



Identification and distribution of mineral rents in southern Africa

by F.T. Cawood* and R.C.A. Minnitt*

Synopsis

The definition of mineral rents has historically been somewhat unclear, but a growing understanding of the source and composition of the revenues that comprise these rents mean that they can be more easily identified and quantified. Furthermore the way in which the flow of the rents from mineral developments are captured and then distributed has been a point of contention amongst the various stakeholders. Investors, the host government, the resource owners, environmental interests, indigenous groups and land owners are identified in this paper as the principal participants in mineral development and while each is entitled to a portion of the rent, the size of their portions will differ. A competitive rent-sharing model for southern African countries has been established and indicates how the range of stakeholders could be rewarded for their contribution. Acceptance of the sharing ratios amongst the recipients is a function of their understanding of the size of the rent and their position in the hierarchy of stakeholders. At first glance investors appear to receive the largest share of the rent, but they disburse some of the rent to hidden costs, which when all is said and done, means that investors and host governments retain approximately equal shares of the mineral rent. Both the investor and government are faced with the dilemma of how to equitably distribute the rents they have captured to minority stakeholders. Government captures corporate tax, mineral royalties and a wide range of subordinate taxes, but is required to construct policies that will ensure distributional equity among the various levels of government as well as among the provinces that comprise the country. Investors will have to ensure that a portion of the rents they capture are diverted to other stakeholders namely resource owners, environmental interests, indigenous peoples groups and the landowners. This paper identifies the major recipients of rent and provides some indication of equitable distribution ratios for mineral wealth among them—a first step in ensuring that mineral development is compatible with long-term sustainable development and in the best national interests.

Introduction

Minerals development is essentially the process of converting non-renewable natural mineral resources into reproducible capital. During this process rents (or wealth) are produced. The rents are meant for the benefit of the stakeholders in mineral development but

the distribution thereof may be perceived to be inequitable because of the different bargaining powers amongst stakeholders. The challenges facing those responsible for managing mineral wealth are many. For example, there is the possibility that the cost of mineral development exceeds the revenue received for production, in which case there will be no rents to distribute. There is also the possibility that stakeholders will be disappointed by the size of rents, resulting in an expectation gap—a potential source of conflict amongst them. The size of this gap will depend on how well information is shared among stakeholders. A third challenge focuses on equity issues and the importance that each stakeholder recognizes the priority and hierarchy of claims to mineral rents. This means an acceptance among stakeholders that the larger the share of one stakeholder, the smaller the shares of others. A final consideration relates to equitable intergenerational distribution of mineral rents and issues relating to sustainable minerals development. This paper explains the possible rent-sharing ratios, which ratio-distribution is recommended as an alternative approach to the management of mineral wealth (MMSD, 2001). Historically, mineral development symbolized conflict between the various stakeholders because of self-interest. Sustainable development allows for early stakeholder identification and consensus on how the benefits must be shared, motivating stakeholders to work together in an attempt to maximize rents. This style of mineral development will firstly, minimize the expectation gap and secondly, maximize stakeholder benefits.

An introduction to mineral rent

The development of the concept of '*mineral rent*' grew alongside the early concerns about

* Department of Mining Engineering, University of the Witwatersrand.

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the distribution of returns from the agricultural sector (Robinson, 1989). The debate on mineral rent started when Smith (1776) adopted the classical view that the highest cost farm (mine) would determine the economic rent received by other farms (mines). Mines whose costs equal their mineral revenues would receive no rent while others that mine higher-grade deposits or are located close to their markets, receive rents. Smith's definition closely resembles the current understanding of economic rent. A drastic departure from Smith's way of thinking came when Ricardo (1821) argued that: '*Rent is that portion of produce of the earth which is paid to the landlord for the use of the original and indestructible powers of the soil*'. Ricardo's understanding of rent led to the term '*mineral royalty*', which is a facility to compensate the owners of mineral assets for resource depletion. Ricardo's interpretation of mineral rent does not entirely match the current understanding of economic rent. Later interpretations of rent emulated these early contributions by Smith and Ricardo, all of which, to some extent, resembled their theories or combinations thereof.

Among the many definitions of economic rent, a number have captured the varying perspectives of the underlying theory. Some of these are as follows:

- The general approach is to define rent as the financial return over and above that required to induce the initial investment
- Cordes (1998) redefined economic rent as '*the magnitude of revenues that can be taxed without causing the pattern of resource use to be altered*'.
- An expanded definition of economic rent for the minerals industry is: '*the present value of the future stream of net revenues that mineral deposits can generate over time, where net revenues are the difference between total revenues and total costs and costs include a competitive return on investment*' (Cawood, 1999).

Distribution of mineral rent

Unlike the magnitude of rents that are determined by the unique characteristics of the mineral deposit, the distribution of rents is primarily influenced by three main factors. *Firstly*, the legal system of a host country identifies the recipients of mineral rent. *Secondly*, the host country's fiscal policies, resource owners' expectations and public opinion determine the rates of allocation to each recipient. *Thirdly*, the hierarchy of claim to rents is prescribed principally by the national objectives but can be modified by social pressures. One must appreciate that the hierarchy of claims to mineral rents may differ significantly from project to project and country to country, depending on how government policies allocate relative stakeholder bargaining powers.

The identity of each recipient is distinct, but any combination of recipients is possible. The simplest model of distribution is where the government, on behalf of the public, is entitled to all the rents. Examples of potentially profitable mining operations that have been neglected in centrally planned economies suggest that State intervention in the control and ownership of mineral properties is not sustainable in the long run. The copper mining industry in Zambia is a prime example. An alternative model of distribution is private control of all categories of rights and

property, allowing for little or no State intervention. A disadvantage of such a model is that many stakeholders share the rent, thereby reducing each recipient's portion. By the same token, an advantage is that the rents are distributed more widely among more stakeholders. This is particularly true for South Africa where the mineral rights in some areas were subdivided into undivided shares, resulting in large numbers of mineral right holders over the same mineral deposit (Minnitt and Cawood, 1999).

This paper shows that the State, investor, mineral rights owner, environment, indigenous community and the landowner should be the principal beneficiaries of mineral development but, depending on the uniqueness of the situation, there may be more (or less) stakeholders sharing the wealth.

Quantifying mineral rent

No investor or government would deny the existence of rents derived from the exploitation of non-renewable mineral resources, but determining the size and nature of these rents is easier said than done. One might argue that the mineral royalty distinguishes the mining industry from the rest and is therefore the ideal fiscal instrument to equate with mineral rent. Although this simplistic '*Ricardian*' approach has merit, it is not practical because of the huge variances in royalties for the region, especially South Africa with its mixed (highly complex) system of mineral rights ownership.

Perhaps a more appropriate method of quantifying mineral rent is by means of natural resource accounting methods. The United Nations (1993) National Accounting Standards propose a system where resource rents are calculated as the value of output less production costs. Production costs are defined to include mining input costs, labour costs, capital costs and the required return on the investment. This paper has also adopted this approach for determining sharing ratios between host governments and investors. The net result is that both the return on the investment (i.e. the return above the initial hurdle rate) and government receipts are treated as total rent.

Defining rent sharing ratios

This section proposes a competitive rent distribution model for discussion and comparison with government ratios in Botswana, Mozambique, Namibia, South Africa, Tanzania, Zambia and Zimbabwe. A summary of the mineral projects, fiscal parameters, country information and cash flow results appears in the appendix. The fiscal parameters for the cash flows used in this section were taken from an earlier study by Cawood (1999), who derived a Competitive Investment Framework (CIF) from the policy information of developing countries¹ that attracted significant (foreign) mineral investment into their economies as a direct consequence of changes in policy. These results were then statistically analysed in order to establish a rent-sharing ratio that would be regarded as internationally competitive and attractive to the international investor. The framework's fiscal

¹ The selected countries were Chile, Argentina, Indonesia, Peru, Mexico and Ghana

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parameters, meant as a guide for alterations or additions required by other developing countries wishing to attract foreign direct investment, was entered into the cash flow models in order to derive a distribution model for discussion and comparison purposes. Like these 'model' countries, southern Africa is well endowed with mineral resources² and the region depends heavily on the responsible economic development of these primary assets. The host governments in the region are responsible for policy-making, which policies must provide the fuel for the engine (mining industry) in an effort to generate mineral rents and, consequently, ensuring sustainable economic development.

The methodology for establishing sharing ratios

The sharing ratios shown in Figure 1 were determined by cash flow analyses of five typical southern African mineral projects. These were a large South African Witwatersrand type gold mine; a greenstone type gold mine; a large limestone project; a medium-sized underground coal mine and a copper mine. The analyses included a technical project description, risk assessment, capital treatment, effective tax rate calculation and wealth-sharing ratios. The graphical representation of rent-sharing ratios in Figure 1 provides a basis for discussion and determination of model ratios for southern African states.

The model (Figure 1) is not intended to be the last word on the matter, but rather forms a basis for discussion and comparison in analysing the division of mineral wealth. Major stakeholders often have to distribute a portion of their wealth to other, less important, stakeholders. For example, the national government has to share with lower levels of governments while investors must share with labour (bonus payments) and the local community (contributions to local health and education facilities). Understandably, relationships between different stakeholder (groups) are often poor and greater understanding of stakeholder needs is an essential element of any strategy to share the benefits equitably. A good mineral policy not only provides a clear description of the environment investors must operate in—it must also engineer an acceptable distribution model.

Sharing the rent

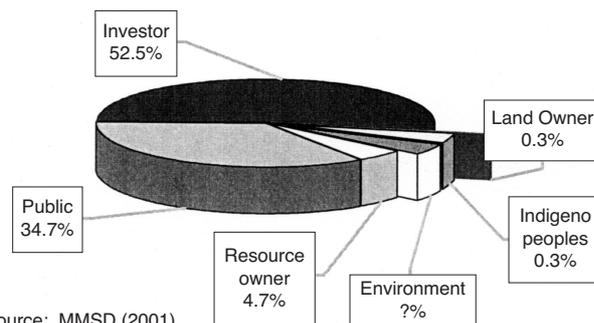
Equitable sharing of mineral resource rents between the host country and the investor developing the mineral property, is one of the principal factors in ensuring political stability and the creation of an enabling environment for minerals development in the developing world. Investors place their capital in mineral projects to create wealth and therefore require a reasonable return on their investment. The distribution of rent between the country hosting the mineral resource and the investor is therefore of critical concern to them. The recipe for the distribution of rent between the investor and the host country must be equitable to both parties at all times. Cawood (1999) determined an optimal rent-sharing model of how total mineral rents should be

shared between the investor and an internationally competitive and investment friendly host government. He found that, on average, about forty per cent of the wealth generated should find its way to State coffers while the investor should retain sixty per cent for its effort. There is good correlation between the results of this study and that undertaken by Cawood (1999), in that the sum of public and resource owners' rents as shown in Figure 1 amounts to about forty per cent, as would be the case where the minerals are owned by the State.

Investor rent

This study equates investor rent with the calculated investor net present value (NPV) as derived from the cash flow analysis. Investor NPV was determined as the nominal gross revenue less total capital costs, value-added tax, import duties, export tax, royalty, nominal operating cost, annual repayment of loan, income tax and withholding or dividend tax, adjusted by the discount rate. It is therefore the discounted net present value of the return on the investment after costs and taxes have been subtracted or 'Investor share of wealth' (i.e. the discounted net present value of the investor's share of the wealth net present value of the project) divided by the sum of the discounted net present values of the project and the State's share of the wealth, expressed as a percentage.

Investors demand blue-sky potential as compensation for risks involved and rely on the host country's good will as reflected in policy documents, capable management and efficiency in production to maximize their share of the rent. The share of rent for the range of recipients shown in Figure 1 indicates that the investor receives about fifty per cent of the total rent. Although this portion may seem excessive at first, one must appreciate that there are some (cost) variables that are extremely difficult to reflect in a cash flow because of their 'hidden' nature. Examples are payroll taxes, fuel levies, goodwill contributions to local health and education facilities and employee bonuses during times of high profitability. It is therefore realistic to assume that the investor has to reallocate a percentage to other stakeholders and minority interested and affected parties. The end result is that the investor and the host government probably retains approximately equal proportions of the mineral rent. The investor optimizes finance, management and production efficiency to maximize rents for all stakeholders. In order to maximize benefits, investors should identify all stakeholders, regardless of their respective importance, as early as possible.



Source: MMSD (2001)

Figure 1—Competitive rent-sharing model

² Some examples are gold on the South African Witwatersrand, copper in Zambia, the diamond deposits in South Africa, Namibia, Angola and Botswana, and the minerals associated with the Great Dyke region in Zimbabwe.

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Once they have been identified, fixed wealth-sharing ratios can be negotiated using a participatory approach. The host country should allow investors to set public rent through a single all-inclusive tax rate. This somewhat unusual approach may be viewed with scepticism by some governments, but it is not entirely new considering the use of stabilization agreements in Latin America and recent commitments that the overall effective tax burden will not be above a certain percentage. For example, the Chilean Foreign Investment Law provides for tax stability (up to 10 years) at a rate of 42 per cent as the effective total income tax charge (Warden-Fernandez and Wälde, 2001). Because labour is one of the primary factors of production, the workforce must be treated as one of the beneficiaries. This will mean that special bonuses be paid to workers when profitability reaches certain fixed pre-negotiated targets.

Public rent

This study equates public rent with the calculated NPV of total revenue collected by the State as derived from the cash flow analysis. State revenue was determined as the discounted net present value of the total host government receipts (i.e. the sum of the following sources of State revenue: income tax, VAT, import duties, export tax and withholding or dividend tax, excluding some indirect taxes such as payroll taxes, regional levies and fuel taxes). It may also be termed *State share of wealth*, i.e. the discounted net present value of the NPV of total State share divided by the sum of investor NPV and the State's share, expressed as a percentage. It is collected through the average effective tax rate, i.e. the discounted net present value of all taxes divided by the discounted NPV of taxable income, expressed as a percentage.

The State's share of the wealth, excluding the hidden taxes mentioned in the definition, should amount to about thirty-five per cent as illustrated in Figure 1. Mineral royalties must be added to public rent where private ownership of mineral rights is disallowed by the host country. Considering the United Nations' endorsement of State's sovereignty over natural resources, a concept eagerly adopted by most developing countries, mineral royalties should reside under public rent. The reason why this study distinguishes between mineral royalties and taxation is because of South Africa's unique system of mixed private and State-owned mineral rights³, which system is about to change to exclusive State ownership of mineral rights. The unique distribution of mineral rights in South Africa prompted the State to reserve certain '*strategic*' minerals in its favour in an attempt to secure additional public rents³ from these national assets despite them being privately owned. It started by means of a lease consideration formula that was first introduced in 1910, which concept later replaced the flat (corporate) tax rate following the recommendations of the Corbett Commission of Inquiry in 1936. The end result was that gold mines were '*taxed*' twice on basically the same formula. The salient features of '*formula taxation*' are as follows:

- Government collects more taxes during periods of high profitability, but gets less when profit-to-revenue ratios are low
- If not connected to a minimum rate (as is the case with Botswana and Namibia), the formula may result in a zero tax liability
- The tax liability can be reduced, and even waived, when profits are reinvested.

If resource owner's rent (typically mineral royalties) is added to that of public rent, the host government will receive approximately forty per cent of the rents, which supports Cawood's (1999) optimal sharing ratio. Although forty per cent appears to be an appropriate benchmark in the developing world, this ratio will vary depending on country-specific characteristics and the risks host governments and investors are prepared to tolerate. Equitable sharing between government and the investor, while at the same time optimizing the benefits derived from utilizing the mineral resource, is no easy task because of the inverse relationship between the respective portions, which causes conflict in decision-making. Conflict between the two parties also stems from their perceptions of what constitutes a fair split. Because each nation's circumstances, needs and objectives shape its own unique minerals and taxation policies, no ideal or model for sharing mineral rents is available to policy makers (Cordes, 1998). Rents collected by host governments as custodians of the national patrimony from mining operations are normally distributed as public rents to the population in the form of services and infrastructure. Before investigating possible ways of optimizing public rent, one needs to understand their composition, which is briefly discussed below.

- *Corporate tax contribution to public rent*—The corporate income tax is the most important contributor to State revenue, with about eighty per cent of all the revenue received by the host governments in the developing world coming from this source over the life of a mineral project (Table I). The corporate tax rate is of prime importance to the foreign investor who will use it as the first direct tool for comparing the tax competitiveness of host countries. The result is that host countries set their corporate tax rates below or within the 30 to 35 per cent global average in an attempt to lure investment into the country. However, sometimes States compensate for this '*loss*' by introducing more and higher levels of minor taxes, thus creating a perceived competitive regime. Investors favour a tax regime where the corporate tax system accounts for most (preferably all) taxes because it is easier to estimate the total tax liability over the life of the mine.
- *Mineral royalty contribution to public rent*—A royalty is the second most important minerals tax instrument where mineral rights are publicly owned, and accounts for approximately five per cent of the wealth shown in Figure 1. The State, in its role of custodian of the natural resources of the country, expects a royalty payment for the removal of mineral products from within its borders. This payment may take the form of periodic instalments (mineral royalties and/or severance taxes), a lump sum payable in advance

³ For a comprehensive discussion on mineral rights and the evolution of formula tax in South Africa, see Cawood and Minnitt (1998) and Cawood (1999) respectively

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Table 1

Tax competitiveness of southern african States

Description	Botswana	Mozambique	Namibia	South Africa	Tanzania	Zambia	Zimbabwe	Average for Southern Africa	Competitive (optimal) range	Competitive (optimal) average
Public rent Averages										
Income tax (%)	40	60	64	67	60	50	70	59	28–97	77
Royalty (%)	20	19	24	18	18	15	0	16	0–17	6
Minor taxes (%)	40	21	12	15	22	35	30	25	3–16	8
Distribution of rent Averages										
Public rent (%)	57	59	60	49	46	37	50	51	32–43	40
Investor rent (%)	43	41	40	51	54	63	50	49	43–686	0

Source: MMSD (2001)

(outright sale of the mineral rights and/or auctioning the right to develop) or complex variations and combinations of periodic and lump sum instalments. However, there are international examples of countries that do not charge mineral royalties, such as Chile, Peru and Zimbabwe⁴, but such a 'weakness' in mineral policy will cause shortages in public rent if these are not collected under some other guise. Related to mineral royalty payments are severance taxes and State reservation of 'the right to mine' minerals. Generally speaking, these are instruments designed to allow for some compensation to the public in the event of mineral rights not being State-owned. South Africa has a long history of reserving the 'right to mine' certain mineral types to the State (Cawood and Minnitt, 1998) such as precious stones, precious metals and oil. This reservation has been reintroduced as a prominent feature of the new minerals policy. Unlike past legislation, where only the right to mine minerals of strategic importance was reserved to the State, the new policy makes provision for the vested right on all mineral types.

- ▶ *Minor tax contribution to public rent*—The remainder of public rents is made up of minor taxes, such as minimum taxes (Namibia), additional profits taxes (Ghana), capital gains taxes (South Africa), fuel taxes (most countries), withholding taxes (Botswana), import/export taxes (widely levied but mining industry is normally exempt) and payroll taxes (most countries). Although these taxes are usually charged at low rates, they have 'nuisance' value and because together they can severely impact on the split of rent between the recipients, these minor taxes should be restricted to a minimum.
- ▶ *Conflicts within government*—In an attempt to answer the question, 'Who should get natural resource revenues?' Scott (1978) identified several criteria for the level of government collection and the distribu-

tional requirements of natural (mineral) resource rents. In terms of the southern African situation, Scott's observations on the following issues could be considered.

- The right of lower levels of government to share in the rent through the collection of royalty-like payments. However, southern African governments generally do not allow the collection of mineral royalties by lower levels of government.
- The importance of distributional grants to promote equity between mineral-rich and mineral-poor provinces. The South African government established a central revenue fund for this purpose (Constitution, 1996).
- The uniqueness of the mineral deposit in terms of commodity, markets, life of the operation (which is related to size), locality and existing infrastructure. Some areas may be more sensitive than others to sudden mine closures and may therefore require a larger proportion of rent, especially for mineral operations with a short lifespan.
- The size, location and demography of the population to whom the benefits should be distributed. This may be especially important where gross geographic product and infrastructure are vastly disparate as is the case in South Africa.

The host government must engineer a public policy that will ensure an equitable distribution among levels of government but at the same time ensuring an enabling environment for the investor. An enabling environment caters for more than the self-interests of the investor, it also maximizes the benefits of other stakeholders. Host governments interested in maximizing their allocation of mineral wealth should consider inclusion of the undeveloped mineral assets into the national accounts system, similar to the approach proposed recently for South Africa by Blignaut and Hassan (2001). Secondly, take a leading role in stakeholder identification and negotiations. Thirdly, negotiate a fixed ratio with the investor through a single tax rate that will account for all taxes, except for the mineral royalty that should be managed separately. Fourthly, decide on how the public rent mentioned above should be shared among the different levels of government. The negative environmental and socio-economic consequences of mine

⁴ During a recent (July 2001) public announcement in Pretoria at the SADC Committee of Mining Ministers at southern Africa—Australia Minerals Sector Synergies Symposium, the Zimbabwean Minister of Mines indicated that his government is in the process of introducing mineral royalties. Such royalties will be charged up to a maximum of ten per cent (non-tax deductible) of the sales value

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closures are normally borne by local governments. This suggests that there is a case for certain minerals to be owned and managed by lower levels of government. Low value aggregates and construction materials that are locally exploited and marketed are good examples. However, this will take some motivation, because most of the States in southern Africa do not allow collection of mineral royalties by lower levels of government.

Resource owner's rent

Because the norm in developing countries is for mineral rights to be publicly owned, resource owner's rent has already been partially included in the discussion of public rent. However, South Africa still recognizes private ownership of mineral rights, which merits a separate discussion of resource owner's rent. If such private ownership of mineral rights is allowed, the investor is responsible for distributing the royalty to the holder of the mineral rights.

A mineral royalty is, by definition, payment to the holder of the mineral rights as compensation for the extraction and alienation of minerals from the land. Where private ownership of mineral rights is allowed, mineral royalties are payable directly to the holder of the rights as opposed to public ownership, where the host government or its nominee collects the royalties. The magnitude of the royalty payment for mineral resources of comparable value should theoretically be equal, regardless of ownership status. However, empirical evidence shows that the identity of the owner of mineral rights has a strong influence on the size and method of royalty collected. For example, the self-interest of private individuals on privately-owned mineral rights results in higher compensation for the rights than the State, whose officials, responsible for collecting rents on behalf of the nation must act within the policy framework. Even for similar deposits, the distinction between the royalties payable to the State and that to private entities is necessary because the compensation expected by the two parties may be significantly different. It is the unique characteristics of the resource, such as location, size, shape, depth and grade, that should determine the royalty payment, rather than the identity of the owner.

Environmental rent

A valid concern for nature justifies that some portion of the economic rent is distributed towards caring for the greater environment. Historically environmental concerns have not attracted the regard that they are due, but the growing awareness of environmental responsibility has altered the pattern of wealth sharing. These are combined with emotive arguments to change sharing ratios so that environmental costs are likely to continue to grow. This is especially true of developed nations, where environmental compliance costs and contributions to environmental conservation programmes are expected to be much higher than the estimate of four per cent currently indicated in Figure 1. Finance institutions are also playing an increasing role in caring for the environment by pressuring non-compliant mining companies to treat the environment according to its value to society. An example is the World Bank recommended closure of the Ok Tedi copper operation

(Mining Journal, 2000).

The host government, as custodian of the national patrimony, has the responsibility of ensuring that the greater environment is cared for through its policies. It must develop a culture of caring for the environment among the entire population as a national priority. This would require the creation of environmental regulatory structures for mineral development that are able to collect time series data for environmental analysis, set environmental standards and monitor performance relative to these standards. An important consideration for governments is to allow for comprehensive base-line studies in order to value environmental compliance costs, alternative (competing) land use applications and mineral rents accurately. Finally, governments must have the capacity to enforce environmental standards by penalizing violators (*polluter pays principle*) and reward developers achieving better than required standards.

Indigenous rent

There may be wide divergence of views between national governments and local communities, and open conflict over how revenue is shared, how adverse economic and social impacts of mineral development will be mitigated and how the benefits could be sustained after mine closure.

The increasing bargaining strength of indigenous rights movements has resulted in local and aboriginal communities receiving additional compensation and contributions towards their socio-economic programmes. The legacy of colonial rule left a culture of deep-rooted dissatisfaction in the developing world because of the disregard for indigenous rights through 'forced' land dispossessions. Failure to recognize these rights has led to severe civil and political disruptions in many developing countries. Zimbabwe, the Democratic Republic of the Congo and Sierra Leone are cases in point. The closure of the Bougainville copper mine as a result of rebel activity in Papua New Guinea was considered to be the most serious national crisis since its independence (Thompson, 1991). The recently resolved Bougainville crisis (1988–2001) began when local landowners sought a bigger share of revenues from the large copper mine at Panguna.

There is a broader awareness in industry of the need for community involvement in planning and decision-making and the need for good community relationships. Contributions towards social programmes have resulted in the emergence of fringe recipients, not through legal entitlement, but in the interests of goodwill. Examples include the provision of health and education facilities, job creation programmes and social upliftment programmes.

Table II

Environmental expenses (SA Rand)*

	Wits Mine	Greenstone	Limestone	Copper	Coal
Rock dumps	790 698	263 566	263 566	790 698	0
Tailings dams	2 418 605	806 202		2 418 605	806 202
Water	2 325 581	1 015 116		2 325 581	5 188 372
Surface	1 920 930	568 605	996 512	1 920 930	4 862 791
Pit		523 256	523 256	4 186 047	0
Total	7 455 814	3 176 744	1 783 333	11 641 861	10 857 364

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Richards Bay Minerals in KwaZulu-Natal (South Africa) and Western Mining's copper operation in Tampakan (Philippines) are two examples.

This study equates indigenous rent with the calculated NPV of an effective one per cent royalty on turnover, derived from the minimum payment expected by the Royal Bafokeng for platinum mining in their territory. Based on the example of the agreement between the Royal Bafokeng nation and Impala Platinum in South Africa, it is assumed that indigenous peoples should receive a minimum payment of one per cent on sales revenue. This one per cent royalty amounted to an average of about four per cent of total mineral rents (as shown in Figure 1).

The host government has, yet again, a major role to play in ensuring that indigenous communities are considered during mineral development. Some legislation, for example the draft South African Mineral Development Bill, provide for discretionary payment of royalties, or part of the royalties, to local and/or indigenous communities. However, this general and often insensitive approach does not provide for sustainable development of the community and the following issues are worth considering by host governments. Firstly, the government should develop an official '*Negotiation Policy*' as is the case with the Chilean '*Compensation Policy*' that defines the rights of all parties and set the framework for compensation using a consensual approach. Benefits may include any one or combination of a variety of schemes, such as direct contributions to primary health and education facilities, periodic instalments paid into a fund specifically designed to benefit communities, adult skills and literacy programmes, preference to locals when contracting employees, etc. Secondly, create a comprehensive geographic information system (GIS) on all aspects of indigenous communities that will assist mine developers with stakeholder involvement. Such a GIS would be critical in deciding on the legitimacy of indigenous claims. The Land Restitution Policy in South Africa may be used as a guide to compile a database of legitimate claimants.

Landowner's rent

When the mining company is not the owner of the surface title, the landowner becomes a legitimate recipient of mineral rent. These owners include private entities (that may include the indigenous community), the host government (at national, provincial or local government level) or environmentalists (national parks). As in the case of mineral rights, the payment to the landowner is affected by his/her identity. The land value in an environmentally sensitive or fertile area is almost certainly higher than that of arid land. The premium for fertile and scenic land is an indication of the opportunity cost when mine development is preferred above other land uses. The surface title owner may obtain these rents through outright sale or surface rental fees. Coal mining companies in South Africa, after buying the land from the owners, frequently allow them to continue using unaffected and/or rehabilitated areas at a nominal rental fee. In addition, they frequently allow owners the first option to buy the land back at a nominal price when mining operations finally cease. Figure 1 shows that the landowner receives a small and apparently insignificant proportion of total rent when compared with other major stakeholders in mineral development.

Although one might argue that government should not interfere with the landowner's exclusive right to develop the land for benefit, one must appreciate that governments often own vast tracts of land, in addition to having permitting or administrative powers over privately owned land. There is therefore a legitimate role that governments should play in optimizing land rents, over and above the usual land sales price that represents a market-clearing price. Governments could, for example, consider creating a comprehensive geographic information system on all land and mineral title that will assist mine developers with stakeholder involvement. In addition they could promote equitable and appropriate standards for valuing property in order to maximize stakeholder benefits. Valuation standards are especially important in the presence of competing land uses.

Conclusions and recommendations

This paper addressed one of the most important challenges policy-makers face when managing mineral wealth, namely how the benefits of mineral development should be distributed among stakeholders. The diverse interests and often unrealistic expectations of stakeholders may cause disagreement in how benefits should be shared. Traditionally, the claim to mineral rents was determined by the legal system, national objectives and fiscal policies. From the many international examples of conflict and mistrust associated with mineral development, an alternative approach is required in an attempt to minimize the expectation gap among stakeholders. The potential for conflict may be reduced considerably when all legitimate beneficiaries are identified, the hierarchy of claims understood by all and consensus is reached on sharing ratios before mining commences. This implies that the distribution of benefits is no longer the sole responsibility of the host government, with the mineral developer playing a more important role in this regard. It is in the investor's interest that all stakeholders have fair representation during the distribution process as it will considerably reduce political risk. In terms of the proposed model the government, as one of the two principal stakeholders (the other being the mineral developer), will be responsible for the creation of an enabling environment, collection of public rents and the distribution thereof to lower levels of government. It is the mineral developer's responsibility to distribute rents to the remaining stakeholders, which distribution may occur through NGOs or other credible organizations. This approach will result in a common and united vision of '*Let's maximize mineral rent for all*' shared by all stakeholders, regardless of their relative importance.

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References

BILIGNAUT, J.N. and HASSAN, R.M. A Natural Resource Accounting Analysis of

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- the Contribution of Mineral Resources to Sustainable Development in South Africa. *South African Journal of Economic and Management Sciences* SS No. 3 April 2001, Pretoria. p. 39.
- CAWOOD, F.T. Determining the Optimal Rent for South African Mineral Resources. A thesis in fulfillment for the degree of Doctor of Philosophy, University of the Witwatersrand, Johannesburg, August 1999. pp. 221 and Appendices.
- CAWOOD, F.T. and MINNITT, R.C.A. A Historical Perspective on the Economics of the Ownership of Mineral Rights. *Journal of the South African Institute of Mining and Metallurgy*, vol. 98. no. 7, Johannesburg, South Africa, November/December 1998. pp. 369–376.
- Constitution. The Constitution of the Republic of South Africa, Act 108 of 1996.
- CORDES, J.A. Negotiating Sustainable Development in Resource Based Industries. A Manual on Mining, Environment and Development (Part 2), *Institute for Global Resources Policy and Management, Colorado School of Mines*, Golden, Colorado, USA, 1998. pp. 2–12.
- Mineral Development Draft Bill. Department of Minerals and Energy, Pretoria. *Government Gazette of the Republic of South Africa*, vol. 426, 18 December 2000 no. 21840. General Notice 4577.
- MMSD. Aligning Mineral Wealth with Sustainable Development: The Southern African Perspective in Research Topic 5: Mining, Minerals and Economic Development and the Transition to Sustainable Development in Southern Africa; *Mining, Minerals Sustainable Development* (Southern Africa). 2001.
- Mining Journal. Ok Tedi damned. *Mining Journal*, London, vol. 334, no. 8573, 10 March 2000. p. 190.
- MINNITT, R.C.A. and CAWOOD, F.T. Mineral Rights—Information as an Alternative to Taxation. *Journal of the South African Institute of Mining and Metallurgy*, vol. 99, no. 6, Johannesburg, South Africa, October–December 1999. pp. 341–350.
- RICARDO, D. (1772–1823) *Principles of Political Economy and Taxation*, Various editions, 1891–1984.
- ROBINSON, T.J.C. *Economic Theories of Exhaustible Resources*. Routledge, London, 1989. pp. 191.
- SCOTT, A. Who Should Get Natural Resource Revenues? University of British Columbia, Library Box 3-28, no Journal/monograph information. 1978. p. 51. http://www.library.ubc.ca/spcoll/ubc_arch/u_arch/scott.html.
- SMITH, A. (1776) *An Inquiry into the Nature and Causes of the Wealth of Nations*. A Selected (1993) edition, Oxford University Press, London, 1993. Various editions and publications (1773–1993).
- THOMPSON, H. The Economic Causes and Consequences of the Bougainville Crisis. *Resources Policy*, Butterworth-Heinemann Limited, March 1991. pp. 69–85.
- United Nations. Integrated Environmental and Economic Accounting. Interim Version: Studies in Methods, Handbook of National Accounting, Series F, no. 61. United Nations, New York. 1993.
- WARDEN-FERNANDEZ, J. and WÄLDE, T. Mining Law in Latin America: A comparative study of Chile, Peru, Argentina and Bolivia. *CEPMLP, University of Dundee*, January 2001. p. 111. ◆

APPENDIX

Description of mineral projects used in the study

Specifications	Gold (Greenstone)	Gold (Witwatersrand)	Limestone	Coal	Copper
Mineral lease area (ha)	635	2000	1330	4 462	2000
Measured reserves	967 000 oz	9 500 000 oz	25 000 000 t	30 000 000 t	2 500 000 000 lb.
Price (1996)*	US\$387.82/oz	US\$387.82/oz	US\$52.10/t	US\$43.17/t	US\$1.043/lb
Cash-flow duration	20 years	20 years	20 years	20 years	20 years
<i>Capital:</i>					
Pre-mining (US\$)					
Year 0	3 093 200	51 264 000	6 000 000	15 000 000	10 000 000
Year 1	186 000	-	-	-	15 000 000
Year 2	-	-	-	-	-
Development (US\$)					
Year 0	2 675 315	110 000 000	10 000 000	10 000 000	250 000 000
Year 1	10 161 352	110 000 000	10 000 000	5 000 000	250 000 000
Year 2	-	100 000 000	5 000 000	-	-
Year 3	-	50 000 000	-	-	-
Year 4	-	-	-	-	-
Year 5	-	-	-	-	-
Plant and equipment	5% Revenue	5% Revenue	5% Revenue	5% Revenue	5% Revenue
<i>Production</i>					
Year 0	-	-	-	-	-
Year 1	16 000 oz	-	500 000 t	-	90 000 000 lb.
Year 2	32 000 oz	-	500 000 t	1 000 000 t	110 000 000 lb.
Year 3	32 000 oz	200 000 oz	1 000 000 t	1 200 000 t	110 000 000 lb.
Year 4	43 600 oz	300 000 oz	1 000 000 t	1 200 000 t	110 000 000 lb.
Year 5	43 600 oz	400 000 oz	1 000 000 t	1 200 000 t	110 000 000 lb.
Years 6–11	43 600 oz	450 000 oz	1 000 000 t	1 200 000 t	110 000 000 lb.
Years 12+	45 000 oz	450 000 oz	1 000 000 t	1 200 000 t	110 000 000 lb.
Operating costs	US\$175/oz	US\$230/oz	US\$22.92/t	US\$8.00/t	US\$0.45/lb
SA lease formula		$y=15-\frac{90}{x}$			
SA royalty used	2.5% Revenue		3.75% Revenue	3.75% Revenue	3.75% Revenue

* Despite changes in prices for some commodities from 1996 to 2001, the use of 1996 economic information does not significantly alter the relative rent-ratios because profitability has been maintained, largely because of currency volatility and industry response to global competitiveness.

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Competitive investment framework parameters								
Criteria	Chile	Argentina	Indonesia	Peru	Mexico	Ghana	Mean	Standard deviation
Corporate tax (%)	35	33	30-35	30	34	35	33.1	2.3
Oil/gas tax rate (%)	30-55	33-55	65-85	NA	NA	50	53.3	18.8
Minimum tax (%)	0	0	0.15	0.5	1.8	0	0.4	0.7
APT (%)	0	0	0	0	10	25	5.8	10.2
Capital gains (%)	0	0	30-35	30	0	25	14.6	16.3
VAT/Sales tax	0	0	0	0	0	0	0	0
Fuel tax	Yes	Yes	No	Yes	Yes	No	Yes	
Withholding (%)	0	0	7.5	0	0	0	1.25	3.1
Import duty (%)	0	0	0	0	0	0	0	0
Export duty (%)	0	0	0-10	0	0	0	1.4	3.8
Payroll tax (%)	Yes	Yes	No	Yes	Yes	Yes	Yes	
Land tax	No	Yes	No	Yes	Yes	No	Yes/No	
Province/ Municipal	0	0	0	0	0	0	0	0
Mineral royalty (%)	0	0-3	1-13.5	0	0-3	3-12	3.6	5.0
Oil/gas royalty (%)	NA	12	NA	NA	NA	NA	12.0	

Notes: NA Not available
 VAT Value added tax
 Averages rounded off to one decimal of a per cent
 Limited to taxes applicable to foreign investor
 In order to allow for an effective comparison of value-added or sales tax, a zero rate is used in the Table when these taxes are refundable

Investment framework of southern African States							
Criteria	Botswana	Mozambique	Namibia	South Africa	Tanzania	Zambia	Zimbabwe
Corporate tax (%)	25	35	25-55	30	30	15-35	35-37.5
Minimum tax (%)	0	0	25	0	0	0	0
APT (%)	0	0	0	0	0	0	0
VAT/Sales tax	12.5	5-20	10	14	0-20	0-17.5	15
Withholding (%)	30*	18	0	12.5	10	15	20
Import duty (%)	0	0	0	1	0-5	0	0
Export duty (%)	0	0	0-10	0	0	0	0
Province/ Municipal	0	0	0	0	0	0	0
Mineral royalty (%)	3-5	3-5	1-13.5	1-5	0-5	2	0

Notes: Import and export duties = 0% when the mining industry is exempt from duty charges
 * Includes 15% free government share

Cash flow results (US Dollars)										
Mine	Investor's rent	Landowner's share of investor rent				Resource owner's rent	Environmental rent	Indigenous rent	Investor rent	Public rent
		Project NPV^	Area	Rate R/ha (1996) (National average)#	Rate \$/ha (1996)					
Wits gold	71 636 758	2000	873	203.02	406.047	13,984,190	7,455,814	10,757,069	39,033,638	56,876,590
Greenstone	35 882 479	635	873	203.02	128,920	1,690,501	3,176,744	1,300,385	29,585,929	17,098,892
Limestone	122 053 780	1330	873	203.02	270,021	5,250,462	1,783,333	4,038,817	110,711,147	59,188,304
Copper	128 645 838	2000	873	203.02	406,047	12,612,642	11,641,861	9,702,033	94,283,256	58,744,651
Coal	180 208 547	4462	873	203.02	905,890	5,100,151	10,857,364	3,923,193	159,421,949	94,126,952
Total (1996)	538 427 402				2,116,923	38,637,946	34,915,117	29,721,497	433,035,918	286,035,389

Rent distribution		
Public rent	286,035,389	34.7%
Landowner's rent	2,116,923	0.3%
Resource owner's rent	38,637,946	4.7%
Environmental rent	34,915,117	4.2%
Indigenous peoples' rent	29,721,497	3.6%
Investor rent	433,035,918	52.5%
Total	824,462,791	100%

Source
 ^ Cash flow model using competitive averages
 # Stats SA: Statistical Release P1141 (Transfer of rural immovable property 1996/97)
 • EMPR Services (Commercial Guidelines for environmental rehabilitation costs)
 > Cash flow using Bafokeng/Impala 1% of revenue agreement

