

Options for mining development in Africa

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Self-sufficiency in agriculture has been the principal development target in Africa for the past decade. It is now generally appreciated that that target can only be reached if population growth can be controlled and farmers are paid to make it worth while to grow a surplus. Responsibility for the next phase of development – wealth generation – will depend largely by default on the rapid growth of mining, particularly smaller mines. This paper sets out the country requirements for a successful mining sector in Africa. Experience in Zimbabwe and elsewhere suggests that there are three essential components: (i) simple, transparent mining legislation that gives title to the discoverer of a mineral resource in the form of a freely tradeable property right; (ii) the availability of local and/or international sources of risk finance; and (iii) a workforce that includes numbers of persons who have been trained in the technical and financial aspects of practical mining.

In a 1991 speech¹ Robert MacNamara, former head of the World Bank, emphasized that Africa is a continent in crisis. Amongst the many symptoms of that crisis he gave the following examples:

- (i) the incomes of the world's poor fell only in Africa and the numbers of Africans who live in absolute poverty has increased to 75 million;
- (ii) Africans eat about 20% less food than do Indians and Chinese; and
- (iii) by 1986–87, 90% of net financial flows to Africa were in the form of 'aid'.

The principal villain behind this scenario is fecundity, with averages of 5–5.5 children per family. As a result Africa's population is doubling every 22 years.

For the past 20 years the concern with Africa has been centred around its inability to feed itself. It is an unarguable priority: since 1960, agricultural production has risen by 2% annually (on a very broad average) but its population has been growing steadily at over 3%. The consequence is that food imports are rising by 7% a year.

However, the basic requirement for a successful agricultural sector has by now been well understood by a majority of African governments. This is simply

to pay the farmers enough to make it profitable for them to do more than just feed their own families. As a consequence agricultural production has grown faster since the middle 1980s than at any other time during the past 20 years. The problem has not gone away, but at least it is no longer bedevilled to the same extent by countervailing political and ideological viewpoints.

It is now necessary to look beyond the fundamentals of birth control and agricultural self-sufficiency and to ask how can the continent generate the wealth needed to haul it towards prosperity? Here the answers are not so clear cut. Certainly small indigenous industries will respond to the presence of farmers with disposable income, and the debt burdens might lessen as governments abandon the state-financed megaprojects that lie foundering in every country. However, at this time, it is hard to envisage Africa competing head-on internationally with the products of Southeast Asia. Tourism can help, but Kenya has demonstrated that this is not an open-ended option. The exploitation of niche markets is another possibility, such as horticulture in Zimbabwe and embroidery in Madagascar. Yet those are modest openings and not available to all countries.

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¹Institute of African Affairs, Forum on Africa's Development Crisis, April 1991.

food, farmers must have a financial incentive to increase their output. As with the food example, the answer is based on marketplaces.

The 'missing middle' of African mining

A clue to the proposed solution is given by noting the odd distribution of mines in many African states. Typically an African country will have at one extreme, numbers of local people using traditional ('artisanal') methods to mine gold and precious stones on an illegal or semi-legal basis, while at the other extreme there will be one or two major mines, arising from foreign investment after lengthy *ad hoc* arrangements have been negotiated at the highest level with the government, and which exist in social and financial (and often physical) enclaves. Between these two extremes there will be almost no mines at all.

This phenomenon has persisted despite considerable sums being spent by governments and donor agencies to train geologists, to provide equipment and expatriate advisers and to create special legal and fiscal regimes for foreign investors.

Consequently in the mining sector of Africa there is no counterpart of the agricultural smallholder or the back-street workshop. This contrasts markedly with other countries and regions with significant mining industries – South America, China and Indonesia, for example.

A primary reason for this phenomenon is because African mining policy is still deeply influenced by the autocratic outlook of the colonial governments, often reinforced by 30 years of following the socialist precepts of a command driven economy. Although the approach may vary – *dirigiste* in the francophone countries, rather more *laissez faire* in the anglophone countries – almost all African mining legislation is centrally administered, usually with complete discretion given to the state to determine who mines what and where.

Zimbabwe is the sole exception to this, with a mining law that has been described by a major investor as 'every bit as good as Western Australia's'.⁴ Because the Zimbabwe mining industry consists of over 400 mines producing some 35 different minerals – probably more mines than the rest of Africa combined – the situation in Zimbabwe clearly has lessons for the second, wealth-generating, phase of Africa's recovery.

The majority of the mines in Zimbabwe are small, milling under 50 t/day. However, that does not detract from the achievement of having created

Wealth-generating options

Until recently most countries saw manufacturing as the main wealth-generating route forward, by adding value to locally produced commodities, and much effort has been put into achieving it. Despite those efforts, the manufacturing sector has been stagnating at around 10% of GDP and 9% of employment for the last 25 years, and there is no sign of an upturn.

Something of a watershed occurred in 1991 with the publication of a study commissioned by the UN Secretary-General on Africa's commodity problems, using a team led by the ex-Australian prime minister, Malcolm Fraser. It concluded that value-adding and import substitution was premature because the upstream commodities were no longer being produced at competitive prices. To quote: 'the failure in the commodity sector has been central to the economic crisis facing Africa'. The report calculated that by 1988 Africa's market shares for cocoa, coffee, cotton and copper had fallen by between 20% and 40% of the 1970 market share.

As a book reviewer in *Natural Resources Forum*² commented, 'in essence the Fraser report contends that Africa's comparative advantage for the next term is still in commodities, both agricultural and mineral, and that a concerted effort to revitalize production and exports of these primary commodities is a *sine qua non* for restoring economic growth to Africa'.

The major commodity opportunities will probably be in the mining sector where, again, over the past two decades Africa has been falling behind both relatively and absolutely. In 1960, Africa's mineral output was worth about US\$3000 million in constant 1980 dollar terms; it peaked at about US\$7000 million in 1970, but by now it is back to about the 1960 level. There have been few major mineral discoveries in Africa over that period especially as compared to those in say Chile, Brazil and Papua New Guinea.³

This is in part due to a lack of risk capital being put into exploration in Africa. From parallels drawn from successful mining regions elsewhere in the world, the World Bank estimates that about US\$250 million should be spent annually in Africa on exploration; in fact only about US\$100 million is being spent (and probably much of this is in the form of donor agencies' contributions to 'institutional strengthening' – ie support for Geological Surveys in the capital cities).

This paper offers a solution to the stagnation of the mining sector that might be as important for Africa as the earlier understanding that to obtain sufficient

²Philip LeBel, *Natural Resources Forum*, February 1991.

³Sub-Saharan Africa: from Crisis to Sustainable Growth, World Bank, 1990.

⁴Executive Director of Delta Gold NL, quoted in the *Zimbabwe Chamber of Mines Journal*, November 1991.

a mining industry. Geology and grade, not lack of risk capital, has dictated the size of the mines in Zimbabwe.

Based on the Zimbabwean experience, there are three essential requirements for a successful mining industry. These are:

- (i) a simple law giving title to the discoverer of the mineral resource in the form of a freely transferable property right;
- (ii) the availability of local and international sources of risk finance; and
- (iii) a trained workforce.

The importance of the mining law

The historical reasons behind the facilitative mining law in Zimbabwe are interesting. Unlike any other country in Africa, the first colonials were not administrators or farmers but miners, many driven by the thought that the schist belts of Zimbabwe could hold the mother lode of the vast palaeoplacer of the Witwatersrand. With this major vested interest in place, the mining law was written to favour mining. It created a mining title which was a freely transferable property right. The mining law ensured that the whole country was open for prospecting on a 'finder's keeper's' basis, with mineral claims having priority over surface rights.

A long lineage can be traced for this law, being drawn from the Tati gold fields of Botswana, where the first 'formal' gold mines in Southern Africa were started in the 1860s. Those laws were in fact ultimately derived from imperial Spain, through Mexico which controlled California until 1848. The claim system of the Forty-niners evolved out of this, and Californians emigrating to Ballarat and Bendigo brought it to Australia. Australian miners opened up the Tati gold fields of Botswana and so introduced the concept to Southern Africa, whence Cecil Rhodes imported it into Zimbabwe (with some Yukon-inspired modifications) in 1890.

The claim system is one of two key features of Zimbabwe mining law. The second is the ease of transferability of title. This feature recognizes that it is rare, in any country, for the first person who lays claim to a deposit to have the resources to be the proprietor of the eventual mine, and as a consequence for a healthy mining industry to exist, there has to be a largely unregulated market place in mining claims. Thus, in Zimbabwe business is done between buyer and seller without any government intervention except for the purpose of registering the change of title. This system makes it profitable for persons to seek minerals for others to develop and ensures the

rapid transfer of exploitable deposits from finder to developer (and then to further owners if necessary). It is a key concept, fundamental to the success of the mining industry in, for example, North America and Australia, and yet the very idea of a marketplace in mining titles is almost unheard of in Africa.

It can be argued that Zimbabwe is a special situation, not just because of its history, but because of such factors as its diverse geology, the presence of many European entrepreneurs who created a mining tradition and the priority of mineral title over existing property rights. But the situation in Zimbabwe is not special. The geology is no more favourable than say, Tanzania. The great majority of claims (if not as yet of mines) are now owned by black Zimbabweans and the pre-eminence of mineral rights is generally accepted in most other comparable legal systems.

Indeed, all the evidence points to the need for a liberal mining law along the lines of the Zimbabwe model, if a significant mining industry is to be created. It is not enough to have a stable government and a stable currency. For example, the francophone countries of West Africa situated on the mineral-rich geological feature known as the West African craton (Mali, Niger, Burkino Faso) all use the CFA franc, which is supported by the French franc, and all have experienced (until recently) many years of stable rule. Yet their mining industries exemplify the 'missing middle' problem described above.

In the francophone countries, the law has always been *dirigiste*, and such changes that have been made have been largely superficial, and even counter-productive. For example, in a pattern that has spread through much of anglophone and lusophone Africa as well, attempts have been made to create a separate, simplified, legal regime for small-scale miners and a sophisticated one for large mines. The net effect, in at least one country, has been that foreign investors can have mining title as a property right but local prospectors and miners cannot.

Risk finance

On finance, thinking has been bedevilled by a false concept of the way mines start in Africa. It is normally seen as a steady sequence where a mining company goes from discovery to reconnaissance to exploration to evaluation to negotiation to exploitation. It is often envisaged as a process in which sophisticated computer-driven techniques predominate at every stage of this progression.

In fact, most mines – and particularly smaller mines – are found, financed and developed in an atmosphere resembling a casino rather than a computer

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room. The nature of mining in Africa means that there is a proliferation of unknowns, not just product market and price, but also rates of inflation, unforeseen bureaucratic hurdles, changing exchange rates and (not least) extent of ore reserves.

To deal with this uncertainty either experienced mining financiers or gamblers are needed. Because Africa has access to few of the former, the main source of finance for mines in Africa comes from local and foreign firms who are prepared to bet a small part of their resources on a gamble.

Such private sources of funds can appear in surprising places; at a conference on small-scale mining in Maputo, Mozambique in December 1990, the 'small-scale miners' present, who had come down at some risk from the war-torn northern pegmatite regions, turned out to include proprietors and entrepreneurs who had made their wealth in other fields and then put it into the mining industry.

However, taxes in Africa have generally been structured to prevent a sudden accumulation of affluence – for instance by high capital gains taxes. Yet it is the availability of such acquired wealth, and the consequent preparedness of the lucky individual or firm to put a portion of it in a high-risk high-return venture, that provides the capital of many small- to medium-sized mining enterprises.

Training for the African mining industry

There is an awkward imbalance in the mining skills to be found in much of Africa. Geologists and graduates in related fields such as geophysics and economic geology predominate over all other disciplines, by a ratio which would appear to be about 5:1. In the past, governments and the donor agencies have concentrated almost exclusively on training in those areas, with the result that African mining engineers and extractive metallurgists are seldom found in Africa.

The rationale for this is simple – that to get a mining industry a country must first have geologists to find the deposits. However, the evidence is that in the past, mineral deposits in Africa were mainly found by local people, and that this process is continuing today. In the last 20 years for example, local people have discovered significant new deposits of gold in Tanzania, emeralds in Zambia and Zimbabwe and aquamarines and other gemstones in Zambia and Mozambique. Nor are geologists very important for small producing mines; at a very rough average, in

most small mines in Zimbabwe a geologist is needed for advice about three times a year.

At the same time geological training in Africa does not necessarily impart the practical and financial skills needed to develop the many deposits that have been found. Here again, the Zimbabwe experience is illuminating. The diploma-level courses offered at the Bulawayo School of Mines do not teach geology, but have followed the demands of the industry, training mining and metallurgical technicians and mine surveyors. The University at Harare trains geologists, but also mining engineers and extractive metallurgists.

There is a need therefore for Africa to train more 'practical miners' capable of taking advantage of a liberalization of the mining law and the availability of risk capital. For too many mining professionals in Africa, academic geology in government offices has become a way of life, and consideration should be given to using this under-utilized human resource, perhaps through re-training courses, to start and run mines.

Conclusions

At the present time about US\$4000 million annually goes into Africa for technical assistance and there are about 100 000 expatriate experts on the continent. Despite this, only the first stage of the battle for African recovery has been won, which is getting countries to acknowledge that high population growth and low prices paid to farmers are at the root of their growing poverty.

The next phase of recovery – of using natural resources to generate wealth – will be dependent principally on the growth of mining. Until now countries have focused on investment by major mining groups for megaprojects, with *ad hoc* arrangements for these nationally important developments.

In the process they have missed the opportunity for a vigorous proliferation of smaller mines, and the consequent potential of such mines as precursors of much larger operations. The requirements for grasping this opportunity are first for a uniform mining law that grants full title to the finder or holder of a deposit, second for tax and other fiscal incentives to encourage risk money to develop those finds and finally the availability of trained people to develop and manage them. Without those features African mining will continue to be an unsatisfactory mixture of multinationals and riverside panners.