

Optimizing mineral linkages needs a conscious policy approach

For the mining sector to improve its contribution to broad based development, it must be better integrated into the national and regional economic fabric through linkages. To harness linkage opportunities, challenges such as those relating to deficiencies in human capital formation, particularly in knowledge intensive areas, as well as infrastructure inadequacies must be addressed

—The Africa Mining Vision

What can be done to open out the enclave nature of African Mining? The AMV and the ISG report argue that the way forward is to **strengthen linkages** between the mines and the immediate economy. This is not a totally new idea; as far back as 1980 the AUC Lagos Plan of Action advocated strengthening forward and backward linkages. But the Africa Mining Vision goes by further extending the notion of linkages beyond the mining chain itself by adding sidestream and lateral linkages. Indeed the AMV and the ISG Report goes beyond the “mining box” itself by urging planning for and investment in **development corridors**. Non-mining businesses and enterprises can take advantage of these arteries if the roads and railways and that move minerals to markets are strategically routed.

The key principle is to always adopt policies that are development orientated and therefore to plan investment in a strategic way. This means, for example, not only maximising the direct economic benefits of mining but also making sure improvements in infrastructure are implemented in such a way that other sectors of the economy can also benefit. Such conscious planning often has an **African regional integration** dimension; for example if a mine is far from a suitable port or the resource is in a landlocked country, this will involve regional cooperation as well as national strategies.

Linkages can be defined in different ways: quantitatively as inputs and outputs into the mining operation, or qualitatively in terms of the relationships between enterprises in the supply chain or even as the exchange of ideas. More generally, in a business environment, linkages are used to define any commercial interaction between different

profit-orientated enterprises and can take many forms such as supply contracts, partnerships and joint ventures or more informally, sharing of market information or technologies.

Taken together, the various linkages form a system of individual parts that can operate and function independently of each other but achieve their full vibrancy through interaction and overlap. Thinking in terms of linkages encourages consideration about how each participant in an industry is connected to others. In fact, in mining, every stage of the process from mining the ore through to final product manufacture using the metals may have **upstream, downstream, sidestream and lateral** linkages.

The fundamental problem with mining in Africa, according to the ISG Report, is that such linkages to the mines are not well developed (apart from transport and energy). This reflects the industry’s main orientation—extracting and shipping bulk minerals to overseas markets. It is not that the mining industry lacks linkages as such – just the opposite – it’s just that industry integration is mainly with overseas enterprises. This is precisely what usually makes mining an enclave activity as far as Africa is concerned. And it is, in turn, the reason why mining does not contribute sufficiently to development.

Tackling the problem entails recognising the constraints of the local economy and then consciously developing policies and plans that respond to the African context. For example, in terms of **upstream linkages**, it may be that local companies don’t have the capacity to provide the equipment that the mines need or perhaps central procurement by international mining companies

means that they aren't given a chance to tender. So stipulating a measure of local content in any mine operation might be a good way to start redressing the balance.

But African countries need to choose where to make the most effective intervention. This means the policies adopted need to take account of the mineral itself and the market. For example, it may appear attractive to adopt policies that strengthen **downstream linkages** such as smelting. Smelting may *look* attractive but the value it adds to an ore has declined in recent years as returns have been driven down by world overcapacity. In this case, the world market does not favour trying to develop downstream linkages. And in any event, without local manufacturing, the immediate market for refined mineral products is likely to be low.

Indeed there may be little realistic opportunity to enter the market at all. For example, for certain specialist metals, mining companies will have strong historical and technical links with the fabricators or manufacturers. And these companies will be unwilling to take on the risk associated with switching suppliers.

On the other hand, for bulky ore, the high transport costs does encourage some local concentration even though further processing and indeed manufacturing itself may well be done closer to the main markets. So here the kind of mineral creates the opportunity to develop downstream linkages that are local.

Supporting **sidestream linkages** such as financial services, power, logistics, communications, skills and technology development is critical because these can all support linkages elsewhere in the mineral value chain. This is especially true downstream, where inputs such as research and development, skills, technology and infrastructure become increasingly important.

Many sidestream linkages depend on the quality of human resources that are available – and education is often poor in sub-Saharan Africa. So building a skilled and knowledgeable workforce is a prerequisite. South Africa is a good example of how this can be done. It has strong **clusters** of specialised goods

and service industries as well as established tertiary institutions and programmes geared to transferring and improving skills in the sector. However, even South Africa's training at tertiary level is far too low to sustain strong local growth given international competition for skills.

Lateral linkages, generally only emerge in the advanced stages of industrial development. A lateral linkage is where capacity and expertise acquired in mining is applied to another sector. For example, knowledge in areas such as process control, construction equipment, and materials handling can be sold to non-mining enterprises.

In the longer term, policies should focus on helping secondary and tertiary level enterprises develop, these are more sustainable as they will continue long after the mines have been exhausted.

Between them, Africa's **regional economic communities** have the potential to supply the major mineral based components of the regional and global economies; iron-ore for steel manufacturing, nitrogen, phosphates and potassium for agriculture, and cement, steel rebars and copper for construction and infrastructure. But production has to be at sufficient scale to compete in regional and international markets. Removing trade barriers between African regions would ensure that the market for African produced feedstock is large enough to merit scaling up production to create regional value chains

So the right policies and strategies are critical for harnessing the development potential of extraction and processing and most of these can be conceived in terms of strengthening linkages. These can be summarised as:

- *More consciously and consistently integrating mineral policy into development policy.* This involves a shift away from the traditional—and practically exclusive—focus on mineral extraction.
- *Enhancing primary sector integration into the broader economy.* Building backward and forward linkages requires complementary strategies, primarily creating the business environment and public sector institutions that foster

growth. And secondarily—as far as governments can—setting terms on access to mineral resources that both impose linkage conditions on mineral rights holders and provide incentives for investors to structure projects in ways that deepen the integration of mineral projects into national and regional economies. Reasonable national local content and value-addition targets need to be incorporated into mining regimes.

- *Promoting mineral beneficiation before export.* Downstream processing of minerals before export need not be placed at the top of the national agenda for the mineral industry. Beneficiation contributes to growth and diversification only when it generates above average upstream and sidestream linkages, and should not be pursued merely for its own sake. Although some countries have used export taxes to promote downstream processing, experience is mixed and such taxes need to be applied judiciously.
- *Directing attention to developing upstream capital goods and service industries.* This is critical for employment generation and for generating new products and processes.
- *Enhancing local linkage development through local participation and empowerment models.* Many benefits can flow from local participation and empowerment models.
- *Extending economic infrastructure.* Funding and driving the establishment of economic infrastructure, particularly power and transport, is critical in prudent mineral development. Policymakers need to maximize the beneficial spill over effects of infrastructure triggered by mining by planning around resource corridors. Policies should encourage the collateral or integral use by other economic sectors. Mineral transport infrastructure needs to allow third-party access at nondiscriminatory tariffs. Expanded infrastructure will also promote rural development.
- *Developing human resources and fostering innovation.* Effort needs to be directed to expand higher technical skills required by the minerals

industry. Public support is required for innovation in fields related to natural resource exploitation through national innovation systems, such as tax incentivisation of local R&D and technical human resource development, as well as the allocation of some resource rents to developing technological linkages.

- *Pushing regional integration.* The gradual movement towards regional integration would go some way in overcoming barriers to establishing linkages, through creating regional common markets. African governments need to dismantle the numerous impediments to intraregional trade in order to realise the larger regional markets. Larger regional markets allow producers to benefit from economies of scale and mean that backward and forward linkage opportunities can be more readily exploited. (South Africa's New Growth Path has mooted creating an African Development Fund to invest in regional infrastructure and so stimulate intraregional trade and investment.)

In conclusion, successful linkage development relies on simultaneous multi-factor promotion in skills, savings, business performance, governance, pricing, policymaking and implementation capacity. (See the Mozambique case study below on how this can be achieved).

But of course, developing linkages and using mining as an engine of industrial development both depend on sustained demand for the minerals themselves. In the next bulletin, we will see that since, according to the ISG Report, we are in a period of a sustained rise in mineral prices – a super cycle – this provides an opportunity that Africa must grasp in the name of development.

Thinking strategically about linkages — a Mozambique case study

Mozambique emerged from its protracted civil war one of the poorest countries in the world. The Mozal aluminium smelter was the first major development in the country for decades and was made possible by private investment from international players, facilitation from the government and regional support from South African Government.¹

It began operations in 1999. From the outset a local enterprise development programme—Mozlink—was involved in the project, run by the International Finance Corporation and Mozal with the Investment Promotion Centre of Mozambique. Mozlink had evolved out a programme to train and mentor local small and medium enterprises in mining to bid for, win and perform construction contracts following Mozal standards. That success promoted the formation of Mozlink to provide technical and managerial assistance to upgrade the capacity of local mining SME suppliers to participate in Mozal's supply chain for goods and services. By 2007, Mozlink had built capacity in 45 local small and medium enterprises. In addition, monthly spending on 250 local firms supporting Mozal increased to \$17 million. Small and medium enterprise performance as measured by quality management, maintenance and safety improved by 20 per cent.²

Indirect spillovers fostered by Mozlink included the Mozambique Organisation for Quality to promote and train Mozambican domestic companies in international health, safety, quality and environmental standards; the Mozambican Business Network to encourage interaction with small and medium mining enterprises; and a three-year programme (with backing from the International Finance Corporation and large foreign investors) to get local SMEs more involved in procurement programmes for mining, natural gas and other industrial areas.³

Sidestream linkages from the smelter included an improved power grid, a large-scale water supply network, housing, better roads, a finger jetty to load products directly onto ocean-bound liners, a highway connecting the port of Maputo to South Africa, and overall improvements in investor confidence, which prompted them to consider setting up a heavy mineral sands operation (Corridor Sands).⁴

Notes:

1. UNECA, 2004.

2. Jaspers and Mehta, 2007.

3. Jaspers and Mehta, 2007.

4. UNECA, 2004; Sandenbergh et al., 2009.