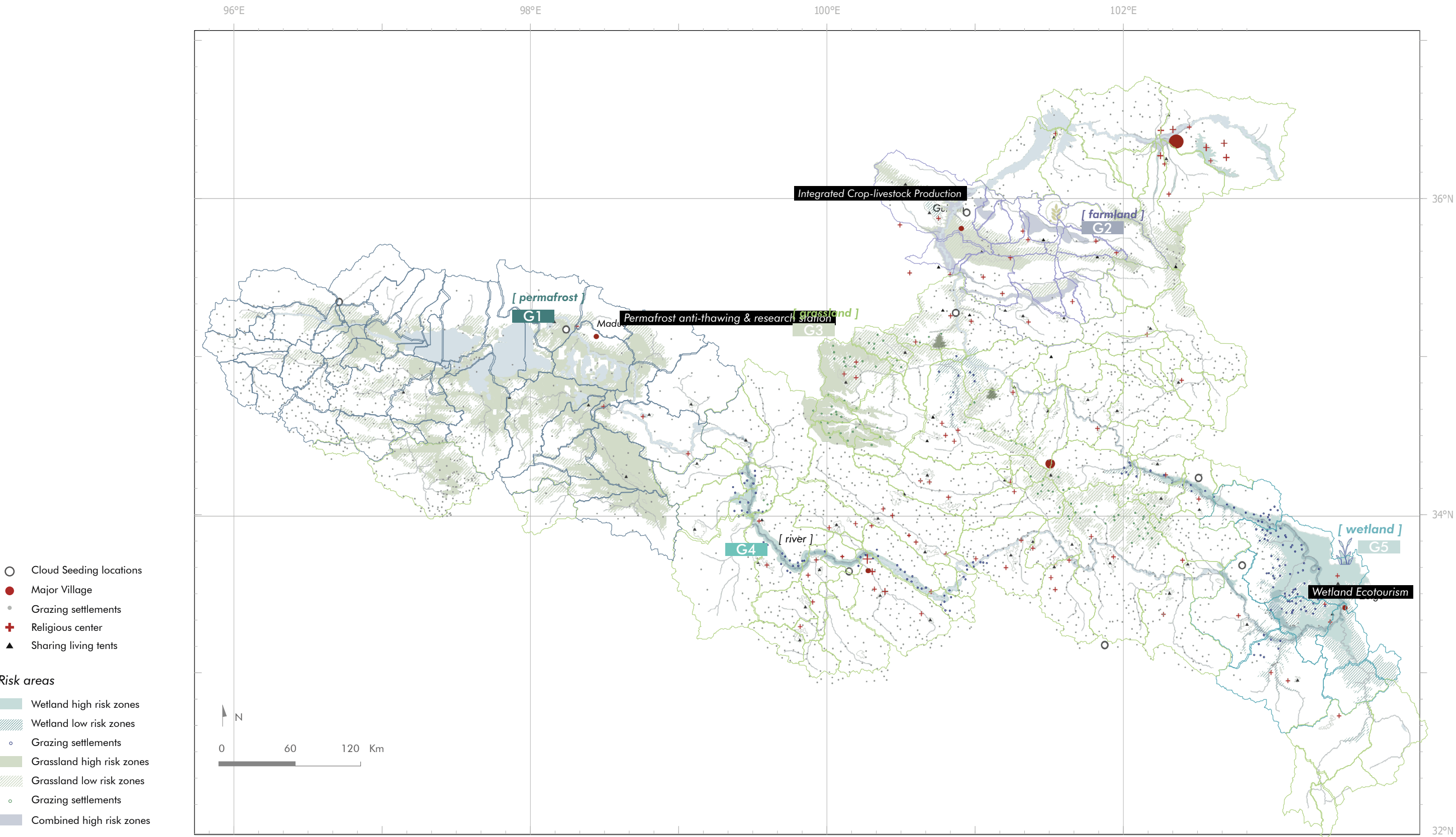
Grazing ability



Yaks are well suited for grazing on steep slopes and rugged terrain. They are able to move over rocky terrain and can graze on a variety of vegetation, including grasses, shrubs, and lichens.

08 DESIGN STRATEGY

RECOVERY PLAN



DETAILED DESIGN

Design framework

Levels of design

Yak economy

3 Sites

Zoige wetland ecosystem

- Section, plans, strategic phasing
- Technical purifying units, atmosphere rendering

- Watershed economic feasibility

Cainaihai farmland ecosystem

- Section, plan
- Diagram

- Watershed economic feasibility

Madoi permafrost ecosystem

- Section, plan

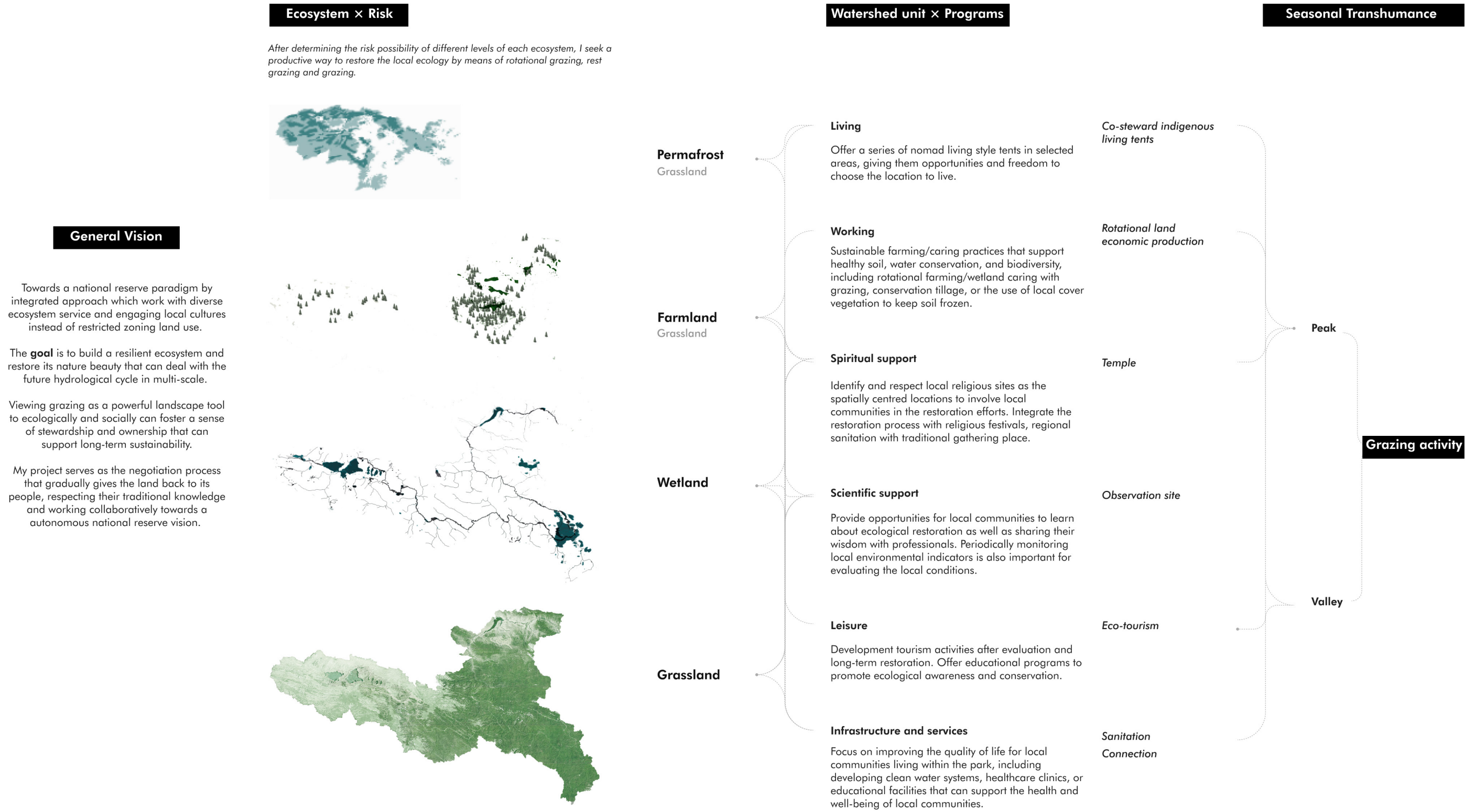
- Watershed economic feasibility

Project Conclusion

09.



Prayer flags are seen at Dokha Compa, the sole Tibetan monastery in the Yellow River nature reserve, in Madoi country Tibetan Autonomous Prefecture, Qinghai province, China August 31, 2019. REUTERS/Ryan Woo



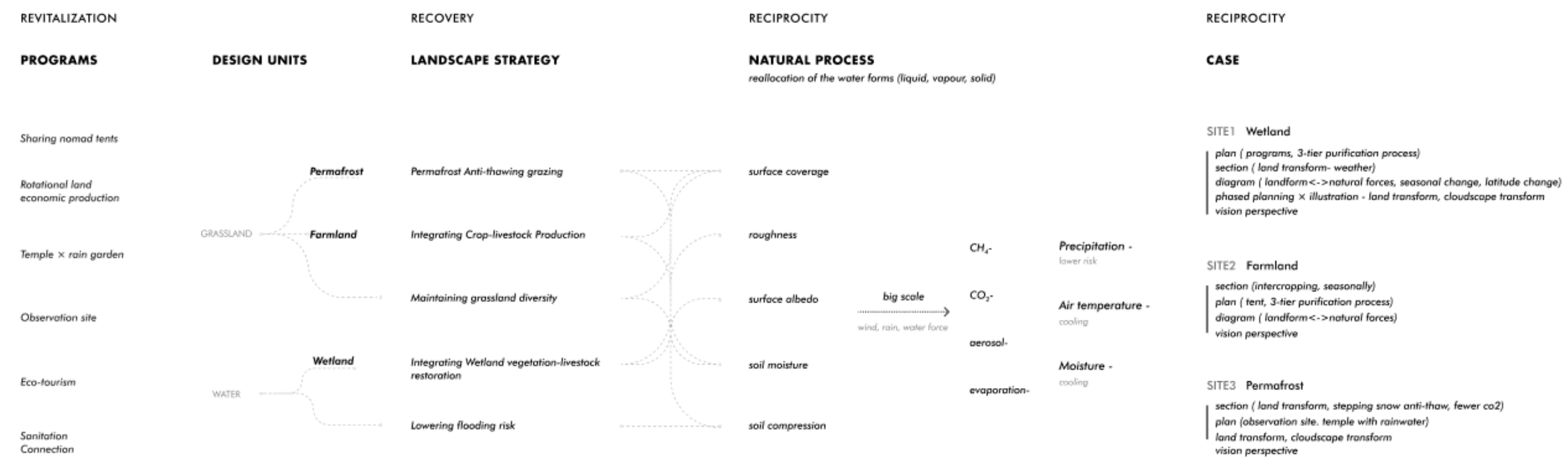
09 DETAILED DESIGN

.1 DESIGN FRAMEWORK

Urban and territorial design serves as a crucial field of synthesis, inspiring and negotiating change in science, practice and governance. The whole design is accompanied by Re-identify, Return and Revive. Practiced in different scales, latitudes and seasonal changes.

The largest scale in design is from Regional scale(Three Rivers Origin) to identify different geomorphic characteristics and re-identify its natural identity. This process is examined from the distribution of water in all forms (snow, rainfall, soil infiltration, wetlands, rivers) and identify their risks and potential in local environment.

Due to the variations of latitudes and morphology in site, it's divided into 3 parts: headwaters with wide valleys and steep slopes, Ruorge Basin where lays lots of wetlands and plains and the lower segment for



09 DETAILED DESIGN

.2 LEVELS OF DESIGN

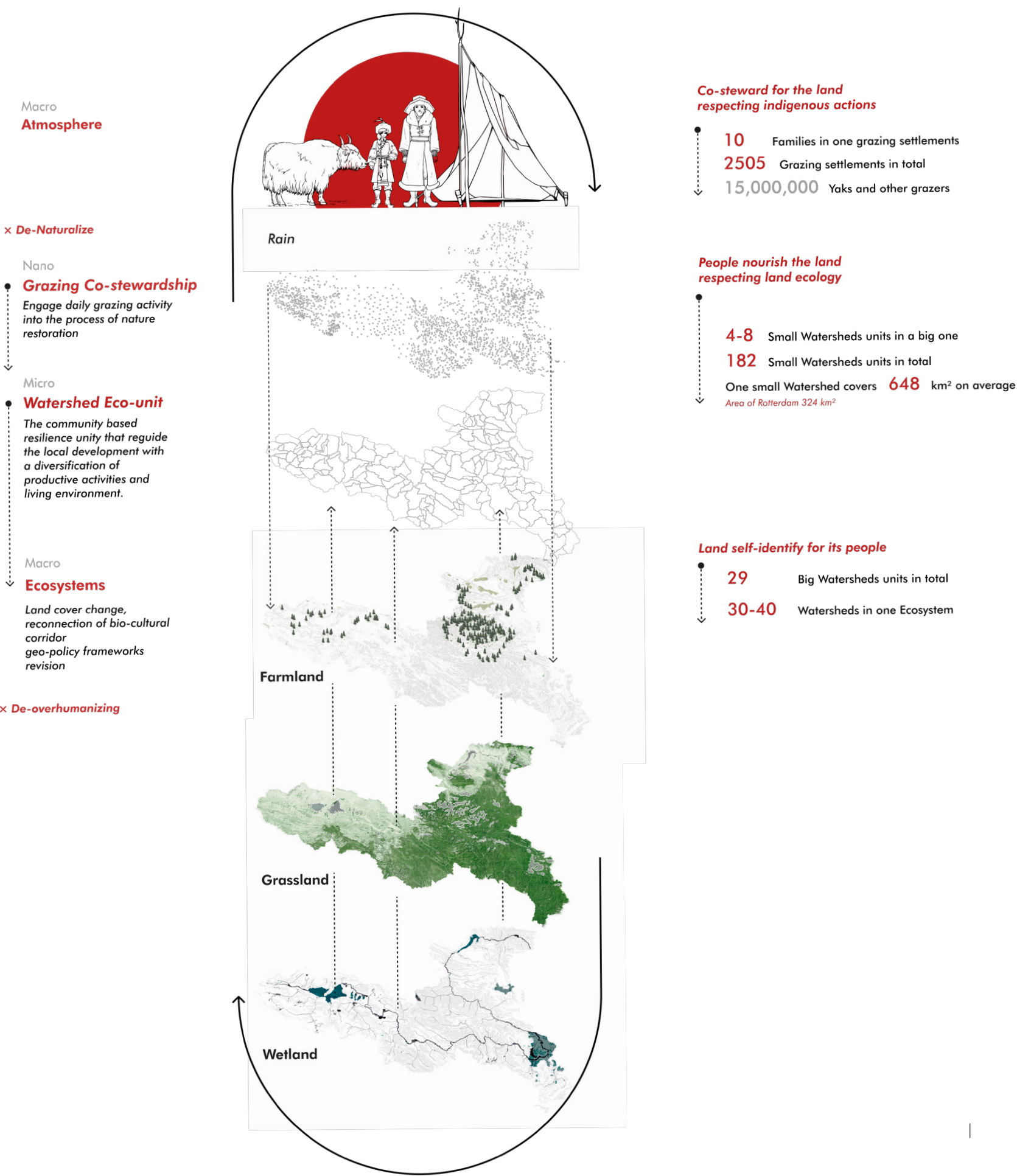
The concept of multi-scalar design encompasses a holistic approach that addresses various levels of spatial organization, from individual families to settlements, watersheds, and ultimately the larger ecosystem. It recognizes the interconnectedness and interdependencies between these scales, aiming to create a harmonious and sustainable relationship between human activities and the natural environment.

At the individual family scale, multi-scalar design emphasizes the importance of considering the needs and aspirations of each household. It focuses on designing functional and efficient living spaces that promote well-being and quality of life. This may involve incorporating sustainable building materials, energy-efficient systems, and innovative technologies that minimize environmental impact.

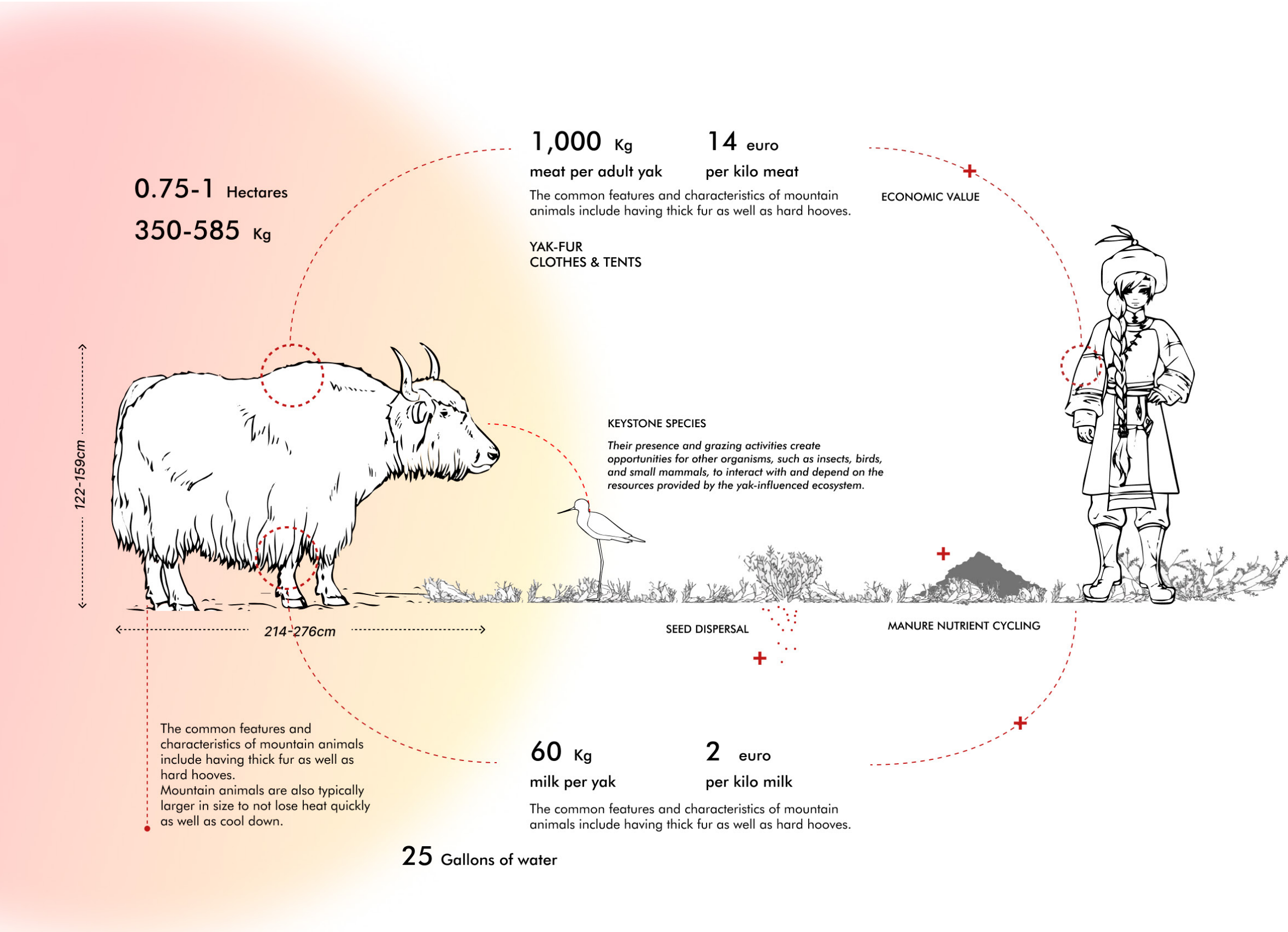
Moving to the settlement scale, multi-scalar design extends its scope to encompass the broader community and its built environment. It emphasizes the creation of livable and inclusive communities that foster social interaction, cultural preservation, and economic opportunities. This can be achieved through thoughtful urban planning, the integration of public spaces, the provision of essential services, and the promotion of local businesses.

Watershed scale takes into account the hydrological dynamics, water quality, and ecological processes within a specific watershed. This involves implementing strategies for sustainable water use, watershed restoration, and the protection of sensitive ecosystems. It also considers the impacts of human activities on water resources and seeks to promote responsible practices that ensure long-term water security.

At the largest scale, multi-scalar design addresses the big ecosystem perspective. It acknowledges the interconnectedness of different ecosystems and the need for their conservation and restoration. This may involve the establishment of protected areas, the preservation of biodiversity, and the promotion of ecological connectivity. By considering the larger ecological context, multi-scalar design aims to create resilient and sustainable ecosystems that support a wide range of flora, fauna, and ecological processes.



.3 YAK ECONOMY

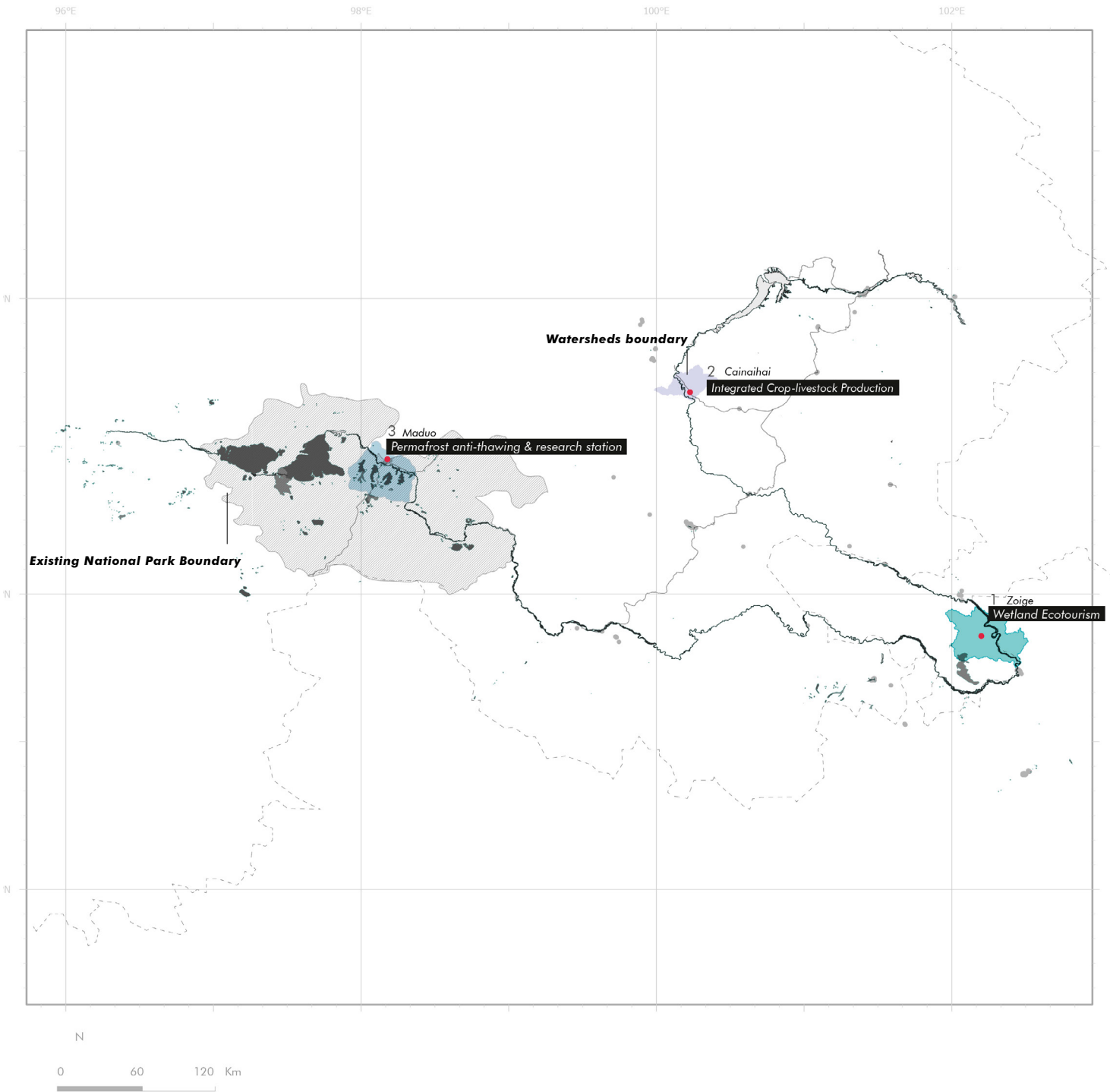


09 DETAILED DESIGN

.4 SITES

The regional scale will designed on 3 sites in each parts, focusing on different strategies. The aim is to find a way to return to the healthy hydrological cycle that Yellow river once had with the atmosphere. They will also be associated with productive pratices and sustainable economic activities to find a new way out for the local community.

Different local intervantions will be performed regarding the risks and potential of the natural capitals in order to achieve a dynamic equilibrium that acknowledges the landscape eco-services, socio-cultural value, local identity and collective agency.





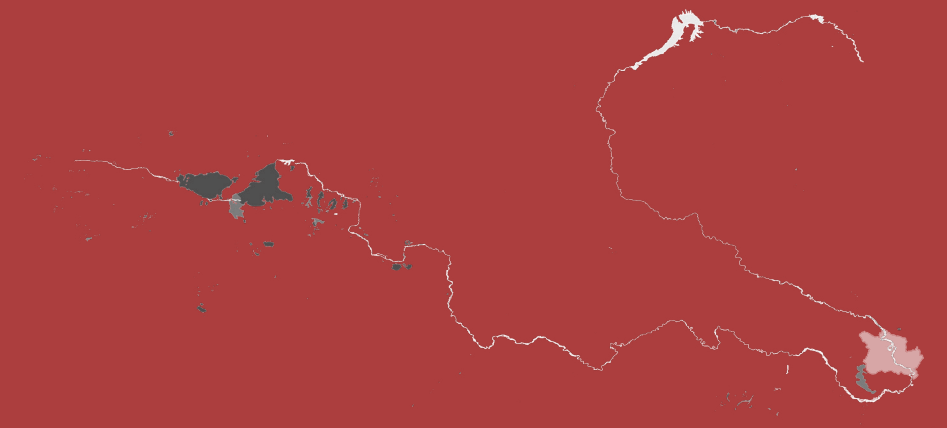
ZOIGE WETLAND ECOSYSTEM

若尔盖

The re-design of wetland ecosystems can not only benefit the environment but can also empower local communities to take ownership of their land and become active stewards of their natural resources.

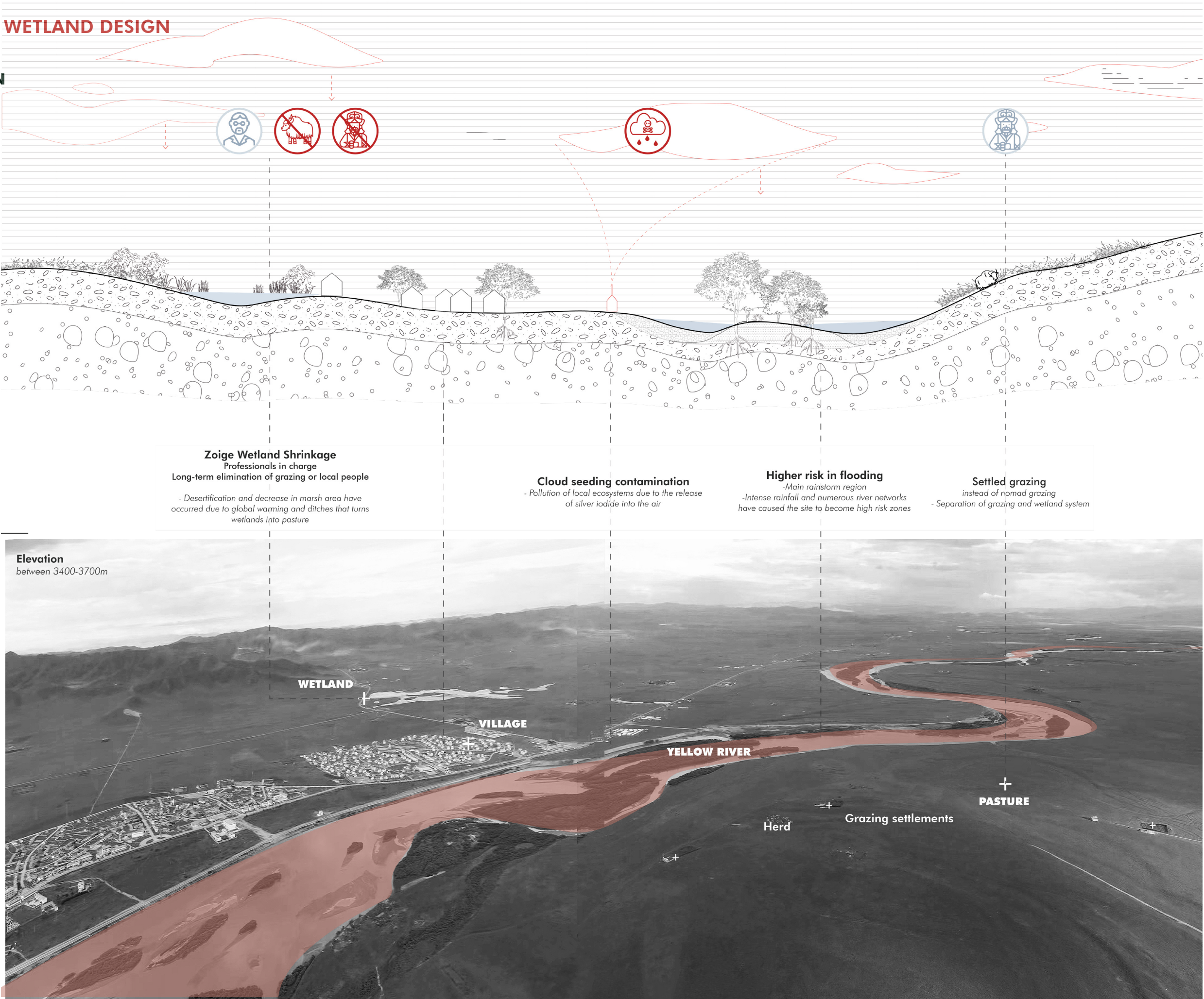
This suggests a strategic approach to ecological restoration, where livestock grazing is used as a tool to improve the health and function of wetland ecosystems. The specific methods - including controlling where and how intensely livestock graze, improving water flow, constructing artificial waterways, and establishing vegetation buffers - are all tactics aimed at enhancing the wetland environment.

The indigenous communities were engaged in every step of the wetland restoration process, from the planning and design phase to the implementation and ongoing maintenance. This collaborative approach helps to ensure that the project meets the needs and priorities of the local community, and that they are invested in its success. By involving local residents in the restoration process, they become more invested in the project's success and are more likely to take on an active role in the ongoing stewardship of their land.



TYPICAL WETLAND SECTION

This is section shows a general section of the regional scale in the wetland ecosystem part.
Because the terrain is relatively gentle, the nomads in this region do not move much in elevation.



DESIGN PRINCIPLES WETLAND DESIGN

Local pastoral communities may engage in practices such as agroforestry or the planting of crops alongside livestock grazing areas. These practices can help to increase soil fertility and provide additional sources of food and income for the community.

PHYTO-PURIFICATION

FILTERING FLOODPLAIN

500 m



173

WETLAND SECTION

The wetland ecosystem will be carefully designed to enhance its natural functions, such as water absorption and flood control, it is possible to create a more resilient ecosystem that can provide important ecological services for the surrounding community.

CONNECT WETLAND SYSTEM

Connection of wetland system with the help of grazing

SHAPE WETLAND SYSTEM

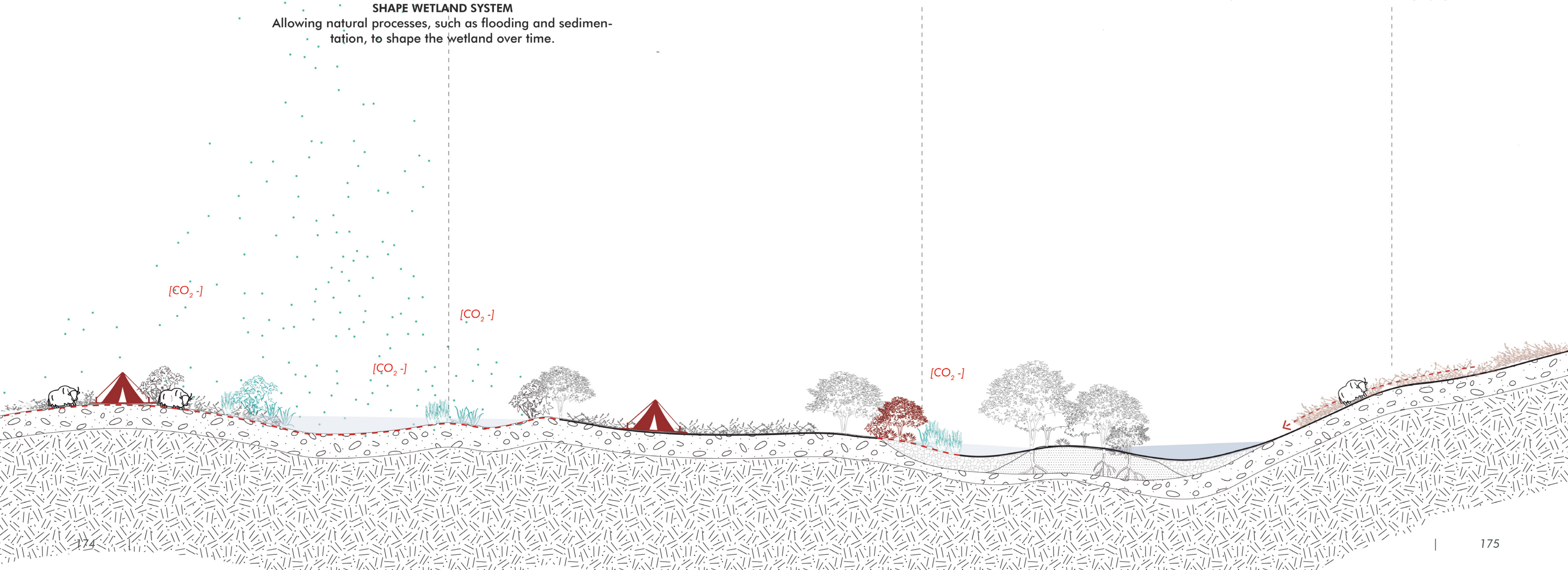
Allowing natural processes, such as flooding and sedimentation, to shape the wetland over time.

FILTERING FLOODPLAIN

naturally filtered by the plants and soils in the wetland, which remove pollutants such as sediment, nutrients, and other contaminants from the water

PHYTO-PURIFICATION VEGETATION

Contaminated water are purified by plants that are chosen for their ability to absorb and remove specific pollutants from the water through phytotransformation.



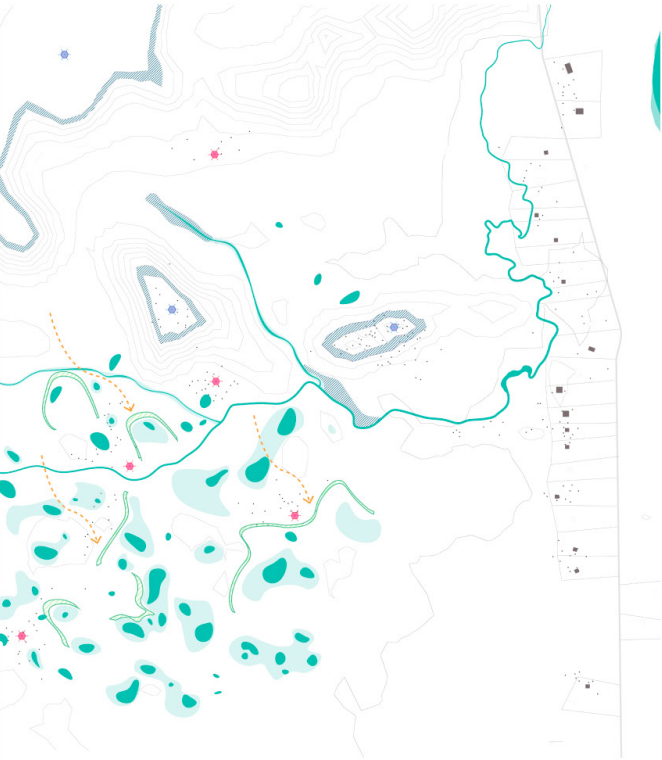
STRATEGIC PHASING

CURRENT 2020



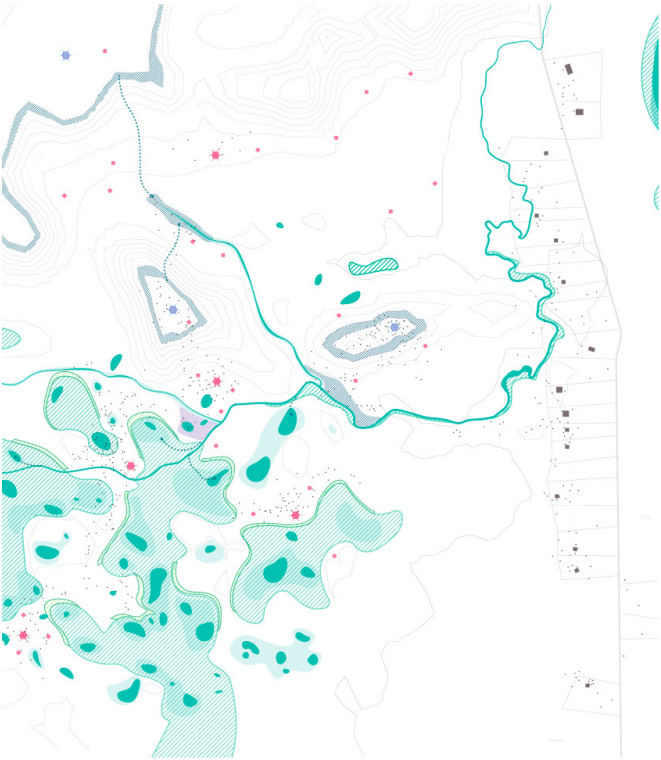
wetlands

RECOVERY 2025-2030



wetland overflow
major wind direction
vegetation buffer
indigenous community
phytoremediation corridor
nomads

2030-2035



wetland overflow
vegetation buffer
indigenous community
phytoremediation corridor
nomads
filtering artificial wetland
grazing ditch

RECIPROCITY 2035



wetland overflow
vegetation buffer
indigenous community
phytoremediation corridor
nomads
filtering artificial wetland
wetland passage

Settled grazing
Risk of flooding

Dry season: Practice nomadism
Grazing in specific areas to connect wetland system
Wet season: Settled grazing
Plant local wetland vegetation to lower the flooding risk
Phytoremediation corridor to purify chemicals

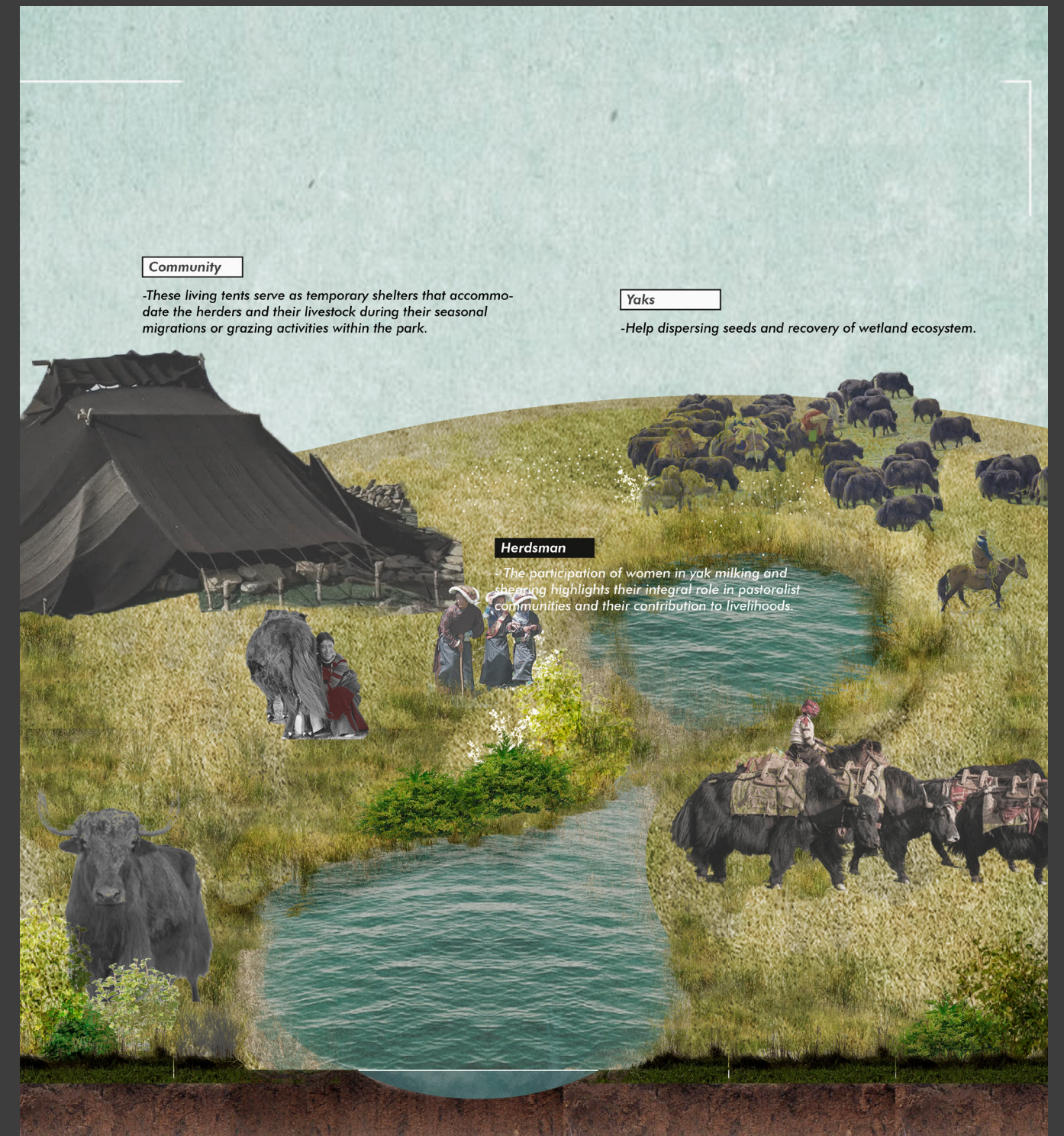
Grazing ditches to drain excess water
Larger extent of recovery

Large areas of nomadism are allowed in all seasons
Start of eco-tourism with respect to local grazing activities and wetland ecosystems

PHASING



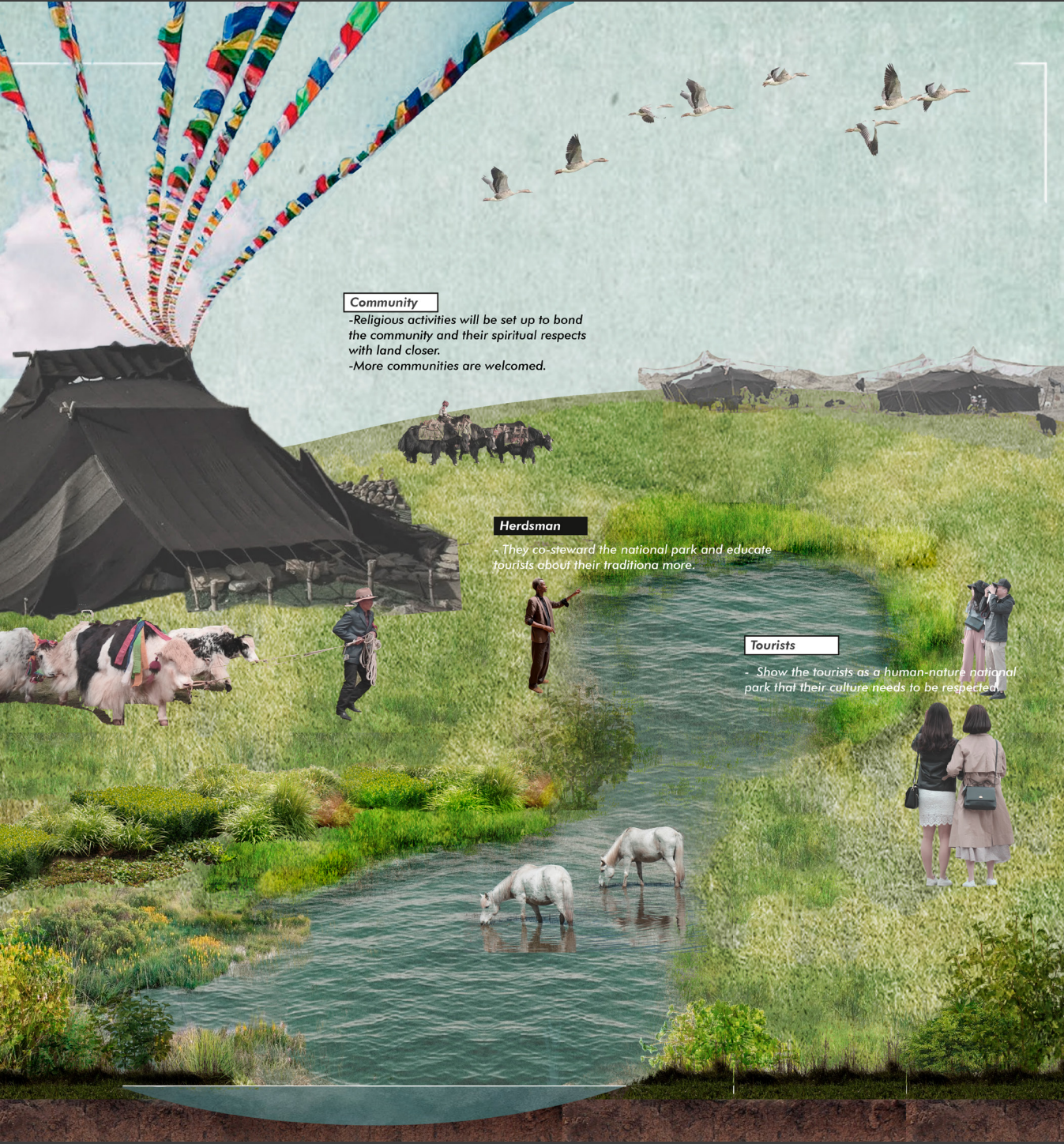
CURRENT 2025



RECOVERY 2025-2030



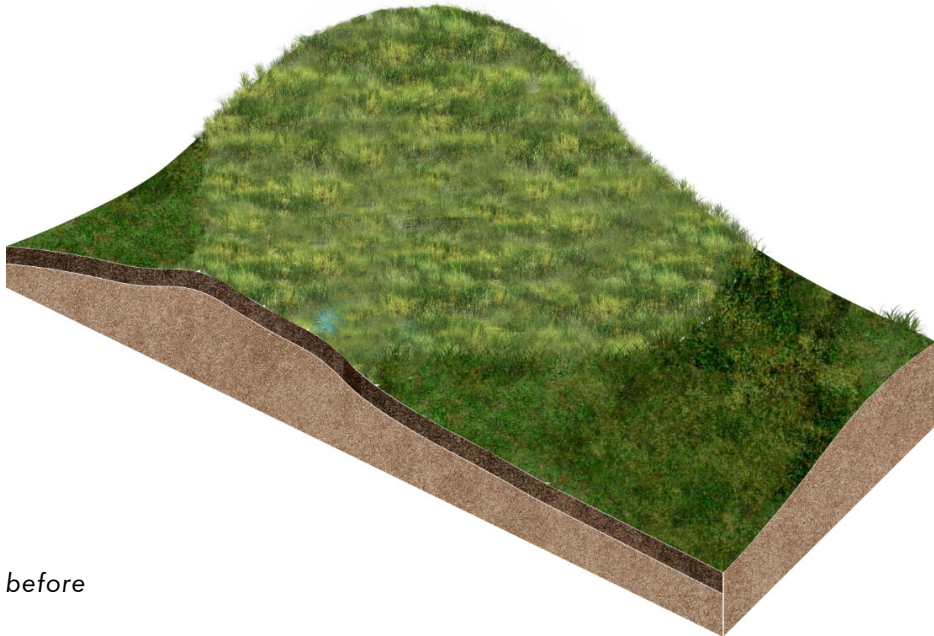
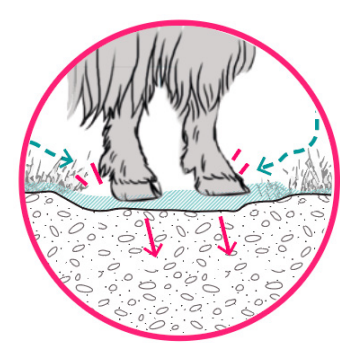
RECOVERY 2030-2035



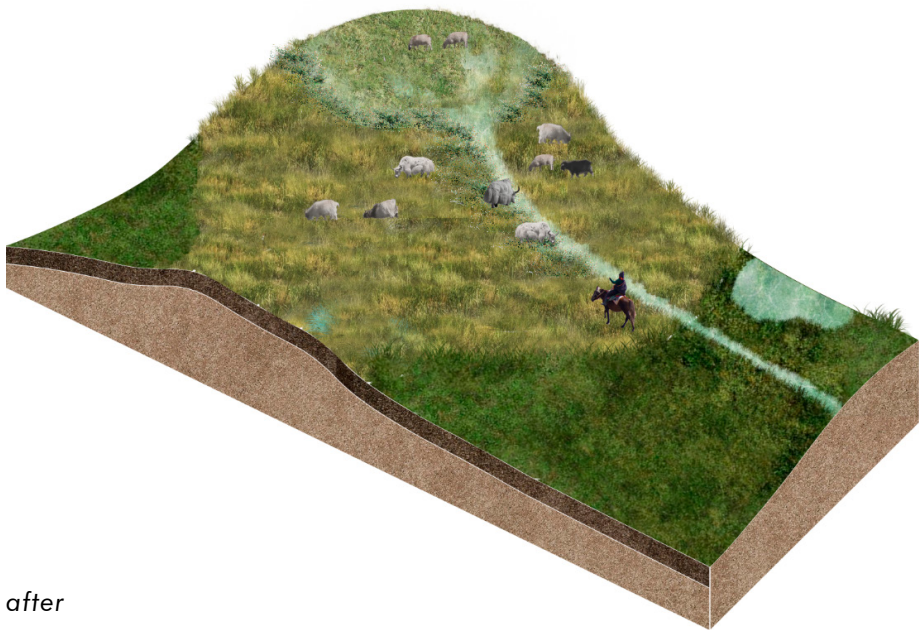
RECIPROCITY 2035-2040

TECHNICAL UNIT PURIFYING CONTAMINATED RAINFALL

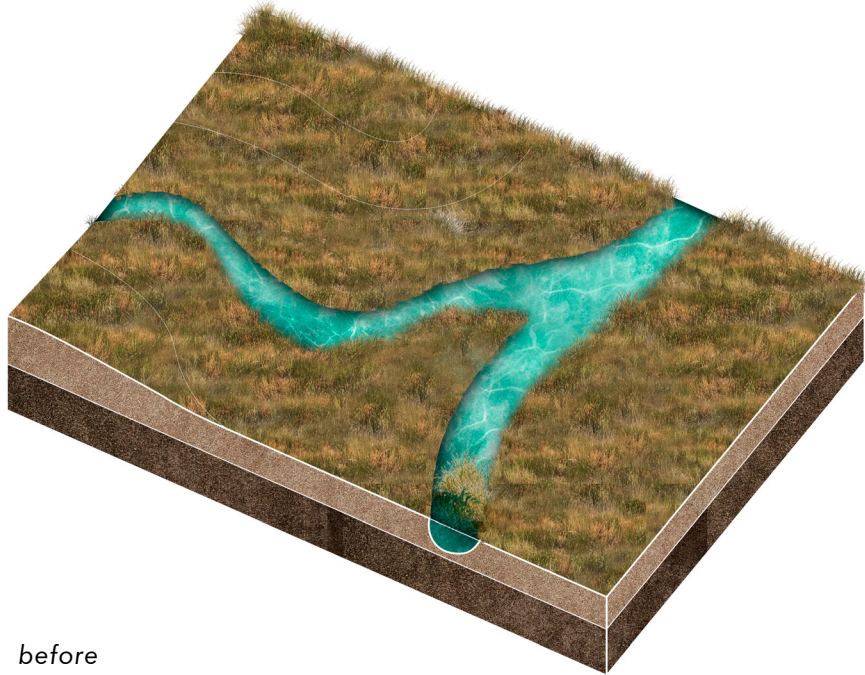
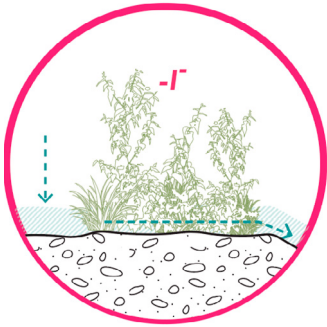




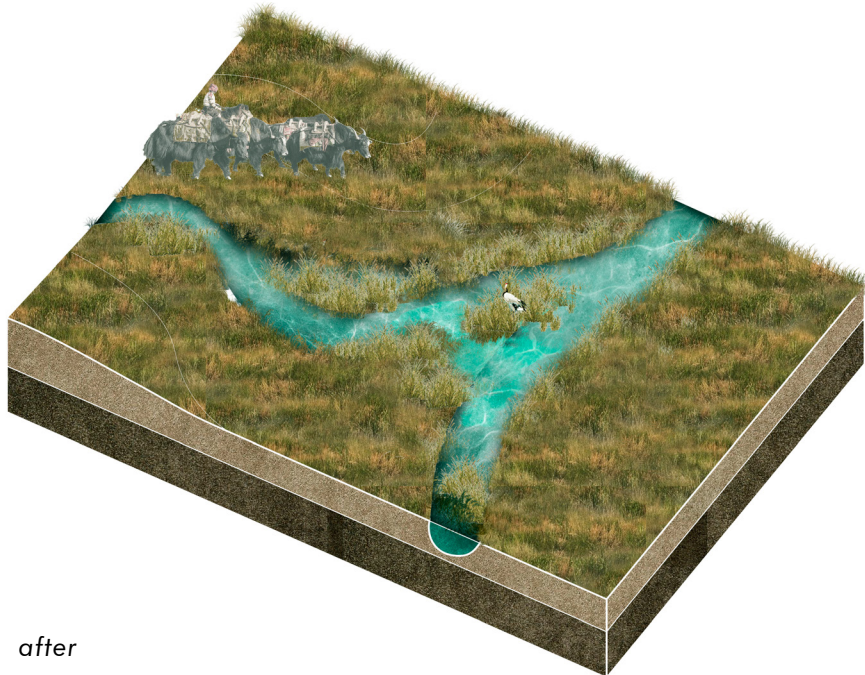
before



after



before



after



SPRING

The sharing tents on their nomads route provides local communities a place to engage in the traditional ways of living.



SUMMER

This season suffers from the most heavy rain and therefore, the wetland system is designed to lower flooding risks as well as trap and retain sediment that is carried by rain water.



AUTUMN

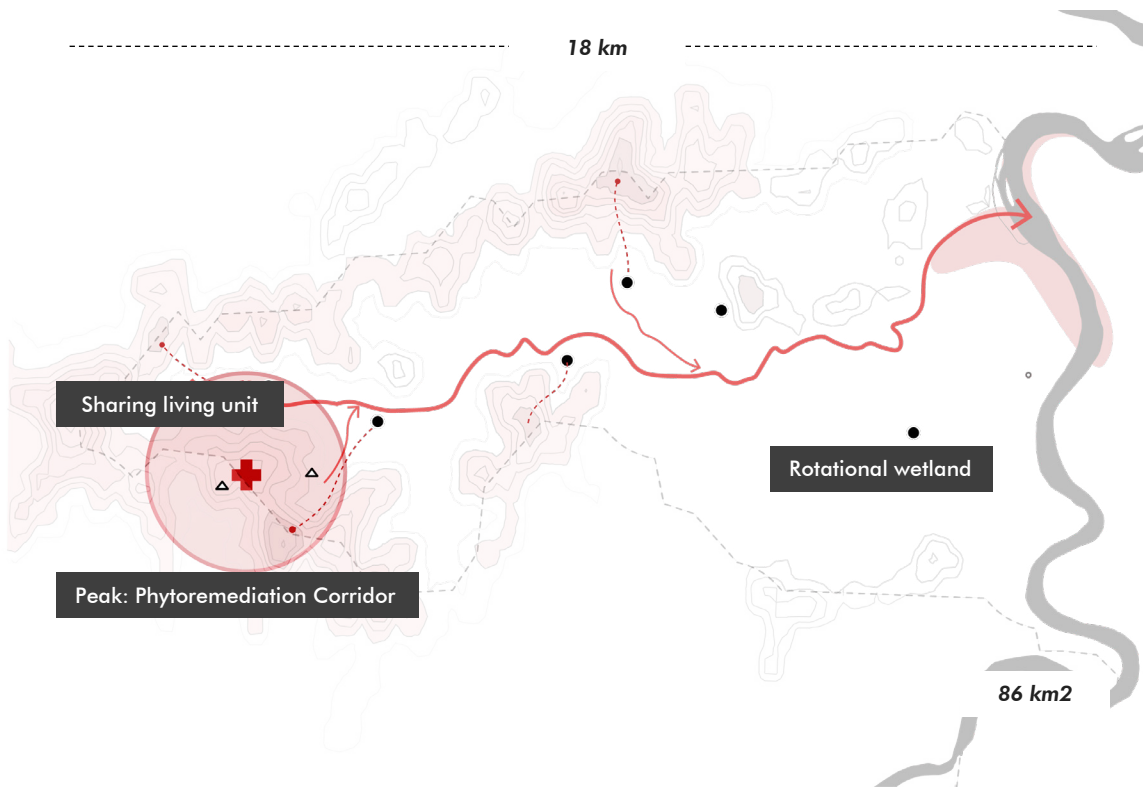
In the season of spreading seeds and grazing on plants, yaks help to maintain open areas that are important for seed dispersal and regeneration. They may also help to control the growth of invasive plant species, which can outcompete native plants and disrupt the balance of the ecosystem.



WINTER

Religious activity and monks in winter.

WETLAND WATERSHEDS UNIT



Wetland Unit
Living, religious temple , purification, working

Area	86 km2
Family	376 mu
Density	70 Families/ km2
	10 Yaks and 10 sheep/ family
Subsidy	6 yuan per mu

There was about 10 yaks and 10 sheep per family in total
But only 2.5 yaks and 5 sheep can be sold every year
Which accounts for 32,850 yuan income for each family (4,692 euro)

The Chinese government currently gives herders a grazing ban subsidy of 6 yuan per mu and a grass-livestock balance subsidy of 2.5 yuan.
One family theoritically has 376 mu land, which can have grazing ban of 2,256yuan and 940 yuan grass-livestock balance subsidy.

In my current deisgn plan :
Each animal before has 0.3 hectares of area for grazing, which is below the recommending average of 0.5 hectares of area for grazing
In total the area has to reduce 4000 yaks and 5,000 sheep which is to reduce 2 yaks and 3 sheep per family
Which accounts for 6,750 yuan income loss for each family (964 euro)

But this can be compensate if the eco-tourism arise and the country reward the region`s people with ecological recovery fee.
The survey shows that the average economic income of each Sanjiangyuan tourist to the region is 2,000 yuan per tourist. Ruorgeri received 1.64 million visitors in the whole county.

There will be estimated 5,000 tourists come to the region for one single year and each family has 50 tourism group in a year for example. So that will be an income of over 10,0000 per family.

If the government also gives the family for landscape recovery compensate for 10 yuan per subsidy, thwn there will be 3760 yuan.

Citations

¹ Acknowledgement for the data support from "National Earth System Science Data Center, National Science & Technology Infrastructure of China. (<http://www.geodata.cn/>)"
² The data set is provided by National Tibetan Plateau Data Center (<http://data.tpdc.ac.cn/>)

So an avergae family income in Zoige wetland will be:
32,850 + 2,256 + 940 - 6,750 + 10,000 + 3760= 43,056 yuan (5,800 eruo)



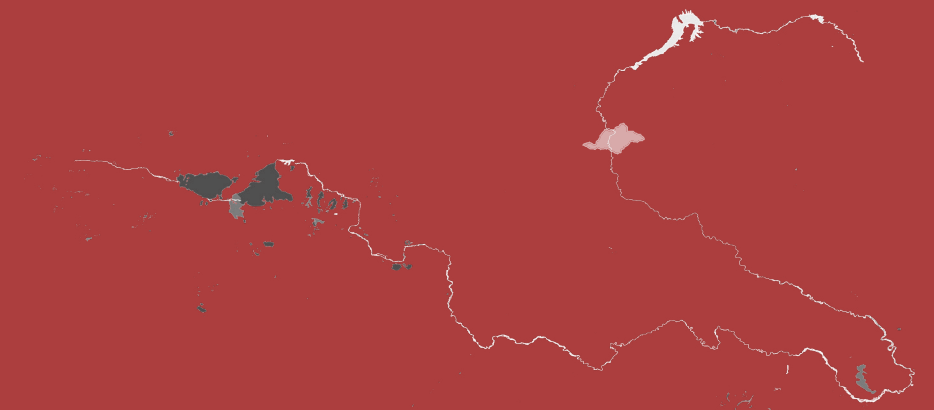
CAINAIHAI FARMLAND ECOSYSTEM

才乃亥

The re-design of wetland ecosystems can not only benefit the environment but can also empower local communities to take ownership of their land and become active stewards of their natural resources.

This suggests a strategic approach to ecological restoration, where livestock grazing is used as a tool to improve the health and function of wetland ecosystems. The specific methods - including controlling where and how intensely livestock graze, improving water flow, constructing artificial waterways, and establishing vegetation buffers - are all tactics aimed at enhancing the wetland environment.

The indigenous communities were engaged in every step of the wetland restoration process, from the planning and design phase to the implementation and ongoing maintenance. This collaborative approach helps to ensure that the project meets the needs and priorities of the local community, and that they are invested in its success. By involving local residents in the restoration process, they become more invested in the project's success and are more likely to take on an active role in the ongoing stewardship of their land.



PASTORALIST COMMUNITIES CULTIVATED LANDSCAPE

Local pastoralist communities may engage in practices such as agroforestry or the planting of crops alongside livestock grazing areas. These practices can help to increase soil fertility and provide additional sources of food and income for the community.

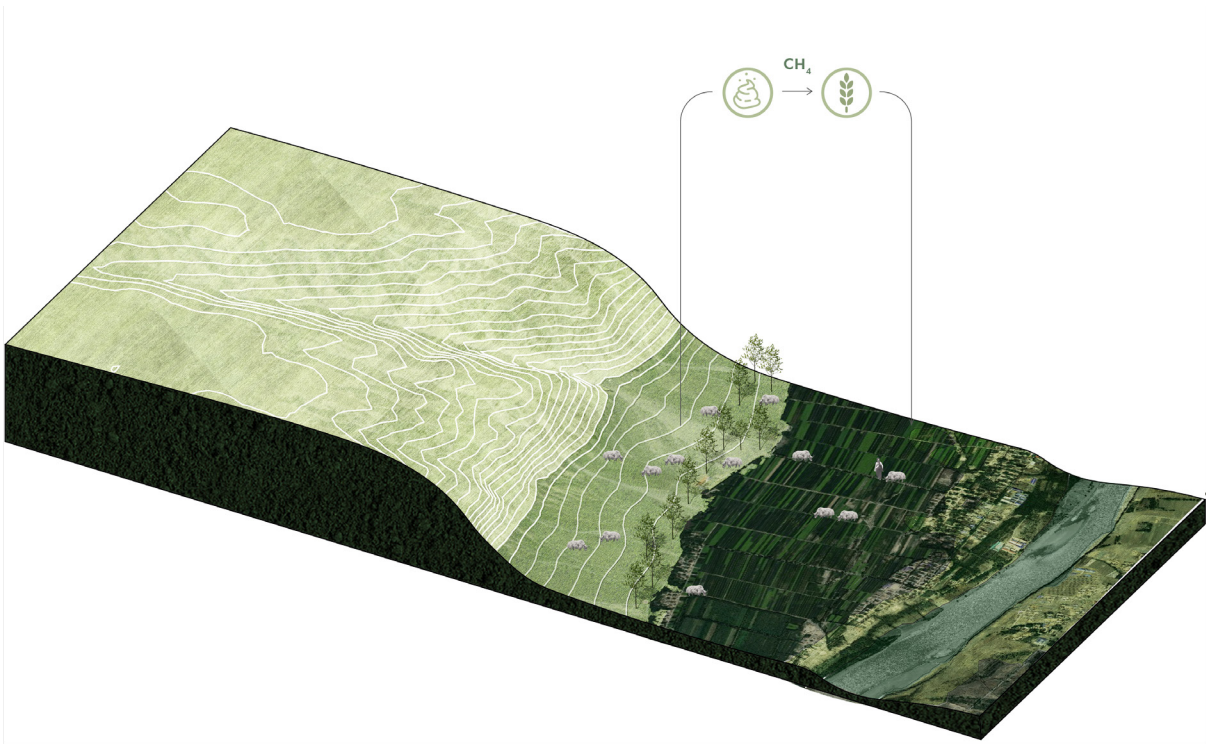


LIVESTOCK – BARLEY CULTIVATED LANDSCAPE TIMESPAN

Practicing livestock-barley production in Qinghai involves planting barley in the spring, allowing livestock to graze on the fields during the summer, and harvesting and processing the crop in the fall for use as winter feed. The yearly schedule outlined above provides a basic overview of the key steps involved in this agricultural practice.

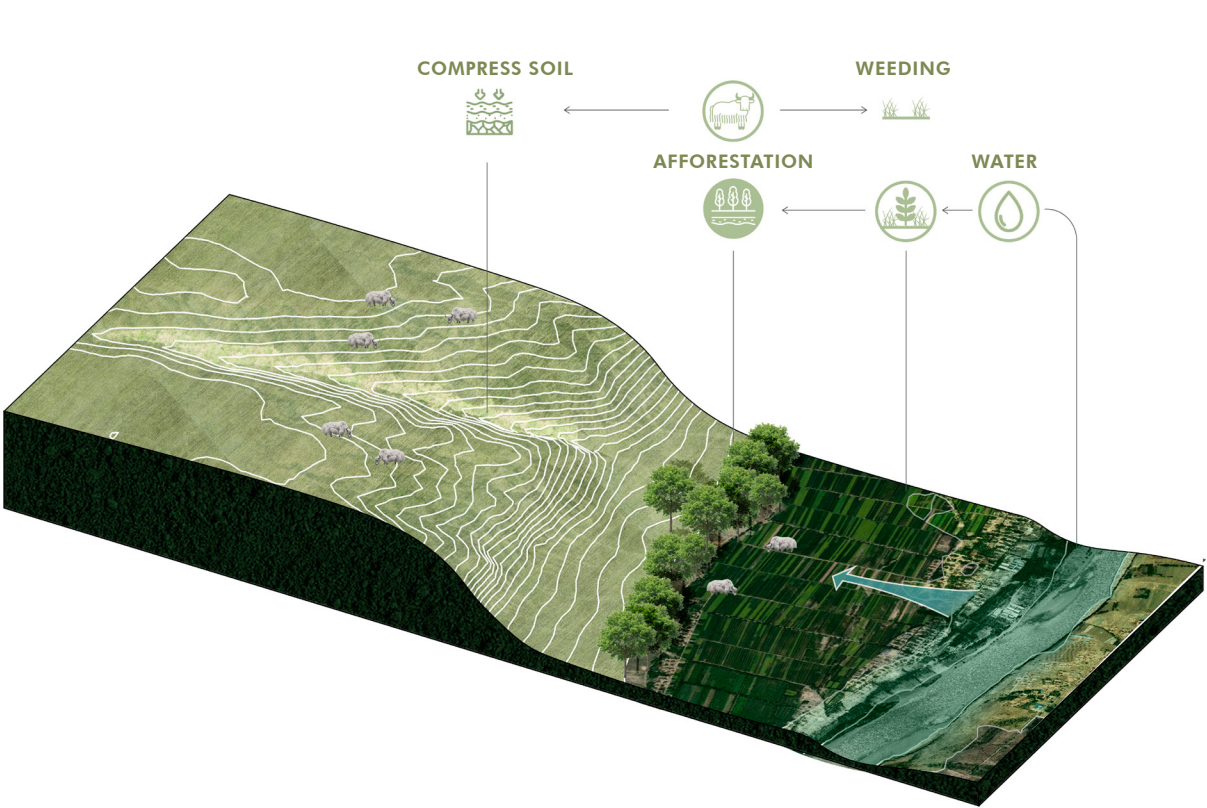
SPRING

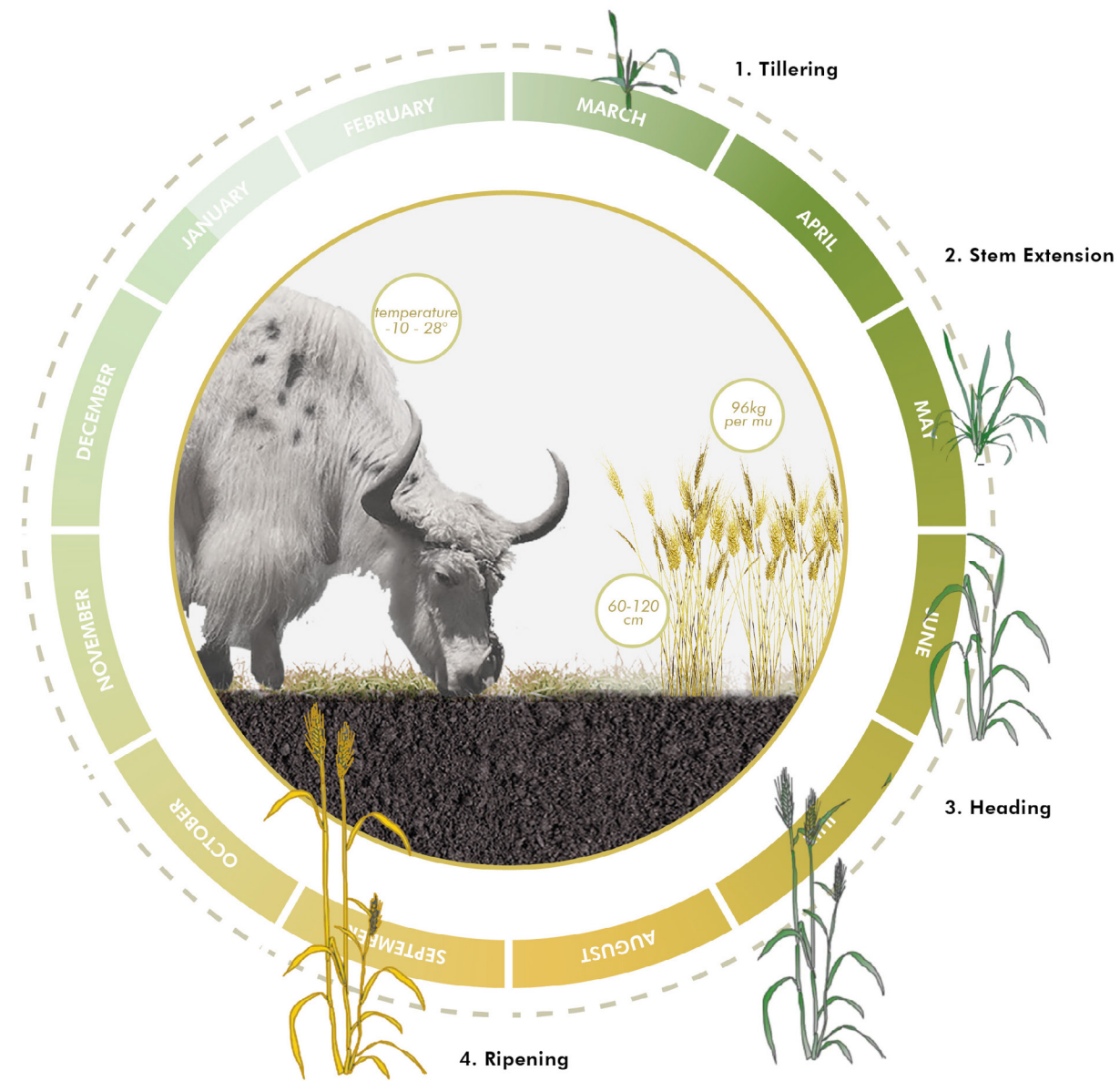
The animal manure will be used to fertilize the plantation of barley as well as afforestation.



SUMMER

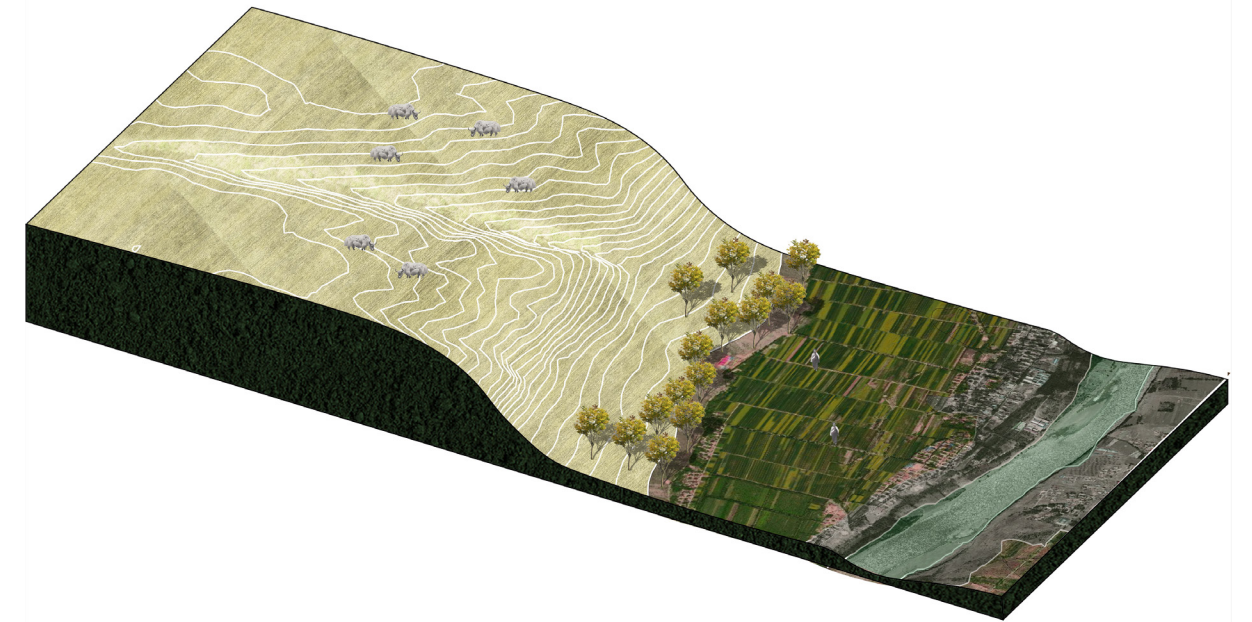
Livestock graze on the barley fields. Grazing helps to control the growth of the barley plants, preventing them from becoming too tall and weeding.





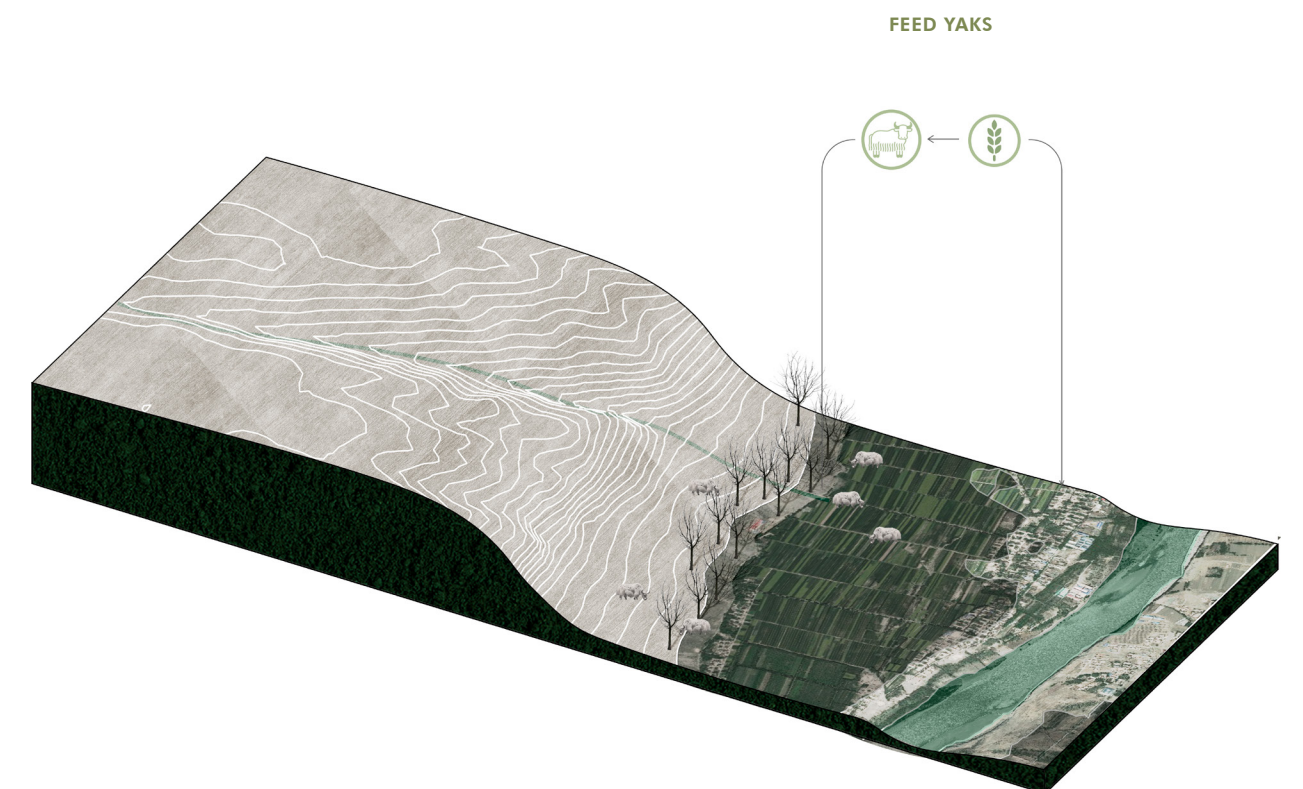
AUTUMN

In the fall (September-October), the barley crop is ready for harvest. Local community can also gain economic profits from barley.

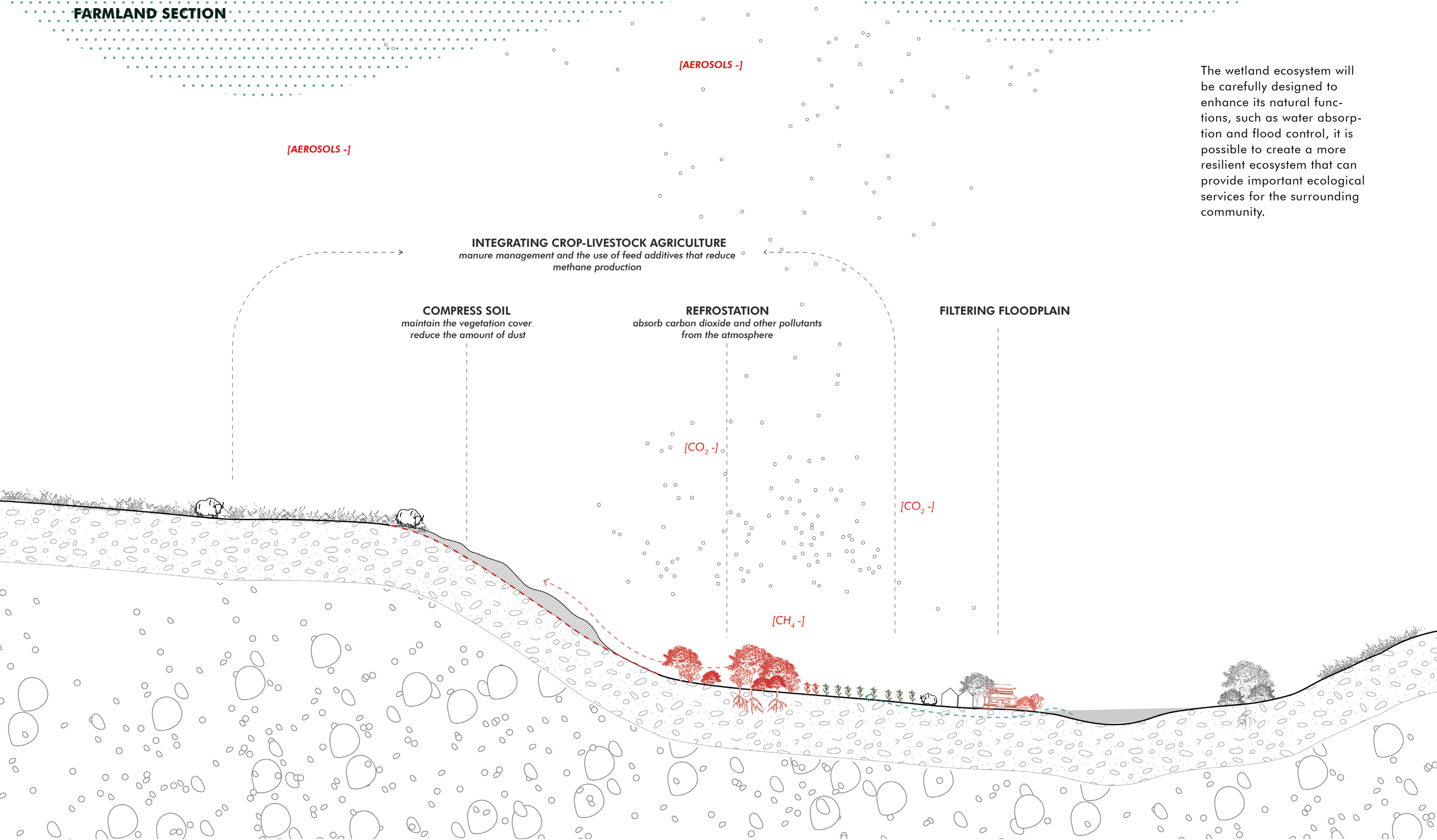


WINTER

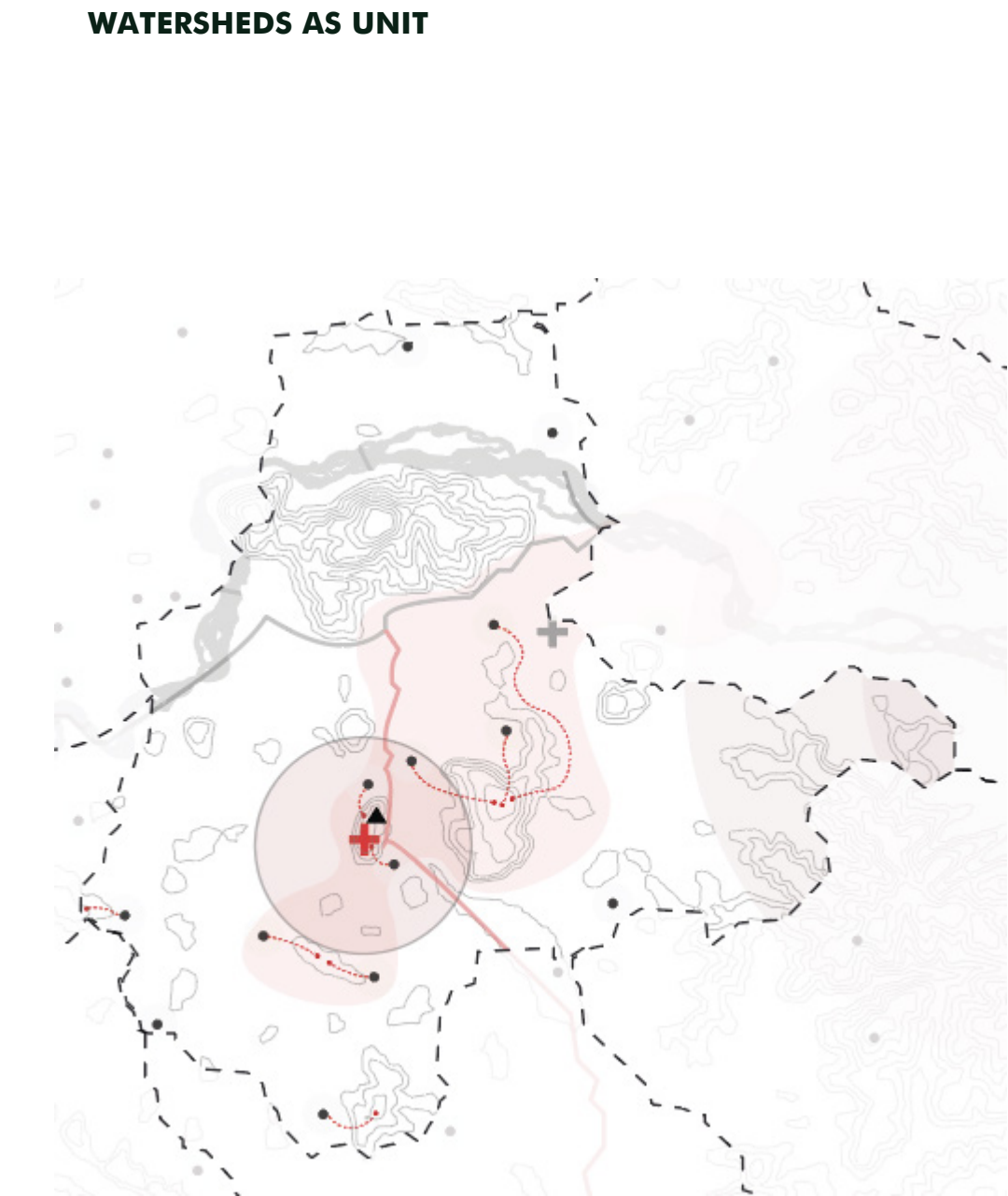
The processed barley is then fed to livestock during the winter months (November-February), when forage is scarce and the animals need extra nutrition to survive the cold weather.



FARMLAND SECTION



The wetland ecosystem will be carefully designed to enhance its natural functions, such as water absorption and flood control, it is possible to create a more resilient ecosystem that can provide important ecological services for the surrounding community.



There was about 8 yaks and 1 sheep per family in total
7,302 families in total, 9657 km² (14485500mu)
But only 2 yaks and 0.5 sheep can be sold every year
Which accounts for 21.835 yuan income for each family (4,692 euro)

The Chinese government currently gives herders a grazing ban subsidy of 6 yuan per mu and a grass-livestock balance subsidy of 2.5 yuan.
One family theoretically has 506 mu land, which can have grazing ban of 3,306 yuan and 1,256 yuan grass-livestock balance subsidy.

In my current deisgn plan :
Each animal before has 2.1 hectares of area for grazing, which is above the recommending average of 0.5 hectares of area for grazing

The economic value of barley are estimated as 15,000 yuan per family per year and an estimate of growth by 5,000 yuan,

If the government also gives the family for landscape recovery compensate for 10 yuan per subsidy, there there will be 5060 yuan.

So an avergae family income in farmland will be:
21,835 + 3306 + 1256 + 5000 +5060=36,457 yuan (4,860 eruo)

Citations

¹ Acknowledgement for the data support from
"National Earth System Science Data Center,
National Science & Technology Infrastructure
of China. (<http://www.geodata.cn/>)"
² The data set is provided by National Tibetan
Plateau Data Center (<http://data.tpdc.ac.cn/>)

Area	148 km ²	Barley area	5 km ²
Family	506 mu		
Density	45 Families/ km ²		
	8 Yaks and 1 sheep/ family		
Subsidy	6 yuan per mu		
Recommendation			
Add Barley	5 km ² (+ 5,000yuan)		
Subsidy	10 yuan per mu for landscape recovery		



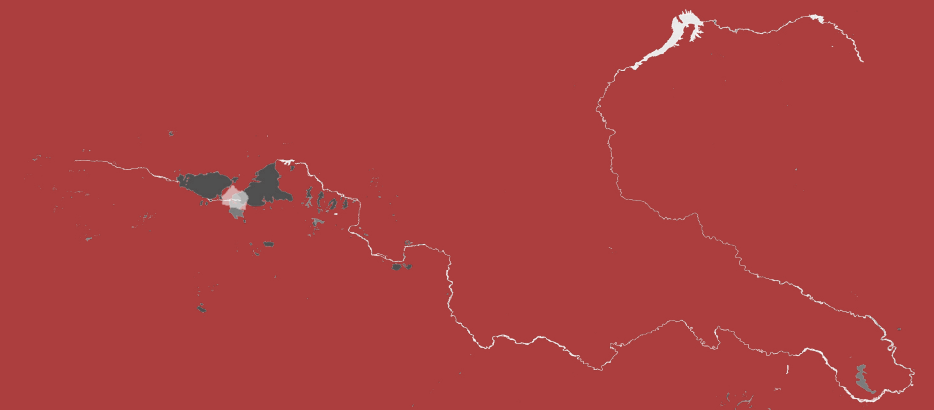
MADOI PERMAFROST ECOSYSTEM

玛多

In order to propose a synergetic strategy for managing water resources, it is important to have a good understanding of the future hydrological cycle. This can be estimated by calculating the percentage of atmospheric water resources that are not converted to rain, as well as the amount of precipitation that is expected at each location in the future.

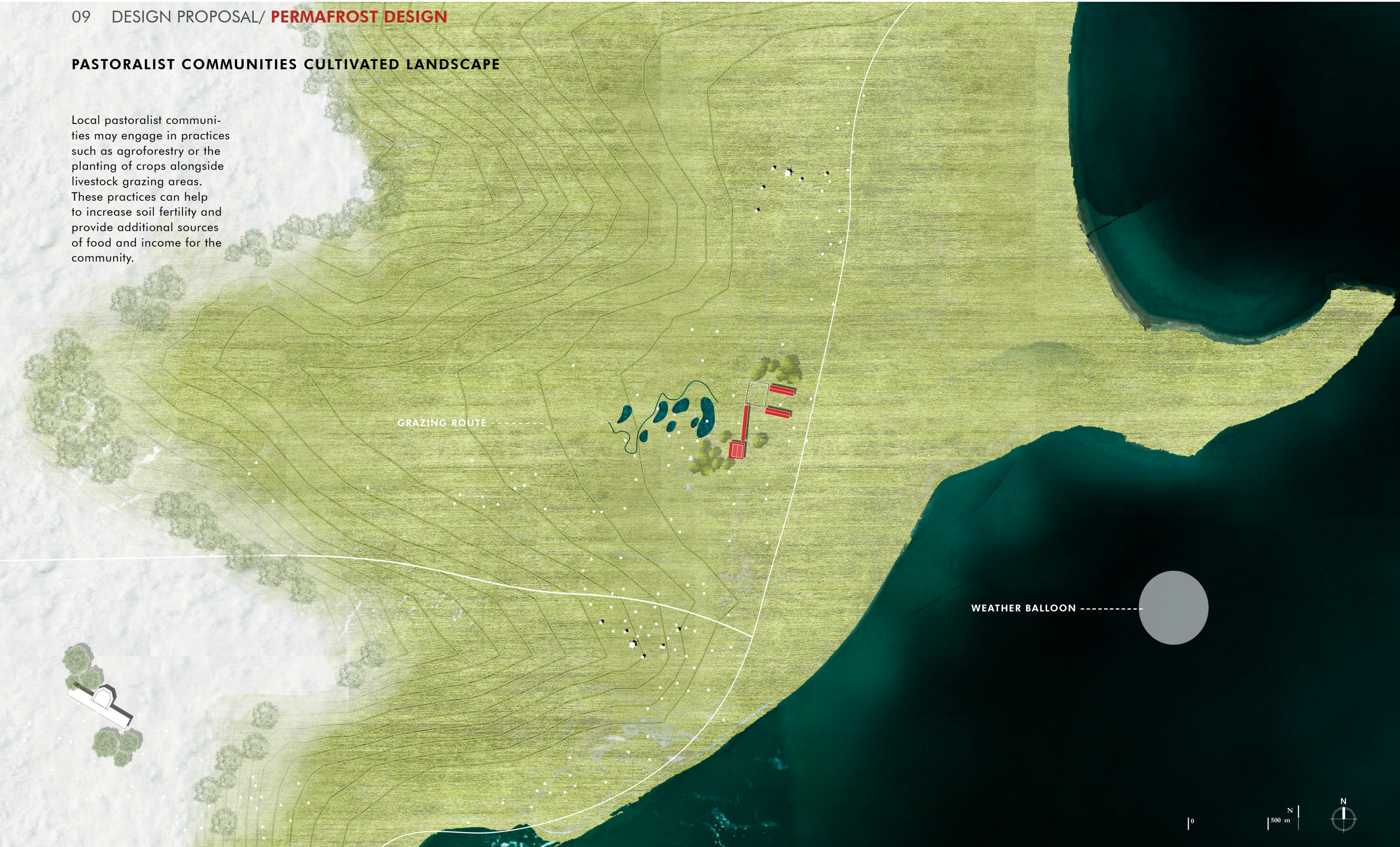
By using this information, it is possible to estimate how much rainwater will be potentially available in the future, which is critical for developing effective water management strategies. This can help identify areas where water flooding and soil erosion may be an issue, and develop appropriate interventions to ensure that water resources are managed in a sustainable and equitable manner.

By understanding these potential changes, the proposed plan can take proactive measures to mitigate their impacts and ensure that water resources are managed in a way that supports both human and ecological needs.



PASTORALIST COMMUNITIES CULTIVATED LANDSCAPE

Local pastoralist communities may engage in practices such as agroforestry or the planting of crops alongside livestock grazing areas. These practices can help to increase soil fertility and provide additional sources of food and income for the community.



PERMAFROST SECTION

Plant communities in alpine environments play a vital role in controlling soil temperature and the presence of permafrost by shielding the soil from the warmth of the sun, extracting water through the roots, transforming the ground into good insulators and preventing soil erosion.

PLANT DECIDUOUS BROAD-LEAVES TREES

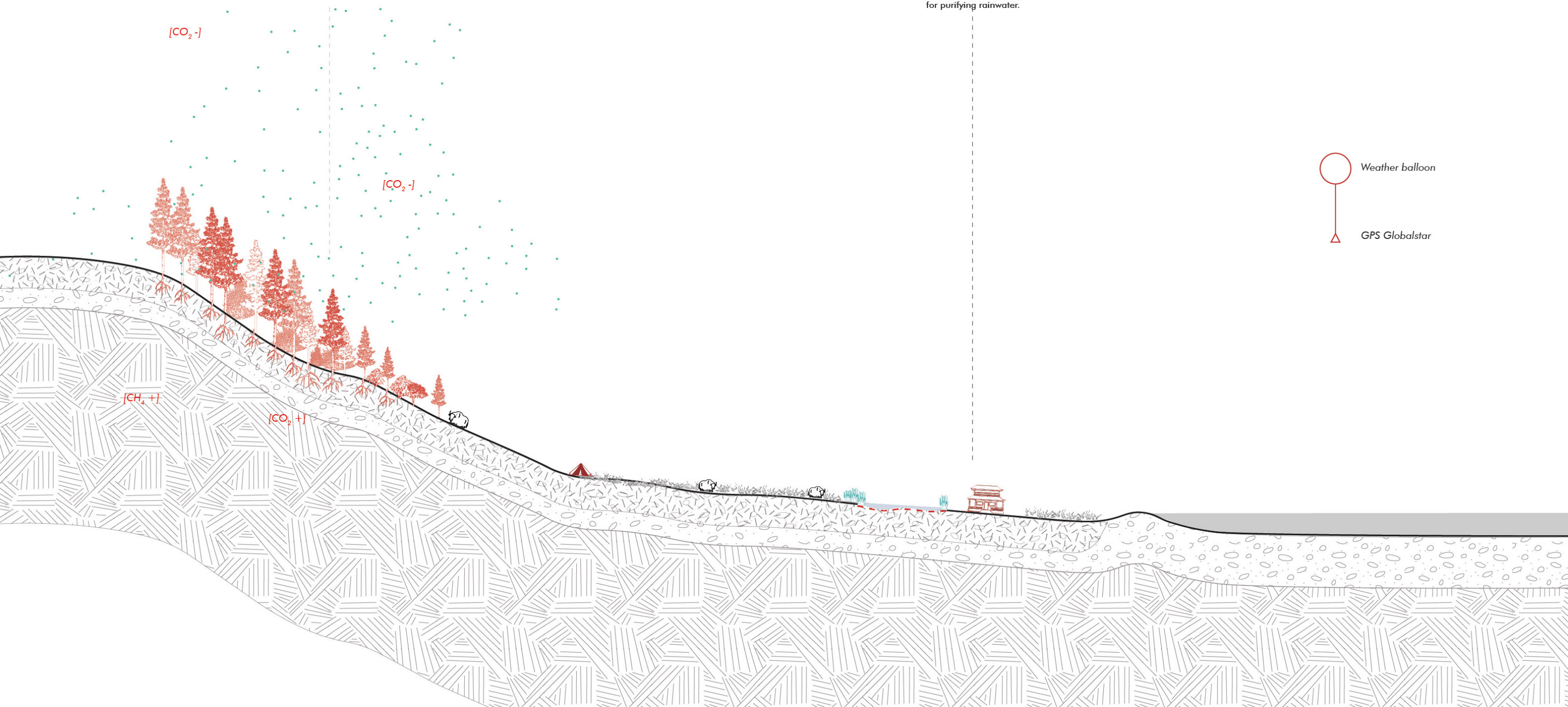
Plant deciduous broad-leaved trees on sunny slopes to slow the melting process by shading the heat from the sun during the melting season. It also helps absorb greenhouse gases.

SPIRITUAL BUDDAHISM TEMPLE AND SANITATION

Buddhism has always emphasized the relationship between man and earth, and has always reflected the importance of nature in its teachings. It is also a gathering place for various rituals of Tibetans, and therefore can serve well as a supply center for purifying rainwater.

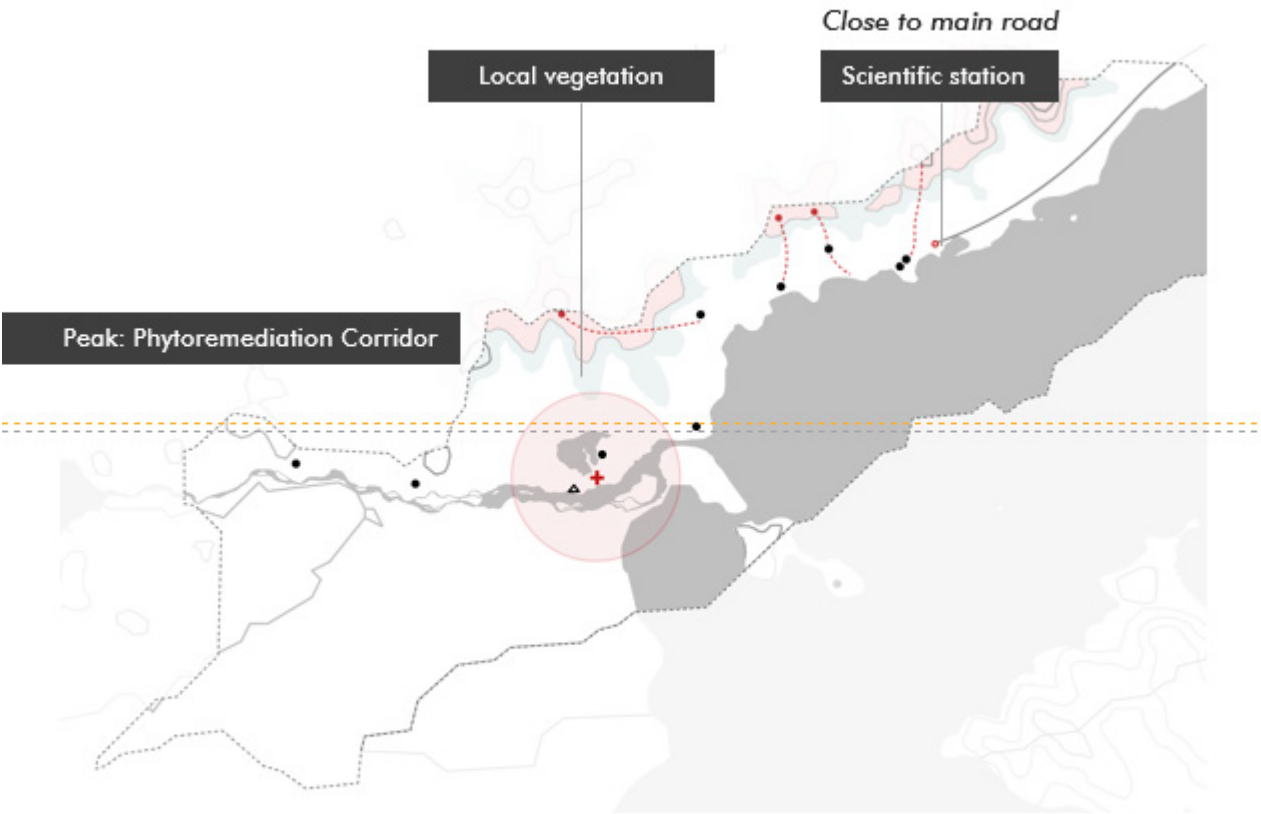
ALPINE PERMAFROST RESEARCH OBSERVATION

Allowing spatial use for scientific purposes



WATERSHEDS AS UNIT

The data of this area is relly insuffeicient.

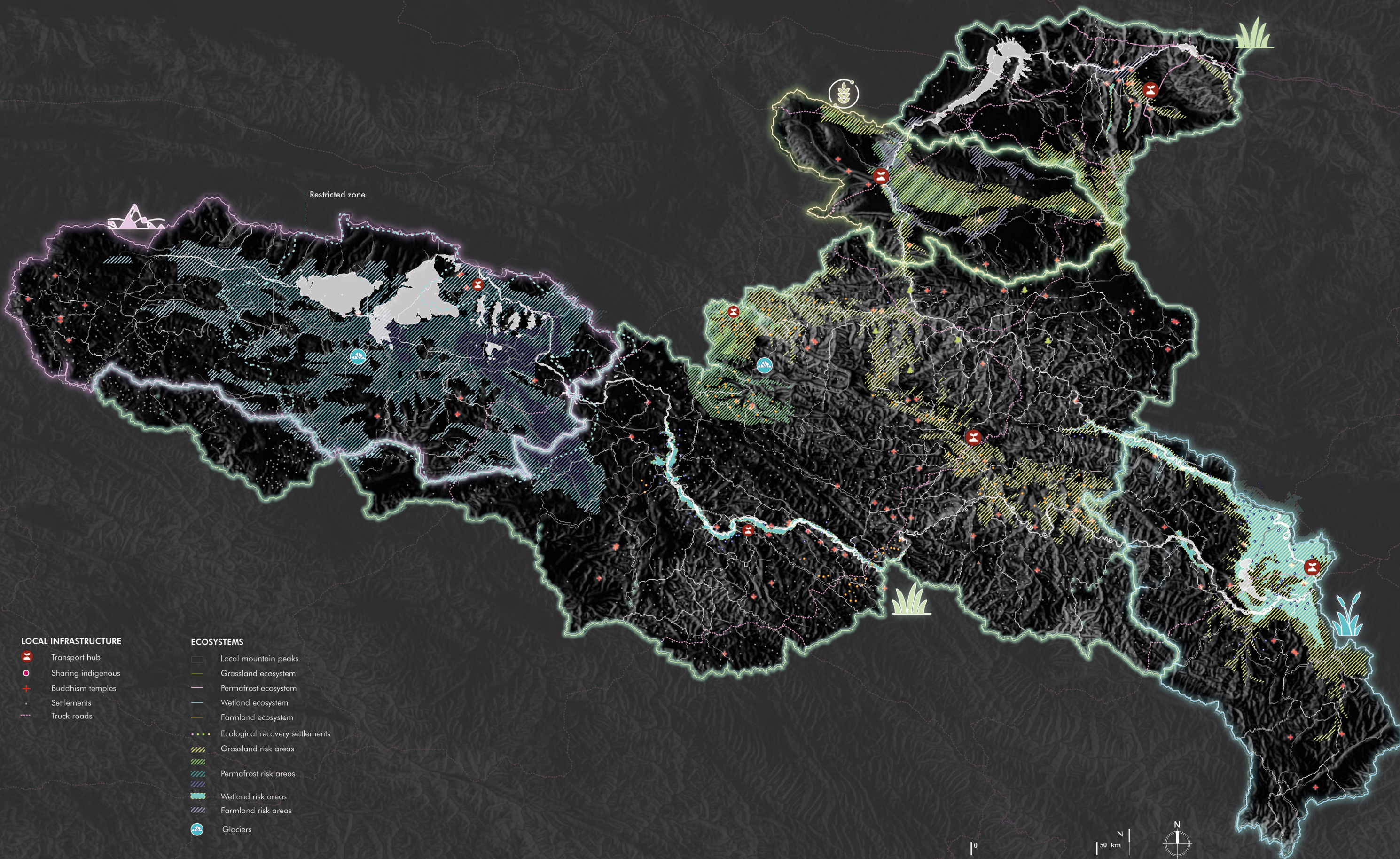


Permafrost Unit
Living, scientific research, purification, religious centre

Citations

¹ Acknowledgement for the data support from
"National Earth System Science Data Center,
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of China. (<http://www.geodata.cn/>)"

² The data set is provided by National Tibetan
Plateau Data Center (<http://data.tpdac.ac.cn/>)

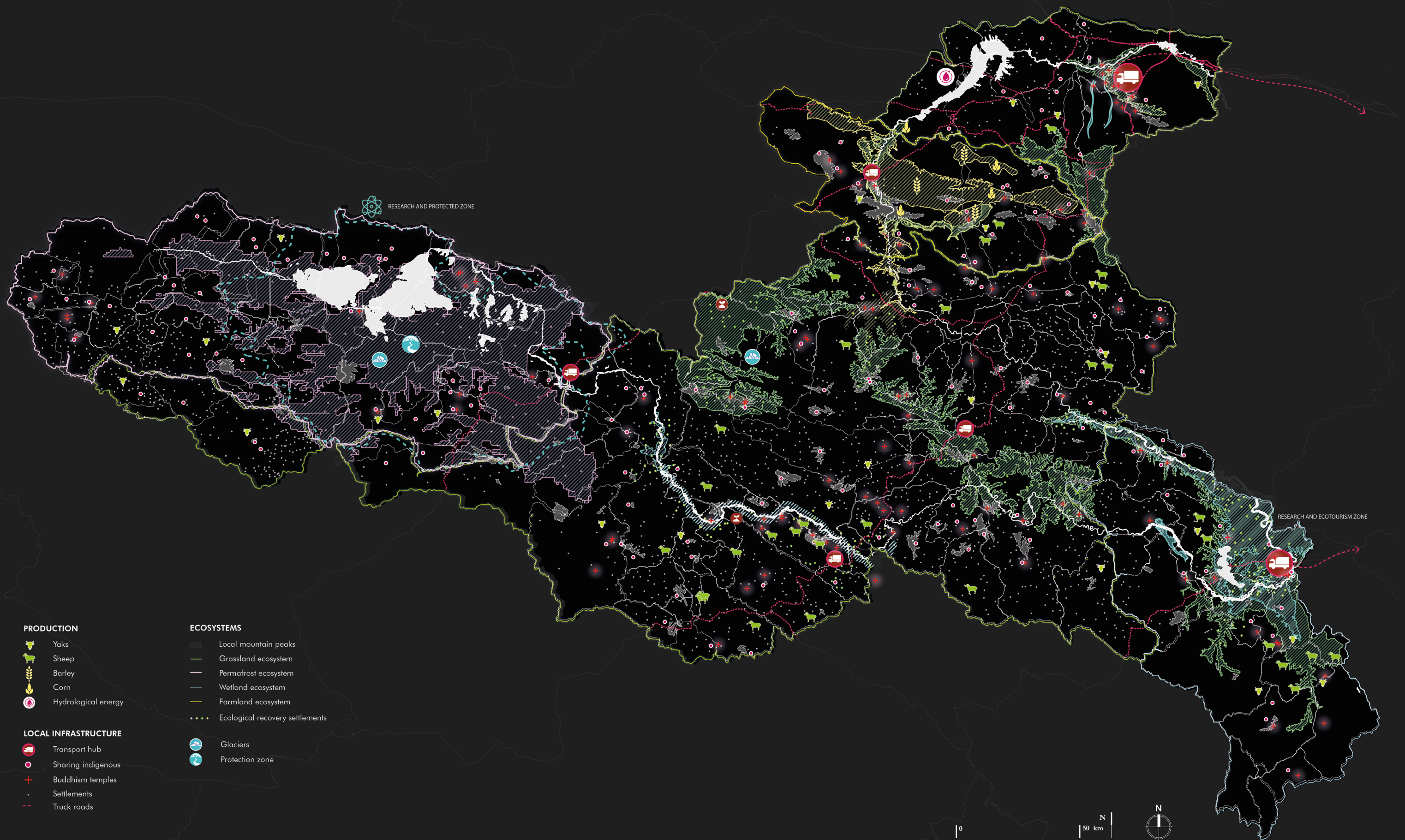


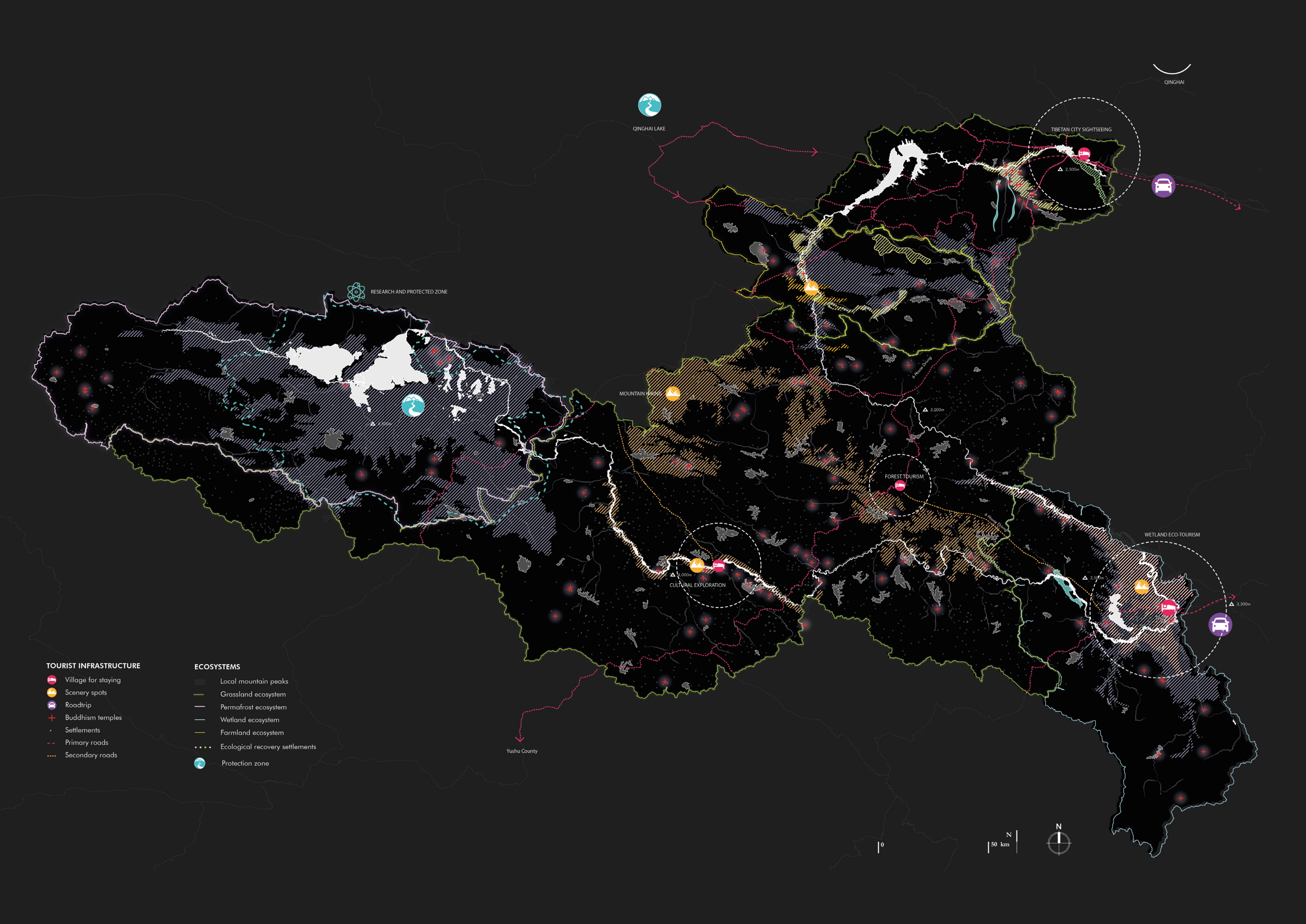
LOCAL INFRASTRUCTURE

- Transport hub
- Sharing indigenous
- Buddhism temples
- Settlements
- Truck roads

ECOSYSTEMS

- Local mountain peaks
- Grassland ecosystem
- Permafrost ecosystem
- Wetland ecosystem
- Farmland ecosystem
- Ecological recovery settlements
- Grassland risk areas
- Permafrost risk areas
- Wetland risk areas
- Farmland risk areas
- Glaciers









.4 RESPOND TO POLICY

CO-STEWARDSHIP OF NATIONAL PARK WITH TIBETAN PEOPLE

1 THREE-RIVER SOURCE NATIONAL NATURE RESERVE

Expand the extent of national reserve & Set new national park system

Agree with the idea of national park.

However, the national reserve charter fails to adapt to changing ecosystems and impending challenges, while prohibiting too much that could be negotiated.

A new set of paradigm needs to be framed for the continuation of indigenous traditions and adapting to the dynamics of ecosystems.

2 SKY RIVER PLAN

Allow the Sky River Project to exist and empower local people to fight against

Don't agree with the Sky river project because it encourages an ongoing dominance under human-nature pluralism and exaggerate future disturbance of ecosystem.

However, as long as ruling regime continues, the project will proceed in one way or another.

3 FENCED GRAZING & FIXED GRAZING

Phased planning cancellation of fenced grazing & fixed grazing policy

The vast majority of ecologists and research studies have shown that fixed and fenced grazing does not have a positive impact on pasture recovery, and that this policy violates the millennia-old nomadic tradition of Tibetans.

I totally disagree with this policy, and I hope to change the local ecological landscape by restoring the act of nomadic grazing. This requires phased planning, and a series of programs and infrastructure construction to facilitate the process.

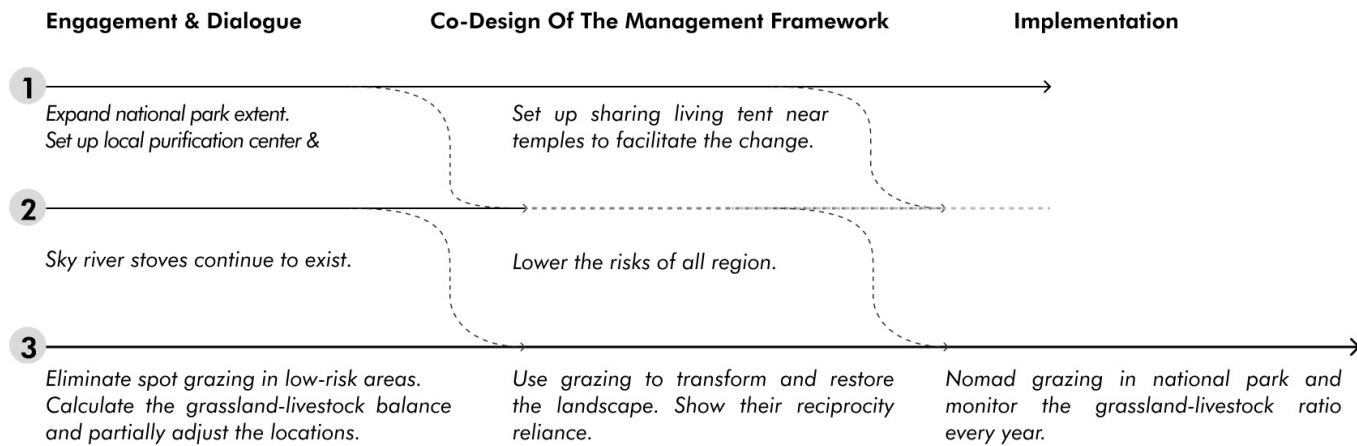
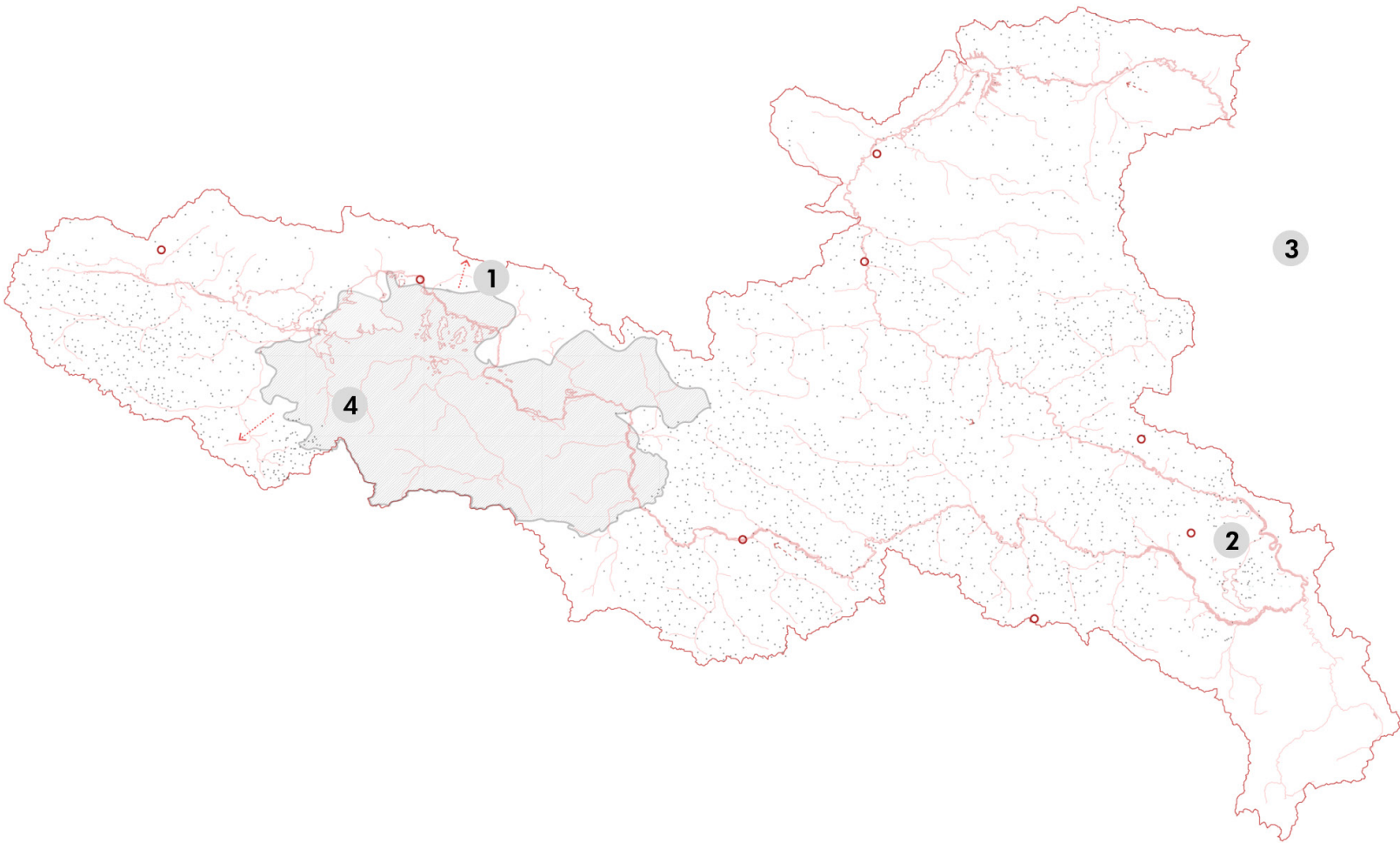
4 RESETTLEMENT POLICY

Disagree in the region, that the existing few nomadic families in the park far less than the limitation

Part of scientific observation points

But nomadic activities shouldn't increase in the future

The lake plays an important role in Tibetan Buddhist history and is one of the six holiest sites for pilgrimage



CONCLUSION

10.



10 CONCLUSION

GRADUATION PROJECT RELECTION

My graduation project was probably the most flattering and incredible journey I've ever been on, and for the first time I felt a sense of purpose and creativity in urban planning and design. I had no idea how to do it initially, but I was fascinated by an article named 'Prologue to the Sky River' for the Sanjiangyuan region of China written by Elise Chuck Elise Hunchuck, Marco Ferrari & Jingru Cheng. Words are magical, and the ancient country as seen by those foreigners is like a veil, their depiction of China is accurate yet strange to me.

Initially, my intention was to develop a de-colonized approach within a Western context and framework. However, I soon came to realize the delicate, ambiguous, and highly political nature of the relationship between the Tibetan and Chinese peoples. Even the mere mention of their names evoked caution within me. It became clear that the concept of colonization failed to adequately capture the complexity of the situation, and few Chinese scholars dared to delve deep into the tension-laden circumstances.

I found myself frustrated, not only by my own desire to understand these people on a deeper level, but also by the realization of my own ignorance regarding my country and the sacrifices made by the Tibetan people for our unity, resources, culture, and identity.

Complications arose as contradictions emerged between the information gathered online, primarily from Western media sources, and the stories and interviews I conducted with local individuals. On one side, the voice of the Chinese media seemed stifled, while on the other, the locals did not completely oppose the central government's One-size-fits-all policy.

This realization prompted me to seek a new framework—one that is not radical, aligns with the nation's overall planning, yet maintains a clear standpoint in asserting the rights of the Tibetan people.

THE APPROACH OF PROJECT

Embarking upon the vast topic of atmospheric environmental technology in the era of the Anthropocene is a formidable challenge.

Employing the framework of line of inquiry learnt from the Transitional Territory Studio has proven to be an invaluable tool, enabling me to grasp the intricate fabric of the region. Matter and Geopolitics section has facilitated my understanding of the Tibetan Plateau's ecological system, as well as the social dynamics surrounding the nomadic communities who engage in seasonal transhumance activities within its vast expanse. The Topos and Habitat sections came into shape after the profound investigation of the land. Though I have not physically set foot upon this land, I find myself within a hidden connection that deepens with each dive into the extensive literature review, predominantly focusing on the technical and ecological aspects of

the Tibetan Plateau.

Initially, my focus cantered on the problem of transboundary water resources allocation, particularly examining the implications of dam construction in the upstream regions of Chinese rivers originating from the Tibetan plateau and its potential impact on downstream South Asian countries. However, the wise counsel of my mentors urged me to refine my scope and look deep into the source region itself.

Then I started to do the literature review both in English and Chinese. Additionally, I conducted online interviews with members of indigenous communities, seeking insights from their unique perspectives. To further enrich my research, I explored documentaries that shed light on the intricate interplay between ecology, society, and politics. These invaluable resources were generously shared by scholars, local inhabitants, and NGOs, providing me with a diverse range of perspectives to inform my study.

THE FEEDBACK AND LEARNINGS

In general, my first mentor Nikos taught me how to logically compose a project and the art of effectively conveying and persuading others. With his brilliant ideas and guidance, I developed a solid understanding of project structuring, ensuring that every aspect of my work aligned coherently.

My second mentor Francesca cares a lot on the humanistic perspective, infusing it with a delicate sensitivity to the human experience. She always supports me and encourages me, she makes me to believe in myself during moments of self-doubt or low spirits.

With every mentoring session, we end up with exchanging of new and exciting insights that pushes the boundaries of exploration. The iterative process begins with a focused project, followed by examination of relevant literature and the utilization of GIS to enrich the ideas. The process of design be found, that is a spiral and rising one of "converge-diverge-converge".

I used to be troubled by how to make a project detailed enough to persuade people. But the lessons imparted by them will undoubtedly continue to be there within me long after I graduate, shaping not only my academic journey but also my future endeavours.

Other tutors from Transitional Territory also give me a strong will of continuing my project with sense of responsibility and courageous. I did lots of changes especially after P2. Given the feedbacks and their ideas, I developed the concept of a new national park paradigm, in a relatively huge site. Undoubtedly, it is the passion and belief exhibited by these tutors that fuel my research in my academic exploration.

The courses delivered by a series of lectures have enriched my understanding of the Anthropocene concept and introduced me to the philosophical insights of scholars like Bruno Latour. I consistently revise and

These academic foundations, combined with the collective wisdom shared by my mentors, tutors, and the intellectual atmosphere cultivated at Transitional Territory, provide the fertile ground upon which my project takes root and flourishes.

ON THE RELEVANCE AND TRANSFERABILITY

I believe that my project offers a unique approach to address the knowledge gap in Chinese territorial design by emphasizing an indigenous-led perspective. It underscores the importance of incorporating indigenous perspectives and practices into urban design, paving the way for a more inclusive and culturally sensitive approach.

Through the integration of wetland systems, sustainable agriculture, and ecological restoration, my project showcases how urban development can coexist harmoniously with the natural environment. It demonstrates the integration of environmental stewardship principles within urban design, highlighting the significance of responsible resource management and ecological preservation.

Moreover, my project recognizes the vital role of economic opportunities and sustainable livelihoods for local communities. By incorporating agricultural practices, tourism initiatives, and cultural preservation, it demonstrates how urban design can contribute to the economic well-being and cultural identity of indigenous populations.

This project represents a bold endeavor to bridge indigenous knowledge on a global scale with the Tibetan minority group. Despite the distinct context from the Western paradigm, the framework and critical thinking employed successfully bridge the gap, proposing a new paradigm for national park development within the dilemma context of globalization and capitalism.

10 CONCLUSION

PROJECT CONCLUSION

China's problems are delicate, and I often feel that the country is a mire of 1.4 billion people dragged along at a slow pace beneath a fast-moving surface. With a populous base as vast as the Yangtze, wealth and resources dispersed as unevenly as the rugged terrain, and education levels as diverse as its multitude of dialects, China's metamorphosis is a dance of delicate steps on a tightrope of challenges. Since the transformative reforms of 1949, China has been imbibing Western thought and technology, as swiftly and relentlessly as the Yellow River's flow.

These advanced tools have been mirrored on a majestic scale, yet the march of Chinese thought seemed to have paused at the threshold of the last century. Beneath the dazzling armour of productivity and execution, lie the intricate weave of a nation's contradictions, the silent echoes of historical compromises, and the whispered sacrifices of its regions.

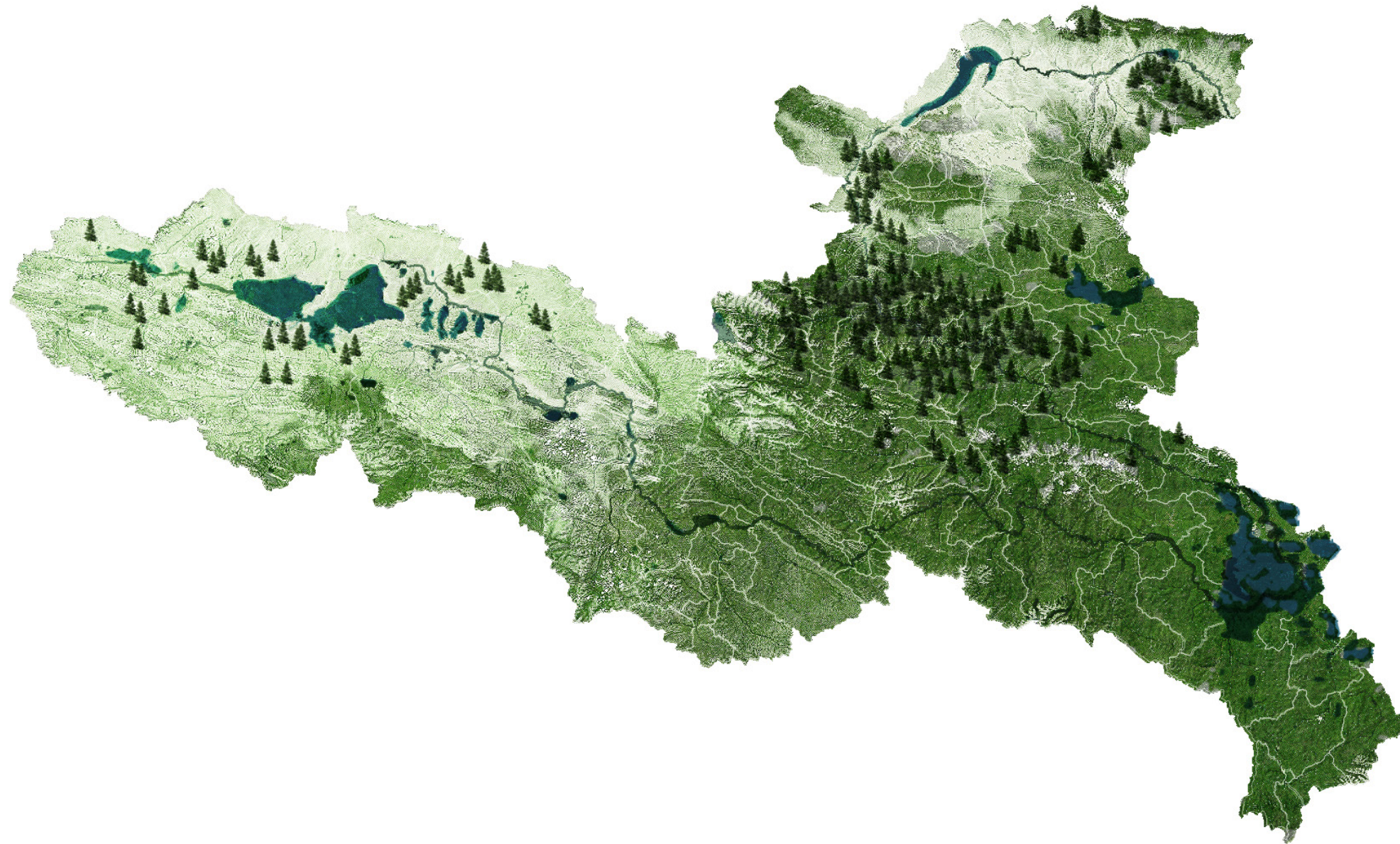
All these currents converge towards one direction - a nation's unyielding ambition and pride that refuses to be relegated to the shadows. Everything must advance in unison, regardless of the means, like a dragon ascending towards the heavens in a gust of wind.

As I contemplated the meaning of "national park," I pondered its significance and questioned the need for a fresh perspective. The term itself was introduced by an American artist, and since then, national parks have emerged across the world. These protected lands have brought about changes in how we perceive and interact with nature. Consider the grand Himalayas, the tallest mountains on Earth, which have enticed countless adventurers seeking to conquer their peaks, celebrating human strength and power.

Yet, we often overlook the deeper meaning the Himalayas hold for local communities. For Tibetans, these majestic mountains embody the gods themselves, adorned with over 6,000 Buddhist temples. Local guides from Nepal effortlessly navigate these peaks, carrying heavy loads and enduring extreme weather conditions. Their profound familiarity stems from their innate connection to the land, as they are born with its challenges and beauty.

Similarly, Tibetans have thrived in the high-altitude environment, adapting to the region's low oxygen levels and cold climates for thousands of years. Many landscapes now designated as national parks, perceived as pristine and untouched, have actually been shaped by indigenous peoples over countless generations.

It is time for a new narrative, one that shifts away from the notion of conquering nature's elements and instead focuses on belonging to the landscape. We are not mere tourists but honored guests, sharing this space with the yaks, sheep, wolves, and all living creatures. This vibrant ecosystem beats as the lifeblood that sustains the people who call this place their home.



10 CONCLUSION



Yellowstone, the world`s first national park



Numerous explorers came to clime to the peak. The word "conquer" has been used to celebrate human`s power and strength



For Tibetans, these majestic mountains embody the gods themselves, adorned with over 6,000 Buddhist temples.



Many landscapes now designated as national parks, perceived as pristine and untouched, have actually been shaped by indigenous peoples over countless generations.

10 CONCLUSION

FLYER





10 CONCLUSION

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National Earth System Science Data Center, National Science & Technology Infrastructure of China. (<http://www.geodata.cn>)

National Tibetan Plateau Data Center (<http://data.tpdc.ac.cn/>)

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Worldview Snapshots application (<https://wvs.earthdata.nasa.gov>), part of the Earth Observing System Data and Information System (EOSDIS)

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