

ERMISA AND CAMINAR PROJECTS: RESEARCH ON ENVIRONMENTAL REGULATION, CATCHMENT MANAGEMENT AND MINING IMPACTS IN SOUTH AMERICA

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Abstract

The two European Union Framework Programme 6 projects ERMISA (Environmental Regulation of Mine Waters in South America) and CAMINAR (Catchment Management and Mining Impacts in Arid and Semi-Arid South America) have the aims of contributing to the establishment of policy options, management strategies and technologies for the sustainable management of ecosystems in river-basins of arid and semi-arid South America which are subject to impacts from mining.

ERMISA was a one-year project that finished in January 2007, carried out by the HERO group of Newcastle University and the Peruvian NGO "Labor". It was focussed on Peru. CAMINAR is the follow-up of ERMISA and uses Peru, Bolivia and Chile as demonstration countries.

Introduction

Short- and long-term pollution from active and abandoned mines is one of the most serious human pressures on ecosystems in developing countries where mining is or has been an important socio-economic activity. In many countries of the southern hemisphere poorly-managed active mines and unrestored abandoned mine sites are damaging the welfare of both arid and humid ecosystems and their users. Impacts on water as a renewable natural resource are often the most severe and sustained forms of ecological damage. These include: consumptive use of water resources for mining activities; physical disturbance of aquifers and catchments; and hydrochemical pollution, both by substances used in mining and by toxic elements and salinity leached from ores and overburden. In South America, these impacts are most severe in the many arid and semi-arid areas where water resources are in any case scarce.

Nevertheless, mining is a key economic activity which makes important contributions to the export opportunities of South American countries. For this reason, governments in the region have keenly promoted inward investment in mining in recent decades. Sometimes mine concessions have been granted at cost to the environment and in the face of local opposition to mining. Besides modern mines, these countries have inherited a substantial legacy of pollution associated with abandoned historic mines, many of which have been degrading the environment for decades or even centuries without receiving remedial interventions. There is clearly a need for new policies, management systems and technical solutions aimed at making mining as compatible as possible with the protection of natural resources and the associated ecosystems, taking into account the livelihoods of the local population.

Technology, management and policy of mine waters received considerable attention in the European Commission 5th Framework Research Programme. The projects PIRAMID (Contract EVK1-CT-1999-000021) and ERMITE (Contract CVK1-CT-2000-00078) provided new insights and guidelines on passive-in situ remediation and the environmental regulation of mine waters at European level (Amezaga and Younger, 2004 and 2006). Now the International Cooperation section of the 6th Framework has allowed the development of two new projects focussed on the interchange of experiences with South America. The project ERMISA (Environmental Regulation of Mine Waters in South America) was a one-year project that finished in January 2007. It focussed on Peru as case study country and the establishment of a stakeholder dialogue looking specifically at mine water issues. It has been followed by the 3-year project CAMINAR (Catchment Management and Mining Impacts in Arid and Semi-Arid South America) which will continue the dialogue concentrating on arid areas and expanding the project work to Peru, Bolivia and Chile, including the integrated planning of 3 demonstration river basins. This paper will present the main findings and outputs of the ERMISA project and the aims and objectives of the CAMINAR project, currently under implementation.

ERMISA: Environmental Regulation of Mine Waters in South America

In English <http://www.ncl.ac.uk/environment/research/HEROermisa.htm>.

In Spanish <http://www.labor.org.pe/webermisa/ermisa.htm>.

This project had the general aim of contributing to the establishment of policies, management systems and technologies aimed at the prevention and remediation of impacts on (aquatic) ecosystems by mining activities in South America, using Peru as a demonstration country. It has been a partnership between the HERO group of Newcastle University and the Peruvian NGO “Asociación Civil Labor”, which has more than 25 years of experience of social work in the mining sector.

ERMISA allowed the dissemination, as an element for regional dialogue, of the results of 3 previous European research projects led by Newcastle University dealing with technical and regulatory aspects of mine water management:

- FP5 ERMITE: Environmental Regulation of Mine Waters in the EU (<http://www.minewater.net/ermite/>);
- FP5 PIRAMID: Passive In-situ Remediation of Acidic Mine/Industrial Drainage (<http://www.ncl.ac.uk/piramid/>);
- FP6 CoSTaR Access to Research Infrastructure: Coal Mine Sites Targeted for Remediation Research (<http://www.ncl.ac.uk/environment/research/HEROCOSTAR.htm>).

ERMISA has raised the profile of water issues in the management of the mining sector in Peru. It started with an integrated assessment of water issues in the mining sector in Peru (see below) to inform a dialogue on this topic. The main vehicle for this discussion was a special Commission to produce a Water Agenda within the NGO-led Mining Dialogue Group. The Dialogue Group is a multi-stakeholder dialogue process that has been meeting for more than 4-years to address the source of mining conflicts in Peru. It is a voluntary attending group formed by 50 people from mining companies, communities, universities, NGOs, government agencies, congressmen, local governments, among others. The main objective of the Group is to find common views amongst stakeholders with different interests. Up to now, the following issues constitute the prioritized agenda for the Group: mine and water, environmental authority, and prior, informed and free consent, among others. The group has recommended the creation of an Independent Environmental Authority in its analysis of water management and mining. This dialogue was supported by the organisation of the first International Forum on Water, Mining and Catchments. The policy recommendations of the project were discussed with European Commission officials in a workshop in the Directorate General Research of the European Commission attended by the DG Research, Environment, External Relations and Aid Cooperation.

1. Main outputs

1. “IMPACTOS MINEROS EN SISTEMAS DE AGUA DULCE: GUÍAS TÉCNICAS Y DE MANEJO PARA LA GESTIÓN A NIVEL DE CUENCA” (ERMISA Consortium, 2006): summary in Spanish of the “ERMITE Technical and Managerial Guidelines for Catchment scale Management” (ERMITE Consortium, 2004).
2. “RESULTADOS DEL PROYECTO ERMITE – INFORMES” (ERMISA Consortium, 2006): translation in Spanish of the “ERMITE policy briefs” (ERMITE Consortium, 2003) which summarize the outcomes of the project.
3. “Remediación Pasiva In-Situ de Drenaje Minero / Industrial” (ERMISA Consortium, 2006): translation in Spanish of the “PIRAMID FINAL REPORT” (PIRAMID Consortium, 2003).
4. ERMISA Policy Brief No 1 (ERMISA Consortium, 2007): Social and Environmental Impact of Mining in Peru.
5. ERMISA Policy Brief No 2 (ERMISA Consortium, 2007): Water Management and Bilateral Relations.
6. ERMISA Report on Mining and Water in Peru “Estado de la Situación sobre la Gestión del Agua en la Minería: El caso Peruano”:
 - Describes the impacts of “historic” and “modern” Mining (abandoned and active mines) on the environment and particularly on water.
 - Analyzes the conflicts between Mining Companies and Local Communities.
 - Compares legal regulation and instruments for management of water in the European Union and in Peru. The analysis shows that the Peruvian legislation lacks of instruments to force actors to comply with laws, and that competence on water is divided between different institutions (Ministry of Mining and Energy, Ministry of Agriculture, Ministry of Health) with diverging interests. The Peruvian legislation lacks management instruments at the watershed scale. These are the key factors why mining has severe environmental impacts in Peru.
 - Proposes the creation of an independent Environmental Authority.
 - Makes recommendations on how to develop policies for water management and how to implement best practices for mining operations.
7. ERMISA Report on Stakeholder Dialogue “Comisión Agua, Minería y Cuenca Balance y Propuesta de Agenda”. This Report was produced as a discussion document for the Water Commission of the Mining Dialogue Group.

2. Recommendations

These are the main recommendations to improve mine water management in Peru:

1. Institutional strengthening
 - 1.1. Create a decentralized independent Environmental Authority.
 - 1.2. Define procedures for the actual implementation of the water conservation and protection duties prescribed by the Water Law (Ley General de Aguas, 1969).
 - 1.3. Generate water management tools at the river basin level integrating the different sectoral approaches currently in use.
2. Integrated water management
 - 2.1. Establish policies of integrated water resources management with the participation of both the public and private sectors.
 - 2.2. Include the river basin approach on the management of water during the whole-life cycle of mines, acknowledging their role as one the main actors in a basin.
 - 2.3. Evaluation of the total impact of mines on water quality and quantity. It is necessary that the control of the amount and quality of waters affected by mining extends not only to the mine itself, but to the entire impact area up- and downstream.
3. Management Instruments
 - 3.1. Citizen participation in the whole life-cycle of the mine: from the exploration to the post-closure. Mining should be subject to the prior, informed and free consent of the population of the surroundings of the mining projects.
 - 3.2. The Environmental Impact Assessment (EIA) of a mine should include verifiable information on ground- and superficial waters at river basin level with a detailed water balance, to be integrated into a national system of environmental information.
 - 3.3. The EIAs should be administered by an Environmental Authority able to guarantee the independence of the assessments. EIAs should include detailed plans for water management.
 - 3.4. Plans for Mine Closure should be designed before the beginning of the mining activities as a compulsory part of the Environmental Impact Assessment, considering the entire environmental life of the mine and allocating the financial resources necessary to guarantee its fulfilment.
 - 3.5. Include in the legislation Strategic Environmental Assessments before the awarding of exploration concessions in adjacent areas.
 - 3.6. Define the Authority in charge of remediation of environmental liabilities, approve a national plan of remediation and establish mechanisms for its implementation including cost recovery of liabilities from know offenders.
4. Quantity and quality of waters
 - 4.1. Regulate the extraction of groundwater and water diversions in head catchments by the mining industry.
 - 4.2. Elaboration of an updated national hydrogeologic map as a key tool to determine the possible impacts of mining activities in the water bodies present in the zones where mining activities are being planned or executed.
 - 4.3. Creation of a water information system readily accessible to the public in general and to all the actors involved in water management. The mining sector is a key actor for the development of these information systems, due to its capital and facility of access to technology, in comparison with the other actors.
 - 4.4. Define the Water Quality Standards and to modify the Maximum Permissible Limits of emissions adapting them to the water quality standards.
 - 4.5. Standardize measurement parameters. The quantities of metals presence in water bodies should be assessed as total solids and not as dissolved solids.
5. Ecosystems
 - 5.1. Existing discharge permits should be thoroughly revised when they contradict the spirit of the Water Law, and stricter criteria should be applied for those to be granted in the future.
 - 5.2. Legislation should be modified to prevent the overexploitation of ground waters in heads of river basins taking into accounts its impacts on ecosystems and groundwater levels downstream.
 - 5.3. Identify good water management practices in mining for ecosystem protection. Incentives should be introduce to promote good practice and sanction bad existing practices

- 5.4. The income obtained from sanctions of environmental control should be used to reinforce the capacity of control of the competent authority.
6. Technologies
 - 6.1. Water has become the most important resource due to its limited availability and accessibility. Mining companies should be required to use efficiently this resource.
 - 6.2. The use of the best available technology for water handling should be promoted in mines: artificial recharge, passive water treatment systems.
 - 6.3. Recognition of ancestral practices of water conservation when new projects are elaborated and policies of water management are defined, e.g. inventorying of ancestral systems of water recharge in the areas of influence of mining activities.
7. Protected Areas
 - 7.1. Review and reformulate the present norms for the granting of mining concessions in protected natural areas and in their buffer zones.
 - 7.2. The recommendation of the International Union for the Conservation of the Nature should be applied. They prohibit mineral exploration and extraction in the protected areas of highest sensitivity (Categories I to IV) and adopt rigorous controls on activities of mineral extraction in the less sensitive protected areas (Categories V and VI).
8. Rights, culture and conflicts
 - 8.1. To recognize that water implies management of conflicts: the government must create institutional channels for conflict resolution and dialogue with civil society.
 - 8.2. To recognize and to protect the uses and ancestral customs of water management.
 - 8.3. To respect the different cosmovisions around the use and management of the water.
9. Promotion of International Policies for the protection of Water
 - 9.1. The Peruvian State should prioritize the international cooperation between governments in the area of water management in mining
 - 9.2. The transnational companies should apply uniform international standards in their practices regardless of the country of operation.

CAMINAR: Catchment Management and Mining Impacts in Arid and Semi-Arid South America

More than 25% of South America is arid or semi-arid. A general lack of rational water management systems hinders the sustenance / recovery of ecosystems and human communities in these areas. The twin scourges of erosion and salinisation are prone to exacerbation by various human activities. Mining is the sector with the highest environmental impact, yet it contributes more to legal export earnings in the region than any other sector. There is clearly a need to rigorously review the effectiveness of existing policies, and to develop new approaches to river-basin management to ensure that such vital economic activity can be carried out in a manner which does not permanently damage fragile ecosystems and water resources upon which human communities depend in arid/semi-arid areas.

CAMINAR has the general aim of contributing to the establishment of policy options, management strategies and technologies for the sustainable management of ecosystems in those river-basins of arid and semi-arid South America which are subject to impacts from mining. This aim will be achieved using Peru, Bolivia and Chile as 'demonstration' countries, through realisation of the following objectives: establish forums for dialogue on the ecological and water resources impacts of mining in arid/semi-arid river basins (at both national and regional levels); critically evaluate the effectiveness of existing regulatory strategies for mining in arid/semi-arid areas through studies of selected river-basins in the demonstration countries; develop guidelines for integrated water resources and ecosystem management in arid/semi-arid zones of South America with particular emphasis on mining impacts; develop decision support tools to facilitate participatory water management planning; and derive a set of principles for future policy development and implementation to protect fragile ecosystems and dependant human communities in arid/semi-arid regions.

The project will use as demonstrations catchments the River Chili (Peru), the Lake Poopo and Uru Uru basin (Bolivia) and the River Elqui in Chile.

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