MMSD
Mining, Minerals and Sustainable Development

September 2001 No. 55

Management and Distribution of Mineral Revenue in PNG:

Facts and Findings from the Sysmin Preparatory Study A Consultant's Perspective

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Mining, Minerals and Sustainable Development is a project of the International Institute for Environment and Development (IIED). The project was made possible by the support of the World Business Council for Sustainable Development (WBCSD). IIED is a company limited by guarantee and incorporated in England. Reg. No. 2188452. VAT Reg. No. GB 440 4948 50. Registered Charity No. 800066

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1 Introduction

The purpose of this paper is, on the basis of the example of the Papua New Guinean mineral resources industry, to highlight some of the sustainability issues related to mining in a developing country and the respective roles of mining companies, governments and development aid agencies in this context.

Mining is frequently perceived by national policy makers, development specialists and the general public, as a polluting, low-technology activity, a source of "Dutch disease", and therefore not to be considered as a priority sector where to focus action, although mineral resources are a key asset for many developing countries. Minerals, and derived products, are in great and increasing demand by modern economies. They increasingly come from developing countries, where they are an important, non renewable, asset for social and economic development, much in the way they have been (and in some cases still are) a basis for the development of now rich countries, like many EU member states, the US, Canada or Australia. Mineral commodities were, and will remain for the foreseeable future, at the very basis of numerous added-value activities.

2 Caveat and Acknowledgements

The opinions reflected herein have been neither approved or disapproved by either the Papua New Guinea (PNG) authorities or the European Commission. They only reflect the author's views. Nothing in this paper can be interpreted as committing either the PNG Government or the European Commission to any course of action.

BRGM, the French Geological Survey, is grateful to the National Authorising Officer of the European Development Fund and to the Secretary of the Department of Mining of Papua New Guinea, as well as to the Head of the European Commission Delegation in Port Moresby who granted their permission for the use in this paper of some data from the recently completed Sysmin preparatory study[i].

3 The Context of the Study

Minerals are a key-asset of PNG's economy, representing 72% of its 1999 exports (i.e. 767 M€ out of 1174 M€ total exports), near to 18% of its GDP, and 15% of the Government revenue. In 1997, two unforeseeable events: the "El Niño" drought, leading to the disruption of the production at the OK Tedi and Porgera mines, and the depressed metals prices induced by the Asian crisis, caused an important loss of revenue for the mining companies and for the State. On December 30, 1997, PNG applied for support under the 8th European Development Fund (EDF) SYSMIN facility. This fund was established to support the development of the 71 African, Caribbean and Pacific region countries signatories, with the 15 member states of the European Union, of the 4th Lomé Convention, as revised in Mauritius on November 4th 1995.

Under the 8th EDF, Sysmin is a 575 M€ special financing facility, providing grants and loans to support major mineral exporting countries and, where justified, to safeguard their mining

sector by remedial or preventive actions. The facility is governed by Articles 214-219 of the stated Lomé Convention.

BRGM was contracted by the Department of Mining of PNG to assess the eligibility of PNG for Sysmin support, and to define a 50 M€ programme, consisting of various projects aiming at strengthening the country's institutional capacity to effectively promote and regulate the further development of its outstanding mineral potential. The study includes an in-depth diagnosis of PNG's mineral resources sector and of the sectoral institutions, and an economic assessment of the future programme. The decision to go ahead with the programme will be taken by the European Commission, in compliance with the European Development Fund procedures.

This programme, if approved, will be complementary to the ongoing Mining Sector Institutional Strengthening Technical Assistance Project, supported by the World Bank. Together, they will form a unique set of actions, addressing a large series of complex issues such as the mining code, taxation, land tenure, acquisition and processing of geoscientific data, environmental protection, capacity building and training, strengthening of the physical infrastructure of the sectoral institutions.

4 A Short Overview of the PNG Mining Sector

Mining has been important to the PNG economy long before independence in 1975. The gold rushes in the late 1920s and early 1930s in the Wau & Bulolo areas produced very significant amounts of alluvial gold. Annually, some 5 to 10 tonnes of gold were produced by hand panning and by dredges in the Bulolo Valley. During the second World War and the following slump in gold prices, most of these activities stopped and there were no new developments until the 60s when the present modern phase of the mining industry started. Since the start-up of the Panguna mine in Bougainville in 1972 mining has grown again to become a backbone of the country's economy.

The mining sector in Papua New Guinea revolves around a small number of large to very large mines, as well as around a very dynamic small scale mining (SSM) sector with specific features, described below.

In late 2000, there were 3 operating large-scale mines: Ok Tedi, Porgera and Lihir and a medium scale one (Misima) which is reaching the end of its productive life. In addition to these, Tolukuma is a much smaller mining operation, located nearby Port Moresby. The value of mineral production is shown in Table 1.

In 1999, Papua New Guinea was the world's 14th copper producer and 10th gold producer, and an important source of primary copper for the European Union industry.

Papua New Guinea is still considered to be under-explored and highly prospective for the discovery of new mineral deposits. The almost continuous decline in mineral exploration investments recorded since 1988 (fig. 1) is a cause of concern for the future of the mineral sector and of the economy, since it would mean a serious loss of budgetary income. On the other hand, the country is home to a significant number of deposits discovered but not yet

developed. These include both large and small-scale deposits, which are, however, at best marginal under present economic circumstances but which can become exploitable if the economic, legal and other conditions for investment into mining are improving. It is the very aim of the ongoing programme supported by the World Bank, and of the expected future Sysmin programme, to improve these conditions and to increase PNG's attractiveness for mineral resources investors, while assisting PNG in its efforts to manage its unique social and environmental assets.

Mineral resources development in PNG faces a unique combination of challenging conditions. The country is underlain by geological terrains frequently bearing a high mineral resources potential, essentially for copper, gold, nickel, cobalt and platinum group elements. It is one of the world's countries with the highest potentials for these commodities, of great importance to modern economies.

However, exploration and mining in PNG are no easy jobs due to the very rugged topography of many of PNG's key mineralised places, with elevations up to 4,694 m., and extreme natural conditions including up to 12.5 m./year of rainfall in some places, like in OK Tedi, frequent landslides and earthquakes. These are the causes for widespread poor soil stability and the resulting impossibility to find sufficiently stable and large places to properly store the mine tailings and waste, one of the problems faced by the local mining industry.

The country being covered by extensive rain forests is host to a very rich biodiversity, with countless endemic species, many of them yet to be discovered. It is also the home of a unique mosaic of cultures, with over 800 spoken languages. The high technology, efficiency based, industrial culture at the heart of large-scale mining is in extreme contrast with traditional cultures, of which quite a few still ignore the use of metals and/or of writing. Nevertheless, Papua New Guineans are quite familiar with small-scale mining, since the early gold rushes. Nowadays, 8% of the total population is directly concerned by the small-scale mining activities.

As a young country, independent since 1975, where the very concept of nation-state may still foreign to a significant part of the population, it faces the complex issues of development with very limited resources.

5 PNG's Mining Sector and Sustainability Issues

5.1 The Economic Importance Of The Mining Sector In PNG

The mining/minerals sector is a major contributor to both the GDP and to the export balance of the country. In 2000, mining & quarrying represented 17% of GDP and was second only to "agriculture, forestry and fisheries " (25%) in PNG's GDP, minerals represented 50% of total exports, with a predominance of gold (70% of exports) and copper, with some silver being co-mined. When considering their contribution to the foreign exchange balance of PNG, it should be borne in mind that figures based on exports of metals overstate the foreign exchange contribution of the minerals sector since this sector

has relatively high outflows of foreign exchange due to imports of equipment, works and services and repatriation of profits.

There are many financial flows between any thriving mineral industry and the various local stakeholders concerned by mining such as central government, provincial governments, local employees working for the mine, local communities, local suppliers working for the mining companies and their employees. Disentangling these flows and measuring them is no easy task.

Table 1 below, based on Department of Mining and IMF statistics[ii] shows that between 1995 and 1999, the mining sector generated between 16-25% of the Central Governments endogenous revenue (i.e. not linked to foreign grants), representing from 14 to 49% of the given year's total mineral production value. For the years from 1995 through 1997, the Central Government revenue generated by mining exceeded the health and education budgets.

5.2 Facts And Findings From The Porgera Mine

The revenue figures shown in the table grossly underestimate the total wealth generated by the mining sector for the benefit of a wide range of Papua New Guinean stakeholders. Figure 1, based on data provided by the Porgera Joint Venture to the Department of Mining, gives a better view of the generation of wealth in favour of PNG. On this basis, in 1999, the various PNG stakeholders appear to have received 191 MPGK, i.e. 37% of the value of the extracted minerals. The central government received about 42% of the total, the rest having gone to the Enga Province Government(where the Porgera mine is located), to the PNG employees, to local communities, to landowners and to local businesses. The major share of the salaries paid out to nationals (85% of the total workforce) is going to employees from the mining area (55% of the national employees). The major part of the monies spent in favour of the local communities were invested in infrastructure development and maintenance, under a tax credit scheme. This has a stronger positive impact on sustainability of the mining area after mine closure than direct payments to local communities.

A full calculation of the multiplier effects generated in other sectors of the economy as a consequence of mining would be very useful to assess the impacts of mining.

Positive Social Impacts:

The advent of industrial large-scale mining has resulted in many positive social impacts on the local population:

- Health, education and recreational facilities have been developed. At OK Tedi life expectancy in mining areas has increased by 20 years, from 30 to 50 years, and infant mortality decreased from 27% to 2%.

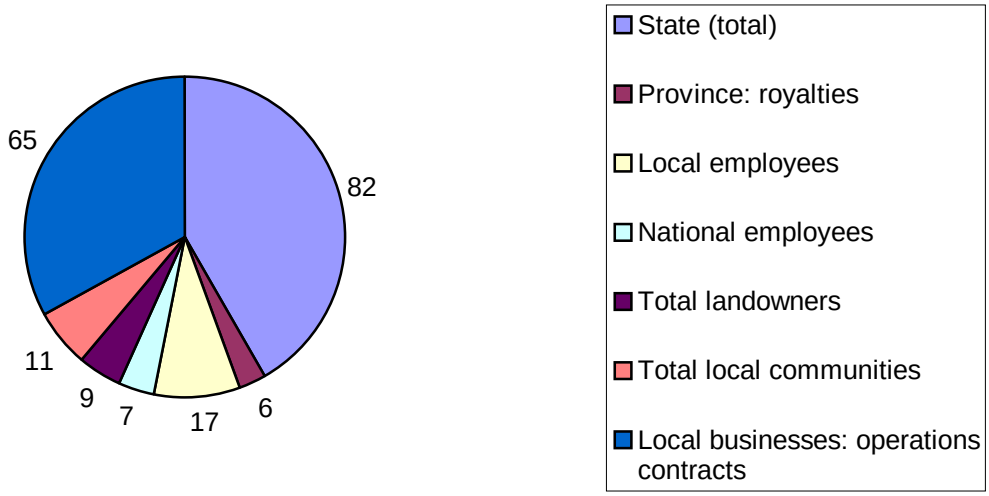
- PNG nationals have been trained and acquired a wide range of skills employable in other sectors of the economy

- Trades and skills training enable local men to work at PJV or seek employment elsewhere.
- The PJV has an active Community Relations Department.
- The Porgera Women's Association has been encouraged and supported. This now comprises over 100 local groups, willing to act communally and collectively across clan/tribal boundaries. Women play a key role in the stability of the society.
- A variety of small contracts have been awarded locally.
- A new town, Paiam, is under construction, with the purpose to be sustainable after the mine itself closes and the company leaves.
- Compensation has been paid to traditional landowners.

	1995	1996	1997	1998	1999
Value of mineral production (in M$)	861	811	645	845	939
Value of mineral production (in M PGK)	1 103	1 067	922	1 704	2 407
Total Central Gov. Revenue in MPGK	1722	1898	2202	2411	2485
Foreign grants in MPK	237	170	312	450	461
% of grants in revenue	14%	9%	14%	19%	19%
Endogenous revenue in MPGK	1485	1728	1890	1961	2024
Mining revenue (taxes, levies, duties, royalties, dividends) in M PGK	282	424	451	306	332
Share of mining revenue in total endogenous revenue	19%	25%	24%	16%	16%
Education (in M PGK)	89.0	62.4	121.4	378.2	422.4
Health (in M PGK)	53.5	90.3	125.4	160.3	171.2
Mining revenue as % of mineral production value	26%	40%	49%	18%	14%
US $/ Kina exchange rate	0,78	0,76	0,7	0,49	0,39

Table 1 – PNG Mining sector and government revenue statistics – Sources: Department of Mining; IMF staff Country Report n° 00/137; Daniel et al. (2000)[iii]

Fig. 1 - PORGERA - Main contributions to the PNG economy in M PGK (1999)
Total: 191 M PGK (~37% of the production value) - Source: Department of Mining



Negative Impacts:

The local tribe, Ipilli, has a violent culture. This was the case before the mine opened and continues to be the dominant cultural norm. Thus, other socially disruptive factors occur within this broader context of violent behaviour. Increased population and the development of a cash economy have served as exacerbating factors. Negative impacts fall broadly under two headings:

Reduced commitment to food production:

- The influx of outsiders and the creation of squatter settlements means large numbers of people have no access to gardens.
- This, together with the loss of traditional gardening skills, has increased reliance on bought food.
- Reduced nutritional values to diet.
- There has been little or no development in the agricultural sector at Porgera. The Extension Office of the Agriculture Dept. is under-funded and understaffed. This is significant in terms of developing a sustainable long-term economy.

Breakdown in social order:

- Civil disturbances are common, especially on PJV paydays when an unknown number of outsiders drift in lay claim to money and join in fights.
- The present system of Compensation and Royalty payment generates both unreasonable demands, and also arguments over distribution.

- Alcohol abuse. Porgera and Enga are officially 'dry'. Nonetheless, alcohol abuse is common with accompanying disruptive effects on family life. It is felt that Police does not rigorously enforce the alcohol ban.
- Domestic violence. On average there are at least two deaths per year.
- Rape. Most is unreported and statistics are unreliable, but incidence seems high. 1996 saw 8 rapes officially reported.
- Changes in marriage practice. Traditionally polygyny was the means whereby increased garden output and pig production could be achieved. The numbers of pigs owned helped determine a warrior's status. Now, cash wages from mine work enable purchase of new wives with no concomitant gardening but with subsequent violence and neglect of the first wife and children.
- Promiscuity, sexually transmitted diseases and HIV/Aids are prevalent.
- The presence of clubs and discos in Porgera station have increased such social negative activities as gambling, marijuana use, black market sales, and prostitution.

It is widely acknowledged that it is the women of the community who are holding Porgeran society together. The influence of the Porgera Women's Association helps ameliorate these negative impacts and harness the more positive impacts of modern society for the general good.

Environmental Impacts:

The main environmental issues for the Porgera mine are: downstream water quality related to the release of the tailings and solid waste into the river system, stability of the waste rock dumps and acid rock drainage.

Given the mountainous terrain, climatic conditions and local seismicity, constructing a tailings impoundment and containing waste near the site of the mine is a technically very risky, with a very high risk of failure of the tailing disposal. The Porgera Joint Venture therefore elected for riverine disposal as the most appropriate method for disposing of the tailings and waste rock. The process plant tailings are released into the river system after treatment. The environmental impact of riverine disposal is not, by far, like as severe as in the case of Ok Tedi, due to the higher absorptive capacity of the downstream river system. However, the waste from Porgera contains higher heavy metal concentrations, other than copper.

The main threats to water quality come from the presence of heavy metals in the tailings, including arsenic, mercury, cadmium, copper and zinc and the presence sulphides, which have the potential to cause acid rock drainage. Sampling work carried out by an independent consultant in 1995 (MPI, 1995) show a disquieting picture of water quality in the river system, e.g.: 32 times Australian limits for lead, 10 times the limits for zinc and nine times the limits for mercury at Wanikipe, 80 km downstream of the discharge point.

5.3 Comparison Of Mining And Of Other Economic Sectors.

It is tempting to compare the impacts of mining activities with those of other economic activities of a comparable magnitude.

Palm oil is, after timber, PNG's most important agricultural export product, at least in volume. In 2000, PNG exported 251 000 tons of palm oil[iv], worth 245 M PGK, or 81,9 M€[1]. Taking an average yield of 6 tons of palm oil/year per planted hectare, approx. 40,000 hectares of land are need for such a production. One hectare generated, in average 2 023 €/year of palm oil, at 2000 prices. Hence, to to generate the same value as the year 2000's mineral production, i.e. over 1.1 billion €, it would have been necessary to clear over 5.600 km^2 of rainforest (more than 1% of PNG's landmass) and to plant palm oil trees, with a corresponding impact on biodiversity. Their large-scale cultivation involves the use of weed and pest control chemicals, as well as the use of fertilisers to maintain soil fertility. The phosphoric content of the fertiliser is likely to progressively contaminate the soils with highly toxic cadmium, since most phosphates used to produce fertilisers are from deposits with rather high cadmium contents[v].

This brief and sketchy example, solely focused on environmental criteria, underlines the need to elaborate indicators entailing the factual measurement of economic, social and environmental impacts of various economic sectors, in order to assess their real costs and benefits within the perspective of sustainable development. Much effort remains needed to establish these indicators, to collect and organise the required data and to prepare cost/ benefit analysis taking into account all the dimensions of sustainable development. This is a domain where the mining industry could help in making data available, and in supporting the work required to establish the indicators and the research work required to prepare the cost/benefit analysis. Such analysis are required to enlighten policies and help in public decision making.

5.4 The Small-Scale Mining Sector

In PNG, the small-scale sector is regulated by the 1992 Mining Act, which distinguishes between large and small-scale mining operations. The former are OK Tedi (copper, gold), Porgera (gold), Lihir (gold) and Misima (gold).

While 4,000 persons are employed in large-scale mines, about 60,000 persons are estimated to be engaged in widespread, largely informal, but legal, small-scale gold mining. Of these some 20% are women and 30% school-age children under 16 years old. In addition to those directly involved, there are many more who depend indirectly on the sector, to whom they supply goods and services. A usual calculation is for 7 people dependent in some way upon the sector for every directly involved miner. For PNG this means a further 420 000 people depend in some way upon small-scale mining. As in other countries where small-scale mining occurs, the number of people involved is difficult to quantify because of seasonal, geographical and other sorts of fluctuations. About 8% of PNG's population is estimated to be concerned by the activity.

[1] At the average €/ PGK interbank exchange rate of 1 € = 2,991 PGK, published on www.oanda.com

The micro-scale miners, comprising about 90% of the sector use pans, shovels, rudimentary sluices & shaking boxes and sometimes, small water pumps. Mining practice and gold recovery are both inefficient. Use of highly toxic mercury for gold recovery is widespread, with important environmental health and environmental damages as a result. Some 4 t. of mercury are purchased annually by the alluvial miners of PNG. Small-scale alluvial mining in rivers, creeks and banks cause significant environmental degradation. In places of intensive mining activity, such as Mt.Kare, the landscape can be completely transformed into a degraded area of pits and waste heaps.

Due to the importance of these activities, the negative impacts of micro-scale mining are likely to be significantly higher than the impacts of large-scale industrial mining, although the subject remains only partially documented.

Despite the dangers mentioned before, it would be wholly unrealistic to expect small miners to stop using mercury. Attempts to limit mercury use have been tries unsuccessfully elsewhere. Education for safe mercury use is the only viable option. For example, simple retorts can be used in which the amalgam is heated and mercury retrieved through condensation.

Simple mechanised mines account for some 9% of the sector. They use portable equipment such as pontoon dredges, hydraulic sluice pumps and riffled sluices. Gold recovery is more efficient but there are problems with pumping & overburden stripping.

Medium-sized mechanised registered mining companies have earthmoving and high capacity ore processing equipment. Gold recovery is reasonably good and the mercury used for amalgamation is fully contained in specialised equipment. They represent 1% of the sector.

The main alluvial mining areas are Wau/Bulolo in Morobe Province, the Highlands, especially around Mt. Kare & Porgera in Enga province and Maprik in East Sepik. However, alluvial and placer gold is found almost everywhere in Papua New Guinea.

The total output of the sector is difficult to quantify. MRO (Metals Refining Operations Ltd), the only legal end-buyer of gold, estimates that only about 40% of the alluvial gold is sold to them for refining & export. The remaining 60% is sold and exported illegally. In this case, the 1.9 t. of legally refined gold from the SSM points towards a total yearly output of some 4-5 t. For the SSM miners, the average earnings are estimated at 250 Kina/month. With at least 60 000 people directly involved, the sector generates some 180 MPGK – nearly 3% of PNG's 1997 GDP. This wealth is not accounted for in the statistics shown in Table 1.

Under the mining Act, small-scale miners working their customary land do not require a Mining Lease; all others do, whatever the size of their operation. This raises difficulties in monitoring leaseholders and enforcing legal requirements. A revised mining Act is in preparation, which may remove smaller operations from leasing requirements.

Different actions are undertaken by the Government, with the support of development aid agencies, to improve the sustainability of the micro small-scale activities, since such

activities, if pursued in a more sustainable mode, are an important way to fight poverty, as recently outlined by the World Bank in its Poverty Reduction Strategy Sourcebook[vi]

At the Wau Branch Office of the Mining Division a highly successful project is operating with the help of a technical advisor funded by AusAid. Two Mining Engineers and a Mining Extension Officer have been trained and educational materials prepared in the local Tok Pisin (PNG Pidgin) language, dealing with better mining practices and safe mercury use. Contacts have been made with 8-10000 small-scale miners trough meetings and outreach tours in the Wau/Bulolo area, the Islands and Highlands. The project has received private sector backing from MRO and Morobe Consolidated Goldfields Ltd., which is in process of opening a medium-size mine at Hidden Valley, near Wau.

MRO plans to open a gold assaying and purchasing office at Wewak in East Sepik. Other offices for the island regions are under consideration. The Asian Development Bank is planning to set up a "Micro-Bank" project based in Wau, which will provide loans to small miners for mining equipment purchases. The future Sysmin programme includes a large project to address the micro-scale mining sector's issues.

6 Conclusions: Addressing the Challenges Ahead

6.1 A Dark Future?

If nothing is done in the next few years, the future of large-scale mining in PNG is bleak, with severe economic and social consequences for the country. The Porgera and Misima mines are expected to close in about 2005, and OK Tedi will close in 2011 (if not earlier). Figure 2 below shows the forecasted value of mineral production, up to 2011, on the basis of the average metals prices prevailing during the year 2000.

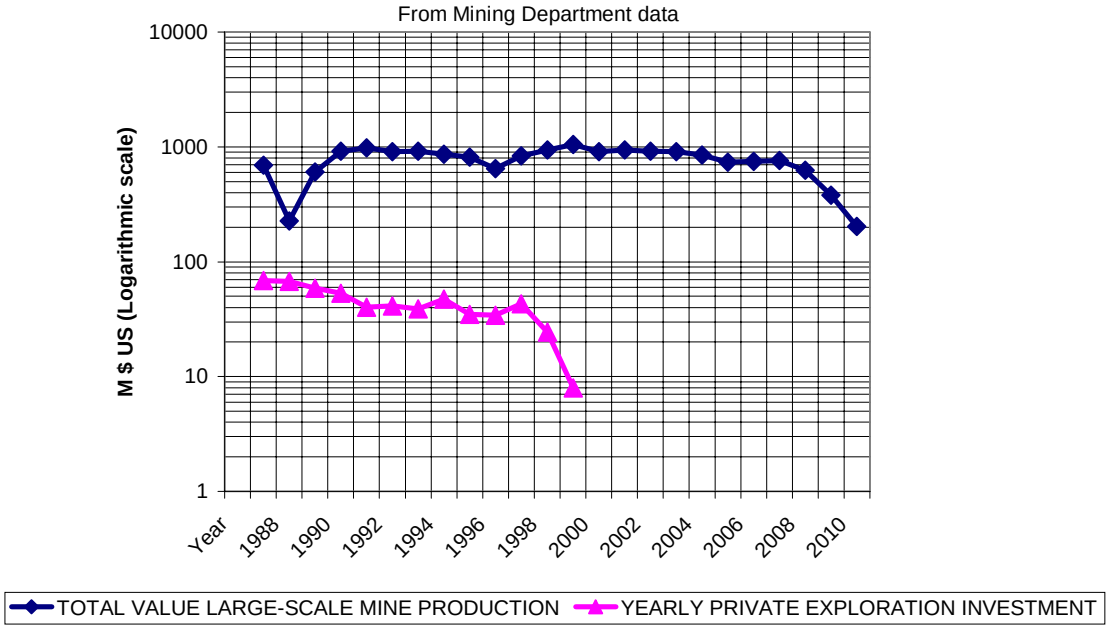
If no new mine production compensate for these closures, the mineral production value will have decreased by 80% in 2011, with a very sharp drop in revenue for all PNG stakeholders. This dreadful scenario is further supported by the continuing decrease of investment in mineral exploration, observed since 1988 (lower curve on fig. 2), with a near collapse of exploration activities since 1998. Exploration investment is the first stage towards a thriving mining industry. No exploration means no new orebodies will be found and mined.

The present situation is a result of the intrinsic difficulty to explore for minerals and mine in PNG. It also reflects the present weaknesses of the government's mineral sector policy and of the sectoral institutions in charge of regulating and promoting all the components of the local mineral resources industry. It is noteworthy that PNG did not fully benefit from the exploration recorded between 1991 and 1997 (fig. 3), and suffers more than other regions from the bust recorded since triggered by weak prices for most metals, especially gold and copper, a consequence of the Asian crisis and, more recently, of the downturn of the US economy, and the resulting sluggish growth in Europe. There is also distrust from private investors for investment in the shares of junior mining companies exploration ventures, generated by the 1997 Bre-X scam. Finally, gold prices are depressed by the recurring sales of gold stocks from the Central Banks.

6.2 *The Way Ahead: Addressing The Issues*

Reversing the trends reported here, and highlighted in fig. 2, requires to rapidly enhance the attractiveness of PNG as a prospective destination for investors in mineral exploration as well as in actual mining, while addressing very complex environmental and social issues. This is no minor challenge, as it requires much continued Government attention and resources, which are already scarce and threatened by the foreseen decline of the mineral production. The present trend means no good for society and environment, since poverty driven activities are much more disruptive for society and environment than well-managed modern industry.

Fig. 1 - PNG - VALUE OF COPPER AND GOLD PRODUCTION AT 2000 METALS PRICES VERSUS EXPLORATION INVESTMENTS



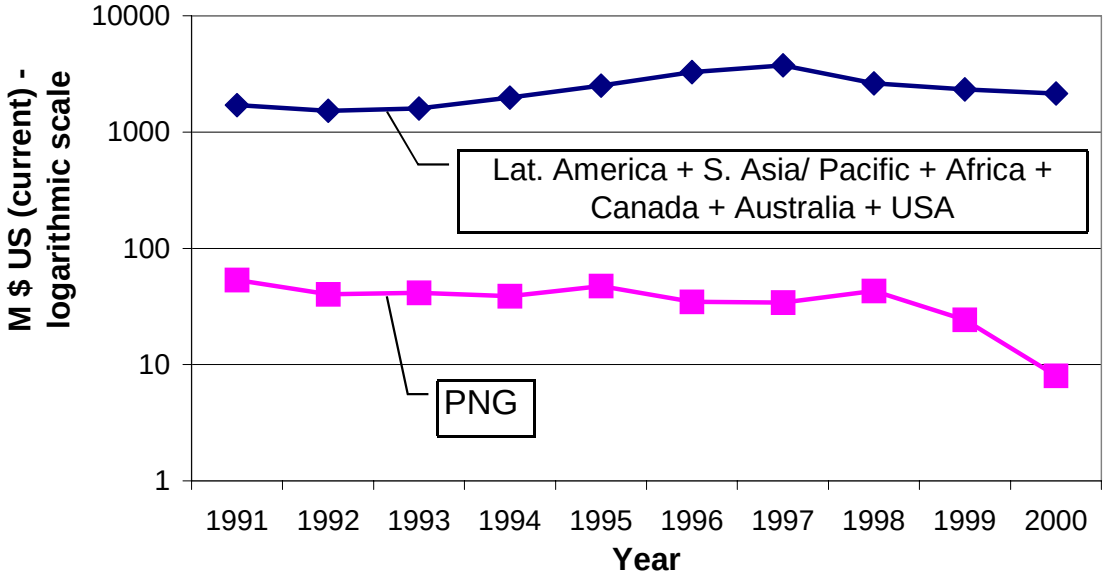
Governments, through appropriate policies and sectoral institutions, play a central role in promoting and regulating the development of the national mineral potential. Their roles include the optimisation of the economic, social and environmental impacts of mineral resources related activities. The private sector cannot replace governments in these roles, but it is an essential partner. Owing to the natural diversity of minerals and of the settings in which thy occur, and to the variety of mineral resources activities the public management of the sector requires significant resources, including a wide range of highly skilled and experienced professionals. They are required for a wide range of activities such as the drafting of mineral sector development policies, mining and environmental codes, management of the exploration and mining leases, monitoring of exploration and mining activities and subsequent reporting, acquisition and dissemination of geoscientific data at the national and/or regional levels (such as airborne geophysical data acquisition, geological mapping, geochemical surveys) and the active promotion of the mineral potential.

Governments of developing countries, having to face a wide range of other pressing short-term issues frequently have great difficulties in allocating the adequate resources to develop, and then maintain, the required institutional capacities. The long-term nature of successful

mineral sector development strategies, where several years (sometimes over 10) may be required between the initial exploration effort and the possible[2] actual start of a mine effort makes it even more difficult to support the sector's development. But no significant private sector investments, i.e. wealth creation, are likely to take place if a government fails to create and maintain the proper investment climate. Hence, the issues related to wealth creation ought to be addressed prior to the questions of wealth management. In many developing countries further effort is required to develop the right conditions to entail wealth creation.

Fig. 3 - Exploration investments - PNG vs other regions

Source: Minerals Economic Group, Mining Journal and DOM



Due to the many pressing short-term issues faced by the governments of developing countries, support from development agencies is essential to provide these governments with the human, material and financial resources needed to define mining sector policies and to strengthen their institutional capacities. However, official development aid to developing countries decreases at a fast pace, while needs increase. From 1995 to 1999, net ODA disbursements to least developed countries decreased by one third, from 16.5 billion $, to just above 11 billion $[vii].

There is a urgency to clearly document the economic, social and sustainability benefits brought by a rational mineral resources industry. Hence, there is a great need to develop indicators, and document them with relevant factual data, to provide a better understanding of the complex relationships existing between the mineral resources industries and sustainable development. The lack of indicators, and of the needed data, makes it very difficult to elaborate properly informed cost/benefit analysis, including the economic, social and environmental pillars of sustainable development. The mining industry plays an important role in contributing to the development of these indicators and in making more data easily accessible about the relations between these three pillars and its activities. This will entail a better, more factual, understanding of the relationships and entail

[2] in case of successful exploration

improvements in the design of development strategies, hopefully leading to a better recognition of the mineral resources sector as a important cradle of development and to an improved allocation of resources by donors. This is essential to help developing countries to make a sound use of one of their essential assets and to fight poverty.

Above data and considerations, although sketchy and incomplete, show the complexity of mineral sector development issues and the necessity to access to more economic, social and environmental data, some of which may not be presently available, to document the cost and benefits of mining for a developing country like PNG. Such analysis are needed to enlighten development policy choices, resources allocations, and to serve as basis for an improved understanding of the complex relations between the mineral resources industries and sustainability. With the decrease of resources available for Official Development Aid coming from the members of the OECD Development Assistance Committee, and increasing needs in many developing countries, there is a strong pressure to allocate the resources to sectors where help is most required and likely to be effective.

If donors are to finance projects to strengthen the capacities of developing countries to promote and regulate their mineral resources sector, then donors need to be provided with solid analysis documenting the relevance and economic efficiency of specific support programs.

Despite its limited resources, the Government of PNG is dedicated to support the sector and keen to strengthen is institutional capacities. Support from development agencies, such as the European commission, the World Bank, AusAid, the Asian Development Bank or Japan's International Cooperation Agency play, and will continue to play in the coming years, a major role in reinforcing these capacities.

The now completed Sysmin preparatory study defined a large sectoral support programme, comprising 10 projects for a total of 50 M€, which together with an ongoing World Bank financed programme, will form a comprehensive set aiming at strengthening PNG's institutional capacities, acquiring and actively disseminating new geoscientific data about some of PNG's geologically most promising regions

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