

# CHAPTER 4

## BUSINESS SOLUTIONS FOR RESPONSIBLE MINING IN BORNEO



### Summary

- The Indonesian and Malaysian governments are both considering increasing their mining production from deposits in Borneo, particularly that of coal. There are more than 1,100,000 ha of coal concessions within the HoB, of these most, 980,000 ha, are in the research or exploration phase, indicating the potential future growth, and impact, of the industry in the HoB.
- WWF believes that due to the high carbon emissions from coal, its use as an energy source should be significantly reduced over time. However, in the short term WWF recognises that coal will remain an important and relatively low cost source of energy for developing countries.
- Illegal coal and gold mining has significant social and environmental impacts, along with economic consequences for governments and legitimate activities. National and regional governments need to continue to tackle illegal mining, while seeking to provide alternative livelihoods for the many rural poor who are involved.

### Recommendations

- Clear regulation and effective enforcement is needed across the region. For example, ensuring that the regulatory requirement for Environmental Impact Assessments and reclamation of land are consistently enforced.
- Heightened efforts are needed to control illegal mining. A specific example is the need to reduce mercury use by illegal gold miners and protect them from the adverse health effects.
- Mining companies should identify high conservation value forests before commencing mining operations and ensure an adequate management plan is put in place to protect the value of the area during mining operations and after they are completed.
- Mine rehabilitation needs to be planned logistically and financially well in advance of the commencement of mining operations.

More information can be found in the solutions sections:

Activities	Solutions	Page
Locating and planning	High Conservation Value Forest	72
	Environmental Impact Assessments	74
Managing	Mercury Use	75
	Mine Rehabilitation	76
Financing	Responsible Finance	77
	New Financial Incentives	78

## Introduction

Mining has made an important contribution to the economic development of Borneo, providing export revenue, jobs, and resources for power generation. However, the environmental impacts of mining have also been severe and there is a growing recognition that continued economic development in Borneo will be contingent on significant improvements in the environmental and social practices of companies and individuals operating there. Furthermore, much of the mining in Borneo is for coal; burning coal is a significant contributor to climate change which is adding to environmental and social pressures in Borneo and around the world.

Mining in Borneo has been carried out by traditional miners since the eighteenth century. Large scale commercial mining took off following geological surveys by the Dutch in the first half of the twentieth century and has since grown rapidly. In recent years, both the Malaysian and Indonesian governments have expressed interest in further expanding large-scale commercial coal production in Borneo. The challenge for the governments' vision for conservation and sustainable use enshrined in the HoB Declaration is therefore to ensure that as producers turn their attention to deposits within the HoB, careful spatial planning is conducted, and good regulations are developed and / or are rigorously and consistently enforced.

In many ways however, small scale miners pose a greater challenge for regulators than larger operators because their activities are more numerous and they are often dispersed throughout inaccessible areas. Steps need to be taken to ensure that the access and activities of small scale, as well as illegal miners, are effectively controlled.

## The Coal mining sector in Borneo

### Production

Annual coal production in Indonesia has grown rapidly in the last decade to over 250 million tonnes. This figure is currently forecast to continue to grow by 4-6% per annum, reaching 316 million tonnes in 2014.<sup>88</sup> Much of this growth is expected to come from Kalimantan, which holds 53% of Indonesia's 4,300 million tonnes of recoverable coal reserves.<sup>89</sup> Some of these reserves are within the HoB, indeed there are already signs of activity; there are more than 1,100,000 ha of coal concessions within the HoB, of these most, 980,000 ha, are still in the research or exploration phase.<sup>90</sup> This provides some indication of the potential growth of the industry, and its future role managing lands within the HoB in Indonesia. However, this does not include the illegal mining activity, which is also significant.

The Malaysian coal industry is almost wholly based in Sarawak. In contrast to Indonesia, it is relatively undeveloped producing a little over 1 million tonnes per annum which supplies 6 power plants.<sup>91</sup> However, the Department of Minerals and Geology estimates that Malaysia holds reserves of 1,724 billion tonnes with the vast majority of these in Sarawak (80%) and Sabah (19%).<sup>92</sup> Some of these reserves are located in environmentally sensitive areas inside the HoB, for example the Maliau Basin (nominated to become a World Heritage Site) and Danum Valley forest reserves in Sabah are both thought to sit above significant deposits.

Brunei also has considerable coal deposits, but since the closure of Brooketon Colliery in 1924 it has no active mines. There are no public plans to develop Brunei's coal resources although some exploration is taking place in order to update estimates of known reserves. The country has rich oil and gas resources from which it generates all of its electricity and it is actively exploring new reserves to maintain this supply.

<sup>88</sup> Business Monitor International, Indonesia Mining report Q3, 2010

<sup>89</sup> Innovation Energy Environment, 2010

<sup>90</sup> Indonesian Ministry of Energy and Mineral Resources, 2008.

<sup>91</sup> Malaysian Mining Industry Report 2008

<sup>92</sup> Mineral and Geosciences Department, Malaysia, 2010

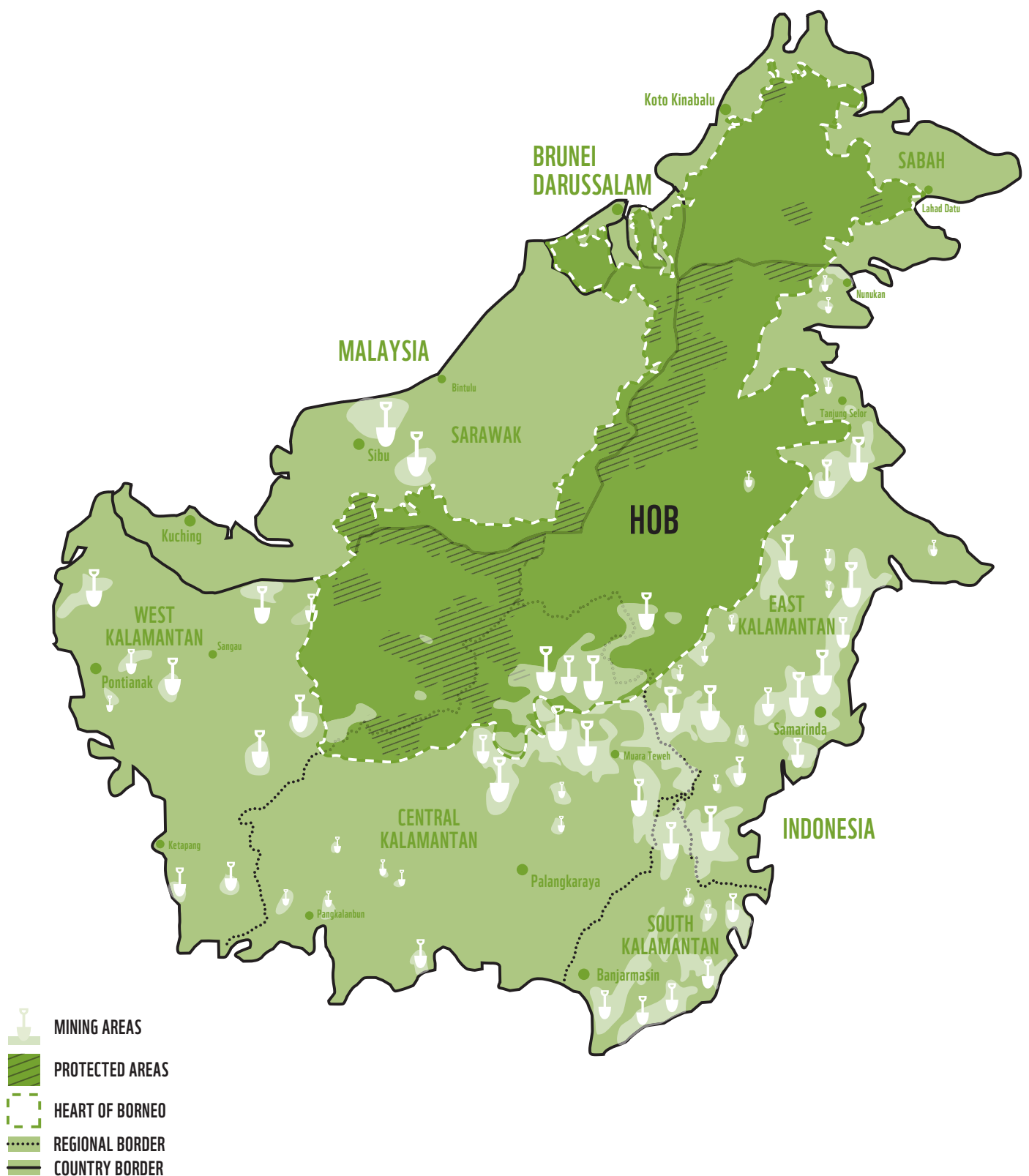


FIGURE 4.1: ILLUSTRATIVE MAP OF MINING CONCESSIONS IN KALIMANTAN, MINES IN SARAWAK

NB: This map provides an illustrative estimate of the location and size of concessions based on publicly available information; it is not intended to be a precise representation.

## Consumption and Export

About 20% of Indonesian coal production is used domestically, principally to generate electricity, but also directly by industry. The Indonesian National Energy Policy states that it plans to see coal represent 33% of the energy mix in 2025<sup>93</sup>, up from 17.1% in 2006,<sup>94</sup> and about 25% today.

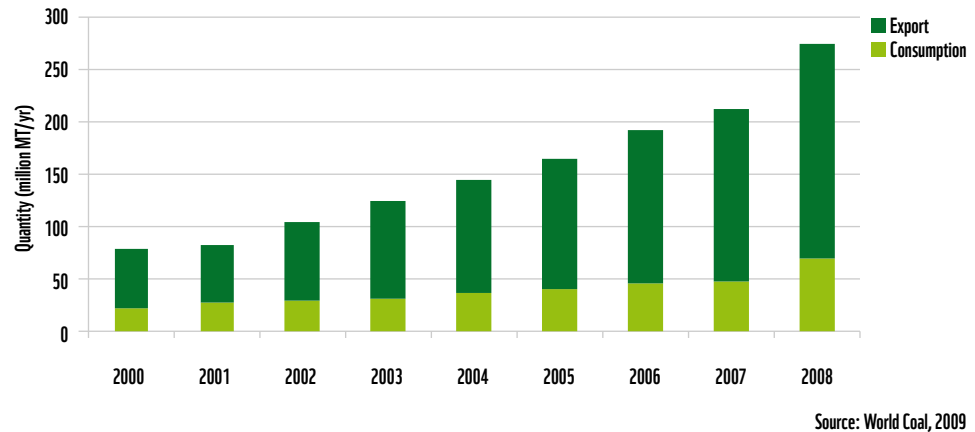


FIGURE 4.2: INDONESIA THERMAL COAL CONSUMPTION AND EXPORT

Indonesia exports large quantities of coal to Japan, Taiwan, India and South Korea; indeed Asia represents 78% of sales.<sup>95</sup> Consumption in many western countries is predicted to decline, partly due to the external costs associated with carbon emissions and climate change. However, as Figure 4.3 shows, the International Energy Agency (IEA) prediction sees continuing growth in world demand, largely driven by developing countries, particularly India and China. WWF believes that due to the high carbon emissions from coal, its use as an energy source needs to be significantly reduced over time. However, in the short term WWF recognises that coal will remain an important and relatively low cost source of energy for developing countries. The 'WWF Energy Vision' does in fact acknowledge that coal usage will increase in the global energy supply to 2020, before declining as other renewable technologies are developed as cost effective alternatives.

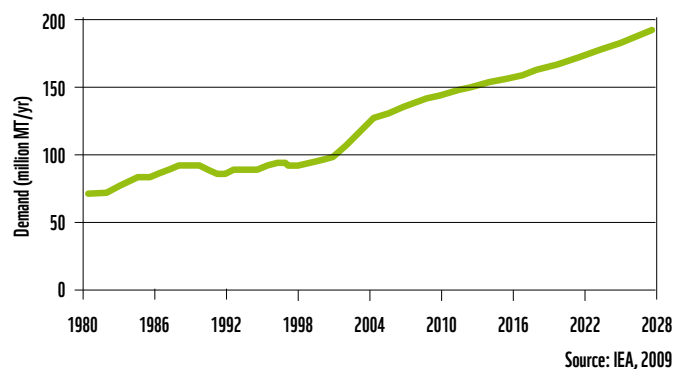


FIGURE 4.3: WORLD COAL DEMAND FORECAST (BUSINESS AS USUAL SCENARIO)

Coal exports are an important source of foreign exchange for Indonesia, generating revenues of USD 7.7 billion in the first 4 months of 2010 alone.<sup>96</sup> The industry has also been an important contributor to economic growth, representing 4.5% of national GDP in 2009. In Kalimantan coal represents more than 7% of the local GDP<sup>97</sup>.

<sup>93</sup> Along with 30% natural gas, 20% oil, 2% coal liquefaction, 5% renewable energy, and 5% geothermal.

<sup>94</sup> Presidential decree no. 5 Tahun, 2006

<sup>95</sup> Handbook of energy and economic statistics of Indonesia, 2009

<sup>96</sup> <http://theindonesiatoday.com/stock-headline/1292.html>

<sup>97</sup> BPS Kalimantan Tengah Dalam Angka, 2009

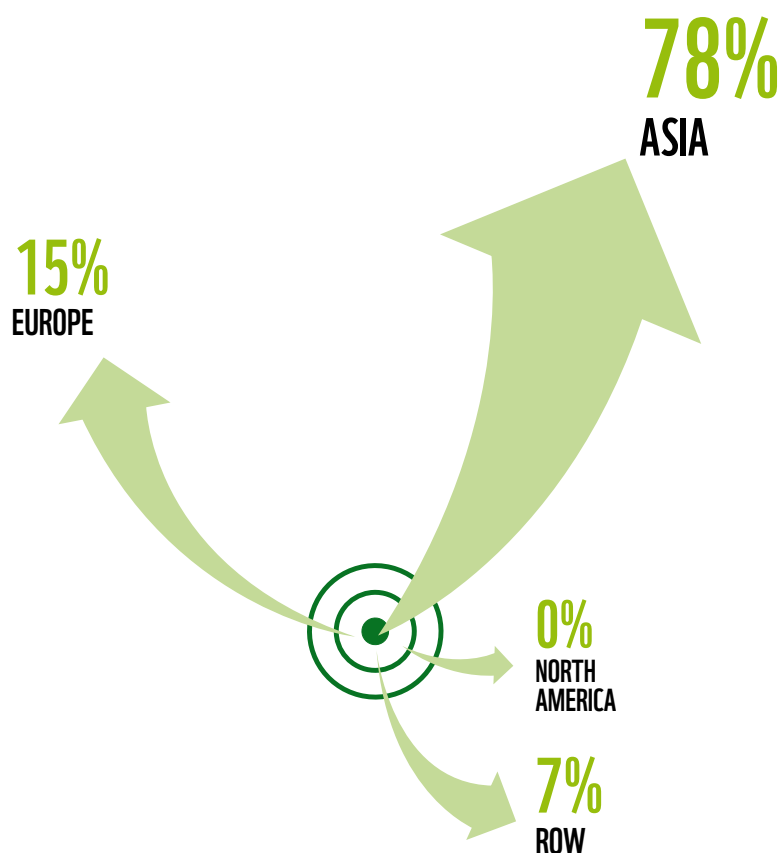


FIGURE 4.4: EXPORT DESTINATIONS FOR COAL FROM INDONESIA AND MALAYSIA

Malaysia's national consumption has undergone a rapid increase over the last decade, driven largely by increases in the proportion of coal in the fuel mix, which has replaced more expensive natural gas, and is now up to nearly 40%.<sup>98</sup> Given Malaysia's current low domestic production, this is sustained by imports, principally from Indonesia, Australia, and China. These imports have a significant cost of more than USD 1.6 billion per annum.<sup>99</sup>

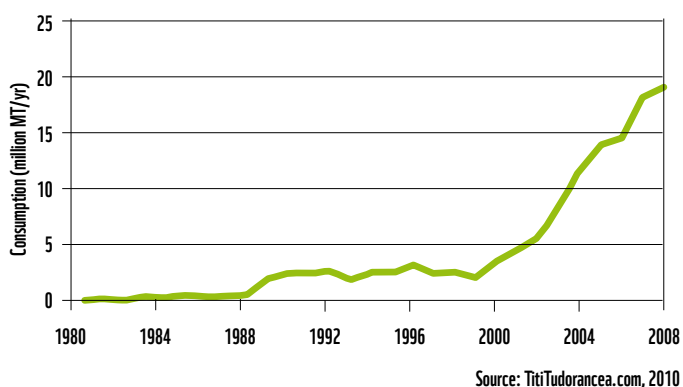


FIGURE 4.5: MALAYSIAN COAL CONSUMPTION

<sup>98</sup> COGEN3, Malaysian National Energy Review, 2003.

<sup>99</sup> <http://malaysianminerals.com/minerals-statistics.html>

## Production Developments

Potential for relatively low cost energy generation, increased export revenues in Indonesia, and reduced import costs in Malaysia, are motivating both governments to seek greater exploitation of their deposits in Borneo.

In Kalimantan there are plans for the development of a 1,461 km Integrated Coal Transportation System connecting the main areas along East and South Kalimantan's coast for increased coal export; Sanggata, Mahakam, South Balikpapan, Mangkupadi and Batu. Proposals include 7 new or expanded port terminals, providing significantly greater export capacity. Some of this is financed by international private investors hoping to guarantee a portion of future exports. For example the India based Middle East Coal Company intends to invest USD1.4 billion in East Kalimantan, including part of the rail line and a port capable of receiving capsize vessels.<sup>100</sup> To ensure that there is adequate reasonably priced coal for domestic consumption the New Mining Law No 4/2009 requires all companies to sell at least a quarter of their production to domestic users.

An emerging development in Indonesia's coal industry is the exploitation of coal bed methane. Indonesia is thought to hold 450 trillion cubic feet of coal bed methane resources. The first extraction of some of this is being led by VICO (jointly owned by BP and ENI) in East Kalimantan. Production is expected to start in 2011 from their Sanga-Sanga block, from which traditional gas extraction has been carried out for 40 years. Coal bed methane is often released during coal extraction, resulting in significant greenhouse gas emissions. However, it can also be an additional source of combustible fuel, and its further use could provide a potential route to reduce the carbon intensity of energy production in Indonesia.

The Tenth Malaysian Plan sets out plans for increased exploitation of coal resources in Sabah and Sarawak. These developments intend to reduce the cost of coal imports and increase regional energy security. The plans include the construction of two new coal power plants, one in Lahad Datu, Sabah, and one in Peninsula Malaysia, together with the associated mining infrastructure to meet their capacity. However, the Sabah plant has received significant media and NGO attention calling for the project to be abandoned.<sup>101</sup> Challenge has also come from the Ministry of the Environment, who rejected the initial Environmental Impact Assessment based on its failure to address a number of environmental sensitivities in the area.<sup>102</sup> In addition, the Sabah State Government has committed to conserving the Maliau Basin assigning it Class 1 Protection as Heritage Conservation under the Cultural Heritage Conservation Enactment 1977, such that future coal extraction of reserve in this area would require legislative approval.

Amongst the mining sub-sectors, coal mining has the most significant potential to impact on lands within the HoB. Both the Malaysian and Indonesian governments have well developed plans to increase their coal production from Borneo and these proposals will need to be carefully evaluated for their compatibility with parallel objectives to conserve and sustainably manage the HoB and increase the contribution of other sectors such as eco-tourism. For producers, a number of measures can be taken to reduce any negative impacts and these are outlined in the second half of this chapter.

## Other Mining in Borneo

### Gold

In 2007, reported Malaysian gold production was 3,497 kg<sup>103</sup>, but there was no large scale commercial gold production in Sabah or Sarawak.<sup>104</sup> The Department of Minerals and Geoscience has, however, acknowledged the potential, particularly in Bau, south-west Sarawak, where small-scale miners have been operating since the nineteenth century.

Small-scale gold mining in Kalimantan is more widespread than in Sabah and Sarawak, particularly because alluvial deposits are more common. Small scale gold mining operations often operate without a licence and use illegal techniques, such as the use of mercury to extract gold. Mercury is a highly poisonous metal which is persistent in the food chain; the contamination of watercourses results in significant social and health impacts, as well as causing environmental damage.

<sup>100</sup> Business Monitor International, Indonesia Mining report Q3 2010

<sup>101</sup> For example the Green SURF coalition launched a petition, run by Land Empowerment Animals and People, Partners of Community Organisations, Sabah Environmental Protection Association, the Malaysian Nature Society Sabah Branch, and the Sabah office of WWF-Malaysia.

<sup>102</sup> Sabah Chief Minister Datuk Musa Aman as cited in The Star, 2nd April 2008 said "after careful consideration, we just cannot take the risk and destroy the environment that is intact. We need to look for more environmentally-friendly sources of energy."

<sup>103</sup> A decrease of almost 20%

<sup>104</sup> Mineral and geosciences department, Malaysia, 2010



FIGURE 4.6. PANNING FOR GOLD IN A BORNEO RIVER

Large scale gold mining in Kalimantan, on the other hand, has been in decline, most notably since the closure of Rio Tinto's Kelian gold and silver mine in East Kalimantan in 2003, which had produced almost 15 tonnes of gold and silver per year. There remains interest however in the potential for future production. For example, the village of Muara Asa in East Kalimantan is reported to hold total gold ore deposits of 300 million tonnes, yielding 400 mg of gold per tonne of ore. In addition, Waringin, Central Kalimantan, is estimated to hold over 140 million tonnes of ore.<sup>105</sup>

Gold deposits often coincide with copper and future investment is being made on this basis; the Kalimantan Gold Corporation announced in late 2009 that it will issue additional shares to finance continuing exploration of copper and gold deposits in the south east of the HoB in Central Kalimantan, as well as outside the HoB boundary, near Malinau, in East Kalimantan<sup>106</sup>.

While the historical impacts of large scale gold mining in Borneo appear to have been relatively limited, new exploration in Kalimantan, interest in Sarawak, and on-going illegal activity, coupled with current record gold prices, point towards an increasing threat for the HoB. The authorities will need to be mindful of potential negative impacts of gold mining from both existing small scale and new large scale operations. The second half of this chapter outlines a number of solutions to environmental and social impacts which are relevant for private operators.

## Diamonds

Mining for diamonds is carried out in Kalimantan and Sarawak, principally by small scale alluvial miners. Reports suggest that while some of these have permits, many are illegal. There is also a major diamond mine in South Kalimantan, owned by PT Galuh Cempaka. According to the company website, it is estimated to hold 2.6 million carats within a 44.3 million cubic meter gravel bank. The presence of diamond deposits in Borneo presents some risks for the HoB, but a present there do not appear to be significant plans to develop these at scale. Authorities may wish to focus on regulating small scale activity. For prospective producers a number of the solutions outlined in the second half of this chapter will also be highly relevant.

<sup>105</sup> Business Monitor International, Indonesia Mining report Q3 2010

<sup>106</sup> <http://www.kalimantan.com/i/pdf/KLG-Admission-Doc.pdf>

## Regulating Mining

Effective regulation and enforcement is a critical part of mining operations. Regulations help ensure operations are carried out in a manner which reduces the risk of undue negative impacts to third parties. In doing so, regulations help maximise the economic benefits of an operation without compromising or sacrificing the economic, environmental, and social needs of others.

Regulations in Borneo, and in particular in the HoB, need to guide companies to implement more environmentally and socially sustainable practices to avoid these potential adverse consequences.

To maximise compliance, regulations need to be clear and enforced. One of the challenges indicated by companies through consultations were issues related to unclear or conflicting regional regulations. Decentralisation in Indonesia has given regional government the responsibility to set and maintain regulations, but these efforts must still be coordinated.

For the regulators, the challenge is often greatest in monitoring the operations of small scale miners. These are less conspicuous than large scale mining and their operations are generally more numerous and isolated. Moreover, the Indonesian Mining Authority predicts that uncertainties in long term tenure introduced by the New Mining Law will proliferate small scale mining, as international actors are deterred. It is essential that regulators anticipate the required institutional developments to adequately regulate these actors.

Of particular concern are illegal mines. Illegal mines are those which operate without a licence, and often use inefficient and polluting techniques with little regard for health, safety, and the environment. Most illegal miners operate at a small scale, however there are some much larger scale operations which avoid enforcement. One illegal coal mining operation is reported to have 16 excavators and 200 trucks at their disposal. Accurate figures are difficult to gauge but illegal miners were thought to account for more than 5% of coal production in South Kalimantan<sup>107</sup> in the year 2000, and across Kalimantan and Sumatra illegal coal production is thought to be in the region of 20 million tonnes per year<sup>108</sup> today. These miners degrade concessions before commercial operations begin, resulting in lost private returns and considerable lost government revenue. National and regional governments can do more to control informal decision making and ensure that regulatory enforcement applies to all mining operations.

Tracking the origin of mining products is challenging, and stemming the illegal mining trade is hindered by high and diffuse domestic and international demand. The ease with which illegal miners can find a market for their goods despite the poor environmental and social practices under which they were produced means there is currently little incentive to improve operations. This makes it all the more important that governments work to reduce illegal mining and enforce regulations.

<sup>107</sup> Indonesia: Facing the Challenge, Australian Government, 2000

<sup>108</sup> Lucarelli, 2010, The history and future of Indonesia's coal industry: impact of politics and regulatory framework on industry structure and performance, Stanford Program on Energy and Sustainable Development.



# ENVIRONMENTAL AND SOCIAL CHALLENGES AND SOLUTIONS

Government ambition to increase coal mining in Borneo demands that ever more careful attention be paid to environmental and social concerns, especially given the presence of concessions and exploration inside the HoB.

Without clear government guidance and strong regulatory enforcement there is a significant risk that measures will be insufficient to maintain the value of the HoB forests and the quality of the environment to ensure the wellbeing of local communities.

Table 4.1 outlines some of the key potential environmental issues which can arise from poor management of mining activities.

Habitat loss	Open cast mining is land intensive necessitating the removal of large areas of terrestrial habitat and the loss of associated ecosystem value. There are also often secondary impacts which lead to habitat loss associated with both open cast and underground mining activities. These include direct habitat removal and habitat fragmentation for construction of access roads or rail infrastructure. Although not a direct removal of habitat, increased noise, vibration and dust associated with mining activities can create an adverse impact on habitats adjacent to the development site.
Land removal and soil degradation	Large volumes of soil and overburden are extracted and processed in mining operations, and these can generate contaminated tailings as by-products. This can result in soil degradation, erosion and contamination, and also generate 'geohazards' such as subsidence and landslides. This reduces land productivity and value, and can also lead to safety risks for local communities.
Degradation of watercourses	Mine effluent can adversely affect water quality by increasing sedimentation in local watercourses and introducing contaminants. Even low levels of mercury and cyanide (used in gold processing) are toxic to most forms of wildlife and humans. Tailings can form acids through oxidation which leach into the groundwater and enter watercourses. The disposal of untreated waste and process effluents in shallow marine environments can be especially problematic for coastal ecosystems and the fisheries they support.
Social conflict, health, and displacement	Mining operations (both legal and illegal) attract large influxes of workers and associated temporary settlements and informal economies. This can encourage the spread of communicable diseases (e.g. HIV-AIDS) and diseases which thrive in poor quality worker living quarters which can also spread to local communities. There is often high workforce turnover, caused in part by adverse health effects of mercury and cyanide where these are used. Mining activities can in some cases displace both indigenous and local communities, resulting in conflicts with mining companies over security and land rights.

TABLE 4.1: POTENTIAL ENVIRONMENTAL ISSUES DUE TO POOR MANAGEMENT OF MINING ACTIVITIES

As part of or alongside responses to regulatory drivers, there are a series of practical actions which mining companies can take in order to reduce any environmental and social impacts they may have. The following boxes respond to the issues above, taking note of challenges raised in consultations and propose a range of practical solutions.

### What's the issue?

#### High Conservation Value Forest

Forests are valuable for many reasons: regulating water flow, preventing floods and land slides, storing carbon and providing habitat for endangered species. Clearance of high conservation value forest (HCVF) results in reduced habitat and the loss of 80-90% of species.<sup>109</sup> Orang-utan habitat, for example, declined 39% between 1992 and 2002.<sup>110</sup> If areas valuable for conservation are not identified and mining activities avoided in and adjacent to HCVF the lost forest value might outweigh the benefits from mining.

### What did you tell us?

**Mining less land intensive** – “Mining operations have lower land requirements than palm oil or forestry and so is HCVF such an important issue for us?”

**Need for better and quicker services to identify and manage HCVF** – HCVF assessment can be a slow process in Borneo due to lack of assessors, and there is a need for better industry specific management guidance.

**Cooperation for conservation** – Wildlife corridors and conservation initiatives need to be planned at a landscape level requiring potentially complex multi-stakeholder cooperation.

**Restricting access** – “Illegal actors give the industry a bad name.” – HCVF are often in relatively remote areas; restricting access from small scale and illegal actors can cause conflict and be resource intensive.

### Solutions and guidance

Despite creating a smaller overall environmental footprint than other sectors in the HoB thus far, mining activities still need to avoid development which adversely impacts HCVF areas. The distribution and locality of HCVF needs to be considered prior to allocation of concessions and long before clearance and mining operations begin. In order to facilitate this, the private sector and regulators alike would benefit from spatial planning databases and tools which indicate the presence of HCVFs. In situations where some habitat fragmentation is unavoidable, wildlife corridors connecting fragmented forests should be established to connect wildlife populations. WWF recommends that new concessions are not awarded in primary forest or any area required to maintain or enhance HCVF.

See: [www.hcvnetwork.org](http://www.hcvnetwork.org) for the latest tools and guidelines for HCVF identification and management.

<sup>109</sup> WWF, 2005

<sup>110</sup> Husson S. et al: The Status Of The Orang-utan In Indonesia; Report to the Orang-utan Foundation, UK, 2003



**FIGURE 4.7: INDONESIAN SCIENTIST CONDUCTING SMALL MAMMAL SURVEY IN BHP BILLITON COAL LEASE AREA ASSISTED BY BHP ENVIRONMENTAL ASSISTANT**

## **CASE STUDY: BHP BILLITON'S INDOMET COAL BIODIVERSITY STRATEGY**

### **The issue**

BHP Billiton's IndoMet Coal Project (IMC), located within the Maruwai Basin in Central Kalimantan, is in the Pre-Feasibility Study Phase. IMC strives to benefit biodiversity conservation in Kalimantan both within the BHP Billiton areas of operation and by supporting broad-based conservation activities in the region. In order to better understand the challenges in the area before mining starts, IMC has commissioned more than 10 biodiversity surveys and a landscape-level high conservation value (HCV) assessment for the entire Maruwai Basin, enlisting the assistance of national and international scientists and NGOs. The first biodiversity assessments commenced in 1999 and start dates for construction and mining will be dependent on the outcome of the Selection and Definition phase studies, and having due regard for the development requirements contained in the Coal Contracts of Work (CCOWs) and Indonesian legal and Government approval requirements.

### **The response**

IMC formulated the 'IndoMet Coal Project Biodiversity Strategy', implemented through leading industry practice and biodiversity-oriented projects. The plan requires overarching biodiversity procedures and systems across all IMC areas of operation. For example, biodiversity plans and engineering procedures are developed for each individual mine and major infrastructure element, incorporating site specific biodiversity information assembled from surveys. Each plan includes technical design factors, habitat set-asides, special regeneration plans, species specific requirements, and closure requirements.

### **The result**

As BHP Billiton gains a better understanding of the environment around the IMC project it is able to respond with appropriate management strategies. For example, it ran a series of workshops with leading NGOs to build understanding of the pressures and sensitivities with local groups and regulators. BHP Billiton and Fauna and Flora International (FFI) have worked together since 2007, and in 2010 commenced a partnership to improve understanding of high conservation value areas within Murung Raya district with the goal of developing a conservation and sustainable development strategy for the district. In addition, BHP Billiton has supported the Borneo Orangutan Survival Foundation (BOSF) in its reintroduction of 149 rescued orangutans into the forests around the project area as well as other parts of Central Kalimantan.

## What's the issue?

## What did you tell us?

## Solutions and guidance

### Environmental Impact Assessments

Environmental Impact Assessment (EIA) (also known as AMDAL in Indonesia) is a legal requirement in all three territories in Borneo, and is a necessary pre-requisite prior to commencing mining operations. Despite this regulatory requirement, there are still a number of challenges to ensuring EIAs adequately assess and mitigate environmental impacts related to mining development in the HoB.

**The cost of conducting EIAs** – EIAs require additional expenditure before projects begin which can be a burden for small companies.

**Incentives need to be provided by the government** – “Companies can only be expected to follow the requirements laid out for them by regulators.” – Regulators need to provide clearer guidance, and enforce it more effectively to incentivise companies to produce detailed EIAs.

EIAs should identify the potential environmental and social issues relating to mining activities well in advance of the mining operations themselves and EIAs should be reviewed and approved by the local regulators before activities commence.

Mine developers (both small and large scale) can draw on global good practices for EIAs, including:

- **Informed site selection:** The EIA should be considered as a ‘site selection tool’ and should be initiated as early as practically possible in the exploration and pre-feasibility stage of mine planning.
- **Use of the ‘mitigation hierarchy’:** The EIA should follow the mitigation hierarchy (a concept which aims to reduce overall environmental impact) by initially preventing or avoiding adverse environmental impacts using appropriate site selection and examining alternative sites; then attempting to minimise or reduce impacts using mitigation measures, and then repairing or restoring adverse residual effects, potentially using biodiversity offsets.
- **Participative:** The EIA should provide early and appropriate opportunities to inform and involve the interested and affected stakeholders, and their inputs and concerns should be addressed explicitly in decision-making. This is especially important when considering indigenous peoples and other vulnerable minorities whose cultural traditions may be at risk.
- **Effective monitoring:** Monitoring (of both the operational and post-closure phase) is vital to ensure that the mitigation measures implemented are effective in avoiding significant environmental impacts. Mitigation measures (which may be documented in an Environmental or Biodiversity Action Plan) need to be re-visited regularly, and in different seasons to ensure effectiveness.

More information on conducting effective EIAs and obtaining timely approval can be found through the following agencies and government departments:

- International Association for Impact Assessment: [www.iaia.org](http://www.iaia.org)
- Malaysian EIA guidance: [www.doe.gov.my/old/?q=ms/content/environmental-impact-assessment-eia](http://www.doe.gov.my/old/?q=ms/content/environmental-impact-assessment-eia)
- Indonesia AMDAL guidance: <http://bapedalda-diy.go.id>
- Brunei has recently implemented EIA regulations, which must be approved by the Ministry of Development: [www.mod.gov.bn](http://www.mod.gov.bn)

### What's the issue?

### What did you tell us?

### Solutions and guidance

#### Mercury Use

Mercury is a metal that if inhaled or absorbed is highly toxic to both humans and wildlife. Mercury use in gold mining is banned in both Malaysia and Indonesia; however, its use continues amongst many small scale miners and illegal operations. In Central Kalimantan, over 50,000 kg is thought to be emitted into the environment annually in one location alone.<sup>111</sup>

**Alternatives needed** – “Mining provides an income, and mercury use increases yield, what is the alternative?”

A number of groups are helping small scale miners reduce the negative health impacts from mercury use, and potentially find alternative revenue streams including:

- A UN-led initiative, the Global Mercury Project, is working in Kalimantan to reduce the use of mercury and provide miners with mercury recycling technology: [www.globalmercuryproject.org/countries/indonesia/indonesia.htm#Indo\\_Newsletters](http://www.globalmercuryproject.org/countries/indonesia/indonesia.htm#Indo_Newsletters)
- Yayasan Tambuhak Sinta is currently working with government, NGO's and donor agencies in 50 villages in the district of Gunung Mas. The project helps villages to develop and implement 'economic livelihood groups': [http://project-activities.susiladharma.org/location\\_asia\\_oceania/yaysan\\_tambuhak\\_sinta.shtml](http://project-activities.susiladharma.org/location_asia_oceania/yaysan_tambuhak_sinta.shtml)

#### INTERNATIONAL CASE STUDY - ORO VERDE: COLOMBIAN SMALL SCALE MINING CERTIFICATION SCHEME

In response to the negative impacts of uncontrolled mining activities on the environment and communities in the Chocó Bioregion of Colombia, the Oro Verde, or Green Gold initiative has successfully developed and promoted sustainable small scale mining techniques to reverse the trend. Under the scheme mercury and cyanide use are prohibited, instead relying on filtration and panning techniques to separate gold and platinum from other sediments. In addition, careful planning and timing of sediment extraction and washing is promoted to avoid erosion and watershed degradation.

The initiative covers more than 140,000 ha, where both communities and the environment benefit from the activities. Miners must comply with environmental and social criteria to join the scheme, and in return they receive a guaranteed price for their production. The sustainable production allows the gold to receive a premium on the market, and the profits are passed on to the producers and communities:

- 10% goes to certified miners as a direct economic incentive for environmental services.
- 30% allows the commercial wing of the programme to be sustainable.
- 60% is reinvested in the region in development projects.

<sup>111</sup> Kabar Itah, August 2010

## What's the issue?

### Mine Rehabilitation

Mining activities only require the temporary use of land and once the valuable resources have been extracted it is vital that the area is adequately restored to its previous state. Mine rehabilitation plans are a regulatory requirement and should be drawn-up before mining activities begin, and approved for each mine as part of the EIA. The costs of rehabilitation should thus be factored into the mines operating costs from the beginning.

Plans for the reclamation and rehabilitation of mines will include provisions for pre-mining assessments, storage of sediment and top soils during mining activities, and a strategy to return removed soil, with minimal disturbance, and replant the area to encourage natural regeneration. In addition, rehabilitation efforts should be monitored to track progress and ensure there are no adverse effects such as land contamination.

## What did you tell us?

**Technical capacity** - "Many small scale miners do not have the technical capacity or available resources to put into mine rehabilitation."

**Tenure** - "Uncertain tenure reduces the incentive to put a lot of work into mine rehabilitation before operations begin."

## Solutions and guidance

Good practice guidance can be found through the references in Environmental Impact Assessments solution box above.

The case study below provides an example of good practice for pre-operations assessment and planning for future site rehabilitation.

### CASE STUDY - PT INDO TAMBANGRAYA MEGAH TBK MINE REHABILITATION PLANNING

#### The Issue

PT Indo Tambangraya Megah Tbk (ITM) strives to protect the natural habitat and biodiversity in its concession areas. Recognising the value and sensitivity of the HoB, ITM is carrying out detailed site assessments in their Bharinto Ekatama coal mining concession. Mining operations necessitate the removal of some of the forest habitat, but the long term impacts of this can be minimised through careful and thorough pre-project assessment and post-project site rehabilitation.

#### The Response

As part of their pre-project assessment at their Bharinto concession, ITM is collaborating with Purwodadi Botanical Gardens to conduct a field study examining the biodiversity in the area, producing an inventory of the flora and fauna and measuring the carbon stock. Particular attention is paid to the variety of wild orchids, as these are sensitive to environmental change, and can be used as an indicator of the environmental health of an area. Local communities are interviewed to assess their different requirements and uses of local plants. Using this information a sample of plants are being collected and transferred to a temporary location for cultivation. After mining operations are complete and during the rehabilitation of the area the removed top soil will be back-filled and this stock of plants will be used to replant the site, helping to restore it to its previous natural state. Continuous monitoring will be employed, together with genetic analysis of the diversity of flora in the rehabilitated site.

#### The Result

ITM plans to use its detailed information about the site together with the samples collected to minimise the impacts of its operations and maximise the speed at which the area is restored to its natural state once operations are complete. Through engagement with the local communities ITM aims to ensure that it takes into consideration their needs and requirements. In addition it helps educate communities as to the importance of environmental protection and sustainable use.



FIGURE 4.8 BORNEO IS HOME TO NUMEROUS RARE ORCHID SPECIES



## What's the issue?

### Responsible Finance

Mining companies, particularly those funded by large multi-national commercial banks, are required by their financiers to demonstrate appropriate management of environmental and social impacts. For project finance funded mining developments, these environmental and social commitments are often established under the Equator Principles.

In the HoB specifically (but also common the world over) and there are several challenges with the current approach:

- Mine development and expansion may be funded using corporate loan facilities as opposed to project finance which means the use of proceeds are not always known by a bank. Banks face difficulties applying the Equator Principles to these types of facilities and thus face challenges ensuring responsible mine development.
- Mine development or expansion may be supported by local or national Indonesian or Malaysian banks which are either not Equator Principles signatories, or have limited environmental and social risk management functions.
- Even where mine expansion or development is supported by banks with leading environmental and social management functions and risk screening procedures, banks are challenged by how to practically, and pragmatically, implement these commitments, and in particular identify areas of high biodiversity value (e.g. High Conservation Value Forests) in their client's projects or portfolios.

## What did you tell us?

**Investment criteria** – “Sustainability performance can affect our ability to attract investment or get project finance.” – Larger producers seeking investment find responsible lending criteria to be an important incentive to act.

**Need greater buy-in from stakeholders** – Smaller business investors are often less concerned about sustainability, and contractors need to be brought on board.

## Solutions and guidance

**Encouraging local banks to adopt the Equator Principles:** More banks in the region are being encouraged to become Equator Principles signatories. Although voluntary, they are the de facto standard across the financial sector for determining, assessing and managing social and environmental risk in project finance. The Equator Principles are supported by the International Finance Corporation's (IFC) Performance Standards (PS) which provide detailed guidance to banks and their clients to manage environmental and social impacts. For example PS1 (Social and Environmental Assessment and Management Systems), PS3 (Pollution Prevention and Abatement) and PS 6 (Biodiversity Conservation and Sustainable Natural Resource Management) are likely to be highly relevant to mining companies in the HoB. Supplementary to the Performance Standards the IFC have developed a specific Mining Industry Guideline which banks should encourage their clients to adhere to: [www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/gui\\_EHSGuidelines2007\\_Mining/\\$FILE/Final+-+Mining.pdf](http://www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_Mining/$FILE/Final+-+Mining.pdf)

**Spatial biodiversity risk tools:** WWF can help support financiers in identifying and avoiding areas of high biodiversity value. WWF is currently in discussions with key financiers to develop spatial mapping tools which identify for example, High Conservation Value Forests and protected areas. See our website for details of our progress.

## What's the issue?

### New Financial Incentives

Forests and rivers provide society with valuable ecosystem services; however, private companies do not always take these values into account when making decisions to protect the environment during mining operations. New financial incentives are being implemented to encourage greater consideration of public forest values by private actors.

A range of new financial incentives are available to mining companies to support them in a transition to more sustainable production. These include payments for ecosystem services, payments for reduced carbon emissions through the Clean Development Mechanism (CDM) and Reduced Emissions from Deforestation and forest Degradation (REDD+). Many of these are under development, but there is considerable momentum within the field and good prospects of growth.

For example, the carbon markets currently provide payments for reduced carbon emissions by generating carbon credits under the CDM which can subsequently be sold in the carbon markets. Under the CDM coal mining companies can receive payments for projects which reduce emissions of coal bed methane for example. There are currently no active programmes of this type in Borneo, however, a number of coal producers in China and India are profiting through these types of project.

In addition, mining companies may be able to receive REDD+ payments for minimising forest damage and forest restoration activities if they can demonstrate (in accordance with methodologies that are being developed) that they are helping to reduce emissions which are additional to their regulatory requirements.

## What did you tell us?

**Sustainability costs** – “Changing management practices and incorporating sustainability factors is expensive.”

**Regulatory incentives** – More than 80% of interviewees thought sustainability needs to be driven and enforced through government regulations.

**Financial incentives** – NGOs and governments need to help producers learn about the new financial incentives available and how to take advantage of them.

## Solutions and guidance

While the basic guidelines for sustainable practices need to be set through regulators, mining companies can also be financially rewarded for particular activities through national and international incentive systems. These incentives can represent a significant increase in revenue, such that operating the mine in a more sustainable way increases mine profits.

For example, the Fuxin Coal Mine in China set up a CDM project and will receive credits for capturing coal bed methane, a strong greenhouse gas, which was previously vented to the atmosphere. The project is expected to avoid over 600,000 tCO<sub>2</sub>e emissions annually<sup>112</sup>, worth USD 9.6 million in carbon credits<sup>113</sup>. Not only will the company benefit financially from the sale of carbon credits; the captured methane will also be used to generate electricity, reducing their operational costs.

<sup>112</sup> <http://cdm.unfccc.int/Projects/DB/DNV-CUK1214932135.8/view>

<sup>113</sup> 26/11/2010: CER price Euro 12.26 (Bluenext.eu) = circa USD 16 \* 600,000 CERs = USD 9.6 million (un-discounted)



## Business case for responsible mining in Borneo

To realise the governments' vision for the HoB it is essential that the principles of environmental sustainability are embraced by the mining sector in Borneo. The economic case for reducing land degradation and improving environmental practices is increasingly recognised at national and international levels based on the valuable services which a healthy environment delivers to society.

The issue is more complex for individual companies. A range of challenges, often linked to a lack of regulatory enforcement, and technical capacity have been identified by mining companies and these are addressed in the preceding sections. Notwithstanding these challenges, the business benefits of improving environmental practices are increasingly recognised by mining companies in Borneo.

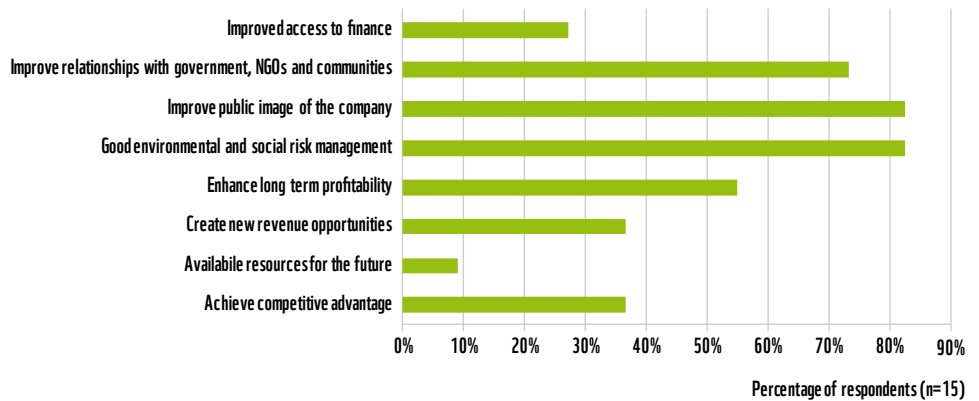


FIGURE 4.9: BENEFITS OF GOOD ENVIRONMENTAL AND SOCIAL PRACTICES AS REPORTED BY MINING COMPANIES IN BORNEO

Figure 4.9 is based on interviews and surveys with 15 respondents from mining companies operating in Borneo. 82% of this group identified good environmental and social risk management as a benefit of sustainability activities and the same proportion thought their company would benefit from an improved public image. Almost three quarters (73%) of respondents felt that sustainability activities improved their relationships with governments, NGOs and community groups and perhaps related to this, 64% saw reduced risk of being targeted by negative media campaigns. More than half (55%) of mining companies felt that sustainability activities would enhance their long term profitability.

Furthermore, as indicated in the solution boxes on previous pages; from heightened enforcement of existing regulation and new financing requirements from lenders; to strong competitor responses on biodiversity management; many factors are coming together to strengthen the business case for responsible mining in Borneo.