

Erosion of the Commons in the Karakoram of Northern Pakistan?

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<https://doi.org/10.11588/hasp.1524.c22060>

Keywords: Common Pool Regimes, Water Management, Mountain Agriculture, Karakoram

Introduction

Farming land, pastures and water are essential natural resources for millions of peasants worldwide, their availability and accessibility to are of existential importance. Yet the ability of using these resources depend not only on the extent to which they exist, but also on the associated property rights. Farming land is usually defined as private or state property; it is either owned by the cultivating farmers, by other private landowners, corporations, or the state.

The dichotomy between private and state property seems to be the norm. In reality, however, natural resources can also be subject to other property regimes, they can be considered common property or freely accessible (open access) (Schlager & Ostrom 1992). The latter applies for example to the open oceans or the atmosphere, while pasturelands in particular, as well as forests and fishing grounds, have been regarded and used as common property resources in many regions of the world for centuries. The management of such commons is based on regulations and agreements between the members of a particular group and is referred to as a common pool or common property regime (Agrawal et al. 2023).

Such common pool regimes for pastureland and water have also existed in the Karakoram mountains for centuries that ensure the functioning of irrigation systems and pasture use as well as access to these resources for stakeholders (Schmidt 2004a). These regimes have proven themselves; they are robust and sustainable and have lasted until the recent past.

Today, however, the question arises as to whether such common pool regimes are still stable against the background of modernization, individualization, and commodification processes as well as the current accelerating climatic and ecological changes.

In this respect, this article explores the following research question: How robust and sustainable are the local natural resource regimes in the Central

Karakoram against the background of recent transformations or can an erosion of common pool regimes be observed?

Natural Resource Utilisation in the Karakoram

The basis for securing livelihoods in the Karakoram is the so-called mixed mountain agriculture, based on irrigated agriculture and mountain pastoralism. Sophisticated canal systems and elaborate regulations for maintenance, conflict resolution and water distribution have been developed to implement a well-functioning irrigated agriculture that provides the local population with staple foods. The intensively used farmland in the valleys is privately owned, while the essential resource water is regarded as a common good, the use of which is subject to fixed regulations. The construction, maintenance, control, and use of canal systems that bring water to the fields require the commitment of larger groups, such as the village community; no household can manage this alone. In this respect, stakeholders must come together to manage the water resources and the necessary infrastructure accordingly.

For the second pillar of mixed mountain agriculture, pastoralism or mobile animal husbandry, peasants send their livestock to pasture areas that are located at various altitudes and are grazed at different times of the year. The pastures are also considered as common lands and are managed by the village communities, since the maintenance of paths, pasture huts and stables is also a costly undertaking and can be better managed at the community level.

Based on the works of Ostrom (1990) and others, I analyzed the property and use regimes for land and water in the Central Karakoram for success factors (Schmidt 2004a). For this, I conducted intensive field research in Shigar and investigated the local resource use systems with regard to land and water. The focus was on the locally applied land and water rights as well as the practiced forms of agriculture and irrigation.



Fig. 1: Map of Gilgit-Baltistan (Draft: M. Schmidt 2024)

The Shigar Valley is located in the Central Karakoram and administratively belongs to Gilgit-Baltistan (Fig. 1), the disputed region of Northern Pakistan. The permanent settlements with their irrigated farmlands are located at altitudes between 2100 m and 3050 m (Fig. 2), while the extensive pasture areas extend to altitudes of over 4000 m in the surrounding mountain ranges. All villages have their own sophisticated canal systems to irrigate the arable lands, as the low precipitation makes irrigation necessary. Except for the former aristocratic class and a few successful businessmen, most farming households only have a small amount of arable land (1-3 ha) and small herds of livestock (cows, sheep, goats).



Fig. 2: Irrigated fields in Shigar (Village Teste) (Photo: M. Schmidt 2023)

In an earlier research project at the end of the 1990s, I could show that elaborate communal irrigation and pasture management systems exist that are robust and enable the largely sustainable use of the limited resources land and water (Schmidt 2004a, b). Thus, the local common pool regimes contribute to a regenerative use of scarce resources in the high mountains.

Questioning existing resource strategies

A fellowship from the Jakob Fugger Center of the University of Augsburg allowed me to revisit Shigar in 2023 and to examine how the use and management of land and water have changed over the last 25 years and to what extent the common pool regimes continue to exist and function. During two field campaigns of several weeks, I conducted 45 semi-standardized interviews with farmers and village leaders across Shigar in April and September 2023. The focus of my interviews and observations was on current forms of water and pasture management, perceptions and impacts of climate change, as well as on processes of modernization and commodification.

My journey through the valley quickly reveals that agriculture still plays a major role as a livelihood: intensive farming is carried out on the oasis-like agricultural land of the villages and there are almost no fallow fields visible. Confirmed by the conducted interviews, almost all households in Shigar still farm,

although for several households this is no longer their main economic activity. However, fertile arable land is transformed into built up area due to the brisk construction activities throughout the valley. Various forms of modernization in agriculture also became apparent, such as the increasing use of tractors, threshing machines, and chemical fertilizers.

Gurgling canal water and successfully cultivated fields indicate that the irrigation system is still working. Melt water from the glaciers and snow fields reaches the fields via countless, branching canals. However, what catches the eye is the fact that several canals have been lined with concrete pipes and gutters in recent years (Fig. 3). The physical canal system is being 'modernized'. This technical modernization is usually carried out with the involvement of state institutions, though the initiative comes mainly from the village communities, who apply for financial and material support from governmental or non-governmental organizations.

Whether the construction of concrete canals will improve the functionality, efficiency and durability of the irrigation system is, however, highly doubtful. Certainly, concrete irrigation canals reduce water loss and help to stabilize the corresponding canal sections. But in fact, concrete canals have a short service life and are highly vulnerable to damages, such as frost blasting, rock falls, mudslides, or slipping of gutters. In this respect, the technical modernization of irrigation canals in no way leads to greater sustainability. On the contrary, concrete constructions will require further investment after only a few years and on a regular basis. Even the Governmental Irrigation Office openly admits, that "concrete canals last only for 15-20 years. In winter, cracks are coming" (Deputy Director Irrigation, Skardu, 22.09.23).



Fig. 3: Concrete irrigation canals (Photo: M. Schmidt 2023)

With these state-sponsored interventions, the independence of village communities in water affairs is also being lost. They become increasingly dependent on external support and lose the ability to tackle tasks on their own initiative, as they have successfully done for centuries. „Today, communities

always seek for funds from the government. [...] Their forefathers managed the canals alone, now they ask for support from the government" (Deputy Director Irrigation, Skardu, 22.09.23).

According to my interview partners, the local management of the canal system and the water distribution system remain largely unchanged. The village population continues to participate in community work, conflicts are settled at village level and the state does not intervene in the management system. "80% of our villagers participate in canal cleaning and repairs, the others have to pay a fine. They all participate, no one questions this system" (Teacher, 63 years, Shigar, 17.09.23). Even in governmental agricultural colonization projects or the construction of new canal systems, local management practices are considered.

The anthropogenic climate change is also becoming increasingly noticeable in the Karakoram, changing the geomorphology, hydrology and ecology of the mountain areas, and thus also significantly affecting the lives and survival of the local population. Of particular importance is the rapid melting of glaciers, which poses a serious threat to local irrigation systems. Due to very high runoff on hot summer days, the canals are exposed to extreme stress and are being destroyed in many places. They then must be repaired immediately so as not to jeopardize the harvest. "Glaciers are melting very quickly. Heavy floods destroy our fertile lands" (Farmer, 60 years, Chhutron, 12.09.23).

Although rapid glacier melt is currently leading to high runoff peaks, in the medium term it will lead to a decline in irrigation water. In particular, villages with relatively small and low-lying catchment areas without large glaciers are already affected by massive water shortages due to low snowfall during the winter months. These two threats require responses from the local population, for example by reinforcing the canal heads, as well as by readjusting the water distribution system, with the consequence that individual farmers have less irrigation water available.

While canal and water management are still practiced as a communal task in which all households participate, a significant transformation is taking place in animal husbandry. Although the vast majority of Shigar's households continue to keep livestock, many no longer participate in the seasonal pastoral works on the high pastures (Fig. 4), instead leaving their animals in the care of a few herders. This means that livestock and pasture management are increasingly being privatized or carried out by only a small number of peasants.

Due to the increasing importance of non-agricultural employment, young men lack the interest and time to work on high pastures for a few days or even weeks. "Most people don't like to go to the high pastures.

They prefer to get labour work, as the labour rate has also increased" (Headmaster, 65 years, Shigar, 17.09.23). As a result, households give their livestock to the remaining herders, who look after and milk the cattle on the high pastures during the summer months and are compensated accordingly. Overall, the number of livestock owned by individual households has fallen sharply, although livestock is still valued as a relatively safe investment.



Fig. 4: Cattle sheds at high pastures near Arando (Photo: M. Schmidt 2023)

Undoubtedly, the importance of mixed mountain agriculture for individual households is decreasing. Due to population growth combined with limited opportunities for agricultural colonization, the local population has been unable to sustain itself with food for decades. Additional income has always been necessary to purchase food. Nowadays, the need for additional cash income is increasing to participate in modernization, which includes expenses for education, health and journeys, and the purchase of consumer goods such as refrigerators, televisions, or cell phones.

In order to acquire these products, many of Shigar's male population without formal education pursue non-agricultural activities and income opportunities of which the following can be realized in the region: Labour work in the booming construction sector offers unskilled labourers the opportunity to earn an income, but usually only for a limited period. The large number of trekking tourists and mountain expeditions on the highest peaks of the Karakoram give many hundreds of young men the opportunity to work seasonally as porters, cooks or guides on mountain ventures every year. In some places, there are also seasonal employment opportunities in hotels or restaurants. The great international demand for gemstones means that its mining has become a lucrative business, while Shigar gained international reputation as a place for special gemstone discoveries. Gold panning has a long tradition in the region. In the past it was mostly carried out by external mobile groups, while today it is increasingly being conducted by locals (Fig. 5). However, the further processing and trading of gold is in the hands of foreign actors, just as it is in the gemstone industry.

The recent sharp rise in the education level also plays a major role in transforming agriculture. Whereas just a few decades ago there were only a few primary and secondary schools for boys in Shigar, today all children in the entire Shigar Valley can attend an elementary school within a reasonable distance. The appreciation of education has increased and almost all parents send their children to schools. Thus, the literacy rate has risen sharply. More and more young males and females are striving for higher education and adequate employment outside agriculture, which can often only be realized in the nearby towns, in the Pakistani lowlands or abroad. Educational migration and episodic or seasonal labour migration have a massive impact on life and livelihoods in Shigar, including the performance and importance of agriculture and consequently the management of natural resources.



Fig. 5: Gold panning at Basha River (Photo: M. Schmidt 2023)

Generally, there currently seems to be a different perception and appreciation of agriculture. On the one hand, the older generations in particular hold on to agriculture and attach great importance to it now and in the future: "Farming gives us security, not to be dependent on markets and governmental subsidies. [... However], everyone wants to start its own business" (Teacher, 63 years, Shigar, 17.09.23). The younger generation on the other hand sees this issue very differently. Many young people no longer want to conduct farming and see much greater opportunities in non-agricultural employment, as the following quote shows: "The young men of our village see farming as a total waste of time" (Farmer, 52 years, Payushu, 09.09.23).

Discussion

In the Karakoram, the "Tragedy of the Commons" could come true after all. However, not in the way postulated by Hardin (1968), who supposedly identified some systemic flaws in the concept of commons regimes, which were largely refuted already by Ostrom (1990). Nevertheless, an erosion of the commons seems to be taking place due to various modernization processes. This is because the interest or opportunities for participation in the common management of natural resources is

declining. Tasks and responsibilities are being transferred to fewer stakeholders and thus often privatized and, consequently, commodified.

As the financial resources of households in the Central Karakoram are low and agriculture is not a way for most households to generate large incomes, professional irrigation management, organized by the private sector for example, is unlikely in the foreseeable future. As the state Pakistan lacks capacity, irrigation will probably not be organized by its agencies either. In this respect, common water management will be sustained into the foreseeable future. Especially as (farming) land is regarded as a valuable resource and is only sold in emergencies.

Shigar's high pasture areas are losing their attractiveness and importance. Due to difficult accessibility, state intervention is unlikely. Herding

activities will be concentrated on a few households in future. In many places, however, high pastures might be abandoned, resulting in scrub encroachment. Exceptions will be areas where valuable resources are found, or which can be used for tourism. However, the declining herding on high pastures not only changes the ecology, but also the socio-cultural function of pastoralism.

The transformation of the common pool regimes will undoubtedly have an impact on the identity of the local population in the Central Karakoram, which still identifies strongly as mountain peasants. The extent to which the erosion of the common pool regimes affects local communities and their social cohesion need to be investigated further.

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