

21ST CENTURY MINING: SIDE-STEPPING MINING'S DEMISE IN SA

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Wits Mining
Institute

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UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG



WHAT/WHO IS THE WMI?

INNOVATION FOR 21ST CENTURY MINING

THE WMI WAY

WMI Vision

Innovation in the extractive sectors through skills, modernization and sustainable development of Resource-Rich Africa

WMI Mission

Doing research and growing talent for Sustainable, 21st century Mining

CSMI RESEARCH AGENDA

Our focus is responsible mining in Africa

- Responsible Mining seeks to:
 - ✓ Achieve zero harm
 - ✓ Realise net positive environmental impact
 - ✓ Improve social performance
 - ✓ Leave a positive legacy
- We train practitioners and leaders, enabling them to manage the sustainability challenges of Africa's mining sector.
- We are a highly-relevant entity for applied research and analysis, providing strategic advice, customised studies, and equipment and policy reviews in health and safety, environment and socio-economic development.
- We are an independent, authoritative space for dialogue on how to manage mining development more responsibly.

Centre for Sustainability in Mining and Industry

Our focus is Responsible Mining in Africa across the Mining Value Chain

RESEARCH AGENDA

We concentrate on People and Process within Systems

CMMS THE CENTRE FOR MECHANISED MINING SYSTEMS

DIGIMINE RESEARCH AGENDA

With its underground focus DigiMine is about real-time risk management and having access to good information for operational safety and efficiency

MINING AND SOUTH AFRICA

INNOVATION FOR 21ST CENTURY MINING

MINING

“The process or business of extracting ore or minerals from the ground”

(<http://www.thefreedictionary.com/mining>)

Mine when used as a verb ... the mining of any mineral, in or under the earth, water or any residue deposit, whether by underground or open working or otherwise and includes any operation or activity incidental thereto, in or under the relevant mining area

Mineral and Petroleum Resources Development Act 28 of 2002 S 1

DEMISE

“Death or de cease; termination of existence or operation e.g. the demise of the empire; end of something...”

(<http://www.dictionary.com/browse/demise>)

Synonyms: extinction · collapse · destruction · etc.

**Will SA mining cease to exist
before resource depletion?**

MINING IN SOUTH AFRICA

The good

- Mining is the foundation on which South Africa's economy is built
- Judged by competition for seats at university, mining appeals to a youth in need of (good) jobs

The bad

- Mining contributed to South Africa's legacies with 'benefit' having a narrow meaning in the past
- Mining stakeholders have different needs making it hard to collaborate

The ugly

- The Tripartite system has collapsed and lacks a united vision
- The steady decline of mining's importance, jobs in mining, share of GDP, etc. continues


MORE VIEWS

- Mining sucks...
- Mining = Profit...
- How often do we hear? *These mining companies...*

Conclusion: Mining is poorly understood

Deep Sea Mining – Insanity Re-Defined By Man's Greed

A Canadian mining company has a license for an insane idea that could become a planetary disaster: Deep Sea Mining. We all know how toxic mines can devastate land-based ecosystems – imagine corporations unleashed to dig up the ocean floor for minerals, far from any scrutiny. It's the last thing our dying oceans need!



[Read More](#)

no Editor August 18, 2016 Mining 0

Environmental Risks of Mining

How they arise and how their effects can be mitigated

Overview

Unregulated mining has the potential to release harmful substances into the soil, air, and water. Mission 2016 proposes that governments enforce regulations on companies and use cutting-edge technology to reduce the damage from mining-related sources. As more mines open in countries with varying levels of environmental protection, it is increasingly vital that safeguards established by the Strategic Minerals Association (SMA) are in place before operations proceed (see the [international regulation](#) page).

http://web.mit.edu/12.000/www/m2016/final_website/problems/mining.html

MINING IN SOUTH AFRICA ISN'T ALL BAD

Johan Krynauw | July 1, 2015 | Breaking News, Current News | No Comments

Laura Cornish of [Miningreview.com](#) suggests that mining in South Africa is not all bad. The South African mining sector is currently being plagued with negative sentiment – 'regulatory uncertainty is driving investment away, electricity prices are too high, electricity supply is inconsistent, wages are escalating, etc., etc.'. And that is just for starters but she believes there are many positives.

<http://www.gssa.org.za/>

The Citizen

Uncategorized 16.5.2014 12:47 pm

Mechanising mine is bad news – UDM

f t s e



FILE PICTURE UDM leader Bheki Ntshona. Picture: Andrew Razzie

THE BOTTOM LINE

#MiningMatters #ItAddsUp

Actually ... It is important

- For grinding our way out of poverty
- For contributing to the strained country budget
- For building infrastructure, delivering basic services, skills development, etc., etc.
- For growth!



457,698
direct jobs



approximately
4.5 million
dependants supported



R116.7 billion
annual employee earnings

MINE SA
2016
Facts and Figures
Pocketbook



CHAMBER OF MINES
of South Africa



THE WAKE-UP CALL

- Falling commodity prices bring hard times to mining and can cause its demise
- There is a limit to how (good) orebodies can help to survive hard times
- **But something is wrong!** Rising commodity prices are no longer bringing good times to SA mining
- Country SA, not only its ore bodies and mining companies, must be competitive
- **In conclusion**, reckless politics can cause mining's demise, no matter what prices are doing

COMPANY COMMENT:

Sovereign; politics in mining

Individual shareholder takes bet on Sovereign, while most investors will avoid South African mining as long as the sector is seen as a political football field or a cash cow

11 OCTOBER 2016 - 09:49



Minsheng Zhong Picture CC BY

<https://www.businesslive.co.za/bd/companies/2016-10-11-company-comment-sovereign-politics-in-mining/>

<https://www.moneyweb.co.za/archive/malemas-trillions-from-mines-claim-is-a-lie/>

[Political economy](#)

Malema's "trillions from mines" claim is a lie

Not much in nationalisation for labour, government or SA – analyst.

David Carte / 8 October 2010 17:23 [No comments so far](#)

JOHANNESBURG – Award-winning analyst Peter Armitage of Investec Wealth Management has produced figures that give the lie to wild claims of mine profitability by Julius Malema.

Malema told hundreds of ANCYL supporters that mine bosses were thieves and that mine profits run to "trillions", which should go to workers and the poor.

The gap between Malema's claims and reality raises the question whether we need "truth in politics" laws, as in advertising.

POLITICS ARE IMPORTANT, BUT THERE ARE ALSO
INTERNATIONAL ISSUES AFFECTING SA MINING

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Global Trend

Scarcity of mineral reserves

Expensive, unreliable infrastructure in Africa

Persistent stakeholder attention

Fluctuating prices cannot support sustainability

Political economy fuelling resource nationalism

Pace of technology adoption is intensifying

21st century skills-sets

Future

Grow reserves or go remote

If not improved, infrastructure will continue to restrict growth

Improvements in sustainable development objectives

Competitive prices - afford the full cost of mining

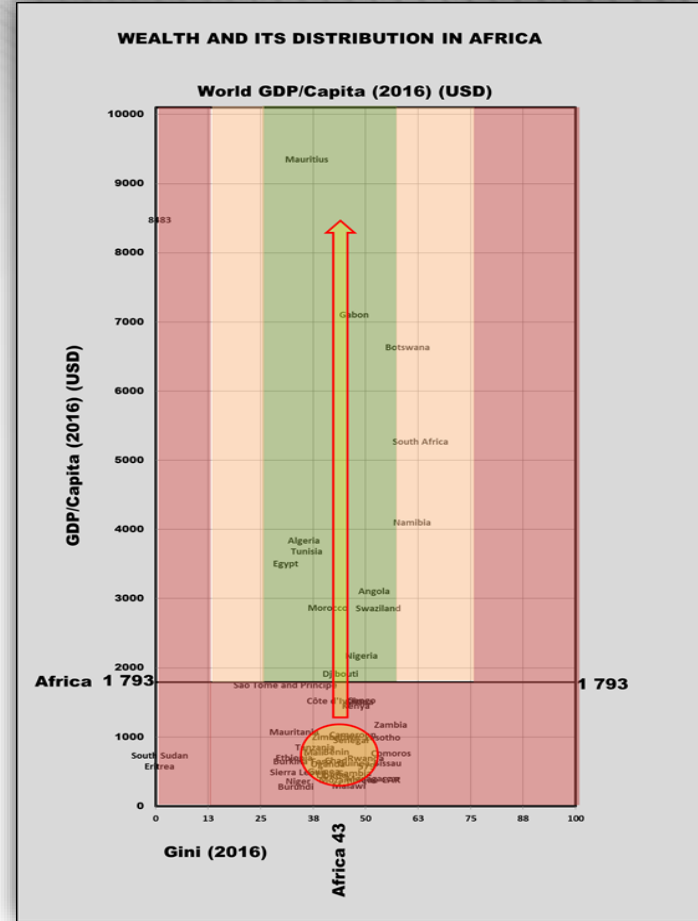
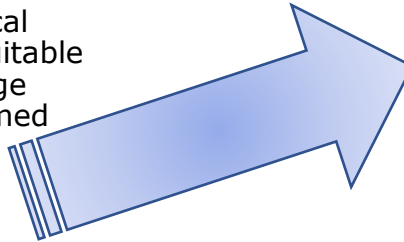
State participation in mining

Technology-intensive mines

Less worker vulnerability

MINING'S VALUE PROPOSITION TO AFRICA

1. Creating benefit by converting tomorrow's resources into money today
2. Spreading benefit to communities in which we operate
3. Stimulating mining clusters by triggering economic linkages
4. Publication of critical information in a suitable format to encourage sensible and informed debates
5. **A better Africa**



HOW WILL THESE GLOBAL ISSUES INFLUENCE AFRICAN MINING?

We have to accept and find ways of

- Creating more benefit for all stakeholders
- Investing in sustainable development practices
- Being technology-intensive (to be competitive)

Communities seeking economic benefit from mining

8TH JULY 2011 [SAVE THIS ARTICLE](#) [EMAIL THIS ARTICLE](#)
BY: **NATASHA COORDAAL**
CHALLENGER PUBLISHER IDENTITY EDITOR ONLINE FONT SIZE: 

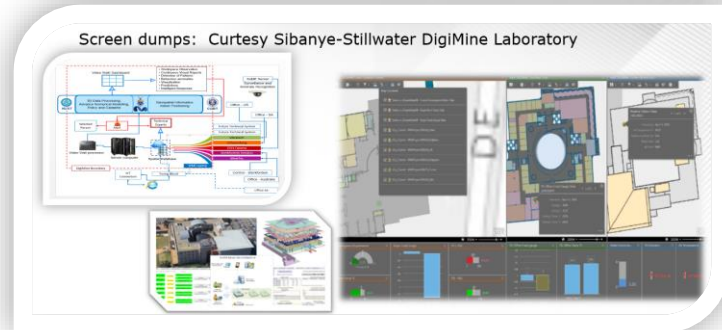
Local communities are increasingly seeking economic benefit from mining activities in their regions through equity stakes, infrastructure development, job creation and improving the communities' ability to supply services and goods, international consulting firm Synergy Global Consulting director **Paul Kapelus** tells *Mining Weekly*.

There is an increased drive in countries to secure greater royalties and equity for communities from mining companies and to examine how the wealth from the mine can be translated into economic opportunities.

<http://www.miningweekly.com/article/communities-seeking-economic-benefit-from-mining-2011-07-08>

Implication: the mine of the future will

- Be and look differently
- Be funded and managed differently
- Require a different skills-set and staffed by new professions that do not exist today...



TECHNOLOGY IS HARD TALK, BUT ...

As a humanity, our journey over time has been 'disrupted' by technology several times

- In the beginning: *Man was Machine*
- Agricultural revolution: *Man wanted Machine* (Started around 8000 BC)
- Industrial revolution: *Machine was Man's muscle* (Started around 1760)
- Information revolution: *Machine makes Man happy ... or sad* (Started around 1940)
- 4th Industrial revolution: Information is forward looking, smart and visual: *Machine is almost Man?*

The result at the start of the 21st Century

- A sustained increase in the standard of living around the world over time
- A mechanised, digital world with machines generating (a lot of) instant information
- This (surface) world of technology is going underground ... and we cannot stop it

Machines already do (underground) work for us where we 'instruct' from a safe space

Machine is (becoming) Man, so Man must become smarter!

TECHNOLOGY'S VALUE PROPOSITION TO FUTURE MINING

Mine sustainability

1. Finding 'forgotten' mineral resources – a “quick-win”
2. (Real-Time) National Resource/Reserve statements
3. Improving efficiency and reliability of infrastructure
4. Reducing the cost of mining
5. Linking buyers and sellers in new ways for better pricing
6. Business improvements for benefit e.g. Real-time economics
7. Sharing information and communicating benefit
8. Appropriate worker-friendly IT systems for mining
9. Mine modernization
10. Relevant learning materials for a 21st century economic cluster

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WHAT SHOULD WE DO TO SIDE-STEP MINING'S DEMISE? (1)

Embrace Africa

- Africa has the mineral resources the world needs
- Africa has the people (and skills) to make it happen

How? African governments and mining companies in Africa can

1. Align their policies and strategies with the African Mining Vision
2. Three cross-cutting subsets as part of all decision-making processes:
 - Innovations for broad benefit;
 - Innovations for mine sustainability; and
 - Innovations for business improvement.
3. Embrace the 21st century and technologies supporting a digital economy

WHAT SHOULD WE DO TO SIDE-STEP MINING'S DEMISE? (2)

Embrace South Africa

- Despite a history of division and conflict, we got it right when it mattered most
- Despite our differences and the intensity of our debates, we understand ourselves ... better

How? South African mining stakeholders can

1. Demonstrate Leadership by creating the will to partner for benefit
2. Commission its own 'Truth and Reconciliation' process to deal with mining legacy issues – for good
3. Create united vision and mission statements of local and 21st century relevance

WHAT SHOULD WE DO TO SIDE-STEP MINING'S DEMISE? (3)

Embrace Mining

- A life without mineral products is miserable
- When mines get it right, the legacy is positive

How? Mining stakeholders can

1. Embrace responsible mining through adopting responsible mining practices relevant to SA
2. Speak the truth about mining (arguments based on fact, not perception) even when it hurts
3. Communicate the importance, impact and disappointments of mining

WHAT SHOULD WE DO TO SIDE-STEP MINING'S DEMISE? (4)

Embrace sustainability

- Despite a long history of extensive mining, South Africa still has good future mineral potential
- Lure capital into mining with an enabling investment framework

How?

1. Appreciate that there can be no sustainable development without mine sustainability
2. Develop a South African meaning for 'just capital' and sharing of benefit
3. Regulate (and administer) for sustainable development and benefit

WHAT SHOULD WE DO TO SIDE-STEP MINING'S DEMISE? (5)

Embrace mine modernization

- Machines and Sensors are now doing what people did in the 20th century
- Technology systems will become more!

How? Other than R&D

1. Implement the roadmap for mine modernization in South Africa (Mining Phakisa)
2. Adopt and adapt of new technologies for intelligent mining systems and decisions
3. Develop comparative statistics for technical and machine efficiencies

WHAT SHOULD WE DO TO SIDE-STEP MINING'S DEMISE? (6)

Embrace 21st century skills

- We have the skills to build new mines and operate existing ones
- Development of new skills, tools and competence to support a safe and efficient 21st century mine

Skills requirements

1. Collaborating skills (to include people, machines and systems)
2. Computer applications to mining – Advanced numeric modelling, 4d GIS and BIM for Mining
3. Systems thinking and Artificial intelligence for intelligent mining systems and real-time mining

CALL TO ACTION: RE-IGNITE THE TRIPARTITE SYSTEM

It's smart to have a united mission – Converting resources into reserves

1. Innovation should start at the orebody!
2. Growing reserves in mining means more jobs are created
3. Maintaining reserves means jobs are saved

It requires Stakeholders who understand that

- Companies Innovate for Benefit, pushing the boundaries on efficiency and profit
- Government Regulates for Benefit, pushing the boundaries on local benefit and taxes
- Unions Negotiate for Benefit, pushing the boundaries on job preservation and worker wellbeing
- Civil society wants Justice, fighting for Balance...



Thank You

www.wits.ac.za/wmi/

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