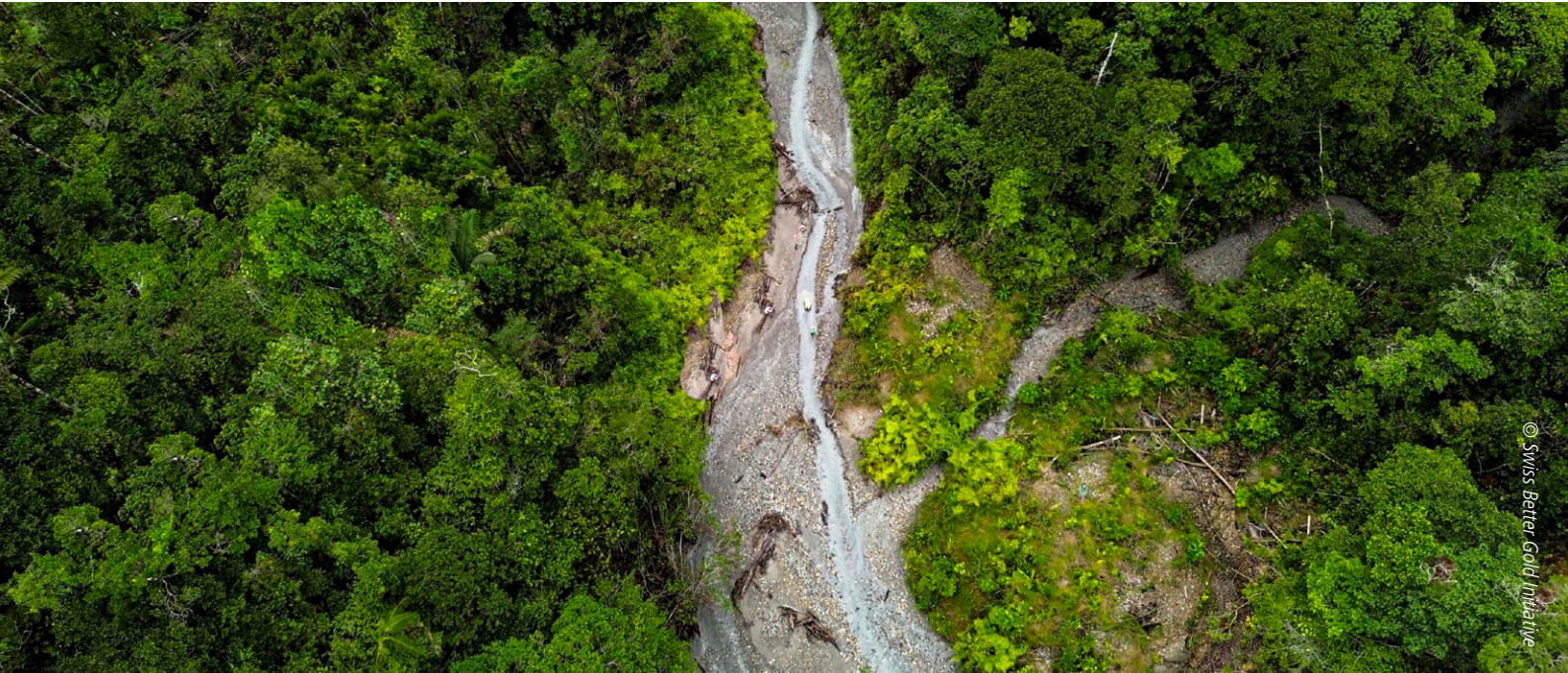


MINING AND ENVIRONMENT



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The mining sector, pivotal to global economic growth, faces significant environmental and climate challenges. These challenges include deforestation, water pollution, and impacts on local communities, which result from extraction processes. Furthermore, the industry contributes to carbon emissions and climate change through the intensive use of fossil fuels in mining operations. Addressing these issues, the sector is increasingly exploring sustainable practices such as improved waste management, mine closure, and the implementation of renewable energy sources.

There is also a growing emphasis on developing technologies, monitoring systems and strategies for reducing the environmental footprint of mining activities, aiming to align more closely with global sustainability targets and environmental regulations. The emphasis on addressing environmental and climate challenges in mining highlights the critical need for responsible sourcing and sustainable practices. As these issues present challenges for the industry, transforming mining practices is an imperative step towards a more sustainable and responsible industry.

As early as the 1980s, Projekt-Consult began developing and introducing locally adapted technologies to improve working conditions and reduce environmental damage. Today, our services have expanded to encompass technical solutions, environmental monitoring, capacity building and strategic advice on the environmental and social dimensions of resource extraction.

Find out more about the services we offer in these three areas:

Climate and mining: How we support governments and mining companies develop and align with climate-smart mining policies and practices.

Environmental management: How we support the mining industry and oversight bodies in integrating improved environmental management and monitoring methods and processes.

Technology and innovation: How we support mining sector institutions with digital services and tools to drive technology and innovation for sustainability.

Mining & Environment



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CLIMATE AND MINING

The increasing focus on climate change is transforming the mining industry, particularly with the heightened need for raw materials essential for low-carbon technologies. As the demand for these materials grows, so does the urgency to implement sustainable and climate-smart mining practices. This shift requires a holistic approach to the value chain, from extraction to end-use, emphasising both mitigation of environmental impacts and adaptation to changing climate conditions. The debate over Critical Raw Materials (CRMs) is central to these efforts, as these materials are pivotal in developing renewable energy systems and other technologies that tackle climate issues. Effective management of these challenges necessitates collaborative efforts across borders, fostering partnerships that align mining practices with global climate goals.

Projekt-Consult is at the forefront of addressing these challenges by connecting stakeholders across CRM-producing and consuming countries, enhancing supply chain resilience, and fostering responsible sourcing practices. Our efforts extend to enhancing environmental and climate monitoring, identifying specific value chains for decarbonisation opportunities, and implementing targeted adaptation and mitigation strategies. This comprehensive approach not only focuses on the direct demands of CRMs but also navigates the broader geopolitical, environmental, and climatic implications tied to their extraction and trade.

Projekt-Consult helps to:

- Bridge the gap between country partners and their strategic CRM bilateral agreements, aligning supply security and sustainability in the mineral sector
- Integrate environmental stewardship and climate resilience approaches in the mining industry

We are adapting to emerging challenges and expanding our scope, with our projects spanning multiple continents. These initiatives focus on innovative policy approaches and concrete technical solutions for responsible raw materials management, reflecting our global reach and commitment to sustainability.

This includes:

- **Critical raw materials and their demand:** Our approach addresses the growing demand for CRMs essential for the energy transition by analysing market dynamics and fostering relationships for responsible trade. Our work promotes CRM trade practices that adhere to broad Environmental, Social, and Governance (ESG) criteria, aligning with international standards and advancing global discourse on responsible sourcing of CRMs. Examples include advisory projects in Indonesia and the Philippines that examines how the countries' CRM production can contribute to combatting climate change and at the same time align with sustainability goals.
- **Climate change and the value chain:** Our projects are dedicated to enhancing the sustainability of value chains, particularly focusing on decarbonisation and aligning with broader climate change objectives. In the SADC region, we are actively working to promote environmentally and socially responsible practices across the mining sector and the emerging local value chains. By evaluating the environmental impact at each stage of the supply chain, we develop targeted strategies that reduce carbon and environmental footprints and promote sustainable industry practices.
- **Adaptation and mitigation:** We have experience in equipping governments and stakeholders with the necessary skills to implement effective adaptation and mitigation measures, addressing environmental and climate challenges proactively. Relevant examples include the development of a Climate-Smart Mining Roadmap for Mauritania or water and energy efficiency audits and resulting recommendations for mining projects in Andean countries. Additionally, we provide capacity building and tailored trainings that enhance resilience and reduce environmental and climate impacts across the mineral sector.
- **Just transition:** As the global community moves towards decarbonisation, it is essential for countries to consider not only the transition away from coal, but also the management of legacies from past and ongoing extraction activities. Projekt-Consult is supporting governments in the Global South to develop strategies for coal mine closure and remediation. Our experts assess regulatory frameworks, mining operations and abandoned mine sites and identify existing gaps and opportunities for action.



ENVIRONMENTAL MANAGEMENT

Environmental management in the mining sector is a critical area of focus due to the industry's significant impact on ecosystems and communities. As global awareness of environmental issues grows, the discussion around sustainable mining practices has intensified. This discourse encompasses a range of topics, from reducing emissions and managing waste to rehabilitating mining sites and conserving water and biodiversity. Effective environmental management not only helps to mitigate the negative impacts of mining but is also critical to securing a mine's social license to operate. It aligns industry operations with broader environmental and regulatory standards, ensuring that mining activities contribute positively to both economic and ecological landscapes.

Projekt-Consult helps to:

- Design guidelines and train stakeholders on conducting comprehensive environmental due diligence to manage risks and ensure compliance.
- Develop systems for monitoring and control, training government, industry leaders, civil society and communities to effectively oversee and manage environmental impacts.

Projekt-Consult brings decades of experience in environmental management from advisory projects across more than fifty mining countries. This background has enabled us to effectively focus on enhancing environmental monitoring methods, promoting environmental due diligence, and capacity building among all stakeholders. These efforts aim to promote sustainable practices within the mining sector, encompassing both large-scale operations and artisanal and small-scale mining.

- **Environmental due diligence:** We have extensive experience in environmental due diligence, focusing on assessing and mitigating risks to ensure compliance with environmental regulations and standards. Our approach includes thorough evaluations of environmental impacts and the establishment of best practices for sustainable operations. For instance, we have developed and supported the implementation of environmental management plans for numerous mining operations in Africa and Latin America. Our in-house experts also contributed to the development of a Handbook on Environmental Due Diligence in Mineral Supply Chains for the OECD and several standards that include environmental aspects and have conducted audits that included environmental considerations.
- **Environmental management for ASM:** Since the 1980s, Projekt-Consult's engineers and environmental experts have been dedicated to mitigating environmental impact in small-scale mining operations. We have provided extensive training and advisory services to numerous mining and environmental ministries, mining regulators, and other institutions, equipping them with the knowledge to effectively regulate and monitor the small-scale mining sector. We have also collaborated with numerous companies, assessing their current operations and procedures and offering guidance to address critical issues such as mining waste management and mercury or cyanide management.
- **Monitoring and control:** Our work in environmental monitoring and control, particularly in Western and Central Africa, leverages cutting-edge IT tools to enhance the precision and efficiency of environmental oversight. We have successfully implemented systems that allow for real-time monitoring of mining impacts, aiding in the proactive management of environmental risks. Looking forward, we are planning to expand these initiatives to include cross-border activities, aiming to establish a unified approach to environmental monitoring across multiple African nations. This regional collaboration will facilitate better management of transboundary ecosystems and promote sustainable mining practices.
- **Capacity building:** Our decades of experience in capacity building have equipped us to deliver comprehensive training programmes, especially targeted at oversight governing bodies in the mining sector such as in Bolivia, DRC, Guinea, Ivory Coast, Liberia and Sierra Leone. We focus on empowering these institutions with the knowledge and tools necessary to effectively monitor, manage and regulate environmental impacts. Through workshops, seminars, and hands-on training, we ensure that these bodies are proficient, enhancing their ability to monitor and manage mine sites.
- **Mine closure:** We provide analyses and improvements to mine closure processes from a legal, political, environmental, and technical perspective. A particular focus is on the environmental risks with regards to biodiversity, water management, and chemical pollutants. Our experts map stakeholders involved in and affected by the closure process at the national, regional, and local levels. This allows us to understand prospects for reclamation and explore potential uses for post-mining areas. Based on field data collection, we integrate international best practices into complex mine closure processes in Colombia, Mongolia, and Thailand.

TECHNOLOGY AND INNOVATION

The mining sector is increasingly dependent on technology and innovation to navigate its complex challenges and improve operational efficiencies. As the global demand for minerals escalates, driven by sectors like electronics and renewable energy, the imperative for sustainable extraction practices becomes more critical. Technological advancements such as Geographic Information Systems (GIS) and remote sensing are revolutionising how environmental impacts are monitored, enhancing precision in detecting changes and disturbances caused by mining activities. Additionally, sophisticated databases are being utilised to ensure traceability along the supply chain, promoting transparency and compliance with environmental regulations. These technological tools not only optimise resource management but also help align mining operations with growing societal expectations for sustainability and corporate responsibility.

Projekt-Consult is improving mining methods through technology and innovation, enhancing methods and processes in the industry across a variety of stakeholders. Our use of GIS for environmental monitoring and sophisticated databases for supply chain transparency is complemented by comprehensive training methods. Enhanced by our sister company GFA's Digital Innovation Unit and Digital Learning departments, we deliver tailored solutions that address both the immediate and long-term challenges of the mining industry. This approach ensures that our projects not only meet current demands but also contribute positively to change within the minerals sector.

Projekt-Consult helps to:

- Enhance environmental monitoring and management using advanced GIS and remote sensing technologies.
- Implement cadastre systems to improve land use planning and resource management in the mining sector.
- Deliver cutting-edge digital services to streamline operations and increase efficiency across mining projects.

We are embracing technological advancements and broadening our impact, with ongoing projects across various regions. These efforts are centred around deploying innovative technologies and developing robust strategies for sustainable mining practices, showcasing our global presence and dedication to environmental stewardship.

This includes:

- **GIS and remote sensing:** We leverage GIS and remote sensing technologies to enhance environmental monitoring across our projects in Africa, such as in the Democratic Republic of the Congo (DRC). These tools are deployed by local oversight bodies to effectively manage resources and mitigate environmental impacts, ensuring comprehensive environmental monitoring.
- **Cadastre systems:** We collaborate with local governments and mining companies to develop and enhance cadastre systems, providing precise land and resource mapping crucial for the sector's sustainable management and planning. For example, Projekt-Consult supported the Rwandan Mining, Petroleum, and Gas Board (RMB) in managing its existing geological data and optimising the current mining license and cadastre management system. Such initiatives highlight our commitment to improving regulatory frameworks and operational efficiencies within the mining industry.
- **Digital services:** We provide comprehensive digital services by partnering with technology providers, ensuring that our solutions are both modern and perfectly suited to our clients' needs. Our expertise is demonstrated through successful projects such as building robust databases for a regional initiative in Latin America, implementing traceability pilots in Colombia, and delivering digital learning training programs in various countries. Further enhancing our capabilities, our sister companies within GFA Group contribute in-house expertise through its Digital Innovation Unit and digital learning teams. This collaboration allows us to tailor digital solutions that precisely meet the specific challenges and objectives of each project.

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