

Sustainability Planning or Closure Planning?

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ABSTRACT

The concept of sustainability planning rather than closure planning is presented as the new paradigm for the mining industry in this paper. The outcomes of the socio-economic baseline studies and consideration of other land uses such as conservation, renewable energy, carbon sequestration and innovative agriculture are described. The need to consider these alternatives from the onset and skills required to form partnerships to ensure success are outlined.

Currently, closure planning and the associated closure costs usually only include the rehabilitation of mining facilities and the adjacent disturbed landforms. These facilities and landforms are most likely to include tailings storage facilities (TSF), waste dumps, pits, processing plants, mechanical maintenance areas, camps and access roads. Creating stable landforms and replanting native vegetation is broadly considered as the leading practice rehabilitation standard.

However thousands of mine sites have been abandoned across many countries with poor or no rehabilitation. Even most leading practice sites have not taken surrounding community desires or land use requirements into account. We need to start thinking about closure planning from a different perspective? An operational mine should consider its activities as part of a continuum of land use that will change over time. Instead of trying to recreate the original landscape, or alternatively abandon the site when it becomes too difficult, the post-closure land use and potential owners should be considered at the mine approval phase.

This paper examines the case study of a large gold mine in Indonesia, which has been closed for ten years. This site completed socio-economic baseline studies prior to closure to understand and incorporate community needs and land use pressures into the planning. Post-closure land uses which are compatible with environmental requirements and alternative non-mining income opportunities are presented in this case study.

INTRODUCTION

Case Study: PT. Kelian Equatorial Mining (KEM) operated a large gold mine in the West Kutai District of East Kalimantan, Indonesia (refer to Figure 1). The mine initiated production in 1992 and operated for 12 years while enduring numerous community disputes and disturbances from local villagers and artisanal miners. A mine closure engagement process commenced in 1999 and evolved into the Kelian Mine Closure Steering Committee (MCSC) with four working groups.

The agreement on rehabilitation and decommissioning activities, post-closure land use as a Protected Forest and long term governance arrangements was finalized after three years of quarterly stakeholder negotiation meetings. Key decisions on all aspects of mine closure were made by consensus in accordance with traditional Indonesian customs. The decisions were signed off by all parties at the end of each meeting and distributed to villages surrounding the mine. Activities agreed by the MCSC commenced in 2004 following exhaustion of the ore reserves and processing of low-grade ore stockpiles.

The Kelian Mine Closure Plan (MCP) documented all the decisions and agreements reached during this process and were prepared in accordance with Indonesia regulations and Rio Tinto requirements. The overall goal of the MCP was to implement of an orderly closure, ensure the sustainability of community programs and to protect the permanent landforms, surrounding forests and rivers in perpetuity. Novel post-closure land uses and governance arrangements were a key aspect of the negotiations required to mitigate long term risks.

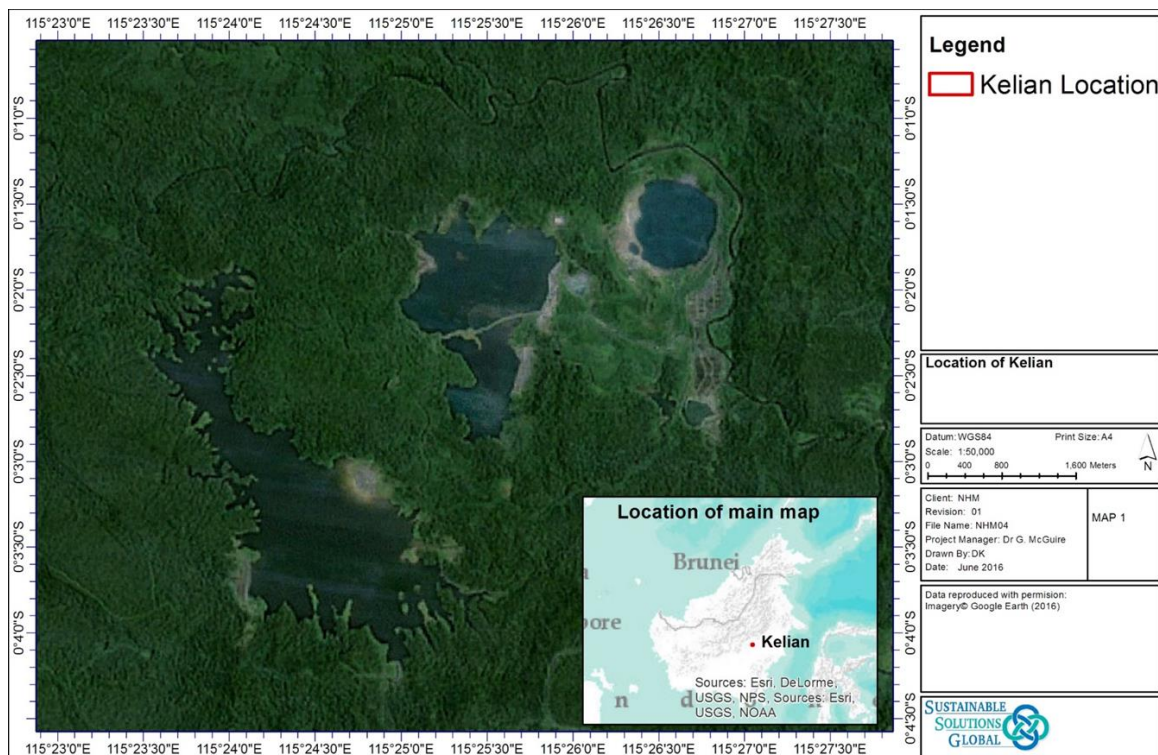


Figure 1 Kelian Equatorial Mining, East Kalimantan Indonesia

METHODOLOGY

A key aspect of the success of the KEM novel post-closure solutions was the collection of current and very detailed, village socio-economic baseline data. The KEM data was analyzed to prioritize “at risk” villages prior to designing post-closure community programs and determining land use options. Based on the following methodology, the following data was collected.

Scope - 80 villages

- Village History, Population, Institutions, Forestry, Hunting and Gathering, Cropping, Livestock, Fishing, Food Security, Health, Education, Assets and Infrastructure, Community Development, Employment, Wealth, Communications, Key Community Issues.
- Social and Economic Calendar; religious and secular events, cropping, hunting, fishing and gathering, cycles of human, animal and plant pests and illness etc.
- Social structures and organization; While it is anticipated that the ethnography of survey villages conform with long recognized organizing principles of village societies in other parts of eastern Indonesia, some survey results may suggest the need for limited ethnographic fieldwork in certain villages for clarification purposes.

Key village measurements

- Changes in population, identity, institutions, infrastructure and development
- Changes in agriculture, fishing and food security, resource competition and depletion; natural and man-made threats; changes in forest, marine and river resources
- Changes in cash sources and dependency, consumption, wealth, existing and emerging social and economic inequalities
- Debt within and between groups, the company, government and other key players
- Capacity of individuals and groups to engage in social and economic life, acquire land and other resources, employment, assistance, benefits and entitlements
- Changing impact of project employment, contracts, assistance, benefits and entitlements on households and village life
- Key community concerns about village life
- Knowledge about the project, and its LOM

RESULTS AND DISCUSSION

The main outcomes achieved by undertaking a socio-economic baseline for closure are to obtain information on the following:

- Communities and groups that have been largely unchanged by the project and are unlikely to be at risk to changes in the project
- Communities and groups that may be a risk to the project.
- Communities and groups that may be at risk from the project with changes in the project cycle

- Communities and groups that may present a risk to each other during changes in the project cycle
- Evidenced basis for intervention or remedial action by the company.

The KEM socio-economic baseline enabled 17 “at risk” villages to be selected as a priority from the surrounding 80 villages of approximately 80,000 inhabitants. The wellbeing (measured as a perception of “wealth”) in these villages was tracked over the following time period:

- **2000 – 2004:** uneven community development - mine incomes and programs, mine closure planning including impact remediation programs
- **2003:** end of mining, first redundancies, start implementing social remediation programs
- **2004:** volatility in community relations as project approaches closure
- **2005:** finish processing stockpiles, MCP approved, decommissioning, start of rehab, mitigation programs
- **2006:** second redundancies, ongoing closure program, remediation programs take effect and reveal normalization in community relations
- **2008:** final redundancies, start of 5 year monitoring period; normalization in community relations
- **2013:** end of 5 year monitoring period; community relations at pre mining level

Wealth perception monitoring results (Figure 3) of these villages before, during and after closure interventions has provided the following key observations:

Key observations enabled by the socio-economic survey

- Standards of village wealth shifted over time so what was perceived as an ‘average’ standard of wealth in 2000 may be considered ‘below’ standard in 2013.
- As consumption and identities changed over time, how people define signifiers of wealth also changed.
- Villagers’ perceptions of wealth did not always equal ‘actual’ observable material wealth as villagers combined physical and existential measures of wealth in calculations.
- Perceptions of inequality and community relations were generally more volatile in villages that employed more mine workers and received greater project benefits.
- Villagers often increased or reduced ‘wealth categories’ (‘above’ ‘average’ below’) to express community dysfunction, resentment or tensions.
- When relations were sound, villagers placed more in the ‘average’ wealth category. When relations were poor more placed in the ‘above’ or ‘below’ standard. Evidence; in 2006 there was little apparent shift in actual wealth from 2004 but community relations in the two years had improved significantly as a consequence of mine closure.

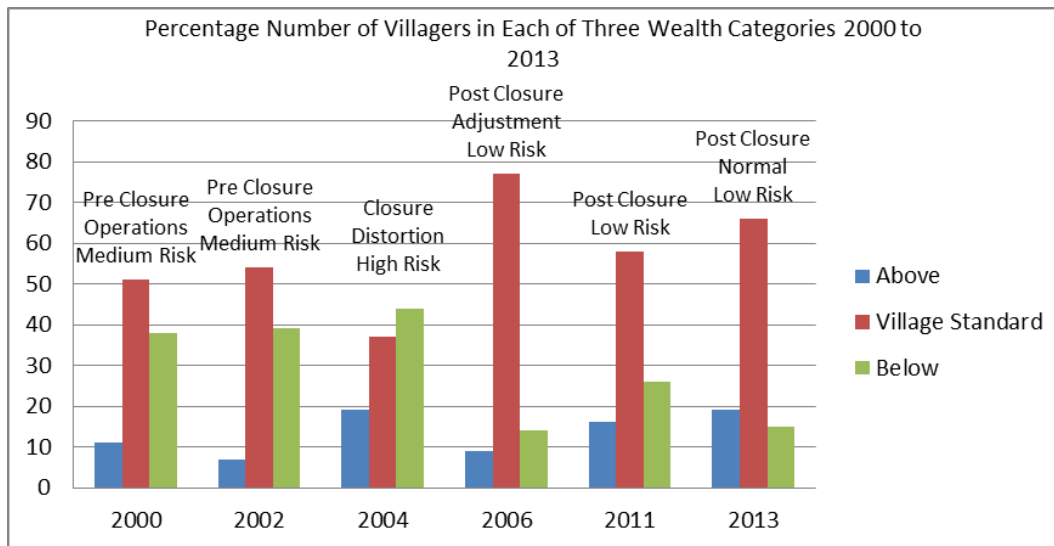


Figure 3 Perceived wealth and inequality risk measurements in 17 'At Risk' Villages from Operations to Post Closure

Closure Inventions

The socio-baseline data collected prior to and during closure at KEM revealed that many villagers considered that they were living below the average wealth of the village. The implications for the project areas was the high likelihood that these people would enter the lease area to search for remaining gold, disturb rehabilitated areas and destabilize permanent structures such as TSFs and waste rock dumps.

The closure inventions were focused both on providing alternative agricultural-based livelihoods for these "at risk" local communities as well as securing the site as a Protected Forest after closure. The land tenure, post-closure governance institution, PT (HLKL) Hutan Lindung Kelian Lestari (Kelian Sustainable Protected Forest) were agreed during the stakeholder engagement and have been implemented accordingly. Consequently, the closure completion criteria for water quality and rehabilitation standards were designed to reflect the final overall land use of a Protected Forest not a Production Forest or Agricultural Land Use.

Further land use developments following the closure of the mine have been the installation of a micro-hydro scheme to supply renewable energy from the on-site waste rock dam. The power generated from this system is sufficient to supply all the power requirements of the remaining protected forest rangers camp and office facilities. Another recent development has been a partnership with conservation agency, World Wildlife Fund (WWF) to protect the very rare Borneo rhinoceros. The secure land tenure and ongoing active protection of the site by local forest rangers has enabled PT HLKL to take on the important task of actively protecting the 15 remaining wild rhinoceros.

CONCLUSION

Considering all options for post closure land uses that also meet goals to sustainably protect permanent structures enables local community and government stakeholders to fully participate in closure planning. This should be undertaken as early as possible to identify suitable third party partnerships and fully anticipate the full costs of closure and relinquishment.

This may be an iterative process as new opportunities and technologies such as conservation areas/sanctuaries, renewable energy and carbon sequestration evolve. The example at KEM with the partnership between PT HLKL and WWF to save the rare Borneo rhinoceros demonstrates that considering all options and establishing a third party as the relinquishment authority enables a smooth transition from mining into other beneficial land uses.

Planning for sustainability beyond the life of the mine will enable other sites to examine all possible scenarios in the context of the current socio-economic baseline information. This will ensure that the most needy or “at risk” community are given priority and that positive long term legacies are given due consideration.

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REFERENCES

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