

**“THE ANTAMINA PROJECT
THE CHALLENGE OF SUSTAINABLE
DEVELOPMENT IN PERU”**

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ABSTRACT

The Antamina project is a \$2.3 billion copper/zinc project, located in Peru, and is designed to produce up to 1.5 million tonnes per year of copper and zinc concentrates over a 23-year project life

Project financing included securing \$1.32 billion of senior loans from 22 export credit agencies and commercial banks and required the project to comply with a variety of national and international standards.

Antamina has been innovative in its approach to a number of environmental, and cultural issues, and as a result, has set new standards in Perú for environmental and community management, and sustainable development.

A successful mega project

The Antamina project, owned by BHP Billiton Plc, Mitsubishi Corporation, Noranda Inc., and Teck Cominco Ltd., is a \$2.3 billion copper/zinc project, located in the Ancash Department in Perú. The project consists of an open pit mine, a 70,000 ton per day concentrator, a 302 Km. long concentrate pipeline, port facilities, a new access road, power line, and town site. The project is designed to produce up to 1.5 million tonnes per year of copper and zinc concentrates over a 23-year project life, and will be the third largest producer of zinc and the seventh largest producer of copper in the world.

This mega project is the largest mining investment in the country and, during its construction stage, was the most important construction project worldwide. On May 28th, 2001, Antamina commenced testing operations and four months later, it reached commercial production. Antamina was officially inaugurated on November 14th, 2001 by Peruvian president Alejandro Toledo. The project was completed ahead of schedule and under budget due to excellent planning and implementation by a qualified team of construction and operations professionals.

The construction stage of the project generated 8,000 direct jobs, with a peak of 10,000 employees, and 30,000 indirect jobs. The permanent workforce consists of approximately 1400 employees, the vast majority of which are Peruvian Nationals; approximately 30% who came from the department of Ancash where the mine is located. Approximately 5,800 indirect jobs will be generated from the project. Independent sources state that Antamina will increase the Peruvian mining exports by 30% and Peruvian GDP by 1.4% within its first year of full operation in 2002.

Since winning the privatization bid for the project in 1996, the company has implemented a successful approach to community development and environmental protection based on sustainable development principals. Throughout the development of the project, a number of initiatives have been undertaken to ensure full involvement of the local populations in community development activities and the company's environmental program.

Due to its size, difficult logistics, cultural considerations and financial aspects, the project has faced a number of unique challenges in the area of environmental protection and management of community interaction. Antamina has been innovative in its approach to these issues, and as a result, has set new standards in Perú for environmental and community management, and sustainable development.

Project financing and environmental and social compliance

Antamina's project financing included the securing \$1.32 billion of senior loans from 22 international financial institutions, which included 5 imports - export credit agencies. The project financing was the largest in history for a green fields mining project.

Financing requires the project to comply not only with environmental and social guidelines and regulations as specified in Peruvian Law and Environmental Impact Study commitments, but with World Bank Guidelines regarding environmental and social performance. Specifically the project is required to comply with the following guidelines:

- Indigenous Peoples-OD 4.20
- Involuntary Resettlement OD 4.30
- Open Pit Mining and Milling Guidelines – 1995
- Safety of Dams-OP 4.57

Principles of social responsibility

Antamina has adopted internationally accepted practices of social responsibility, incorporating them into the design, execution and management of the project.

1. The need to obtain a "social license" to be able to operate in harmony with the local communities in the area of influence;
2. The "triple bottom line" concept, which includes the economic, environmental and social responsibility ; and
3. Stakeholder engagement.

A "social license" can be defined as the consent or acceptance – not necessarily explicit – of an industrial activity by the principal stakeholders; communities, institutions and individuals within the area of influence. It is important to note that the granting of the "social license" by the stakeholders usually implies that the stakeholders will receive a real benefit from the development of the project. If the stakeholders don't feel that they are receiving a benefit, the "social license" may be in jeopardy, and may be revoked, either temporarily or permanently.

This process can facilitate the resolution of many social issues related to mining operations, and help to ensure business continuity by avoiding major public or government incidents or conflicts. A social license is an ethical approach to project development and should be considered as an investment, not as a cost.

A second concept utilized is the "triple bottom line" where – economic, environmental and social responsibility are considered as key components of the business activity. The triple bottom line represents a major change for the mining industry, an industry that has tended to concentrate on the technical aspects of the business, versus interaction with outside stakeholders. This triple bottom-line concept requires that environmental and social responsibility concepts be incorporated into key business decisions.

Experience has shown that the best strategy for achieving acceptance and support of the project is to interact with stakeholders; that is, seek to engage the stakeholders in an open and transparent process of consultation and communication, promoting two way dialogue whenever possible and as soon as possible in the life of the project. Involving the stakeholders, especially the communities, in decisions that may affect their future, is a key step in building trust between the company and the surrounding communities.

Environmental program

Antamina is committed to high standards in all aspects of its operations, including environmental protection, health and safety. The company undertakes to act responsibly as steward of the resources in its charge, working for the well being of its employees and the communities in which operates.

Early in the development of the project, the partner companies established an environmental policy for the Antamina Project, based on their existing EHS policies. This new policy set the stage for EHS performance throughout the design, construction and operation of the project.

The environmental program is based in two key areas: environmental impact studies and environmental management programs. The first consisted of three baseline studies that addressed air, soils, water, biological resources and cultural resources within the project area. Possible environmental impacts were identified, and mitigation measures proposed. Other aspects addressed in the studies were closure, reclamation, and social impacts. In addition, site-specific standards were established for air quality, effluents, and receiving waters, which in some cases exceeded existing Peruvian standards. The establishment of these standards was required to ensure that there was no long term significant impact created by the project.

The consultation process associated with the baseline studies was probably the most intense program of its kind for any type of new project in Peru. It involved public hearings in Lima as well and public consultation in the area of influence. As part of this process, the Environmental Impact Study was widely distributed and provided to any stakeholder wishing to have a copy, also a first in Peru. As a result, the communities surrounding Antamina were well informed about the project and its potential impacts prior to construction taking place.

The environmental management programs consist of monitoring programs for air quality, ground and surface water, and aquatic life. In addition, programs to manage erosion/sedimentation, re-vegetation and solid waste have been established. The company has also established an Environmental Management program based on ISO 14000, and is in the process of implementing this system.

The permitting process included obtaining approximately 300 permits, a majority of which were obtained during the construction process. A rigorous effort was required to research which permits were required, as no comprehensive list existed at the time. Permits were required for construction activities, communications, fuel storage, operations, and water discharge. This rigorous permitting effort is considered to be one of the most thorough permitting efforts undertaken to date in Peru, and will serve as a model for future project permitting efforts.

Safety

The focus of Antamina's safety program is building a culture of safety awareness. This is critical given the low level of safety consciousness that exists within Peru. Training to create this awareness begins with induction training for all new workers and contractors, and extends throughout all levels of the organization. An integrated safety program encourages employee participation in the program at all levels within the company.

Both environmental and safety awareness are programs which can lead to cultural changes over the long term, and as such are part of the sustainable development program. Over the life of the mine through programs conducted on and off the project, it is hoped that a real change in awareness and attitude can be created, and sustained beyond the life of the project.

The International Safety Training and Technology Program or "ISTEC" serves as the framework for the Antamina safety program, providing the necessary standards and structure for a modern safety program at a large mining operation. To encourage positive safety behavior, the company has implemented the Dupont "Safety Training and Observation Program" known as the "STOP" program. The program has been implemented with great success at all levels within the organization.

Hopefully over time, this new culture of safety awareness will spread beyond the operation itself and into the homes and communities of the employees, becoming a sustainable part of the local culture.

To date, safety statistics collected during construction and operation exceed a majority of operations in Peru and are comparable to mining projects in North America. However, safety performance is still not to the desired level, and as a result a two-year continuous improvement program has been established at the operating department

level within the company. In addition to this program, a specialized contractor management program is under implementation in order to improve contractor safety performance. This program will eventually lead to the certification of all contractors working on the Antamina project.

Internal stakeholder engagement

In terms of its internal environment, CMA regards its workforce as internal stakeholders who play a key role in achieving its objectives and to comply with its environmental and social commitments. For this reason, personnel management actively focuses on three basic aspects: personnel safety in the performance of activities, permanent training to improve the level of knowledge, and training in new technologies.

Community relations strategy

Antamina's community relations' strategy is based on socially responsible behavior involving consultation with community members and key stakeholders to obtain a buy-in for the project and to increase the level of trust. Antamina has the goal of building partnerships, promoting involvement by communities and stakeholders. The strategy considers plans and programs that last beyond the life of the mine, hence promoting the concept of sustainable development.

It is important that the community takes a lead role in decision-making regarding the design and implementation of community development programs. Following this strategy, the communities have approved community development plans and budgets, and monitor the progress of the programs as well.

This new vision implies a not only permanent consultation with stakeholders but also their engagement, participation with mutual commitment, transparency and respect.

Community development programs: seeking sustainable mining communities

As described by Veiga, Scoble and McAllister (2001), "a sustainable mining community is one that could realize a net benefit from the introduction of mining that last through the closure of the mine and beyond".

In keeping with the concept of "Sustainable Mining Communities", and using the information obtained from studies and concerns expressed in the public consultation process, Antamina designed

the basic framework for the Community Development Programs based on the following basic principles:

1. Avoidance of paternalism.
2. Supply the tools that the community needs to achieve, through its own efforts, sustainable development.
3. Attract contributions and participation from government, multinational financial and aid agencies, the private sector and local communities, to jointly develop a sound development programs for the region.
4. Complement – not substitute – the obligations of the Peruvian government in its programs for reducing the levels of extreme poverty presently existing in the region.
5. Respect the culture, customs and values of individuals and communities.
6. Work with the community to build social capital (the ability of people to organize themselves and work towards common objectives).
7. Increase the level of trust within the community, and between the community and the company.

On this basis, the company's programs contain the following macro-objectives:

1. Upgrade living standards, by improving the quality of education and health services.
2. Improve production and productivity levels in agriculture and livestock production, the main economic activities carried out by a majority of the local population. These activities will continue to be practiced throughout the life of the mine and beyond, making them good investments with regard towards sustainable development.
3. Promote small-scale business activities, including the development of markets for local products and the infrastructure needed to access them efficiently.
4. Support cultural activities and promote conservation of heritage.
5. Promote the development of "clusters" in the area of influence by prioritizing local purchasing.
6. Prioritize the hiring of local workers, by providing training and opportunities to non-skill workers.

7. Promote environmental protection, not only within the company's area of operation, but throughout the area of influence.

These objectives are divided into three main program areas: economics, environmental and social programs.

The economic program is based on the need to improve agricultural management techniques as well as to increase in productivity and development of marketing strategy. Current agriculture in the area is dominated by subsistence agriculture using varieties of plants and animals that are not optimal for efficient product, nor marketing outside the area of production. In an effort to improve these practices, Antamina has established two experimental agricultural centers; Fundo Cochao, an agricultural training center near the town of San Marcos, and Shahuanga, a livestock and pasture enhancement pilot center, located near the mine. Through the use of the centers, local residents are shown the use of new techniques to increase agricultural production, and the benefits of using new varieties of animals and plants to increase productivity and marketability. As a result of this program, crops and products are beginning to be marketed outside the area.

The environmental program is based on environmental education and community participation in environmental monitoring programs. While conducting monitoring activities, local residents are invited to participate and observe in environmental sampling. In addition, the company as encouraged the establishment of environmental communities both near the mine and the port sites. With assistance from NGOs, these committees have received training in environmental legislation, sampling techniques, and interpretation in results. These committees tour the operations on a regular basis and actively participate in monitoring programs. Monitoring results are presented to both the government and environmental committees on a quarterly basis.

The social programs are based on the need to improve education and health in Antamina's area of influence. The education program includes the training of youths from local communities in computer skills and hotel management, and the training of teachers working in public schools. The health programs include mother-child care, substance abuse prevention and family violence preventive programs. Antamina has also an agreement with NGOs, to provide medical equipment and drugs to all health centers in the area.

Antamina's port operations are located in Huarmey, 300 kilometers northwest of Lima. Community development programs are also being implemented in this area and include educational support programs, the health community program, provision of equipment to medical centers, technical and credit support for farmers, electrification, and water and sewage system for the locations surrounding the port.

Lessons learned

Valuable experience gained on the Antamina project with regard to sustainability is as follows:

- The degree of effort required in the management of environmental and community issues is directly related to the complexity and setting of the project. In the case of Antamina, or any large project in a developing country involving local communities, a very large effort will be required. This effort should not be underestimated when planning for the project.
- Local environmental, health and safety culture may differ substantially from what is expected by the company and from international standards. This means that an emphasis needs to be placed on actually creating a culture of environmental, safety and social responsibility. This new culture can become a sustainable component of the local culture, provided that workers are encouraged to share their newfound knowledge with family and friends, and that these same principals are incorporated into the local educational systems.
- The importance of complying with financial institution's requirements with respect to environmental and social aspects should be factored into the project. In a developing country such as Peru these obligations can be greater than those established or enforced by the government. This places an additional burden on the companies EHS and Community Development staff to become both consultant and enforcers of these requirements. Full support of the management, such as that received at Antamina, is required to ensure full compliance.
- Carefully manage expectations of the local population. This can be achieved through consultation beginning in the earliest stages of the project, and carried through throughout the life of the project. Accurate and timely information regarding the project needs to be

provided, and surveys then undertaken to determine the expectations and perception with the area of influence of the project.

- Cultural understanding and sensitivity is a key factor in establishing productive relations between the company and its stakeholders. Studies should be started early, and carried out throughout the life of the project, in order to build an understanding of local culture, perceptions about project development, and the level of social capital available to understand and promote sustainable development principals. As these factors are understood, the company can more effectively interact with the affected communities, and assist them in capacity building to increase social capital, thereby increasing the chances of promoting and establishing sustainable development in the area.
- Impacted communities should be involved in making decisions that will affect their future. Forums should be established that promote dialogue and planning with regard to community development. The local population should be encouraged to help establish and implement the kind of community development programs that will support sustainable development that is adapted to the specific area and reality of the project. This helps to achieve buy in of the community development projects, and establishes a sense of ownership, and therefore responsibility for the success of the community development project.
- Develop an atmosphere of trust between the local communities and the mining operation. In the case of Antamina, the level of trust inherent in the community was already very low prior to our arrival. An increased level of trust can only be achieved through personal contact, dialogue, and participation by the community in decision making, and the company following through on its commitments. Once established, trust can be easily lost, if the steps that created it are not followed through. Trust is a key component of social capital, a commodity that is critical in the working relationship between the company and its stakeholders.

It is necessary to establish clear environmental and social standards with management buy-in, and to secure adequate level of environmental and community relations resources from the very beginning of the project.

It's critical to identify or map the stakeholders early in the processes, communicate at every opportunity and to establish and maintain relationships with them, constantly striving to build social capital and increase the level of trust between the company and the community. The identified stakeholders can help to identify additional stakeholders that may have been missed in the initial mapping effort. Finally, the experience recommends carefully managing the expectations and never over selling the project.

Regarding sustainable development principals, the Antamina experience has shown that a combination of short term highly visible projects, combined with longer term sustainable programs, is the best way to manage the high expectations normally experienced in such situations. Sustainability can only be achieved through education and full participation of the affected communities, in partnership with mining companies, in order to establish and promote sustainable development principals throughout the life of the project. Both parties need to work together to build trust and credibility, in order to establish a productive working relationship required to reach these goals.