

Global opportunities for 21st century mining

By [Professor Fred Cawood](#)

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A developing country like South Africa must balance the need for more jobs with the need for more profitable mines. A wake-up call came with the recent nose-dive in commodity prices, which caused some mines to become loss-making and poor. Who wants a poor mine? And ... more fundamentally ... why do we have poor mines sitting on world-class ore bodies?

Today, most corporations realise that they should do more for humanity. They also know that in order to do more, their enterprises must be more sustainable. It leaves them with the peculiar challenge that, if they want to participate in a 21st century world, they need to balance conflicting objectives through:

- Considering benefit creation as part of the business model;
- gaining access to realistic commodity pricing models; and
- appreciating that 21st century industries are technology-intensive.



Supply and demand

With sustained increase in the standard of living and a growing middle class in developing countries, the world's mineral production is expected to continue to grow over the long term - and there must be a consistent supply of mineral and metal products to meet such demand.

If we are not more responsible with how we exploit our existing reserves, the expected growth in world demand for minerals will cause a new scramble for resources.

This poses enormous opportunity for Africa and its mineral producers, because considering its largely untapped resource potential, future supply is likely to come from Africa.

Financial and infrastructure risks

A bigger intensity on mining Africa's resources will pose significant financial and infrastructure risks. Infrastructure is crucial for economic growth, and energy and transport constraints are likely to hinder Africa's potential as a growth

continent.

Industrial growth is necessary to combat poverty, and for sustainable growth, Africa must be manufacturing for both local and international consumption.

However, expensive and unreliable infrastructure continues to restrict Africa's growth. It adds to costs and risk, which deters investment and hampers growth. Low growth also means that less jobs are created, resulting in poverty being a persistent problem in Africa. If this trend is not turned around, it will cause (rather unfortunately) persistent African poverty.

Sustainable development

When sustainability and sustainable development are considered from a resources availability perspective, one must conclude that mining (as we know it) is not sustainable.

However, the world has reached a stage where society cannot survive without having access to products manufactured from mineral and metal products – and it is this need that has to be balanced with sustainable development.

Despite recent efforts to strengthen operation-community relationships, deteriorating stakeholder relations make it harder to obtain the social licence to practice.

Legislation and sustainability issues

Growing expectation gaps cause governments to push the limits on introducing legal instruments for regulating and taxing sustainability issues. The intention is good, namely mineral extraction for zero-harm and maximum-benefit, but large overlaps between political and technocratic matters fuels uncertainty on key sustainability issues.

Despite such concerns, the global trend on advancing sustainable development law and policy instruments is likely to lead to more appreciation for sustainable mining.

Realistic and stable commodity pricing models

Low commodity prices result in poor mines. Governments, financiers and markets jump too quickly on governance issues by simplistically inferring “...and if you don't include sustainability in your cost structure, we will punish and label you as a bad corporate citizen...” without giving enough thought to the real issue of fair pricing.

Commodity prices out of sync

In addition to the changing economics, the public and governments continuously scrutinise mining company finances in an attempt to extract more rents.

At the root of the problem is a commodity price that is out of sync with the claims to mining rents, and some stakeholders who are still oblivious to the fact that rent must be earned before it can be distributed.

Having these arguments in mind, we must aim for a future where markets are prepared to pay commodity prices that can accommodate all costs.

Policy uncertainty

The political economy of mining is “charged” because of all the expectations. It raises the issue of responsible investments, which is an attempt to align mining company objectives with societal values.

No wonder mining is still suffering from a poor public image. Resource nationalism is getting stronger with new options (instruments) coming from sustainable development studies.

The evidence points to an inverse relationship between policy-uncertainty and the level of investment - so policy uncertainty impedes investment.

Constantly changing or shifting goal posts affect mining investment decisions, and should rather be replaced by allowing permanent state participation in the mining industry. These issues will result in a future where state participation in mining is the rule rather than the exception.

Technology

In the 21st century, gold (or any other mineral for that matter) rushes will happen as a result of policy change and technology. Technology is the answer to the growing demand for minerals. The increased demand causes surface mines to get bigger and all mines to become more mechanised.

These strategies allow delivery of larger volumes required for industrial growth.

Innovation is key to survival, and sometimes incremental improvement is not enough, e.g. the case of ageing South African gold and platinum mines. Such mines need to innovate for production effectiveness.

The search for better or improved mining methods is on, and with that, ensuring that equipment operates reliably and predictably in new mining layouts. There is absolutely no doubt that the 21st century mine will be technology-intensive.

Workplace conflict

Worker activism not only has a grip on politics, but in countries like South Africa it has reached the point where workplace conflict is threatening mine sustainability.

Mining is getting more difficult as a result of more complex deposits, increasing depths and decreasing grades. The impact of technology is a safer workplace, sustainable operations and a more skilled workforce, with skills that are transportable to other sectors so that the rest of the economy can benefit.

The current skills-set for some mining occupations is not transportable to the rest of the economy, making such workers vulnerable to losing their employment during difficult times. The reason for this is because there is a lack of a skills development strategy for 21st century mining systems.

For mining to be a successful 21st century activity, a new skills-set has to be designed for all occupations.

Hope for a better life

Mining for benefit speaks to sustainable development and resource nationalism. An ore body comes with opportunity and despite its poor public image, mineral discoveries (and mining in particular) cause an influx of people hoping for a better life.

This expectation is seldom realised, leaving mines and government with more problems to deal with. There is a growing trend of more benefit provided directly by mining companies.

Poor service delivery of government adds to pressure on mines to deliver more benefit, inflated by local-content expectations from government and communities. In the future additional benefit arrangements will be the norm as mining companies “buy” political stability at a mine level.

What can be done about all of this?

Now that we have some idea what the future holds and its implications on mining, we can consider actions to ensure that we arrive at the future we are comfortable with.

Innovation stands out if we want to build a better future. By thinking of and implementing the points below the surprise element can be managed so that we can get to a better future - faster:

- Develop an African meaning for “just capital” and broad benefit;
- seek market arrangements allowing for fair commodity prices;
- institutional and legal frameworks that make rent sharing possible;
- remove barriers to entry for mining and manufacturing;
- new approaches to economics ensuring costs exceed revenues;
- identify current mineral resources with potential to become reserves;
- develop national mining R&D facilities for building 21st century mines;
- develop a strategy for a just transition into 21st century mining;
- creating decent work to be performed by skilled employees;
- ensuring accelerated transformation of mining and society; and
- communicating mining benefits.

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