



A Non-governmental Environmental Organization Promoting Ecological Yak Farming for Sustainable Ecology and Economy on the Qinghai-Tibet Plateau

Company/Organization

Gansu Green Camel Bell Environment and Development Center

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Abstract

Founded in 2004, the Gansu Green Camel Bell Environment and Development Center (hereinafter referred to as GCB) is the first non-governmental environmental organization in Gansu Province, China. Over the years, the organization has been committed to conserving the ecosystem in western China. Since 2012, it has been implementing the Maqu Grassland Ecological Conservation Project in Gansu Province. By assisting local herders in traditional nomadic lifestyle and developing ecotourism, the project not only conserves the ecological environment of the Maqu region and improves the living conditions of farmed yaks, but also establishes sales channels between herders and consumer markets. This has not only increased the income levels of local herders but also enabled consumers to purchase traceable, high-quality meat. The case report also includes research findings from the team of Professor Long Ruijun at the Grassland and Yak Laboratory, Lanzhou University, aiming to provide a more comprehensive explanation of the natural, social, and welfare attributes of yaks.

Keywords

yak, ecological farming, non-governmental environmental organization, alternative livelihoods, Tibetan culture

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Case Introduction

Background

The Maqu County is located on the eastern edge of the Qinghai-Tibet Plateau in Gannan Tibetan Autonomous Prefecture of Gansu province, with an average altitude of 3,700 meters. Boasting abundant water resources, vast grasslands and wetlands, Maqu is home to a rich wildlife and serves as the water source for many downstream communities. Herders in Maqu make a living from Yak pastoralism, and have maintained a nomadic lifestyle of following water and grass since ancient times. All herders share pastures and various natural resources with livestock such as cattle and sheep. They gather in communities of families or tribes to graze their livestock. Professor Long Ruijun and his team proposed a concept called FAFI (Farm Animal Freedom Index) which measures the collection of an animal's free activity time and space while allowing the expression of normal animal behavior, with the scores ranging from 0 for strict crate confinement and 1 for free-range farm animals. Accordingly, yaks grazing on the Qinghai-Tibet Plateau score 0.7 or higher, indicating a high degree of freedom for farm animals. Enjoying favorable living conditions, the yaks are healthy, comfortable, accessible to adequate nutrition, and able to express normal behavior without fear or pain. Therefore, yak meat sourced from this region is high in protein, amino acids and nutritional elements while low in fat, making it a sought-after naturally green food that enhances immune system, cell viability and organ functions.

However, over the past thirty years, to address economic disputes and for ease of management, the local government has been enacting policies that prompt herders to divide vast grasslands into small lots of pastures surrounded by fences.

As big pastoralist families are split up into smaller households occupying pastures of various qualities, they are less keen to share grassland resources. Compared to community grazing, yak farming in smaller, fenced-off ranges of grasslands leads to poor animal growth performance. In order to achieve the same level of economic benefits, the herders had to increase the number of yaks in each pasture, resulting in behavioral suppression within restricted space as well as grasslands ecological degradation such as soil erosion, desertification, and shrinking wetlands due to localized overgrazing. Of 12.88 million mu (approx. 858,666.67 hectare) of regional grasslands, more than 90% have shown varying degrees of degradation. Ecological deterioration is associated with decreased carrying capacity of Maqu grasslands which will inevitably cause a decrease in the number of yaks. Since 2005, upon notification of grassland degradation in Maqu, GCB as an Environmental NGO has been searching for solutions to improve the ecological conditions.

The fundamental solution to addressing ecological degradation at Maqu Grasslands is to enable ecological restoration by promoting sustainable grazing and reducing grassland overloading caused by overgrazing. However, reducing the number of yaks will severely impact the livelihoods of herders, as yak farming is their sole source of income. With local social and economic conditions in mind, GCB came to aware that it is crucial to combine community education and economic development into ecological

improvement, instead of tackling environmental issues alone.

About Yaks ^[1]

Yak is the only large ruminant livestock that lives on the alpine meadows in Qinghai-Tibet Plateau. Yak features strong ecological adaptability, unique contribution to local biological environment, high nutritional value and enormous economic potential. This explains why yak farming plays an essential role in the natural and social evolution in the Qinghai-Tibet Plateau, and underpins the local ecosystem, ethnic and cultural heritage, as well as regional development. Its distinct natural, social, and welfare attributes make it a crucial species in the Qinghai-Tibet Plateau, both in the sense that it bridges the local ecological and social system, and that it nurtures the herder community with nutritious food and other resources.

Shaped by the adaptive evolution and domestication process over thousands of years, yak as a livestock possesses “semi-wild” features and maintains strong adaptability to its alpine habitats. It is considered an environment-friendly livestock for its high dietary energy utilization, low methane emissions, and high nitrogen utilization. Being the core of grassland husbandry on the Qinghai-Tibet Plateau, Yak farming provides herders with milk, meat, wool, leather, labor, medicine, fuel, and other ecosystem service values. This is crucial for maintaining the livelihoods, health, well-being, nutrition, and food security of local herders. Traditional yak pastoralism, where yaks are released in different seasons onto different pastures, is not only the most eco-friendly and efficient way to use grassland resources, but also important in achieving a regional food system that is secure, diverse, healthy, sustainable, and equitable.

In summary, traditional yak pastoralism in high-altitude areas represents a unique livestock production system that is animal-friendly, eco-friendly, low-carbon, and organic. It aligns with the international trend of crate-free animal husbandry and provides functional, green and organic products. Guided by the philosophy of “lucid waters and lush mountains are invaluable assets”, yak pastoralism will continue to empower the development of local livestock husbandry industry, improve the well-being of local herder community, and contribute to the revitalization of highland rural areas.

About Environmental Carrying Capacity ^[2]

Environmental carrying capacity can be understood as a species’ average population size in a particular habitat. The species population size is limited by environmental factors like adequate food, shelter, water, and mates. If these needs are not met, the population will decrease until the resource rebounds.

Case story

The initial phase: Implementing economic stimulus to overcome barriers and dispel doubts

Since 2010, GCB has been receiving support from the Ford Foundation and collaborating with Professor Du Guozhen's team at the School of Life Sciences, Lanzhou University. Through field trips and research, they eventually chose to launch the capacity building and community ecological project at the Kaerxi community, Maqu county. However, they encountered many challenges in their attempts to engage the local community and convey the concepts of environment protection and sustainable development. The following two

challenges were the most noticeable. Firstly, while GCB focused on aspects that required long-term efforts such as environment protection, civilization construction, and sustainable development, local herders were more concerned about tangible short-term economic gains. Secondly, GCB sought to introduce new concepts and technologies while respecting herders' cultural traditions, but during the initial communication, most herders held a skeptical and cautious attitude towards GCB's proposals.

Local herders were skeptical of GCB's motivations and questioned whether the project was a scam that would ultimately lead to economic losses. The

project team came to realize that running a project with little short-term profit prospect is difficult and requires careful communication with and long-term commitment to the community. Rushing for immediate gains would undoubtedly have an adverse impact on the outcome. In collaboration with the government and various enterprises and grassroots organizations such as the Gansu Branch of Amway (China) Co., Ltd., “Green Hada” Sustainable Development Center, and “More Hope” Environmental Protection Alliance, GCB decided to address the community’s concern with economic stimulus, providing the community with public services like well-digging and solar panel installation, as well as direct economic aid. By doing so, not only did tangible benefits be brought to the herders, but also was the motivation of the project be gradually conveyed and mutual trust established, laying the groundwork for subsequent promotion of the concept of sustainable grazing.

Establishing herder cooperatives to drive ecological farming from the supply side

When GCB first approached the Kaerxi community in Maqu, the community was adhering to certain nomadic customs including community grazing. Nevertheless, GCB observed a gradual switch to household grazing in divided pastures. Upon further communication, the team realized that the herders were unwilling to rear a big number of yaks in small, fence-off pastures, knowing that doing so would damage the meadows and worsen the yaks' living conditions. In Tibetan traditional culture, herders do not treat animals from a superior standpoint but rather view yaks as equal family members and care about their emotional well-being. According to the research by Professor Long Ruijun and his team, yak-related customs have permeated into the community’s cultural life, including religion, rituals, bride price, trade, banking, theater performance, entertainment,

and sports.

Understanding of the cultural background prompted GCB to assist the herders in restoring traditional nomadism and community grazing. The first step was to encourage the herders to form a community committee to manage natural resources, enabling community members to collectively decide on the number of grazing yaks and sheep based on available natural resources and carrying capacity. During 2013 and 2014, with the help of GCB, the herders established a professional cooperative to lead the transition from household grazing to traditional community grazing. Professional cooperative is the right form of organization which, for many years, was unable to be promoted locally due to lack of legal and procedural knowledge. With GCB’s timely support in registration, market analysis and business planning, herders managed to gather as cooperatives on the basis of voluntary participation, profit sharing, and risk-sharing. Hundreds of yaks owned by the 8 participating households could freely migrating over 9,600 mu (approx. 640 hectares) of pastures. Following the establishment of cooperatives, the community also received interest-free loans from the government, alleviating economic pressure on the project. Apart from achieving the goal of

community grazing, professional cooperatives have resolved other practical issues for the community. One good example would be facilitation of mutual assistance among herders which eases labor shortages due to the relocation of young herders to urban areas.

Mr. Zhao Zhong, Director of GCB, stated that respecting herders' tradition was crucial to the advancement of the project. GCB approached the herders with a learning attitude and discovered that Tibetan traditional culture embodies indispensable concepts such as ecological civilization and harmonious co-existence between humanity and nature. The learning attitude not only facilitates communication with the local community, but also gathers information for the next phase of the project, which is to promote a natural farming method that aligns with local culture.

While respecting the herders' traditional culture, GCB has also introduced advanced concepts and modern technologies to improve yaks' living conditions and to enhance production efficiency. Under traditional nomadic practices, yaks are forced to endure certain extent of hunger and coldness during winters, resulting in weight loss and even illness. Additionally, wild predators such as black bears and Northwestern wolves would attack or prey on yaks, causing economic losses. GCB assisted in the construction of shelters to keep the yaks from cold weather, and provided the herders with protective equipment such as bear traps and predator deterrent lights to reduce the harm caused by wild predators to yaks. GCB also invited Professor Du Guozhen's team, to provide technical and academic guidance. Professor Du's team of researchers conducted trailing research, monitored pasture quality, assessed the impact of grazing, and promoted scientific knowledge and the concept of sustainable grazing among community members.

About the School of Life Sciences, Lanzhou University ^[1]
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The School of Life Sciences at Lanzhou University has long been committed to studying yak farming over the Qinghai-Tibet Plateau. GCB's Maqu project has received academic support in terms of site location and trailing research from Professor Du Guozhen and his team of researchers from the School of Life Sciences, Lanzhou University. As early as 1992, Professor Du established a research station in Gannan area, aiming to enhance the ecological, economic, and social benefits of the Gannan grasslands. Over the last 30 years, Professor Du's team has developed techniques for managing secondary sandy desertification alpine meadows and improving plant survival rates in sandy areas. The team has also proposed a grass-livestock balance model that defines the threshold of overgrazing, and a plan to reduce the number of livestock to achieve ecological conservation and a balanced development between people, grass, and livestock. Professor Du's research not only helps to restore local ecology but also brings economic benefits to local herders.

Professor Long Ruijun of the Grassland and Yak Laboratory is also part of the faculty in the School of Life Sciences, Lanzhou University. Over the past 30 years, Professor Long has researched into the adaptive features of yak to the harsh environment over the Qinghai-Tibet Plateau, implementation of the "from pastures to dining tables" industrial chain transformation of yak farming, as well as the overall management and sustainable development theory of high-altitude grassland ecosystems. Professor Long and his team has established a "Four-in-One" management model for grass-livestock ecosystems on the Qinghai-Tibet Plateau and proposed a "Three-in-One" integrated management theory that covers grassland ecology, livestock production and herder livelihoods. Professor Long's research provides important references for national and local level policymaking in relation to the improvement of local herders' well-being.

Seeking alternative livelihoods: driving eco-friendly livestock farming from consumption

As the capacity building and community eco-project progressed, the concept of sustainable

herding has been gradually spread among the herder communities. There came a challenge of maintaining and even increasing herders' economic benefits with reduced number of yaks. As such, GCB turned towards alternative livelihoods. GCB conducted market research and engaged a professional MBA team to draft a business plan. Therefrom, GCB decided to develop an ecotourism project in Maqu. In the summer of 2015, after conducting training among the herders and developing tourism routes, GCB officially launched the Maqu Grassland Conservation Ecological Summer Camp. At the Awancang Wetland, tourists are mesmerized by the flowery meadows and the hospitable herders who greet the visitors with freshly made yak yogurt and ceremonial white scarves (locally known as "hada"). "The grasslands here are incredibly beautiful, even the yak dung smells sweet," said a tourist upon arrival at this herders' village which is fueled by yak dung instead of electricity, and equipped with neither tap water, nor permanent residential facilities.

As the project progressed, in 2017, GCB reached a conservation agreement with the Maqu Kaerxi community. One yak will be reduced from protected grassland for every 6,000 RMB (approx. USD 834) sourced from community tourism, until the number of yaks in the community's pasture matches its carrying capacity. By doing so, the community aims to gradually restore an ecological balance and mitigate the damage caused by overgrazing ^[4].

The ecotourism project has further evolved into a community-supported agriculture model. Due to weather constraints in Maqu, ecotourism is confined to summer. The economic benefits this brings to herders are far from sufficient. Moreover, relying on middlemen to distribute yak meat, herders used to suffer from low prices and market fluctuations. In order to increase the herders'

income, GCB organized direct sale of yak meat products to ecotourists, establishing a Community Supporting Agriculture operational model.

By doing so, GCB combined ecotourism with expanded sales channels. As visitors gain first-hand experience of eco-friendly yak farming from site-visiting and storytelling, they grow to understand the Tibetan nomadic cultural tradition, in that each yak is given a unique name by its herder, and that due to religious beliefs, herders are extremely careful in slaughtering and selling yaks. Despite the fact that yak calve is a more sought-for food and hence generates a higher profit, the herders are sticking to the tradition of not killing young yaks. Old and weak yaks are also treated kindly by the herders. The warm shelters built by GCB for yaks are referred to by the herders as "yak nurseries," "yak retirement homes," and "yak rescue stations." After hearing the touching stories and learning about the cultural background, consumers tend to go through a conceptual change and better appreciate free-range yak products from the Maqu area. Therefore, ecotourism projects manage to provide herders with a steady source of income by selling free-range yak meat products.

Starting from 2020, GCB has been assisting in logistics and facilitating the communication between consumers and herders. With an existing customer base of ecotourists, GCB has further expanded sales channels for community-supported agriculture by promoting Maqu's eco-farming yak products through WeChat groups and Wechat official accounts. GCB also assists in quality control by providing the herders with consumer feedback. At the end of 2020, during a few weeks, GCB managed to sell about 230 kg of fresh yak meat for the herder cooperatives, generating about 20,000 RMB (approx. USD 2,781) of additional income for the community. Registered in 2021, its Maqu yak meat group-buy

Wechat group has attracted nearly a hundred members by the end of 2022 ^[5].

Results and Impacts

Up to the present day, the herder cooperative and ecotourism project at the Maqu Kaerxi community has been successfully running for 7-8 years. Many parties have benefited from eco-friendly yak farming, achieving balanced development in economy, ecology, and public health.

- **Economy:** Before receiving support from GCB, the community saw significant income fluctuation, although on average the community generated an annual total income of above 200,000 RMB (approx. 27,800 USD). As an alternative livelihood, ecotourism provides a steady source of additional annual income of about 50,000 RMB (approx. 6,952 USD), accounting for about 25% of the community's total annual income. In light of this, alternative livelihoods have brought considerable economic benefits to the community. Every winter, GCB helps the community to sell yak meat. In 2019, GCB sold more than 20 yaks and in 2020 more than 50 yaks, providing an additional income of tens of thousands of RMB. In terms of unit price, every kg of yak meat, if directly sold to slaughterhouses, would only generate a profit of about 50 RMB (approx. 7 USD); if sold to local markets, would generate a profit about 90 RMB (approx. 12.5 USD); if sold to end-consumers via GCB's channel, would generate a profit of about 100 RMB (approx. 13.9 USD) given that GCB's followers recognize the quality of free-range yak products and its cultural background.
- **Ecology:** Herders are committed to reducing the number of yaks after receiving returns from alternative livelihoods. It was estimated that by 2020, the community had reduced more than 30 yaks thanks to increased income sourced from ecotourism. Reducing the number of yaks not only improves the living environment of livestock but also helps to mitigate overgrazing and restore grassland ecological environment. GCB is still working to further reduce the number of yaks reared by the community until it fully matches the carrying capacity of community pastures.
- **Public health:** More consumers have access to free-range and antibiotic-free yak meat in comfortable living conditions. Promoting high-quality yak products is in line with the concept of public health.

Future prospect

When asked about the future prospect of the project, Mr. Zhao expected that the community would continue to develop itself based on the current project model. Should NGOs like GCB withdraw from partnerships with the community and exit from the project, herders would still be able to drive the sustainable development model by applying the knowledge and skills acquired during capacity building and utilizing market power. On the other hand, Mr. Zhao also hoped to cooperate with the government to

promote GCB's development model amongst other herder communities.

Regarding the overall outlook of yak farming industry, Mr. Zhao stated that ecological livestock husbandry is the way forward. Therefore, community grazing is worth promoting, for it allows animals to behave in a natural way. That said, the industry is fundamentally driven by consumption. It is thus essential to conduct consumer-oriented public education which helps consumers to understand livestock's living environment, respect animal rights, build a bond between consumers and animals and encourage a gradual switch to higher welfare animal products. Yak meat is a necessity in the herders' lives while the herders harbor a grateful heart towards yaks, which is worthy of learning for consumers. GCB also encourages animal welfare labelling and traceability codes. Currently, free-range meat products are often placed next to imported frozen meat, failing to highlight the high quality of free-range products. With traceability codes, locally sourced fresh free-range products will be more appealing and competitive, so consumers will be willing to pay higher prices.

Discussion

The above represents the story of the Gansu Green Camel Bell Environment and Development Center in Kaerxi community, Maqu, Gansu Province, China. It's a relatively unique case within the animal farming industry. From the perspective of non-profit environmental protection, GCB has been, over the past decades or so, fully embracing the unique features of yaks. By promoting ecological yak farming, GCB manages to facilitate economic development and ecological restoration within the community, hence developing a closed-loop model benefiting the public, economy, and ecology. By analyzing and learning from GCB's model, we may promote it to other similar projects. The traditional nomadic practices also inspire us to turn to cultural diversity and our traditions for human-nature harmony and sustainable development concepts.

Case Analysis

Dimensional analysis: levers of change employed in the case

Food production and supply	Production	GCB assisted the community to establish professional herder cooperatives that enable community grazing and traditional nomadic practices, so as to improve the living conditions of yaks and shift the focus from quantity to quality. In the initial stage, economic stimulus provided to the community significantly propelled the project. In achieving so, support from partners like the Ford Foundation, Amway, and others played a vital role. Interest-free loans from the government received after the establishment of the professional cooperatives were also a crucial policy support to reduce the community's economic stress. GCB has been exploring alternative livelihoods, and initiates ecotourism to increase community income. Leveraging ecotourism visitors as customer base and bridging consumers and herders, GCB develops community-supported agriculture and provides the community with a secured additional income source.
	Conservation	GCB communicates the concept of sustainable development to herders, and by doing so, raises their awareness of environmental protection and sustainable grazing. Professor Du Guozhen's team from the School of Life Sciences, Lanzhou University provides academic guidance and monitors the impact of grazing on grassland quality. GCB assists herders in establishing a natural resource management committee to collectively decide on the number of yaks reared. This helps to achieve community grazing and traditional nomadic practices and reduce localized overgrazing. GCB entered agreements with the community to reduce the number of yaks upon reaching certain level of income sourced from alternative livelihoods such as ecotourism, thereby reducing overgrazing and restoring grassland ecology.

	Livelihood	GCB provides the community with a series of public services including well-digging and solar panels. By doing so, the community enjoys improved basic infrastructure and enhanced convenience. Through restoration of yak farming methods that are aligned with Tibetan cultural practices, GCB manages to sustain harmonious relationships between humans, animals, and Earth.
Food environment	Accessibility	By establishing a direct distribution channel between herders and consumers through the WeChat platform, GCB manages to allow consumers to access high-quality animal products in a more direct and convenient manner.
	Financial capacity	GCB manages to bypass third parties that eat into the profit margin. As a result, prices are controlled at a reasonable level without sacrificing product quality.
Food demand	Information and education	By launching ecotourism projects, GCB has established direct connections between consumers, herders and the animals. As consumers gain first-hand experience of the herder communities and livestock, and embrace human-animal harmony in Tibetan culture, they tend to develop a preference over animal products raised in an eco-friendly environment.
	Product experience	By facilitating the communication between consumers and the herder community, GCB acts as a quality controller and ensures product traceability.

Addressing the pillars of sustainable development

PEOPLE Nourishing everyone for health and wellbeing	GCB provides consumers with traceable, high-quality meat products.
PLANET Producing in harmony with nature	GCB empowers the herder community with the concept of sustainable grazing. The project improves the living conditions of yaks, reduces pasture

	overload caused by overgrazing, and preserves grassland ecological environment.
PROSPERITY Inclusive, transformative and equitable recovery for the 2030 Agenda	GCB respects the native culture of the Tibetan people, allowing the continuation of traditional harmonious coexistence between human and animals. By introducing advanced technologies to the herder community and providing additional sources of income, GCB manages to achieve economic sustainability. By creating products with unique ecological and cultural attributes, GCB manages to promote consumption upgrade.

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