Challenges in Assessing Social Impacts on ICCAs: A Central Asia Gold Mine

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ICCAs refer to "territories and areas conserved by indigenous peoples and local communities" or "territories of life" to emphasize their importance for livelihoods and well-being, according to ICCA Consortium (nd). ICCAs are internationally recognized as Governance Type D in the IUCN (International Conservation Union) classification of protected areas, and play a role in biodiversity conservation. ICCA is a broad designation that also includes areas controlled and conserved by non-indigenous rural communities. Many ICCAs incorporate sacred natural sites, defined as areas of land and water having special spiritual significance to peoples and communities (Verschuuren et al. 2010, p. 1). These may be areas dedicated to ancestral spirits or deities, and often serve at the same time as refuges for biological diversity. However, the definition of ICCA does not specify the inclusion of sacred natural sites or areas of high biological diversity.

To date little has been done to assess the impacts of development projects on ICCAs. That is in part because ICCAs constitute a heterogeneous mix of lands, and vary greatly in size and protection status. Even though they are important for biodiversity conservation, there has never been a global inventory of ICCAs, as the control of these lands is likely to continue to be contested between local people and the government. Rather, the conservation literature focuses on Indigenous peoples' lands for which there is a global inventory and firm data. Even though Indigenous peoples represent less than 5% of world's population, they manage or have tenure rights over 38 million sq km, representing 28 percent of the earth's surface. About 7.8 million sq km (or 20.7 percent) of Indigenous peoples' lands are already within protected areas, making up about 40 percent of the global protected area (Garnett et al. 2018).

As "territories of life", ICCAs are socially, culturally, politically and economically important for local people as source of livelihoods, well-being, and spiritual values. As such, environmental assessments need to address social as well as biophysical impacts. Specifically, sacred natural sites within ICCAs help understand Indigenous worldviews, for example, how people identify personally with the landscape. Take the example of Mauna Kea where native Hawaiians have been fighting development since the 1960s. Multiple observatories were built on Mauna Kea over many years, and recent clashes have been about the construction of the new thirty-meter telescope. It is not clear if elders are objecting to the scientific use of the sacred mountain, which offers an exceptionally clear night sky for astronomical observations. However, they certainly object to its desecration with trash, diesel fuel and toxic substances leaching into the land. The government considers the mountain as government land, but the people consider it *their* sacred site (Berkes 2021).

Whether the designation is Indigenous lands, or ICCAs/territories of life, or sacred natural sites, the social context of these areas are centrally important, as in the Mauna Kea example. Hence, an environmental assessment on these lands would need to address social as well as biophysical impacts.

Ysyk-Köl Biosphere Reserve, Kyrgyz Republic, as an ICCA

The study area is the Ysyk-Köl Biosphere Reserve. It includes Ysyk-Köl Lake and the gold mine in the case study. The mine site is near the western boundary of the core area of the Biosphere Reserve, shown in dark green in Figure 1.

In our previous work, we analyzed two conservation models in the Ysyk-Köl Biosphere Reserve. One is the Biosphere Reserve itself, a formal protected area recognized and administered nationally. The second conservation model is sacred natural sites, which is local-level, informal conservation. There are some 120 of them within the Biosphere Reserve (Figure 2). Sacred sites are diverse and include springs, river gorges, stands of trees, rock formations, burial sites, and the whole of Lake Ysyk-Köl itself. The lake is the second largest high-altitude lake in the world (after Lake Titicaca) and holds an endemic fauna of fish and other species comparable to Lake Baikal. Ysyk-Köl in Kyrgyz language translates as "warm lake". It is considered a sacred site partly because it never freezes, even though winter temperatures in the area average well below freezing (Samakov and Berkes 2017).

In Kyrgyzstan, sacred sites have no legal status. They are managed by local communities without government support, protected by custom and by voluntary guardians. They include both cultural elements (beliefs, practices) and biophysical components, such as the unique fish fauna of Ysyk-Köl. The two conservation systems are potentially complementary – the Biosphere Reserve designation provides national and international level support, and sacred sites bring local-level support. However, we found that the two systems do not interact (Samakov and Berkes 2016).

Case Study: Kumtor Gold Mine

Illustrating some of the considerations and complications in assessing impacts, the case study is the Kumtor gold mine, owned and operated until 2021 by a Canadian company based in Toronto. It is one of the largest mines in Central Asia. Kumtor started operations in 1995, and the Kyrgyz Government nationalized the mine in 2021. The case is currently at the international arbitration court. Kumtor is an open-pit, high-altitude mine (3,900m - 4,400m) on central Tien-Shan Mountains (Tengir Too Mountains in Kyrgyz) some 60 km from the Chinese border. It is Kyrgyz Republic's largest enterprise and export earner, with a total workforce about 3,500.

Environmental impacts of Kumtor is mainly on mountains and waterways, including the lake. These impacts are largely unknown and often hidden from view. Social impacts do not seem to have been examined at all, except by independent scholars long after the mine started up (e.g., Horrocks-Taylor 2018). The mine is entirely within the Biosphere Reserve and close to the Sarychat-Eertash Reserve, a core area of the Biosphere Reserve. Our focus here are (1) on the impacts on the mountain environment, glaciers and water flows, and (2) Ysyk-Köl and waterways joining the lake (Figure 3).

A major impact of Kumtor is on the mountain environment: Kumtor is in effect a high-altitude waste dump. Gold mining results in large amounts of waste rock. In the case of Kumtor, it also results in waste glacier ice because glacier ice has to be excavated to reach the ore. Waste rock (tailings), together with the excavated ice, are placed on top of glaciers. Davidov Glacier is partly covered with waste rock dumps (Figure 3). These dumps are unstable, as they are on top of a slowly moving body. A large landslide in 2013 involved 200 million cubic meters of waste rock and ice, and caused environmental problems and economic loss due to damage to excavating equipment and loss of work time (Torgoev and Omorov

2014). Other collapses and landslides due to design flaws in the placement of tailings have occurred several times, most recently in December 2019 that resulted in death of two workers (Kyzyljarova 2020).

Human impacts do not seem to show up in Kumtor's annual environmental reporting. These reports focus on wildlife, such as the rare and endangered snow leopard and mountain sheep, biodiversity at Sarychat-Eertash Reserve, water quality monitoring, and cyanide and waste management. We could not find any mention of the social and cultural impacts of the damage to the mountain environment. Mountains are generally revered by the Kyrgyz people and by Central Asian peoples in general because they are close to the Creator (Tengir). In fact, some locals say that the place where the gold mine is located used to be a sacred site in its own right (Samakov, unpublished interview data).

Impacts on glaciers are also linked to water flows connecting to Ysyk-Köl and other water bodies. The dumped waste is in the form of a mixture containing cyanide and heavy metals, which are stored in special containers and used in the development of about 10 tons of sodium cyanide per year. It was assumed that subzero temperatures would help fix liquid waste and prevent leaching (Zheentaev 2016). However, it was subsequently discovered that the glaciers in Kumtor have cold ice on top and "warm" ice and water on the bottom of the glacier, even in winter (Torgoev and Omorov 2014). This provides strong evidence that Kumtor is in a geologically active area, with hot-water springs deep in the rock formations.

Not only there is groundwater in Kumtor at such high altitudes, but the movements of this groundwater is largely unknown. Leaching chemicals and debris flows can enter the Naryn River, which is the headwaters of the Syr Darya River that flows west to Aral Sea (Zheentaev 2016). It is unclear how much of the chemicals used in gold mining end up in Ysyk-Köl to the north of the mine (Figure 3). Kumtor mine has water monitoring stations both on the Naryn River and on the rivers flowing into Ysyk-Köl. Reports are not clear about the results of water monitoring, but they strongly emphasize the importance of dilution factors.

The Barskoon River cyanide spill is informative in this regard. In May 1998, a truck traveling to Kumtor mine had an accident and lost 1.7 tonnes of sodium cyanide into the Barskoon River, which flows into Lake Ysyk-Köl . An international commission later concluded that "No carcinogenic, mutagenic, teratogenic, reproductive or neurotoxicological effects to people are expected." However, local residents and NGOs claimed that more than 2500 people were affected by poisoning, 800 were hospitalized, and four died. Kumtor paid $25 per adult as accident compensation. Local residents argued that this was insufficient compensation for the long-term health impacts and other losses. A social movement of the local people and NGOs started with the incident (Horrocks-Taylor 2018), eventually contributing to the nationalization of the mine.

Conclusions

The gold mine is entirely within the Biosphere Reserve, close to one of the core conservation areas. It appears to be partially in the watershed of Ysyk-Köl, meaning that contaminated waters are likely flowing into this sacred site. The mine itself is in a mountain area that also has sacred site characteristics. Lack of recognition of ICCAs and sacred sites prevents locals from defending their rights in court, and compels them to carry out protests and demonstrations. From a legal perspective, sacred sites do not exist, and hence no one can be held accountable for damages. The cyanide incident at

Barskoon River shows that even fundamental rights, such as those pertaining to human health, are not being respected.

Little have been done worldwide to assess the impacts of development on ICCAs. As "territories of life", ICCAs are important socially and culturally, and require social impact assessment. However, it is difficult enough to carry out environmental impact assessments, let alone social impact assessments, since most national governments do not even recognize ICCAs and sacred sites. Kumtor is one of Central Asia's two major mining projects, the other being the Mongolian "super mine". As well, there is China's "One Belt One Road", the "new silk road" (Laurance 2022). "One of the biggest drivers of environmental change is the tsunami of development projects… new roads, dams, mines … The governments… urge us not to be concerned, as each project is subjected to a rigorous EIA… Yet the alarming fact is, many EIAs are of limited value and some are virtually useless" (Laurance 2022).

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Figure 1. The study area.

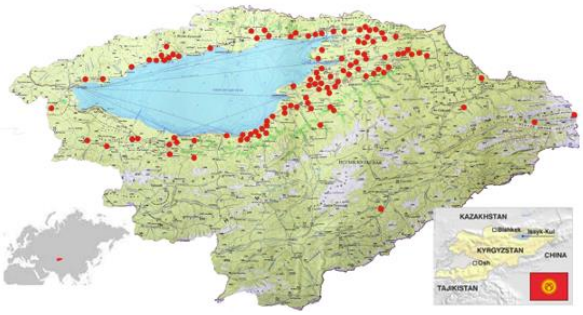

Figure 2. Sacred sites in the Ysyk-Köl Biosphere Reserve (Samakov and Berkes 2017).

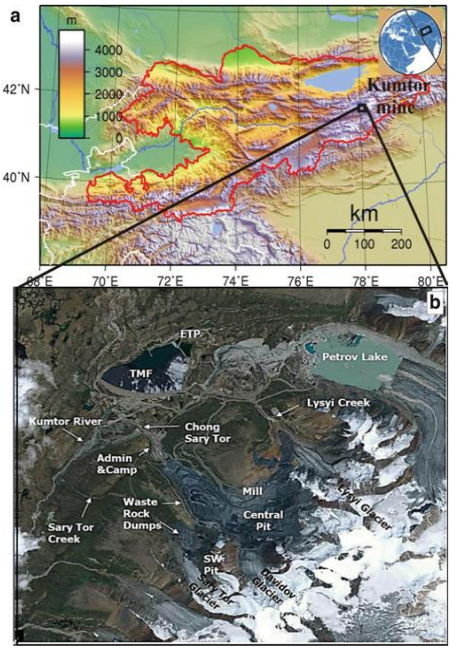

Figure 3. Location of Kumtor mine and a satellite image of nearby glaciers (Torgoev and Omorov 2014)