



Toolkit Companion with Case Studies

**MINING, DEVELOPMENT AND
ENVIRONMENT IN CENTRAL ASIA**



Mining, Development and Environment in Central Asia: Toolkit Companion with Case Studies

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Acknowledgement: The Ministry for Foreign Affairs of Finland and its Wider European Initiative has provided support through the University of Eastern Finland for the process of developing the toolkit for prevention and mediation of mining conflicts, and the associated analysis of environmental security in the mining sector in Central Asia.

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ISBN 978-952-61-0933-6 (print)

ISBN 978-952-61-0934-3 (PDF)

This toolkit companion is an illustrated overview of the trends and challenges in environment, mining and development of the Kyrgyz Republic and Central Asia. It focuses on environmental security in the mining sector and highlights selected causes and ingredients of recent mining-related conflicts, the lessons learned and the opportunities for solutions. The information comes from interviews with key stakeholders during fieldwork and desk studies, from official and scientific sources and from media accounts.

The toolkit companion strives to maintain complete and up-to-date information and to take the neutral position in assessing the local mining conflicts and identifying solutions. It provides Kyrgyz and region-specific material in support of the toolkit application.

This report was prepared by Zoï Environment Network (Geneva, SWITZERLAND), the University of Eastern Finland (Joensuu, FINLAND) and Gaia Group Oy (Helsinki, FINLAND) with assistance and advice from: Kyrgyz Mining Association, Osh Aarhus Environmental Information Centre, Chatkal Development Foundation, Kyrgyz State Agency on Environmental Protection and Forestry, Kyrgyz State Agency on Geology and Minerals, Osh Technological University, Institute of Geology under the Kyrgyz National Academy of Sciences, the Tajik Committee on Environmental Protection, the Tajik Committee on Geology, Tajik Nature Protection Team, and a number of mining companies and local administrations in Kyrgyzstan.



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MINING, DEVELOPMENT AND ENVIRONMENT IN CENTRAL ASIA: TOOLKIT COMPANION WITH CASE STUDIES

The publication of the mining toolkit and its companion documents coincides with the Rio+20 United Nations Conference on Sustainable Development, held in June 2012 in Rio de Janeiro, Brazil. The Rio+20 Conference calls for social inclusion and the reduction of poverty, and acknowledges the special role of the extractive sector in economic development. Environmentally and socially responsible mining contributes significantly to national budgets, and thereby helps governments fund the programmes that fight poverty. On the other hand, mining leads to CO₂ emissions and creates the lion's share of industrial and toxic waste in Central Asia. In the spirit of Rio, mining companies should commit to increasing the efficiency of extraction, to minimizing waste and maximizing recycling and to raising environmental standards. As a high-technology sector, the mining industry is also well placed to promote technology transfer.

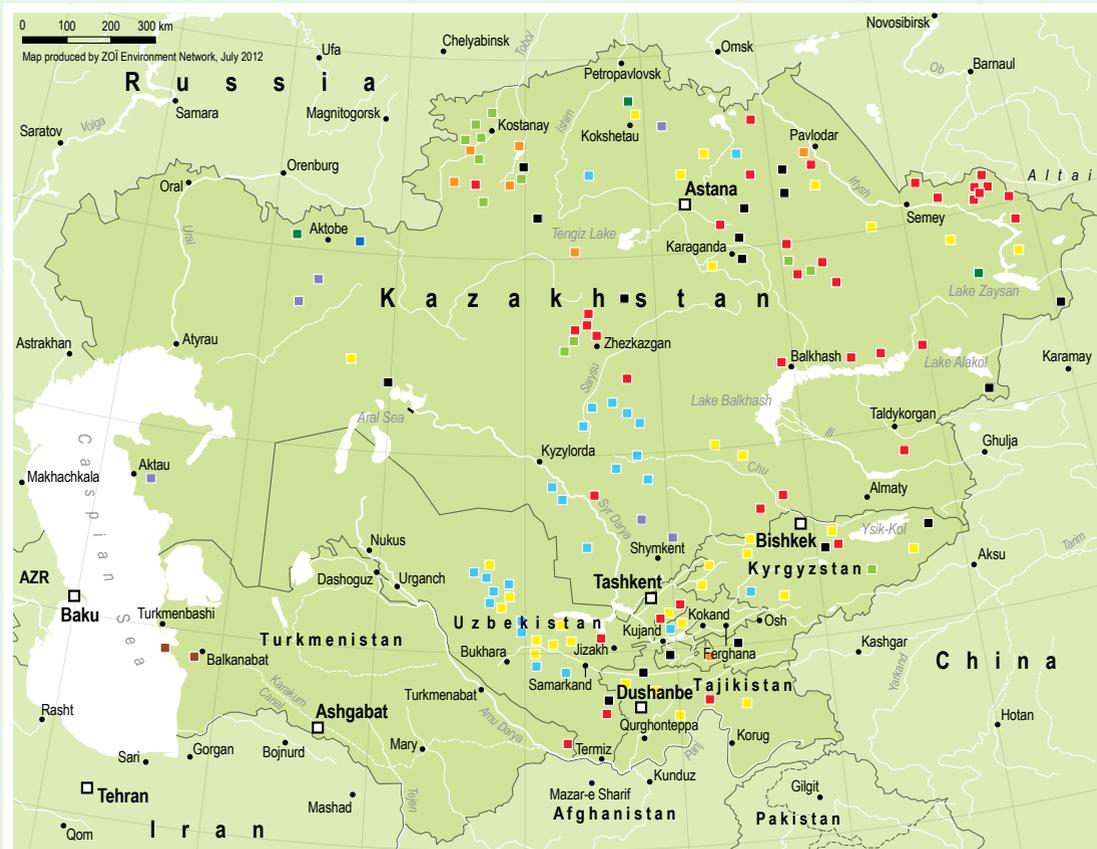
In making its contribution to responsible mining, the toolkit adopts the strategic perspective that the avoidance of mining conflicts is in a country's best interests. Where mining conflicts have persisted, investors have maintained a cautious attitude. Protests have split communities, led to internal conflicts, contributed to instability and damaged the image of regions and entire countries. Resentments can run in any direction – some non-mining communities may be jealous of the mining opportunities elsewhere, while some mining communities may be unhappy about how the mining operations have affected them. The avoidance and resolution of mining conflicts

can have a positive effect on both national stability and inter-community relations, and the issue deserves wider interest on the part of donors and others in a position to improve the situation.

Mineral Resources of Central Asia: A Geologist's Paradise

Of the three Central Asian countries reviewed as a part of this project – the Republic of Kazakhstan, the Kyrgyz Republic and the Republic of Tajikistan – Kazakhstan is the richest and most industrially advanced, and enjoys a high standard of living largely because of its abundant mineral, oil and gas resources. The changes in Kazakhstan following the end of the Soviet era have been gradual, and the country has remained relatively stable during the economic transition in the independence period. Large investors have responded to Kazakhstan's vast resources, political stability and the government's promotion of extractive industries, and as a result the mining sector is flourishing. The oldest established mining operations in Central Asia are in the Altai Mountains in the east of Kazakhstan, and the country is known for its chromium, copper, molybdenum, iron, lead, zinc, manganese, barite, and uranium deposits. Kazakhstan's uranium reserves represent a substantial proportion of the global reserves.

Several mines in northern Kazakhstan extract aluminum and magnesium ores, and a newly started modern private aluminum



Selected mineral deposits in Central Asia

- Aluminium
- Chromium
- Coal
- Copper, lead, zinc
- Gold
- Iodine, bromine
- Iron
- Phosphorite
- Titanium
- Uranium

Source: Central Asia Atlas of Natural Resources (→ <http://www.adb.org/publications/central-asia-atlas-natural-resources>)

smelter will further contribute to growth in the aluminum industry. Chromium reserves are mainly found, extracted and processed in the country's north-west Aktobe province. Numerous and significant copper deposits are found in central Kazakhstan, around Balkhash Lake and the Altai Mountains. Lead and zinc deposits are common in the Altai and south-central Kazakhstan. Overall, two dozen ore processing and concentration plants and nu-

merous mines operate across the country. The majority were inherited from the Soviet era and modernized. Others are newly built using modern technology and advanced energy and environment standards. Despite its mineral wealth and progress in mining sector development, however, investors are wary of Kazakhstan – complicated tax and licence regulations, the definition of bonus rates and corruption all represent risks.





Infrastructure and pollution

- Railway
- - - Projected railway
- Major roads
- Oil or gas pipeline
- - - Projected oil or gas pipeline
- Oil or gas field
- ⚡ Coal mining
- ◆ Mining in sensitive areas
- Recently constructed new tunnels
- ▽ Thermal power plant (coal, oil, gas)
- ▽ Hydroelectric power plant
- ▽ Nuclear power plant
- ▽ Projected hydroelectric power plant
- ▽ Projected nuclear power plant
- Radioactive contamination and limitations for landuse
- Concentration of industrial pollution

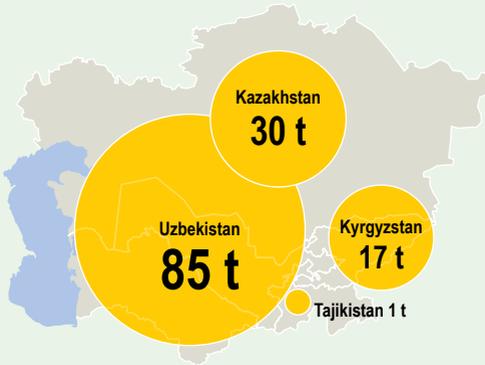
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Map produced by ZOI Environment Network, September 2011

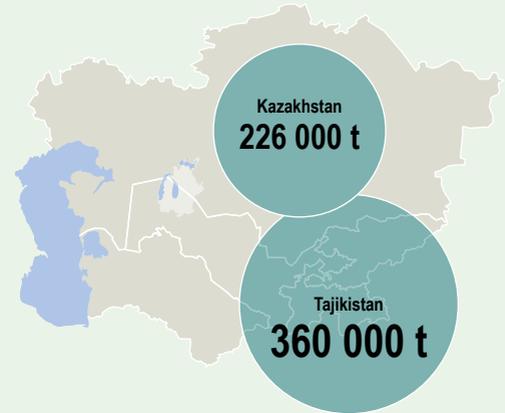
Sources: Pipeline Infrastructure Map of Europe & the CIS, The Petroleum Economist Ltd., London (→ www.petroleum-economist.com); Resources and Energy Atlas of Russia

Production of selected mineral commodities in Central Asia

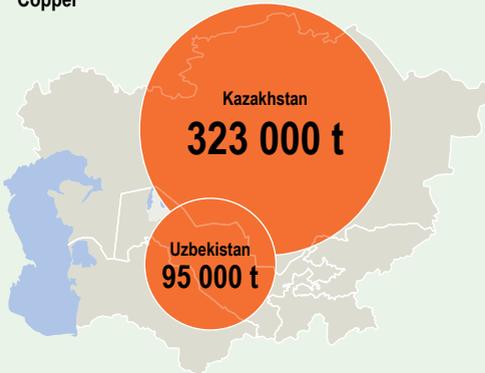
Gold



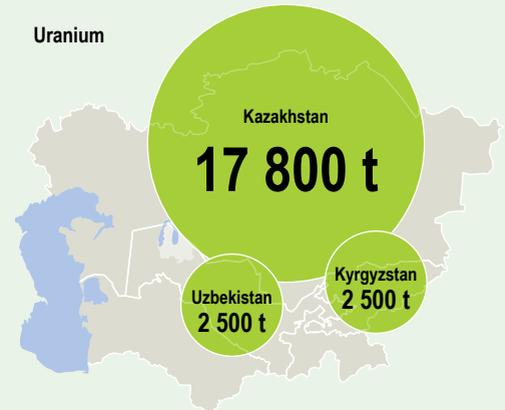
Aluminium (primary)



Copper



Uranium



Map produced by ZOI Environment Network, July 2012

Source: United States Geological Survey Minerals Information (→ <http://minerals.usgs.gov/minerals/pubs/country/europe.html>), Data reported for 2009-2010

The mountain countries of Kyrgyzstan and Tajikistan, in contrast, are less advanced industrially and economically, have fewer mineral resources suitable for development and have been less politically stable. Following independence a succession of governments in Kyrgyzstan and civil war in Tajikistan discouraged foreign investment, and rapidly changing

legislation in Kyrgyzstan and the lack of border security in Tajikistan continue to inhibit progress. In addition, both countries have large areas that are difficult to access because of high elevation and rugged terrain, and because their railroad systems and other infrastructure are underdeveloped.

The mining sector in Tajikistan – with few operational mines, all of which are inherited from the Soviet era – is the least developed of the three countries. Uranium mining, which had been an important economic activity prior to independence, collapsed with the Soviet Union, and has remained dormant for 20 years. The geology of the country was not as well researched as in Kazakhstan and Kyrgyzstan, and the data remained confidential until recently.

Significant reserves of copper, lead, zinc, silver and gold are found in northern Tajikistan, and the majority of mining and ore processing plants are located here. A significant exception is the Tajik Aluminum Smelter, which is situated 50 kilometres west of Dushanbe. This smelter relies entirely on imports of raw materials and uses inexpensive hydropower to extract aluminum. The government has recently announced plans to develop local bauxite ores along with increasing hydropower capacities to support aluminum and other industries. Another major plan for the country's mining sector development is the large silver deposit, Kani-Mansur, in northern Tajikistan. The Pamir Mountains in the east of Tajikistan are famous for gold, copper and other deposits of high quality and gems such as rubies, topaz, tourmaline and aquamarine. But the level of geo-exploration and available infrastructure here is not sufficient for mining operations in the near future. The Anzob mining plant develops significant antimony reserves in the Zaravshan and Hissar Mountains.

Many of Tajikistan's geological archives were destroyed in the civil unrest, or went missing, and in addition to the weaknesses in the geologic records, the country suffered from a brain drain as experts left Tajikistan, either chased out by civil strife or in pursuit of professional opportunities wherever they existed. Border security issues effectively close large areas of Tajikistan to mining. The limitations of the transport system also stifle development, and

laws regulating the use of subsoil are better suited to a socialist system than to the conditions of a market economy. The mining sector has few foreign investors, but the conditions for investment are slowly improving.

The geology of Kyrgyzstan is well researched and the mineral reserves are well explored, but prior to independence actual mining activities in the country were limited to a few strategic mines extracting uranium, mercury, antimony, rare-earth minerals for the needs of the entire Soviet economy, gold and coal. In the wake of independence and acceptance into the World Trade Organization (WTO), and with an improving investment climate and rising prices for gold and other minerals, however, the country opened itself up to international investors. Now, most areas with mining prospects are already allocated for geo-exploration and development, and Kyrgyzstan ranks third in gold production in the region after Uzbekistan and Kazakhstan.

The aluminum reserves in the Alai and Turkestan Mountains of Kyrgyzstan are significant, but extraction is only feasible if the country's hydropower sector significantly expands or regional aluminum smelters are ready to buy the mining product. Estimated iron reserves at the Jetym deposit (4 billion tonnes) situated in the centre of the country are also important and total nearly half of the iron reserves of neighbouring Kazakhstan. But no mining activities have been initiated here so far. Deposits of copper ores often associated with gold are found mainly in the northern and western parts of the country. Many are ready for mining, but local protests have halted further progress. Mercury and antimony reserves and related mining enterprises are legendary from the Soviet era and operate in country's south. The remaining reserves are sufficient for many years of extraction at the current pace. Kumtor is the largest gold mining enterprise of Kyrgyzstan. Discovered in 1978 in

the high mountains of Central Tien Shan, this deposit was studied in detail during the 1980s by the Soviet geologists. Constructed and launched in the early years of independence in the late 1990s, the mine is now contributing 65 per cent of the Kyrgyz mining sector production and is a substantial source of taxes, social fund payments and employment.

During the Soviet era, the countries of Central Asia relied upon the state to provide infrastructure and social services and benefits. The ministry of geology was well financed, and mining and related development activities – road-building, power supply and community schools – proceeded with the support of the state. Now that private companies are responsible for mine development and operation, they face longstanding community expectations that the development of infrastructure and social services previously provided by the state through the state-owned mining companies will be provided by the private companies.

The specific development circumstances vary by company and by location, and the countries themselves have widely different experiences with mining. Since independence, licenses for geological exploration or development of some mineral deposits in Kyrgyzstan have changed hands several times, and typically each new owner-operator has felt no obligation to honour any community commitments made or voiced by its predecessors. Pollution inherited from the Soviet era or former mine owners was not well documented and therefore the environmental impacts of the new mining companies could not be easily

differentiated and assessed. As a result, and in combination with Kyrgyzstan's more limited experience with mining, opposition appears to be the community default position to any new mining ventures in the country. Kazakhstan, in contrast, has a much longer and more stable mining tradition, and while much of the country's mining occurs in sparsely populated desert areas, many local communities have co-existed with mine operations over long periods, such as in the Altai Mountains. Growing contrasts in development activities and income levels among oil-rich western and mineral-rich eastern and central provinces and the rest of Kazakhstan are evident.

As the three countries pursue their mining prospects, they are focusing on their priorities. For Kazakhstan, that means uranium mining in the largely uninhabited region in the middle of the country, the continuation and expansion of chromium, copper, iron, lead and alumina mining and the production of gold as a side product of other mineral processing. In Tajikistan, strong silver reserves and high silver and gold prices make for a priority, and the country expects to have the Kani-Mansur silver mine operational soon. Tajikistan is also opening up its gold deposits to foreign geo-exploration and mining companies. Kyrgyzstan hopes to commission more medium-scale operations in order to double its gold production, to restart rare earth production (which ceased after independence) and to negotiate with China regarding development of iron and other reserves.

KYRGYZ CASES

The cases presented here identify root causes of the conflicts in the mining sector, provide lessons for the future and suggest the solutions that may emerge from careful planning. The cases benefit from field research and from consultations across the spectrum of interested parties.

With the collapse of the Soviet Union, the new Kyrgyz government faced the loss of most of the country's markets. The markets for minerals (particularly gold), however, remained strong, and the government turned to the mining sector to generate the minimum resources necessary to maintain the state budget. Data on proven reserves of mineral resources in the Soviet era were considered confidential, and no one in Kyrgyzstan seemed to understand the market value of the country's mineral resources.

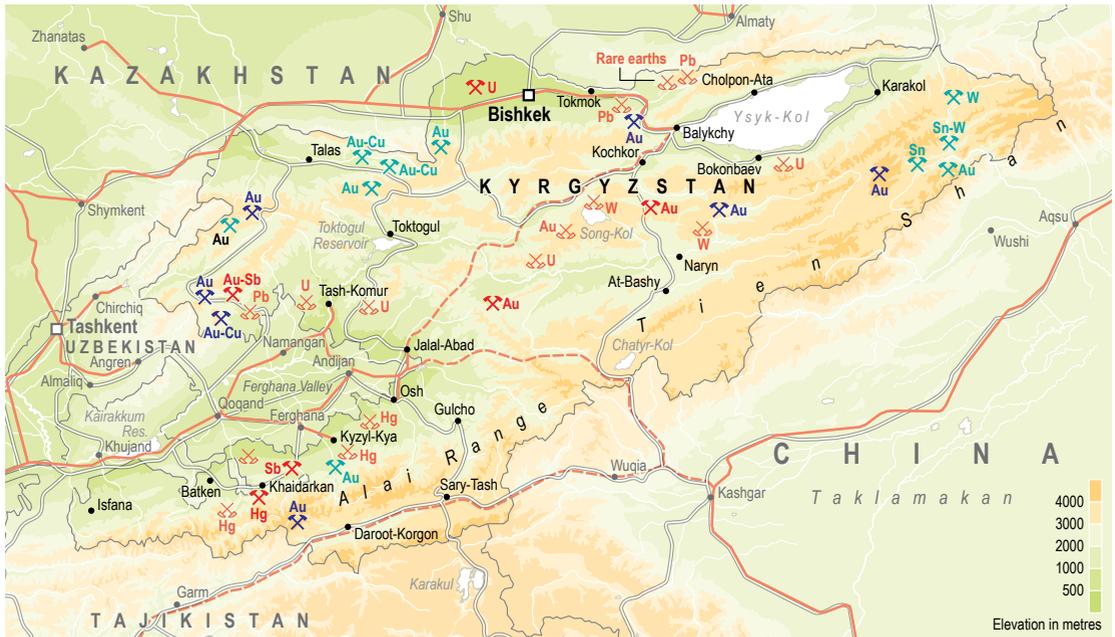
Kumtor is the largest geological discovery and operational mine in Kyrgyzstan. A Canadian mining corporation was engaged to organize the development of mining operations. The project was advertised in the media, suggesting that Kumtor's development would create thousands of jobs, help develop the infrastructure of the region and provide significant tax revenue support for the state budget.

The government made similar claims for the significant gold deposits of Taldy-Bulak and Jeruy, but then granted development rights to investors who could not launch the mining

process in a specified period of time, and the licenses were cancelled or the rights resold to other mining companies. Parliament accused the government of corrupt licensing practices, and society's dissatisfaction with government mining policies grew. New mining legislation in 1997 failed to account for the valuation of previous discoveries, and officials used their vast discretion to issue mining licences based on direct negotiations lacking transparency.

Kumtor started mining operations in 1997, but most of its income was used to repay loans, and support for the state budget fell short of expectations. Local governments sometimes turn to mining companies for help, mainly in local infrastructure development, and Issyk-Kul province, where the Kumtor mine is located, received funds for infrastructure development including power lines and roads with a total budget exceeding US\$ 60 million and another US\$ 20 million to the Issyk-Kul development fund. Kumtor had managed to develop peaceful relations with the local population, but after a sodium cyanide spill occurred as the result of a transport accident shortly after operations began (in May, 1998), the relations began to sour.

The spill contaminated the Barskoon River, and about 1 500 people downstream applied for medical care for possible poisoning. In response, the mining company decided to pay one thousand Kyrgyz soms (about US\$ 50)



Mining industry of Kyrgyzstan

- ✕ New mines planned for the next 5 years
- ✕ New mines put into operation in the last 20 years (independence era)
- ✕ Mines and processing plants operational since Soviet era
- ✕ Closed or suspended: Soviet era mines
- Railway
- - - Railway projected
- Major road

Coal mines are not shown
 Map produced by ZOI Environment Network, July 2012

to each adult, and five hundred soms to each child of the Barskoon village and to all those who went to the hospital with complaints of poisoning. For the poor rural residents in the area, the compensation was not insignificant, and the number of complaints increased over time. As the local population realized that the company could pay more, the demands for compensation spread to nearby areas. Protesters began blocking the roads leading to the mining site, and NGOs became vocal and radical. The company has paid the government damage compensation of US\$ 4 million, but the fate of this money is unknown.

In the summer of 2012, the situation around

the Kumtor mine almost reached the boiling point once again. The Kyrgyz Parliament and Government established commissions to conduct environmental and other investigations on the mine's performance and in parallel issued populist statements regarding the need to revise the investment agreement to get a larger share of stock for Kyrgyzstan. This led to more uncertainty in the operation of this large mine and sent a negative signal to investors. Over the past decade protesters have sporadically disrupted mine production by blocking the roads and supply bases important to the mine. But Kumtor is in the high mountains, far away from villages, while many pro-



Selected mineral resources

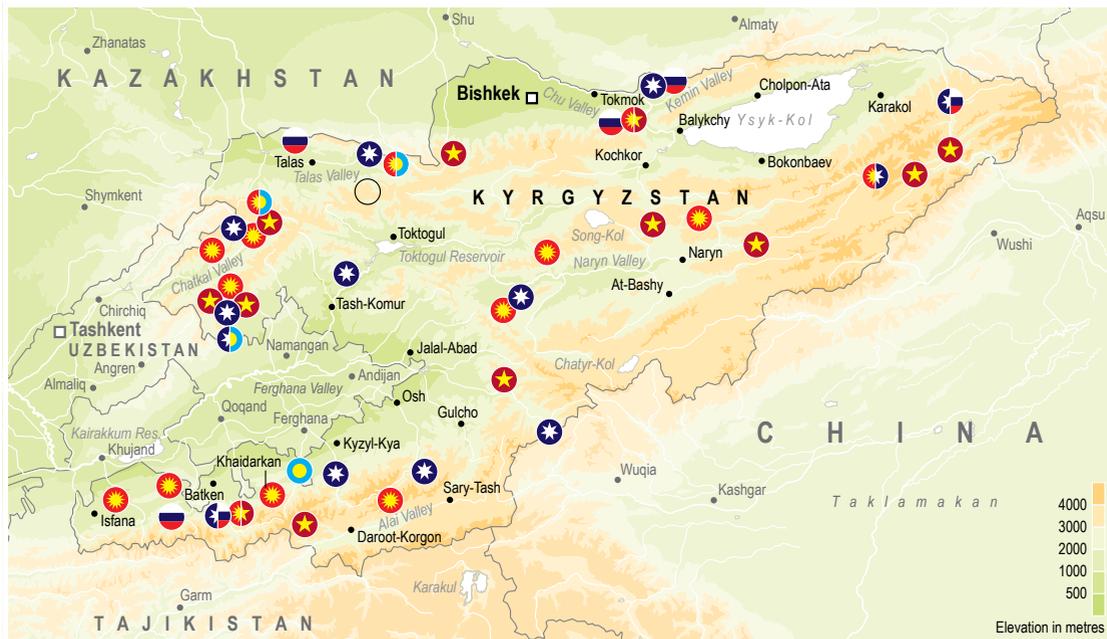
- | | | | | |
|---------------|-------------|-----------|-------------|----------------|
| Gold 5-30 t | Gold/Copper | Tin | Iron | Other minerals |
| Gold 30-100 t | Mercury | Aluminium | Molybdenum | |
| Gold > 100 t | Antimony | Beryllium | Rare earths | |

Map produced by ZOI Environment Network, July 2012

spective mining sites of Kyrgyzstan are very close to populated areas.

In the late 1990s and early 2000s, many foreign companies found out that Kyrgyzstan, as a member of WTO with a predictable and liberal investment policy, offered licences to the deposits of significant reserves of gold and other minerals at low cost. Some companies that came to the country started additional geological exploration and were preparing the proper mining documentation to international standards to access financing for mining projects. When local business elites began to realize the value of the deposits, they started to apply for licences for all types of minerals.

By 2008, the number of licences issued annually peaked at 2 000, but only a few licence holders were doing any work on the ground. Most licence holders were unscrupulous investors, and the government revoked the licences of those who were not mining and reissued the licences to new applicants who often resold the licences to foreign companies. In the context of growing public sentiments in opposition to foreign companies extracting the natural resources of Kyrgyzstan, local leaders catalysed people to protest under the slogan, “We are going to dig our gold”, and often used the environment as a rationale to prevent mining operations.



Current players in the mining sector

-  Kyrgyz
-  Western or Australian
-  Kazakh
-  Chinese
-  Russian
-  Open tender

Situation shown on the map is valid for July 2012
 Map produced by ZOI Environment Network, July 2012

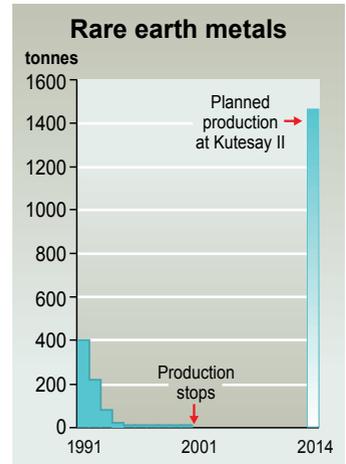
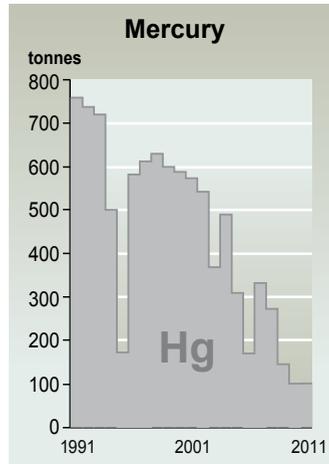
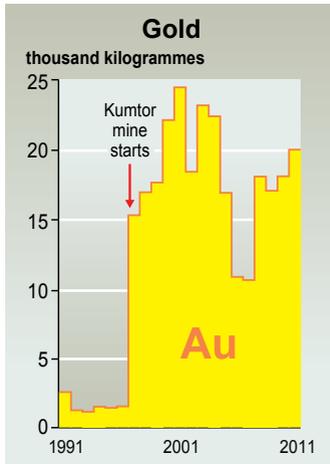
The change of power in 2005, motivated by the desire to rid the government of corruption, resulted in a new governmental structure and improvements in the process for issuing mining licences. Many more licences were issued, but while the government declared its intent to fight corruption, nepotism became prevalent. As power became more centralized, the preferences of the national government overwhelmed those of local authorities and the public interests with respect to mining licence decisions. This centralization of power led to a new revolution in 2010.

Civil unrest in April 2010 contributed to another revolution. The country was gripped by political crisis, and all investment activity in Kyrgyzstan ceased. Investors had to decide

whether to temporarily suspend their activities in the country until there was some stabilization of the situation or to move out all their assets to a more stable region, abandoning all their material assets and their production bases. The new government had new ideas about how to develop the country, and their attitude emboldened local populations and parliamentary deputies to demand new terms for mining operations. Conflicts between locals and mining companies escalated to the point that the companies abandoned operations for the sake of safety and security. Local demands sometimes exceeded the legal framework, and some looting occurred.

Uncertainties in the mining sector were profound – local conflicts, new legislation and the

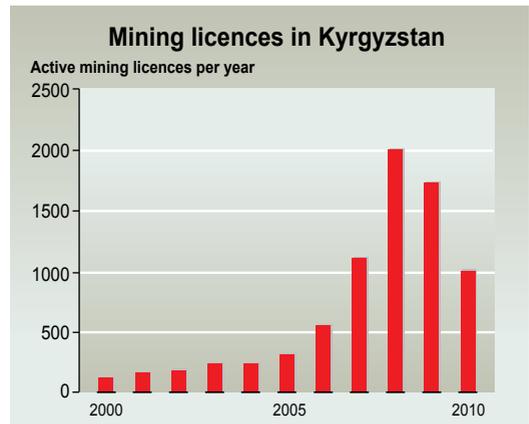
Production of selected minerals in Kyrgyzstan



Sources: Kyrgyz State Agency on Geology and Mineral Resources; USGS Minerals Yearbook: Kyrgyzstan information

general uncertainty related to the intentions of the government all contributed. The planning environment for mining companies became untenable as they faced questions about their ability to operate or to get and maintain a licence. Given the general instability in the country, some mining companies moved to more stable regimes, in Uzbekistan, for example, and the image of the country precluded new investment by all but those with experience in unstable conditions. As a result, the presence of Chinese mining companies that were prepared to work under risk conditions increased rapidly – a trend that is likely to continue in the future.

In the province of Naryn, in the centre of Kyrgyzstan, where a Chinese company was working the Solton-Sary gold deposit, poverty and the lack of jobs prompted young people to challenge the company to get out. The region's experience with mining was limited to placer gold development in the Soviet era, and was characterized by careless environmental practices including the use of mercury



Sources: Kyrgyz State Agency on Geology and Mineral Resources

for extraction. These practices left Naryn with the highest concentrations of mercury in river sediments in the country. Kyrgyzstan began development of Solton-Sary in the early 1990s, and the state still owns part of the deposit (the Altyntor section). Some parts of the society – less radical than the youth – cited environmental concerns as the reason for their

resistance to the Chinese company. The local population wanted control of the mine, but the Kyrgyz government advised them to follow the correct procedures and apply for a licence. With little knowledge of mining and little interest in the correct procedures, the locals nevertheless managed to extract bedrock gold and to produce a gold concentrate, thus increasing their confidence that they could operate the mine on their own. Currently, part of the population in several villages of the Naryn province continues to mine gold illegally thus deflecting mining companies from operating here.

Today, Naryn province faces the prospect of the development of iron ore deposits located near a nature reserve in an area with highly productive pasture land. People in the local villages and across the province are concerned that the government granted a license for deposit exploration to a Chinese company. The license has since been revoked.

The Chon-Alai district in southern Kyrgyzstan had no mining activity and limited geo-exploration in the Soviet period, but in the past decade intensive geo-exploration was followed by the installation of a gold beneficiation plant with Chinese investments. The revolutionary spirit eventually reached the district, and what had been neutrality turned

into opposition to the development as the domino effect reached this remote valley.

Initially, the development of gold mining facilities in Chon-Alai proceeded without public consultations or social contributions, and while the quality of the environmental impact assessment satisfied the central authorities, the locals were not impressed. While the company has started a local sponsorship programme and gradually hired locals from nearby villages, growing distrust led to local opposition to mining operations followed by road blockages and criminal investigation on the issue of illegal export of enriched gold ores from the Chon-Alai district to China.

Some people see no benefits from mining, and believe that mining will disrupt their traditional way of life. Speculators sometimes exploit these people by getting them to take part in local protests that benefit the speculators, and politicians have supported the protesters to further their own interests. Local leaders – lacking the requisite expertise – have made the situation worse by making primitive estimates of the value of the region's mineral wealth. Their exaggerated claims have encouraged the idea that the country's mineral riches should not be transferred to foreigners.

Evolution of mining conflicts in Kyrgyzstan



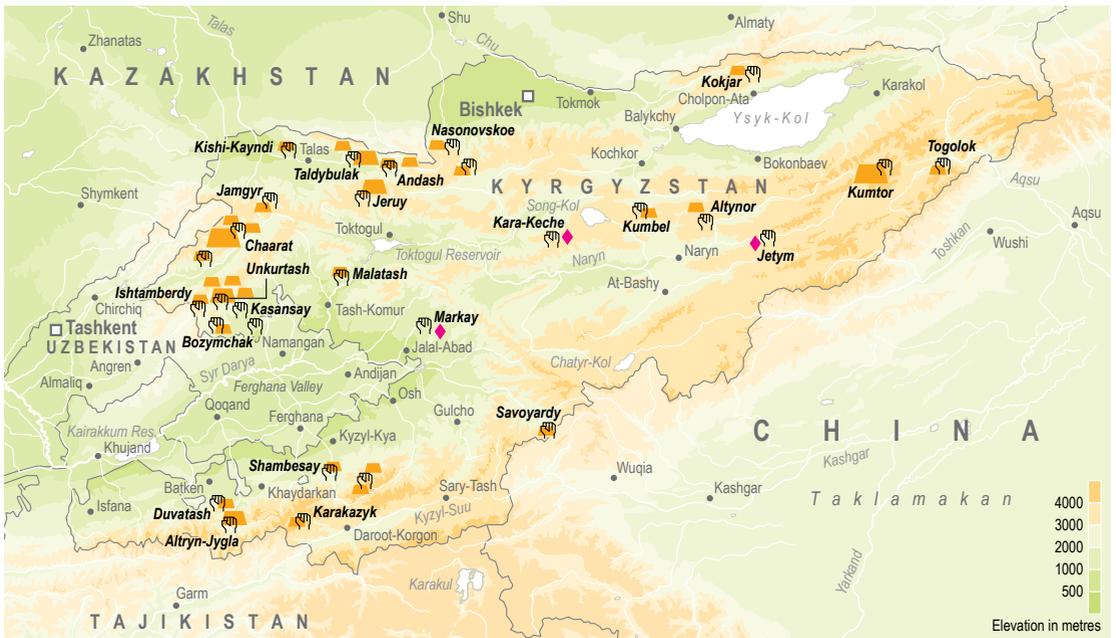
1995-1998
Kumtor cyanide spill and Talas protests



2005-2008
Revolution in 2005, growing mining protests



2010-2012
Revolution in 2010, spread of mining protests



Mining conflicts

- Local resistance to mining
- Selected gold deposits
- Other minerals

Map produced by ZOI Environment Network, July 2012

Chatkal Area

The Chatkal area lies in the north-west part of Kyrgyzstan near the borders with Kazakhstan and Uzbekistan. The Chatkal administrative district covers the Chatkal and Kassan-Say river basins, divided by the Chatkal Range. The Chatkal River joins the Pskem River in Uzbekistan to form the Chirchik River that flows south-west towards Tashkent, and the smaller Kassan-Say River flows towards the densely populated Ferghana Valley in the south-east. Remnants of hundreds of ancient mine works and stone mills located in the area stand as mute testimony to the long tradition of the area's gold and copper mining, which dates back more than 10 centuries. Gold and copper production halted in the twelfth century when invaders took over the region.

In the Soviet era, life in the isolated Chatkal Valley and district was highly subsidized, with the state providing food, social services and education. The area was primarily agricultural, and subject to intensive grazing as herders from Kyrgyzstan, Tajikistan and Uzbekistan brought their stock to the valley. The presence of so many animals led to the development of animal skin production, and the Soviets built facilities that used chrome in the processing of hides. The unfortunate legacy of this industry was the pollution of the Chatkal River, and the depletion of native fish stocks.

With the withdrawal of the Soviets, the provision of winter supplies stopped abruptly, grazing declined rapidly and the Chatkal inhabitants developed survival and self-sufficiency

strategies to adjust to the new conditions. Throughout the difficult 1990s, the poverty in the valley skyrocketed and people were continuously hoping to get support from someone. In those days, gold was the most important (if not sole) source of income for the local population, and as much as 10-20 per cent of the population turned to artisanal mining. To date, the artisanal miners have developed virtually all easily accessible placer gold deposits. As the economy has improved and poverty rates declined, many of these temporary miners have taken up other occupations. Eventually, rising gold prices sparked interest among larger companies from China, Russia, Kazakhstan, Australia and others.

In the last 5-10 years, the Chatkal residents have come to realize that they must be self-sufficient to achieve success. With general economic growth of the country and improvement of the local situation, they feel more confident and secure, but are still nostalgic for the Soviet time. Like in other districts of Kyrgyzstan, locals from Chatkal go to work to Russia or Bishkek. All income is spent on food and clothing with little devoted to savings. Pensions are extremely low, below 4 000 Kyrgyz soms (US\$ 100). On the other hand, due to the remote location of Chatkal, prices for many services and products are high (20-30 per cent higher than the country average). In spite of all these economic challenges, a system of kindergartens, schools and rural hospitals is well maintained in the area.

The main local crops are potato, garlic and grain, while meat production is the key source of cash income. The conditions of pastures and rivers have improved in comparison with the Soviet era, and the population has slightly declined due to outmigration. The non-functional irrigation systems limit the agricultural potential. Local people and authorities see their future in diversification and growth of agriculture, small-scale hydropower, the development of tourism and environmentally responsible mining (gold, copper, wollastanite). They also want the main road to be improved to make the valley accessible year-round. A number of residents mentioned to the research project group that if many mining and geo-exploration companies come to the area, they will improve the road, and if not, nobody will.

Soviet geologists identified the ancient Chatkal area placer and primary gold deposits, which were not economically viable at the time, and mapped but did not develop deposits in the valley. The only mining operation in the Chatkal District at this time was the Tereksai mine, which produced antimony for 40 years during the Soviet era. This mine was formerly a part of the Kadamjai antimony mine and smelter complex located in the south of the Ferghana Valley in Kyrgyzstan. It was the only antimony producer of the former Soviet Union. After independence, ownership of the Tereksai mine passed from the Soviet to the Kyrgyz government, first under the management of the Kadamjai antimony plant and then under the Joint Stock Company, “Kyrgyz Altyn”, and production – in response to changing economic conditions – switched from antimony to gold concentrate. It now provides 450 jobs employing mainly locals. The experience of the conversion of the Tereksai mine from antimony and gold concentrate could be instructive for the Khaidarkan mercury plant, which experiences great technical and environmental challenges in keeping its mining operations going

Due to lack of investment to expand and modernize operations, the Tereksai mine continues to rely on old equipment. Another challenge facing the mine is access to nearby gold deposits: out of 30 small deposits identified, Kyrgyz Altyn held licences for only two. The central government reserved the rest for the exchange programme that swaps infrastructural investments for mineral reserves. One example of such a swap is the Ishtamberdy gold deposit (20 tonnes) located on the Kassan-Say River and mined by a Chinese company. Allegedly, the developers neglected environmental regulations and the right of public access to information and damaged the local ecosystem during the construction phase. Finally, when the factory started operations in 2011, allegations of pollution of the Kassan-Say River angered residents and resulted in violence, road blockages and the suspension of mine operations.

To reduce local environmental pressures and associated public concerns, Tereksai has proposed to align several gold companies operating in the Chatkal area into a consortium, and to build a gold processing cluster plant based on the Tereksai site. The company also encourages other mining companies to register locally in order to increase local contributions to budget and taxes and to improve their transparency for residents and authorities.

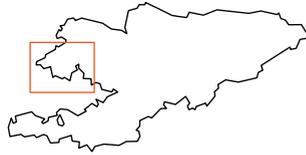
Some of the mining companies new to the Chatkal area specialize in placer gold mining, and typically dig alongside the rivers of the Chatkal and Kassan-Say. About half of these operators are Chinese companies with mostly Chinese workforces; the rest are Kyrgyz, Russian and other foreign firms. The remaining artisanal miners, who formerly operated without much planning, now follow the placer mining companies, taking the leftovers and sometimes using mercury. Their current methods rely more on bulldozers than on shovels, and while their productivity is higher with mechanization, so is their environmental damage.





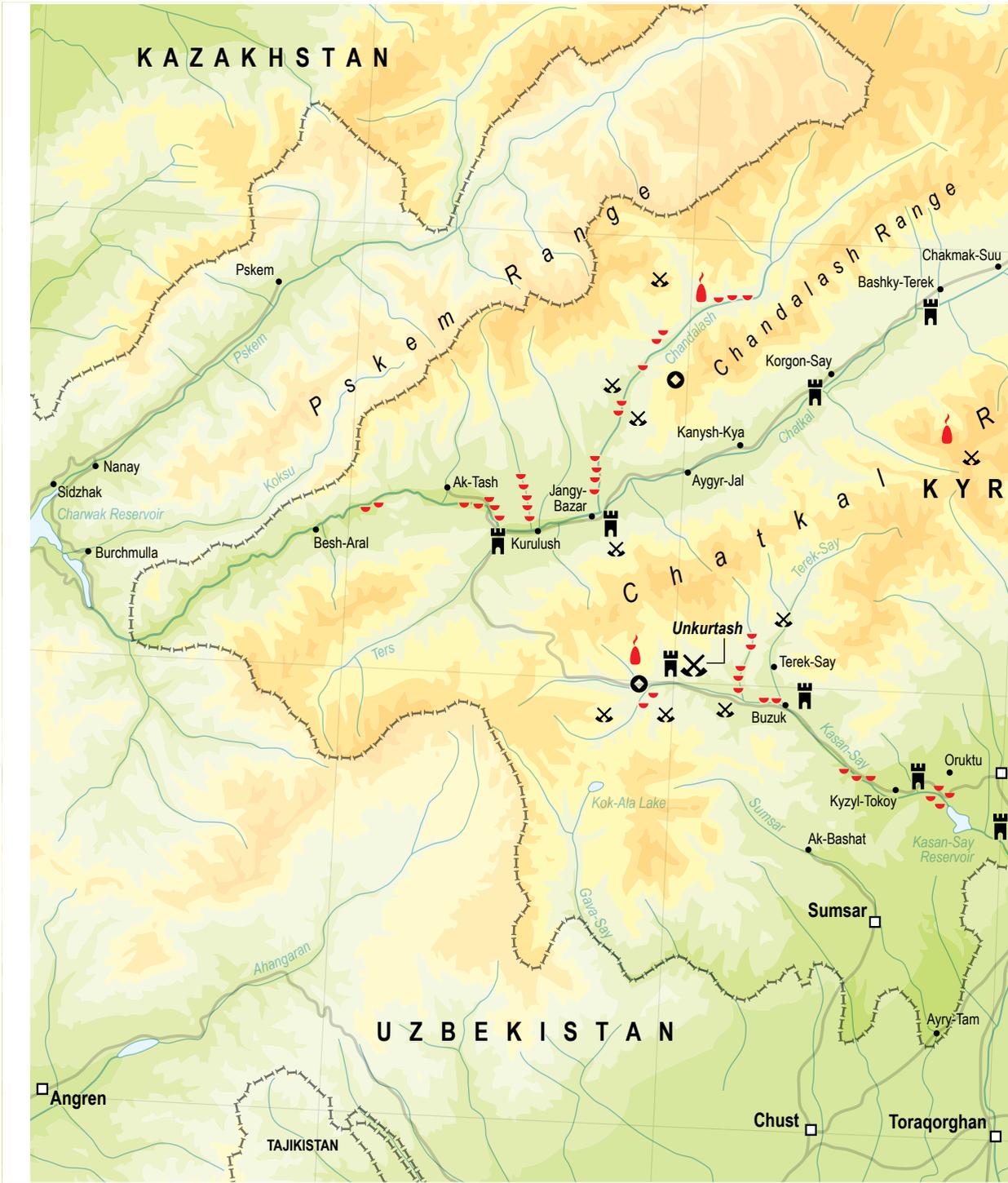
Chatkal environment

-  Nature reserve
-  Forest
-  Forest along rivers
-  Major road
-  Glacier



5 10 15 20 km

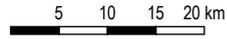
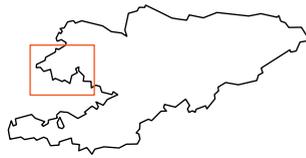
Map produced by ZOİ Environment Network, July 2012





Chatkal ancient mining and historical sites

-  Ancient smelters
-  Ancient extraction of alluvial gold
-  Ancient mines
-  Ancient mills
-  Castles and mazaras



Map produced by ZOİ Environment Network, July 2012

KAZAKHSTAN



UZBEKISTAN

TAJIKISTAN

Angren

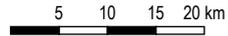
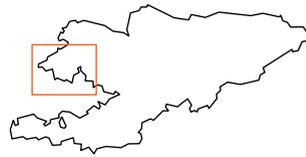
Chust

Toraqorghan



Chatkal placer gold mining

-  Industrial placer mining (ongoing)
-  Industrial placer mining (completed)
-  Artisanal gold mining (ongoing)
-  Artisanal gold mining (completed)
-  Gold placer



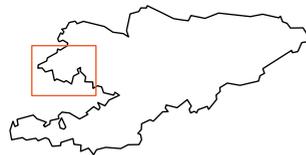
Map produced by ZOİ Environment Network, July 2012





Chatkal mineral resources

-  Gold
-  Lead
-  Antimony
-  Tin
-  Copper
-  Tungsten-Molybdenum
-  Wollastonite
-  Small deposit (Au 5-30 t)
-  Medium deposit (Au 30-100 t)
-  Large deposit (Au > 100 t)
-  Mining facility
-  Mining facility (under construction)
-  Mining facility (abandoned, closed)
-  Geological exploration
-  Radiation



0 5 10 15 20 km

Map produced by ZOİ Environment Network, July 2012



Chatkal mining conflicts

-  Local resistance to mining activities, mainly on environmental grounds
-  Resistance with violence
-  Road blockage by selected villages, demanding road rehabilitation, jobs and other local investments

Information shown on the map is valid for 2010-2012

In the Chatkal River basin artisanal miners work mainly in winter, when they are free from the intense engagement in agricultural activities of other seasons. But work in winter is hard due to the harsh climate. The Chatkal Valley is blocked in winter and there are not many options for employment. On the contrary, in the Kassan-Say river basin, artisanal miners operate mainly in the warm seasons (summer-autumn), when weather conditions are favourable and placer gold deposits are accessible. On average, artisanal miners extract 0.5-1.0 grams of gold per day per person, but labour productivity varies substantially depending on the place, skill and method of work. According to the regulations, artisanal miners must be registered with the village council and obtain a patent from authorities, but very few do so. In difficult times the number of artisanal gold miners in the area exceeded 2 000 persons, which is 10 per cent of the Chatkal district population. Currently, the estimated number

of artisanal miners in Chatkal is less than 500 persons, mainly locals.

The people in the Chatkal area have long associated mining with the provision of social services, and although the state now has responsibility for roads and other infrastructure, the Tereksai company continues to operate in a socially responsible manner by supporting schools and the employment of women. Having established and maintained good community relations, Tereksai enjoys the respect of the locals to the extent that it often facilitates the resolution of disputes between new mining operators and the community.

Other mining companies operating in the area are beginning to follow the example set by Tereksai. Those with sufficient experience to understand the local context are now devoting resources to the education of young people, and are increasing community benefits through procurement policies by buying locally produced food and clothing. In addition, they are sponsoring kindergartens and schools and improving infrastructure such as power lines and roads.

The central government exhibits little interest in the small-scale mining companies and artisanal miners, and exerts only marginal control – scant oversight and few inspections of operations. Local authorities have not had much control either, but some Kyrgyz, Kazakh and Russian operators have demonstrated a willingness to cooperate with local officials, assisting with transport and minor road improvements and bridge repairs. Under pressure from the locals, Chinese operators are responding to requests for support and are enhancing environmental safeguards of their mining operations.

Local perceptions of the effects of mine operations on the community motivate the approach of the local authorities. Mine operations, especially at placer gold deposits along the rivers, cause the suspension of sediments

in water, for example, and downstream users notice the change in appearance, and demand mitigation measures – water purification systems or some preventive steps to curtail the high turbidity. Similarly, increases in the dust and traffic associated with mining have led to demands for the paving of roads and other dust prevention measures such as watering or taking alternate routes. Some local residents also suspect that the increased mining truck traffic causes damage to their houses. Climate change impacts and weather variability in the Chatkal area, especially the recent reduction in snow cover and available water resources (little snow and record low water levels in 2008 and 2011), should not be ruled out as additional stress factors that the local population may sooner or later associate with mining activities. Local winters are getting warmer, the snow melts earlier and other weather patterns are changing.

The employment of local workers is an important issue in relations between the community and the mining companies, and some lower-skill jobs such as driver, excavator operator or security guard are filled by locals. Most of the companies operating in the Chatkal area have spent the past 5-10 years in exploration and development, and are now ready to build or to start operations. During this preliminary stage, the companies hired locals mainly as drivers, and now face policy decisions on local employment for operations. The local workforce qualifies for the lower-skill jobs, and through the mining education college operated by Tereksai, some locals may eventually qualify for professional mining positions. Several new mining companies have long-term plans to send local youth to receive mining education in the capital.

According to local environmentalists, water protection and forest zones along riverbeds should not be included in mine licence areas because environmental damage from industrial

alluvial gold mining is already substantial in the Chatkal area. This kind of mining practice also causes many complaints from the local population and local authorities about water quality and destruction of river ecosystems. Forests of all types are normally monitored and protected by the state forest services, but unclear responsibilities among environmental, forest, geological and water authorities over riverbed ecosystems – including forests – create a gap in effective enforcement and control. Local environmental and land registration authorities feel excluded from participation and their experts do not have the opportunity to provide their views regarding environmental impact assessments of mining projects or have a voice in the process of land allocation for mining purposes. They also have difficulties in accessing and entering some mining sites for regular and on-demand environmental inspections.

The Besh-Aral nature reserve in the Chatkal Valley is facing a challenge of coexistence with the growing intensity of geo-exploration and mining activities around it. While the number of protected animals has somewhat increased compared to the Soviet period due to a clear reduction in grazing pressure, this trend could be reversed due to anticipated impacts (noise, traffic, roads, pollution) of mining activities in the coming decade.

Unclear and changing boundaries of the protected area and its buffer zone, as well as the recent submission of the Chatkal along with bordering areas in Uzbekistan and Kazakhstan for nomination as a UNESCO Western Tien Shan world heritage site, may further intensify the existing contradictions between the conservation of natural areas and mining.

Finally, very few companies are planning or making contributions to environmental rehabilitation funds that according to legislation should be established and used for land reclamation after mine closure or when a mining company suddenly discontinues its activity.

As life in many rural mountain areas is difficult, the locals see the mining companies as the main sponsors or solutions to their problems and are increasingly using tough measures to address their social and development needs.

Limited comprehension of the rules and laws among the local population, combined with despair and poverty, forces locals to resort to the blockage of roads and access to mine sites or more intense forms of confrontation. If mining companies promise to do something, they need to honour this promise, and be open and accessible. Public meetings and hearings facilitated by local administrations and competent NGOs are essential to let off steam, discuss compromises and agree on the next steps. But as experience in other regions of Kyrgyzstan shows, sometimes a negative attitude towards mining is also rooted in the recent politicization of the society, influence of business elites, informal leaders or some groups struggling to take control of the mineral resources or otherwise dissatisfied with the current arrangements. In some situations when mining companies do pursue social development programs – improving the drinking water supply, for example – public discontent over the crucial issues such as employment (when some community members got jobs, and others did not) and environment (dirty water in rivers due to mining) – may easily result in an outbreak of conflict.

Interest in the responsibilities of the mining companies regarding the provision of infrastructure, social services and employment led local authorities to take an active role in the discussion of development issues in the region. Public hearings considered the creation of a mechanism for determining proportional contributions from the mining companies to the mining valleys based on the relative sizes of companies. Supported by local authorities, local NGOs – such as the Chatkal Development

Foundation and the Osh Aarhus Centre – proposed that most mining companies be registered locally and increase their field presence for operational decision-making and sharing of environmental information. No new mining companies registered locally in 2009 in Chatkal, but nine new companies registered in 2010. More than half the Chatkal area mining companies were already registered locally in 2011-2012, and others are in the process of registering. This recent change takes a bottom-up approach to regulation and is increasingly encouraged by central authorities, but challenges associated with local registration remain: some companies may have licences in other areas of Kyrgyzstan, or the licensed area falls within two or more administrative areas.

Prior to 2010, many of the Chatkal mining companies relied on the central authorities in Bishkek on the issue of mining and environmental licences, and then negotiated land allotment with the local authorities as the last step in preparations for exploration or development of the mineral deposits. Public consultations were rare and social assessments non-existent. But such former non-transparent and non-inclusive practices are now being challenged. Mining firms in the Chatkal area are increasingly working with local authorities, sharing information and discussing local development needs. Those who plan to stay for a long time are planning to invest in education or training of local residents to develop certain mining and other technical professions. Currently more than 1 000 local residents already work in the formal mining sector. Local authorities want to see local employment grow to 2 000.

In addition to social assistance, mining companies may be interested in local organic food (especially meat, potatoes, carrots and garlic). These agricultural products are abundant in Chatkal. The companies can also consider investing in small workshops for the production and conservation of foodstuffs, thus developing

a competitive local agribusiness and boosting indirect employment. Finally, mining companies may add further benefits to the region and make their own businesses more efficient and safer by improving the quality of the local roads and by making the main road accessible in winter, a step that has strategic importance for this remote mountain region.

Civil society organizations are active in the area and arrange public meetings to inform citizens of their rights and responsibilities, including those related to environmental information, and facilitate dialogue among mining companies, local authorities, residents, environmentalists and other key players. In the framework of the Finnish research project, in the summer of 2011, the Chatkal Development Foundation, the Osh Aarhus Environmental Centre and Osh Technical University, in cooperation with local environmental authorities, conducted an initial social impact assessment that may lead to a more detailed analysis. This initial assessment covered a broad geographic area, but not in depth. Detailed interviews and a survey of more than 100 representatives from various stakeholder groups (residents, authorities, companies, experts, NGOs) identified problematic issues and areas for improvement.

The Chatkal area has a complex mix of mining developments at different stages, a range of players including multiple companies, and a variety of social needs and stakeholder interests. The actions or failures of one mining company can affect all the others, and the situation calls for cooperation among the companies, the local government and the population. The Chatkal area is, in short, a place for the application of the toolkit. A recent letter to high government officials and mining company

managers reinforces this idea. Signed by 82 residents of the Chatkal area, the letter states that, “[l]ocal people suspend all mining firms from operating in the Chatkal area.” Frustrated that mining company managers failed to attend public hearings and respond to local concerns, the local people decided to take steps to force the mining companies to respond.

The lack of coordination between the planning efforts for mine development and nature reserves has led to contradictory land-use plans in the area. The plans for nature reserves contemplate an expansion of protected areas and include the proposal for designation as a UNESCO site. Some ancient mines may also need to be protected by the state as geological or cultural monuments. This situation illustrates the risks of underestimating the contribution of mapping to mine development planning – the mapping of the region by experts could have precluded the resulting land-use conflict.

Using the concepts in the toolkit, the field study team identified several deficiencies in mining development planning and coordination between different state and local players in Chatkal. Some companies conducted formal and professional environmental impact assessments, but others prepared inadequate assessments, and failed to disclose the results. All of the assessments overlooked the social issues that can indicate local tensions. Each of these deficiencies provides the grounds for local opposition to development. Stakeholder identification, which has been inconsistent, is improving with the advent of round tables organized by local government, a mechanism intended to welcome all stakeholders.

Talas Valley

The Talas Valley lies to the north and east of the Chatkal area near the border with Kazakhstan. In the upper part of the valley, the medium- to large-scale gold and copper deposits are more concentrated and more accessible than the gold and copper deposits in the Chatkal area, but the area has no recent mining history. In-depth Soviet research confirmed significant reserves ready for development, and soon after independence mining companies came to the Talas Valley to conduct feasibility studies and to begin operations. Many of the deposits are along the border (some are just 2-5 kilometres from the Kazakh–Kyrgyz border) or within the transboundary river basin, and the development of these deposits entails international assessments.

The mining investors, with no experience in local public relations, were slow to understand the local nuances. They assumed that specific social obligations and infrastructure improvements would be carried out by the central government, and believed that their mining and environmental licence provided them with the right to access mineral deposits. The situation was manageable at first, but new mining regulations and changes of ownership created tensions as new owners ignored or failed to appreciate previous agreements with the community. The cancellations of mining licences and the transfers of licences to new subsoil users have prompted protests and legal proceedings by the initial licence holders, who have

possibly provoked local residents to arrange illegal meetings and pickets to stop the new licence holders.

This lack of attention from mining companies to local needs and concerns exacerbated the situation, and political changes and more freedoms emboldened locals to take more strident positions. The local resistance led to the suspension or abandonment of mine construction and geological exploration, and at its worst, the situation deteriorated to destruction of mining camps and equipment. As a result most mines remain in a suspended state with equipment secured and administrative functions occurring out of Bishkek. Currently, the social survey arranged by a local competent NGO indicates that roughly one third of the Talas province population welcomes the development of the mining industry, another third is neutral and the last third opposes mining development. These differences demonstrate a complex situation in which decision-making is a highly delicate matter. Acceptance or rejection of the diverging views of the key groups may escalate the potential for conflict in the area.

Significant public protests started at the Jeruy gold deposit in May 2007. While the detailed geological exploration of Jeruy was completed in the Soviet period (reserves of 80 tonnes of gold), the construction of mine infrastructure ceased with the dissolution of Soviet Union. Numerous foreign investors have shown interest in the deposit, but in the 1990s,



Mining and local resistance in Talas

- ▲ Gold
- ▲ Copper and gold
- ⚡ Mining factory and tailings (proposed)
- Local resistance to mining

not only was the situation in Kyrgyzstan uncertain, but gold prices also fluctuated significantly and the mining companies that initially started to develop Jerui either went bankrupt or stepped down from the project due to economic reasons. At the beginning of the current millennium, the company that held the rights to develop the deposit did not arrange funding for the project in a timely manner, and the licence was revoked by the Kyrgyz Government

and transferred to another company, which later sold it to yet another mining company (the fifth).

Both the mining companies that held the licences and the government became involved in dispute resolution at a high level, but the process suffered from the appearance of little transparency. Almost 450 laid-off workers rallied in Bishkek and demanded fair and transparent decisions and work, while the

local protesters blocked the road to this relatively large and remote site and opposed further development of the mine, not least because of environmental considerations. The situation remained stagnant until 2012. With a new proposal by the Kyrgyz government to introduce a system of transparent, fair and open mining tenders, the local resistance has softened to some extent.

The smaller Andash gold and copper deposit is located in close proximity to Kopuro-Bazar village and could be considered yet another mining conflict hotspot of the Talas Valley. The Andash deposit was explored in detail during the Soviet period and in 2004-2006, and holds up to 20 tonnes of gold and 70 000 tonnes of copper. The deposit would be developed by open pit method through drilling and blasting with subsequent flotation of ores for the production of gold and copper concentrates (cyanides will not be used). The majority of villagers live in poverty and could be convinced of the benefits of mining for local development, but the local people are influenced by pressures and statements from various actors, while a clear governmental position is missing. The village was consistently in the centre of populist declarations and its residents are fatigued by uncertainty and promises from all.

The Andash mining company cannot start operations due to opposition on the part of the local population. The company has revised its environmental plan, and offered an unprecedented social package to create 300 local jobs, support mining-related education, contribute to a local social fund, establish a microcredit programme and pay monthly compensation to households affected by mining. The company welcomes independent monitoring of its environmental performance and, if necessary, is open to an additional environmental impact assessment by an independent (international) institution. The main problem is that villagers are not receptive to negotiations or to the

communications by the company and the authorities. Environmental concerns about the future mining project dominate local minds due to the proximity of the village to the planned quarry. The fears range from damage to vital resources such as water and pastures to increasing radiation levels.

Environmental impact assessments for both Jeruy and Andash were conducted in consultation with Kazakhstan, a neighbouring country, and in view of the novelty of the transboundary impact assessment process, international organizations have facilitated the dialogue and information exchange. Like in other parts of Kyrgyzstan, land allocation for pastures, conservation areas and mining remains confusing.

Geo-exploration at the copper and gold deposit of Taldy-Bulak preceding mine construction and operation tentatively planned for 2015 has been until recently severely constrained by local protests and even violence. In 2011 a group of horsemen armed with improvised bombs and sticks attacked a geologists' camp, setting some buildings on fire and threatening workers. The roots of this violence and resistance lie in the population's dissatisfaction with how the previous site managers and state officials maintained local relations. Above all, they are concerned that blasting and mining machinery will disrupt pastoral life, and that mining and ore processing will pollute the environment and affect the health of children and adults. In early stages of mining activities here, agricultural animals were reportedly trapped in geological exploration pits, while the impacts of drought led to additional rumours on the negative environmental effects. The population of the nearby village was also provoked into conflict.

Some mining companies have begun offering benefits to locals in the form of special development funds and diversified social packages including regular payments of financial compensation to local residents, but the

resistance has softened only to the extent that locals say that mines may be acceptable sometime in the future. In fact, some experts warn that villages around prospective mining sites could become spoiled by the funds that companies spent or are ready to spend to earn the loyalty of residents.

One geo-exploration company working at Taldy-Bulak, however, has had success in the continuation of its activities by fashioning a tripartite agreement involving the mine management, the central government and the local people and local authorities. An additional factor contributing to the current lessening of tensions and reconciliation is the involvement of the South African mining company Gold Fields, which has vast international experience in community relations. A similar arrangement guides the development of the smaller Jamgyr gold and copper deposit. Some of the practical steps that companies took to support implementation of these agreements include: the distribution of leaflets with information on the mining licence, project scope and activities; information seminars on geology, environment and social strategies; stakeholder consultation groups consisting of local authorities, residents and NGOs; a community office providing information on company activities and performance; and transparent employment procedures and grievance mechanisms.

The Talas Valley is distinguished by extensive agricultural development that includes large-scale bean cultivation and, in the upper valley, cattle grazing, cereals and potato cultivation. One result of the agricultural development is the uneven distribution of wealth and

the economic and social stratification of the population. According to local NGOs, groups of wealthy individuals have organized in several villages to incite resistance to mining as a way of protecting the status quo. Some local groups have even attempted to take over the deposits, and have spread rumours of genetic damage (due to non-existing sources of radioactivity) resulting from mining operations in an effort to spoil the image of mining and to foster resistance among the local population.

By this stage in the development of mining in the Talas Valley, the local population should have a realistic view of both the environmental consequences and the potential for employment in the mining sector, but the failure of the companies and the central government to recognize the area's social stratification and to take steps to educate the population have delayed progress.

In underestimating the strength of local resistance, the mining companies and geologists blame the lack of rule of law for impeding progress of mining projects. The central government has done little to help, and the Parliament has even cancelled some mining licences on the basis of local complaints – an action that itself may be illegal. At the moment, local resistance is holding up mining operations at a minimum of five mineral deposits.

Given the complicated situation in the Talas Valley, prospective mining developers are well advised to make full use of the toolkit. The mapping guidance may be particularly helpful in resolving issues related to conflicting information, perceptions and fears.

Aktuz Mine and Kemin Area

In the 1930s, geologists discovered lead in the upper Kemin Valley, which is in the northern part of Kyrgyzstan, 120 kilometres east of Bishkek and near the Kazakhstan border and the Chong Kemin national park. By the end of the 1940s, the mining town of Aktuz was built, and the production of lead concentrate was underway. With a shift in priorities in the 1960s, the Aktuz facility was transformed to specialize in the processing of rare earth metals, and became a key supplier to the Soviets. At the same time, the main production and processing shifted to Orlovka town in another part of Kemin. By the end of the Soviet era, the Aktuz mine was supplying enough ore to produce 600–800 tonnes of rare earth concentrates at the Kyrgyz chemical-metallurgical plant in Orlovka town. Surplus supplies went into storage, and with the collapse of the Soviet market, sales moved to foreign buyers. Adverse economic conditions led to the closure of operations in the late 1990s.

The Aktuz production facilities were privatized and switched to the production of gold (including the reuse of the tailings material) with some rare earth production as a marginal product. As rare earth demand skyrocketed, international interest turned to the Aktuz mining area, and the Kyrgyz authorities issued licences to explore for and process rare earth deposits. Of the 75 000 tonnes of originally explored deposits, perhaps 50 000 tonnes remain to be developed.

The transitions from lead to rare earth to gold and back to rare earth make for an interesting history. In the Soviet era the mining industry enjoyed the special attention of the authorities, and the mining settlement experienced no problems with the supply of consumer goods. Workers in the mining sector received high salaries and local residents received strong social support from the state. The local population is accustomed to mining in the area, and nostalgically views its only local industry as generally positive, and even iconic. Mining has conferred some social benefits, and despite a serious accident triggered by an earthquake that released 0.6 million cubic metres of tailings into the Kichi-Kemin river and caused contamination in 1964, the locals remain basically supportive. Ongoing intense exploration for gold and rare earth metals in the valley visually affects the mountain landscape near the Kemin national park and raises concerns of local residents. In general, the mining companies continue to maintain good local relations.

Mining and processing have been dormant in the Aktuz and Orlovka areas for nearly 20 years, however, and taking the support or neutrality of the local population for granted may entail some risks – a new generation and changing local dynamics may affect the attitude of the community towards new developments. Conducting detailed social impact assessments that identify how the community



Mining industry in Aktuz and Kemin

- Gold
- New mining factory
- Soviet-era mining tailing (abandoned)
- Rare earth minerals
- Soviet-era mining factory (abandoned)

has changed may be advantageous to the companies. Local authorities may also need a new vision and social development programmes adjusted to the emerging opportunities. The companies may benefit from considering mining legacies in their environmental impact assessments – mapping the location of legacies, analysing the past impacts, reporting the lessons learned and comparing the current conditions and prospective impacts with those of

the past. Any effort the companies make to resolve legacy issues will enhance their chances of receiving a social licence to mine. One additional prospect for local employment is a gold mine at the Taldy-Bulak Levoberejni deposit in Kemin. The locals advocate for the soonest start of mine operations, but a concern has recently been raised due to the high proportion of foreign (Chinese) nationals already working at the site.

Ferghana Valley

The Ferghana Valley covers a large area in the south-east part of Kyrgyzstan and parts of neighbouring Tajikistan and Uzbekistan. The Kadamjai district, located in the south of Ferghana Valley, produced antimony and mercury in the Soviet era, and has long been considered a safe harbour for mining companies. But even here – with a mining tradition of social responsibility – the industry faces difficulties. The local population accepts mining and appreciates the social responsibility, but in the full knowledge of the environmental damage, opposes practices that may cause further damage. The district is home to a special mining school, and respects responsible mining, but is firm in its convictions that the environmental consequences should be taken into account, and that the mining license award procedure should be transparent and inclusive.

The Soviet uranium mining legacies in this region provide a vivid example of why mining for closure is such a good idea. From the 1940s to the 1960s, open pit quarries and mines in the mountains along the Ferghana Valley were the primary source of uranium for the Soviet military-industrial sector. When mining stopped, the radioactive waste was left on site, and no one made any effort to remediate the environmental damage. For many

sites, the authorities have not even bothered to do so much as erect a fence to keep people and animals out, and even where they installed some sort of protection and warning, the lack of maintenance and supervision reduced their efficiency to zero.

Most uranium mining is now conducted by in situ (underground) leaching in desert areas of Central Asia far away from the Ferghana Valley, but twenty years after the end of the Soviet era, the legacy problem is still looking for a solution. Apparently inured to the legacies, the local population has made few demands on the state, but local NGOs have appealed to the government for action, and the government in turn has appealed to donors for financing. The best prospect, given the high cost of remediation, appears to be the reprocessing of the spoils, an approach that has inherent economic benefits for the mining company. The transboundary nature of the mining operations, and the transboundary risks associated with the abandoned sites call for cooperative efforts among the three countries. Given the complexities of the situation, it is not surprising that progress is slow.

The Environment and Security Initiative (ENVSEC), a partnership of six international organizations,¹ works to provide an integrated

1. The Organization for Security and Co-operation in Europe, the Regional Environment Centre for Central and Eastern Europe, the United Nations Development Programme, the United Nations Economic Commission for Europe, the United Nations Environment Programme, and the North Atlantic Treaty Organization as an associated partner.

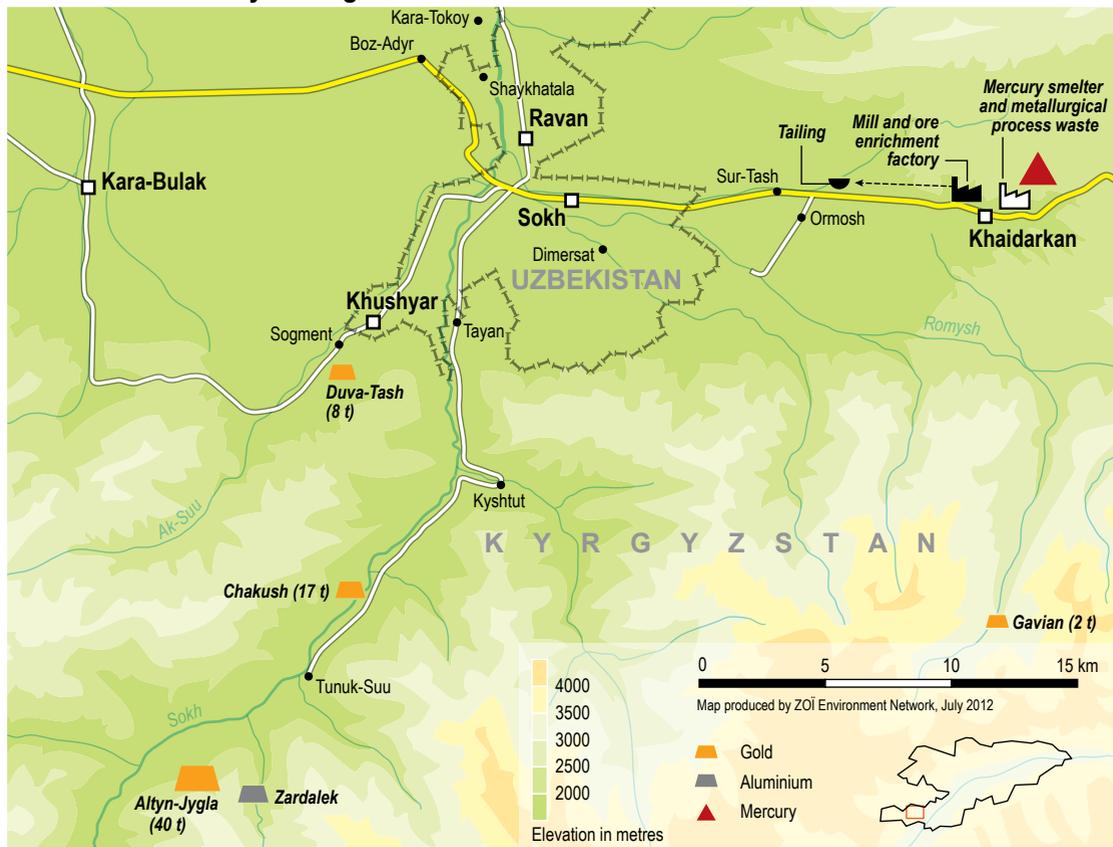


response to environment and security challenges. Several key international organizations in the partnership are active in Central Asia, and have identified links between environmental conditions and security risks. The ENVSEC approach is similar to the toolkit's – after conducting a situation analysis and stakeholder identification, ENVSEC identified and assessed hot spots and facilitated planning that may lead to remediation actions.

Among the hot spots identified and brought to the attention of the authorities by ENVSEC

is the Khaidarkan mercury mine, a state-owned facility that has been operating since the 1940s in the Ferghana Valley. The Aidarken settlement was once a mining town of 11 000 inhabitants, 3 000 of whom worked in the mine and in social services provided by the company. Over the years the population has changed, and now the mine employs about 600–700 workers, while the overall size of the population has remained about the same. The company continues to support some elements of infrastructure (roads, supply of electricity,

Khaidarkan mercury mining infrastructure and other mineral resources



gas, drinking water, sewage) and some social services, but the state now provides assistance, and dependence on the mining company has diminished.

Mercury is a globally recognized toxic metal, and because almost all of the mercury produced at Khaidarken is sold on the global market, the international community is urging Kyrgyzstan to get out of the mercury business. In some parts of Kyrgyzstan local artisanal miners use Khaidarkan mercury to extract gold, a practice that causes river pollution. Some stakeholders

have not been willing to cooperate, while others are supportive of a transition towards less environmentally hazardous minerals mining. Currently, the government is considering the privatization and sale of the mercury mining company, but the local population is concerned about the future of their mining town, and about the responsibility of the new owners for the provision of social services. Mercury mining generated a high volume of waste rock and metallurgic waste as well as pollution legacies, and the environmental challenge related to the

existing tailings is another issue for investors.

The transition to private ownership may provide an opportunity to make a shift from mercury production to other mining activities. One promising alternative is to upgrade and convert the existing industrial facilities for mercury ore processing to a cluster gold processing and concentration facility serving nearby gold mines. The use of one facility instead of several would result in more economic efficiency and less environmental damage to sensitive mountain ecosystems. The transition from mercury to gold would take advantage of the available workforce, allay local concerns related to the health effects of mercury, maintain the support for an established mining community and earn the approval of the international community. The technical and social aspects for such

a transition are not yet well developed, but the opportunities exist for the various parties to consider.

The United Nations Environment Programme (UNEP) has reviewed the situation at Khaidarkan, and has made funds available from the Global Environment Facility and from donor countries such as the United States, Norway and Switzerland, to assist the community in making the transition to alternatives to mercury production. In an effort to help diversify the local economy, UNEP and the United Nations Development Programme have also provided grants for small businesses less reliant on mining. And finally, UNEP is assisting with feasibility studies and engineering plans related to high-priority environmental remediation.

Climate Change

The growing awareness of the effects of climate change is raising concerns about mine planning, especially in Kyrgyzstan, where mining occurs at high elevations. Mountain ecosystems are particularly sensitive, and at elevations of 3 000–4 000 metres, global warming is increasingly thawing what had been a permanently frozen environment. Glacier retreat in the area of the Kumtor mine, particularly the Petrov Glacier and others within the Akshirak massif, has been observed for the last 50 years. Despite some early indications of climate change, the Kumtor mine was built for a stable environment, and the planning extended only as far as the operational and decommissioning periods. Now, 10 years after the planning, the effects of climate change are becoming apparent, and awareness about climate change impacts is much broader than before, so both local populations and decision-makers in Bishkek are getting concerned about the situation.

The Kumtor tailings management facility was designed for terrain with permafrost several metres thick, and with the thawing of the permafrost, the stability of the tailings pond and its dam is now in question. Frozen ground was considered by mine planners as a screen preventing seepage of pollutants below the tailings bottom (in other situations plastic and or other impermeable cover is used) and engineers treated frozen rocks as conventional rocks, underestimating possible changes in

geo-mechanical rock properties. Higher global surface temperatures have also caused glacial lakes to form at higher rates. The warming trend is projected to continue, and to threaten the integrity of the glacial lakes, and by implication, the mining infrastructure. The situation calls for planning that considers these changing conditions and that answers the long-term question of what happens in the area when the mine is ultimately closed. In 2011-2012, unforeseen acceleration of ice movement in the south-eastern part of the Kumtor mine restricted access to the ore and the volume of gold production dropped. In the coming couple of years some 50 million tonnes of ice and rock will have to be cleared away to reach the rich ore reserves and increase gold production at Kumtor.

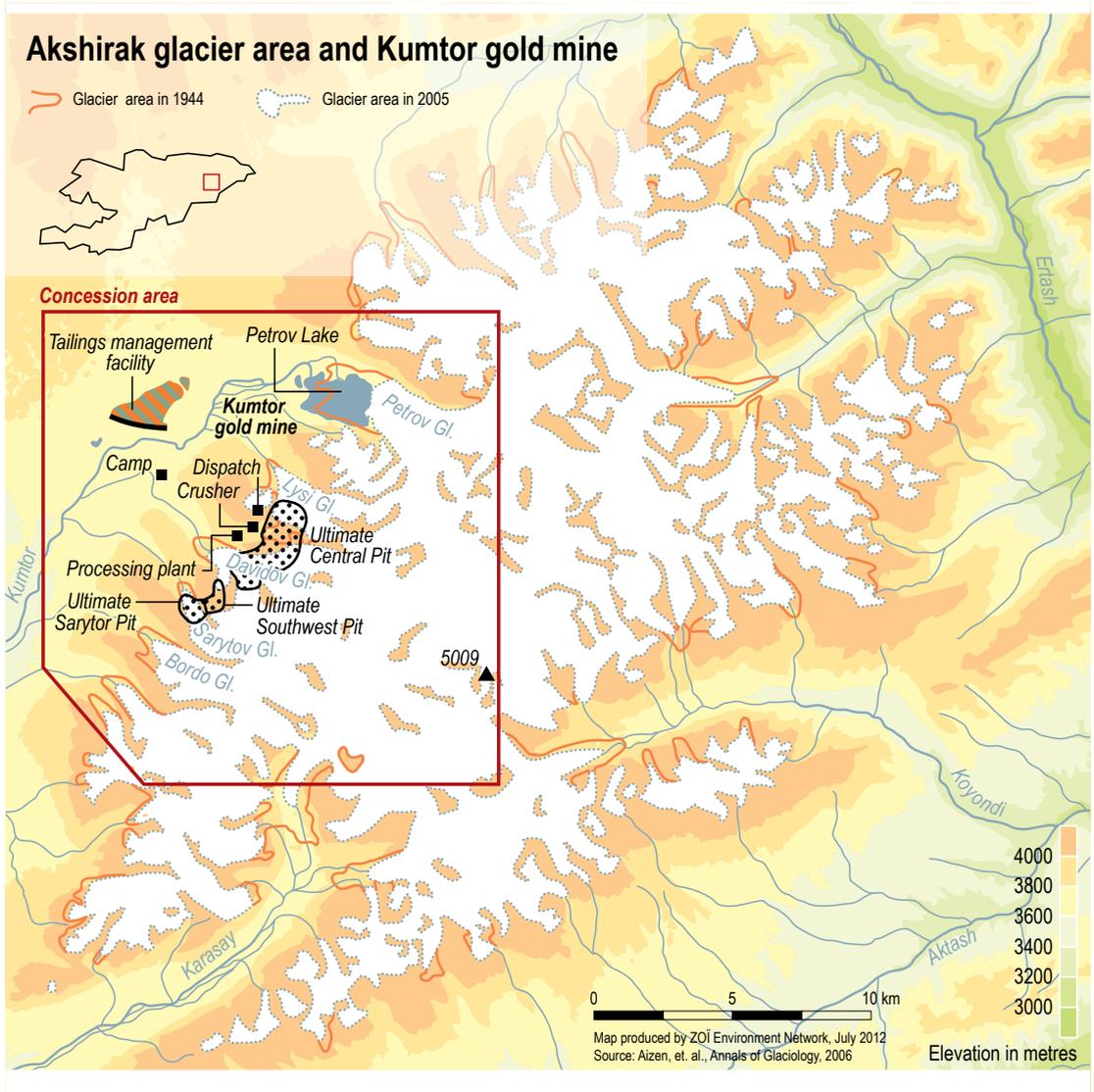
The mining sector is subject to many misperceptions, and all across Kyrgyzstan at similar elevations speculation and rumours suggest that glaciers are melting mainly because of mining activities. Mining activities do cause pollution, and do put waste rock on the surface of glaciers. But mining does not cause the widespread melting of glaciers across the region. In any case, officials have requested that the mining company provide new information regarding the stability of the glacial lakes and the tailings dam and adjust mining project design as necessary.



Mining at high altitudes and climate change impacts

- Areas above 3 000 metres
 - Glaciers and frozen rocks under the impacts of climate change with implications for mining site stability and geo-risks
- Effects of recent glacier and permafrost changes on mining operations
- Active mining sites
 - Gold
 - Other minerals

Map produced by ZOI Environment Network, July 2012



Currently most of the mining activity in Kyrgyzstan is prospecting, but the Kumtor mine is operational, and offers an opportunity to learn from its experience. Located on glacier and permafrost, Kumtor provides a specific example of high-altitude mining in the context of

climate change. Rising temperatures may melt the frozen water that binds the rocks and may cause springs to disappear or undermine the stability of the rocks, all of which have implications for safety and the environment.



Petrov Glacier and Lake. Photo: S. Erochin

Mining and Nature Reserves

The failure to coordinate policies related to nature reserves and to mining has led to situations where the growth of the mining sector and the expansion of nature reserves have come into conflict. The development of the mining sector has taken into account existing reserves, but particularly in Kyrgyzstan, where the number and sizes of nature reserves keep growing, the addition of new areas and buffer zones have infringed on planned mining areas. Whether by the expansion of existing reserves or the creation of new ones, the core areas of mining projects and geo-exploration licence areas are increasingly located in proximity to reserves.

The Kumtor mine, for example, is now both within the Issyk-Kul Biosphere Territory, a large reserve designated well after the mining company received its licence and in proximity to the Sarychat-Ertash strict nature reserve and its buffer zone. Inaccurate maps of the nature reserve showing variable sizes and land use designations inconsistent with

the governmental decrees, and the reliance by stakeholders on these maps in the absence of definitive official information promoted concerns about the perceived intersection of Kumtor mining licence area, prospective geo-exploration areas and nature reserves. Experts note that the state of biodiversity in and around the Sarychat-Ertash reserve has improved during the last years, and mining so far has had only marginal impacts. This situation is similar to the Chatkal area, but because Kumtor is larger and is operational, and the Issyk-Kul province is the key country's tourist area, the Kumtor case tends to be more politicized and discussed. The new government in Kyrgyzstan has recently adopted a new Law on Subsoil and revised the planning procedures to coordinate mining, nature reserves and other land uses. The reconciliation of reserves and mines requires some rezoning and some changes in mining practices – such as the use of explosives near reserves.



Protected areas

- Protected areas
- Ramsar sites (Convention on wetlands of international importance especially as waterfowl habitat)
- Biospheric territories
- UNESCO natural world heritage
- M
 Tentative UNESCO natural world heritage
- UNESCO cultural world heritage
- B
 Tentative UNESCO cultural world heritage

MOVING FORWARD

Kyrgyzstan is a dynamic mountain country well positioned to take advantage of its opportunities in international transport, trade, tourism and textile manufacturing. During the Soviet era, Kyrgyzstan was a leader in the mining of some minerals, and now may be able to recapture that status. Indeed, the mining sector may lead the way in the country's economic development efforts. The mining sector has traditionally made important contributions that support local communities and alleviate poverty.

The development of the mining sector is closely associated with environmental and social changes at the local and national levels, and its reliance on high technology applications may spread its influence to other sectors as well. As the case studies demonstrate, the sector faces many complexities and challenges. The success of the sector depends to a large extent on its ability to meet its challenges in a responsible manner, and to resolve any potential conflicts peacefully and constructively.

Strategic Initiatives

Mining companies, the central government, Parliament, local authorities and non-governmental organizations all have opportunities to advance the development of the mining sector. A number of potential strategic initiatives emerge from a review of the case studies. Some of them are already planned or at work, while others deserve attention.

MINING COMPANIES

Mining companies serve their own interests as well as the interests of their stakeholders when they acquire a good understanding of the communities in which they intend to operate. They also benefit from an understanding of their national role in the economic development of the country. They are most likely to succeed when they do the best they can to help alleviate poverty and to promote economic development. Their strategic opportunities include:

- Participating in more formal and socially inclusive arrangements, such as tripartite agreements (mining company-authorities-community) to contribute to social development
- Establishing local social development funds that are transparently supervised by local authorities and community representatives
- Developing and implementing long-term social responsibility strategies
- Establishing clear and transparent mechanisms for the hiring and dismissal of locals
- Conducting open public meetings as early in the development process as possible to explain their projects in simple language, to answer questions and to engage the local authorities and the community

- Circulating regular reports on environmental performance, taxes, social contributions and plans for environmental management
- Adopting international codes and standards that promote environmentally and socially responsible mining, and using community development toolkits
- Exploring options for giving voice to local concerns related to mining operations and performance and assigning responsibilities and strengthening capacities for public relations
- Considering cultural and natural values and features of the local communities carefully
- Investing in the education of the local workforce, especially youth
- Integrating a mechanism for collective self-evaluation, experience exchange and coordination with regard to environmental performance and contributions to community development into the practice of geological companies
- Developing a corporate code that ensures standardized practices for mining company relations with local communities
- Increasing procurement from local suppliers, and partnering with local agencies and NGOs for the delivery of development projects and services

When mining companies give money to social development funds that operate without proper oversight the results are less than optimal. The companies can use their business experience to influence the investment of social development funds in more proactive and collaborative ways to promote community development. Where

mining companies have used not only grants but soft credits to support social development, the business outcomes as well as the social development benefits have been more substantial and longer lasting.

In cases where the community does not trust the mining company reports, the company can engage others – the central government, NGOs or international organizations – to validate the reports and to communicate their faith in the company’s presentation. Disaggregated reporting under the Extractive Industry Transparency Initiative may also help to fill this data gap. The investment in local education can help the company maintain its workforce across the full range of job requirements.

Mining companies may also build positive relationships with local communities by improving their local presence – registering locally, paying local taxes and maintaining a strong local office for public relations and communications. Investments in a professionally trained public relations staff and proactive efforts to establish open transactions will smooth the way for future negotiations over specific issues of local concern. More and more companies are benefiting from positive public relations, and the practice of maintaining a public relations office is becoming a trend in Kyrgyzstan. When communities receive no information from mining companies, or when the information they do receive is inaccurate, resentments build. In devising their strategies, companies that account for local socio-economic priorities and cultural preferences are likely to be the most successful.

CENTRAL GOVERNMENT

Today, the central government of Kyrgyzstan has the opportunity to become more active in advancing the national interests associated with economic development in the mining sector. Rather than take a wait-and-see attitude, the central government can acknowledge that conflicts exist, and assist in their resolution. The central government's strategic opportunities include:

- Developing a plan for identifying tensions and mediating conflicts, and assigning responsibilities for the various tasks
- Taking the lead on conflict mediation by establishing credible dispute resolution mechanisms
- Establishing a rational and transparent system for access to mine licence information and for local community participation in decision-making, including licence tender commissions
- Requiring sufficient trust funds from mining companies to ensure environmental safeguards, community benefits and compensation for damage, remediation and unforeseen accidents
- Encouraging mining companies to begin community development efforts in the geo-exploration phase to the extent feasible
- Ensuring available and reliable information on environmental monitoring and the effects of all aspects of mining through the establishment of cooperation with competent research centres, NGOs and international organizations
- Coordinating with local authorities on the issuing of mining licences and land-use plans
- Improving the competence of the selected local authorities on all aspects of mining, from exploration and feasibility studies to operations and mine closure
- Making efforts to improve the environmental practices of small-scale miners through more accessible permitting processes and banning mercury and other aggressive chemicals use
- Improving public knowledge of mining by working with local administrations and communities, ensuring that information is well communicated
- Providing effective protection of investments against illegal actions of state officials and local communities
- Incorporating a course of study on mining into the school curriculum and organizing seminars for teachers

The central government currently handles mining conflicts on an ad hoc basis, but the workload exceeds the capacity of the central government to respond effectively. A strategy that involves assigning specific roles to appropriate ministers, Members of Parliament and local authorities may impose some order on the situation.

While the central government is responsible for issuing mining licences, local authorities are responsible for land-use permits. By working with the locals, the central government can reconcile conflicting land uses before a licence is issued, and can consider any local preferences with regard to companies applying

PARLIAMENT

for mining licences. Such coordination would encourage the trend on the part of the central government to consult local authorities on matters of local interest.

Kyrgyzstan's State Agency on Geology and Mineral Resources, with support from the Finnish Geological Survey, has recently launched an Internet-based mapping service with a wealth of freely available geological information. This base could be further expanded with information from mining licence owners, and with links to mining company Websites and access to company progress and performance reports. Such contributions to the mapping service would greatly increase the access to and availability of information, and could open the way to collect feedback from local communities and NGOs on the performance of specific mining sites.

If Kyrgyzstan wants to have a vibrant, world-class mining sector, the country may need to improve the general level of knowledge about mining and minerals. With no formal education on the subject, the population is vulnerable to misinformation and rumour. The mining companies cannot provide all the necessary education in public meetings, and may lack credibility with their target audience. The central government, however, is positioned to encourage the inclusion of mining education in the basic school curriculum. As the base of knowledge expands, the population will reach a better understanding of the value of minerals, the costs and technical obstacles to extraction and the relationship between mining and the environment. Just as finding the mineral resources is a necessary technical prerequisite to ensure the commercial viability of a mining project, creating trust and positive community relations is a necessary social investment to ensure successful mine operations.

The political involvement of Members of Parliament in a specific mining sector conflict tends to make the situation more complicated, but Parliament has a role to play in improving the overall context of mining development. Parliament's strategic opportunities include:

- Encouraging social development, local registration and the increased use of tripartite agreements
- Requiring mining companies to provide a detailed analysis of the social impacts of the mining projects and their contributions to community development
- Encouraging a sufficient rate of local social development contributions by mining companies (the equivalent of 2 per cent of mining costs, for example) and facilitating transparent mechanisms for the transfer and usage of these funds
- Encouraging the development of norms for mining company reporting on social contributions, environmental performance and long-term plans
- Resolving conflicts that arise from contradictory land uses
- Fostering responsibility related to civil protests and the enforcement of existing laws

The trend towards establishing social development funds within a legal framework encourages stability in the mining sector. Conversely, when protests shut down mining operations, and local law enforcement is unresponsive, instability ensues.

LOCAL AUTHORITIES

Local authorities may be able to support the development of the mining sector and the social development of their communities by taking a more active and neutral role in local mining conflicts, and by serving as the interface between mining companies and the communities for development purposes. The strategic opportunities for local authorities include:

- Participating in the tender commissions for mining licences and in mining project advisory groups to ensure effective and significant contributions to local sustainable development
- Elaborating programmes for local development (which will also demonstrate the role of mining sector in the area and its expected contribution to development)
- Being strategic in the use of social development funds (not only for repairs and humanitarian assistance, but also for local business development, making production competitive)
- Establishing a database on land use (including information on mining licence areas and protected areas) or facilitating public access to available databases
- Monitoring and reporting cases of unauthorized mining
- Supervising the required procedures, and assuring the quality of mine closure and remediation projects

NON-GOVERNMENTAL ORGANIZATIONS

Professional and civil society associations and non-governmental organizations tend to appear on the scene when conflicts arise, and often their presence adds to the complexity and adversarial nature of the situation. These players, however, have strategic opportunities to contribute to the resolution of conflict. In some cases, NGOs can play the role of facilitator, and guide the mine development process. Those individuals or organizations with special expertise can also serve as mediators when the conflict is more serious and the parties have staked out what appear to be hard-and-fast positions. International organizations can bring a global perspective to the local situation, and present the experience and best practices of other places. And some organizations may be helpful in coordinating the communications between mining companies and central or local authorities, adding a professional and impartial component to the transactions. The strategic opportunities for non-governmental organizations include:

- Supporting the introduction of and training for social impact assessment, mapping of environment and security risks and other novel approaches to social investments and community engagement
- Targeting projects and initiatives for conflict mediation
- Monitoring regional and national mining conflicts
- Watching the performance of mining companies and authorities on environmental and social impacts management, and holding government to account for revenues from the mining sector

- Participating in and delivering poverty reduction and economic diversification projects
- Providing business development support to local producers

A Final Word

All of the parties to mining development in Kyrgyzstan have a stake in the process. The toolkit and this companion document seek to help the parties protect their interests, express their concerns in a constructive way and identify areas of joint benefits in ways that lead to the prevention or resolution of conflicts, and to the economic and social development of the region in an environmentally responsible manner.

The international community is interested in the stability and sustainable development of Kyrgyzstan and Central Asia. Donors and international experts from universities, NGOs, the United Nations and other institutions could be available to help the parties in striking a balance among individual, local and national needs; could participate in the process as facilitators, mediators and honest brokers in dispute resolution; and could provide resources and expertise to support development.

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