

**LEGAL ANALYSIS OF THE IMPACT AND CONSEQUENCES OF
ENVIRONMENTAL DEGRADATION
IN MINING COMMUNITIES IN SOUTH AFRICA**

BY

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DECLARATION BY STUDENT

I Pretty Maanate Makua declare that legal analysis of the impact and consequences of environmental degradation in mining communities in South Africa is has not previously been submitted by me for a degree at this or any other university; that it is my work in design and in execution, and that all material contained herein has been duly acknowledged.

Signature

date

DEDICATION

I dedicate this mini-dissertation to my mother Mahlaku Ragosebo Makua, my Father Hlabirwa Kopotja Makua and my siblings who have encouraged me to work hard. They have guided me when I led astray and reminded me that I have potential to become a better version of myself. Thank you very much your efforts did not go unnoticed. God bless you.

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ABBREVIATIONS

ACEF - All-China Environment Federation

ADM- Acid Mine Drainage

ARD- Acid Rock Drainage

ARM- African Rainbow Minerals

CWP- Coal Worker's Pneumoconiosis

DMR- Department of Mineral Resources

DRD- Durban Roodepoort Deep

DEA-Department of Environmental Affairs.

DME- Department of Minerals and Energy

DMR- Department of Mineral Resources

EPBC- Environment Protection and Biodiversity Conservation Act

EMP- Environmental Management Plan

HDSA'S- Historically Disadvantaged South Africans

MA- Mineral Act

MHSA – Mine Health Security Act

MHSR- Mine Health and Security Regulations

MPRDA- Mineral Petroleum Resources and Development Act

NDP- National Development Plan

NEMA- National Environmental Management Act

PAJA- Promotion of Administrative Justice Act

KOSH- Klerksdorp, Orkney, Stilfontein, Hartebeespoort

ABSTRACT

Section 24 of the constitution of the Republic of South Africa, 1996 guarantees a right to a healthy and safe environment. It provides for the environment which is beneficial, conducive and productive to the community. However, this right is being violated on a daily basis by the mining companies which degrade the environment through their activities or operations within the mining communities by violating the legal regulations aimed at restoration, rehabilitation, management and prevention of degradation to the environment. Therefore this mini-dissertation advocate for stringent enforcement of the laws aimed at prevention of environmental degradation and further compels mining companies to comply with existing laws. It calls for the minister not to hesitate to revoke the mining licences or withdrawal of the mining permits of any erring mining companies. It utilises the jurisprudence from China and Australia as comparative study in order to draw relevant lessons from their approaches.

Keywords: Rehabilitation, Environment, Environmental Management, Degradation, Community and Mining

CHAPTER 1: HISTORICAL BACKGROUND TO ENVIRONMENTAL DEGRADATION

“We are told that we should live next to the mines and be good neighbours. But they don’t return the favour.”¹

1. Introduction

Environmental degradation is majorly caused by the failure of the mining companies to implement the environmental and rehabilitation processes. Therefore, this failure impacts negatively on the environment and human health on the basis that the environment is no longer conducive and beneficial to the mining communities. There is a need to comply and for plans to be put in place for measures aimed at rehabilitating and protecting the environment at the end of the mining operations and beyond, by the mining companies.

In South Africa, the mining industry plays a vital role in the growth and development of the country and the economy. Since the discovery of minerals in the country this endowment of mineral resources has been a key driver of the country’s social and economic developments. Mining industry needs to pursue actions that seek to limit and mitigate harmful impacts on sensitive ecosystems and associated effects. There is a need to be mindful of the fact that without protection of the natural systems, there will be no sustained long-term economic growth. The extractions of these minerals should be designed to benefit the country as amplified in the Mineral Petroleum Resources Development Act (MPRDA)² and other regulations such as National Environmental Management Act (NEMA)³ and others, as well as the Constitution of the Republic of South Africa, 1996 (Constitution). To date mining continues to be one of the most significant sectors of our economy, providing jobs, growing the economy and building relations with the rest of the world (international trading partners), however poor mining operations are costing the country its major assets and resource which is the environment.

¹ Gericke J quoted by Siphso Kings ‘Gupta mine tests farmer’s resilience *Mail & Guardian* 01 April 2016 – <https://mg.co.za/article>2016-03-03>. Accessed 23/05/2016.

² Minerals Petroleum Resources Development Act 28 of 2002.

³ National Environmental Management Act 107 of 1998.

2. Research Problem

It is now widely accepted that climate change poses an existential threat to humanity.⁴ Good environmental governance is an important pillar in the global partnership for sustainable development.⁵ Environmental governance may be described as the manner in which people exercise authority over nature. Natural resource management was internationalised by the 1972 Stockholm Declaration,⁶ echoing the earlier internationalisation of human rights by the 1948 Universal Declaration of Human Rights.⁷ The concept of a human right to a healthy environment has developed from the first principle of the *Stockholm Declaration* which states that:

“Man has the fundamental right to freedom, equality and permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations.”⁸

The *Stockholm Declaration* does not specify the right to a healthy environment, as such, but it does claim the right to adequate conditions of life in a temporal perspective to safeguard the environment for future generations. It follows that a healthy environment

⁴ Doelle, M “Climate change and Human Rights: The role of the International Human Rights in motivating States to take climate change seriously” 2004 *Macquarie Journal of International and Comparative Environmental Law* 179; Meyer, EL & Odeku, KO Climate change, energy, and sustainable development in South Africa: Developing the African continent at the crossroads” 2009 *Winter Law Reporter* 49; Maguire, R & Lewis, B “The influence of justice theories on international climate policies and measures” 2013 *Macquarie Journal of International and Comparative Environmental Law* 2; Maguire, R & Lewis, B “The influence of justice theories on international climate policies and measures” 2013 *Macquarie Journal of International and Comparative Environmental Law* 2. Accessed 23/05/2016.

⁵ Jeffrey, M “Environmental ethics and sustainable development: Ethical and Human Rights issues in implementing indigenous rights” 2005 *Macquarie Journal of International and Comparative Environmental Law* 105; Schultz, J “Balancing the Relationship between Trade and the Environment within the World Trade Organisation: Is the End of the Sea Turtle?” 1999 *Asia Pacific Journal of Environmental* 37; Agius, J “International Environmental Law and State Sovereignty” 1998 *Asia Pacific Journal of Environmental* 26. Accessed 13/06/2016.

⁶ *Declaration of the United Nations Conference on the Human Environment (Stockholm)* UN Doc A/CONF/48/14/REV.1. (“*Stockholm Declaration*”). See Horn, L “The implications of the concept of common concern of a human kind on a Human Right to a healthy environment” 2004 *Macquarie Journal of International and Comparative Environmental Law* 233. Accessed 04/04/2016.

⁷ The Universal Declaration of Human Rights (UDHR) UN General Assembly in Paris 10 December 1948.

⁸ *Stockholm Declaration* Principle 1.

is necessary for the appreciation of other human rights.⁹ Section 24 of the South African Constitution embodies the right to a healthy environment and to conservation of the environment.

Good environmental governance would begin with a democratic dispensation that allows full participation to civil society in the running and administration of its affairs. Such a dispensation enables national and provincial legislatures to respond to the emerging needs of society for general and specific regimes and laws for environmental protection and sustainable development. Legislation is a major tool for achieving good environmental management.¹⁰ Rule of law,¹¹ respect for human rights and a free and independent judiciary are essential for protecting and enforcing environmental protection regimes.¹²

Since the late 19th century, South Africa has exploited its mineral wealth with little or no regard for the environment.¹³ From an environmental perspective South Africa faces several related challenges,¹⁴ amongst the prominent ones being environmental

⁹ Lewis, B Environmental rights or a right to the environment? Exploring the nexus between Human Rights and Environmental protection” 2013 *Macquarie Journal of International and Comparative Environmental Law* 97; Buchheit, B & Mansfield, M “The global water crisis: Impending disaster and the road to collapse” 2008 Lewis, B Environmental rights or a right to the environment? Exploring the nexus between Human Rights and Environmental protection” 2013 *Macquarie Journal of International and Comparative Environmental Law* 21; Lewis, B Environmental rights or a right to the environment? Exploring the nexus between Human Rights and Environmental protection” 2013 *Macquarie Journal of International and Comparative Environmental Law* 3. Accessed 20/05/2016.

¹⁰MPRDA & NEMA.

¹¹ S 1(d) of the 1996 Constitution. See *UDM V Speaker of the National Assembly & others* [2017] ZACC21 (22 June 2017); *EFF v Speaker of the National Assembly* 2016 (3) SA 580 (CC).

¹² Hassan, P “Environmental Protection, Rule of Law and the Judicial Crisis in Pakistan” 2007 *Asia Pacific Journal of Environmental Law* 167; Mehta. MC “Making the Law Work for the Environment” 1997 *Asia Pacific Journal of Environmental Law* 349.

¹³ *Agri SA v Minister for Minerals & Energy* 2013 (4) SA 1 (CC), *Minister of Mineral Resources and others v Sishen Iron Ore Company (Pty) Ltd & others* 2014 (2) SA 603 (CC). The MPRDA defined joint holders of undivided shares as an “old order mining rights.”

¹⁴ Another veritable source of environmental degradation is the thriving and treacherous illegal mining or the so-called zama zama” around disused mine shafts. See Thalia Holmes “Trapped illegal miners avoid rescue to delay arrest” 17 Feb 2014 15:20; Jonisayi Maromo “NUM warns of looming illegal mining

degradation caused by the failure of the mining companies to implement the environmental and rehabilitation processes.

The extent to which the extractive industry is held accountable for the impact and consequences of environmental degradation in mining communities has been, and still is, a thorny issue in environmental law not only in South Africa, but elsewhere.¹⁵ The question arises is: does the regulatory framework suggest that South Africa adhere the elements of good environment governance with respect mitigated the adverse effects of mining activities on local communities

2.1. Source of the problem

The source of the problem is that the regulatory provisions contained in the MPRDA, NEMA and the NWA, are seldom effectively complied with, implemented and enforced. There are a number of reasons for this.

Generally, the responsible institutions namely; Chemicals and Waste Management, Legal Authorisations and Compliance Inspectorate and Environmental Advisory Services lack capacity and the will to enforce compliance by mines with the conditions of the permits or rights and EMPs / EMPs in that they fail to follow up on rehabilitation and restoration of the land after the mining activities by the mining companies. Furthermore, the regulatory authorities tend to pay lip service to the environmental impact assessment requirements contained in the MPRDA before granting prospecting

disaster” 22 Feb 2014 18:30; Sally Evans, Justice Kavahehmatui, Tabela Timse “Aurora meets Marikana at bloody Blyvoor” 07 March 2014 00:00; Editorials “Editorial: Police failings mock Constitution” 04 Apr 2014 00:00; Janet Love, Angela Kariuki “Violent threat, real opportunity in zama zama gold rush: 25 Aug 2015 00:00; Beatrice Debut “Gang wars erupt over abandoned mines in SA” 02 Nov 2015 11:34 <https://mg.co.za>. Accessed 25/06/2016

¹⁵ Tou, X “The transboundary movement of harmful wastes and the transformation of traditional State responsibility” 2008; Mwebaza, R “Regulating the environment in the European Union: A critical review of the General Law of European Union external environmental relations 2008 Lewis, B Environmental rights or a right to the environment? Exploring the nexus between Human Rights and Environmental protection” 2013 *Macquarie Journal of International and Comparative Environmental Law* 3; Ashiabor, H & Blazey, P “Phasing out detrimental ecological subsidies in the fossil fuel sector: Challenges and prospects for the Asia Pacific Regions 2007 *Asia Pacific Journal of Environmental Law* 211; Oei, P “Oil Pollution and International Law: Singapore Experience with the New Law of the Sea” 1999 *Asia Pacific Journal of Environmental* 87; Davidson, J “Resolution of Transboundary Pollution Disputes: The Great Lakes Experience” 1998 *Asia Pacific Journal of Environmental Law* 233. Accessed 25/06/2016.

and mining rights.¹⁶Sometimes, the Department of Environmental Affairs (DEA) will act against degradation in instances where there is a breach of the duty of care under NEMA resulting in significant pollution or degradation. Certain provincial environmental departments, particularly the Western Cape Department of Environmental Affairs, are more inclined to act against erring mining companies that carry out listed activities in order to give effect to the general objectives of integrated environmental management laid down in this Chapter. The potential impact on the environment and socio-economic conditions ¹⁷ under NEMA without authorisation, cause significant pollution or degradation, or fail to rehabilitate.

While the minerals and regulatory authorities have the legislative power to conduct the necessary clean up and recover the costs from those that were responsible or benefited from the mining activities, however, because of corruption and compromise, the mining companies usually get away with non-compliance as the authorized institutions fail to enforce compliance.¹⁸

The continued pumping of ground water from gold mine shafts into the controlled streams is essential to prevent water contamination, flooding of shafts and decanting.¹⁹ Even after a mine closes, the need to continue pumping into a controlled stream to prevent environmental degradation and pollution remains²⁰ because if the water is not pumped out of the mine shafts, may contaminate clean water resources such as underground water with the chemical residue even overflow into the rivers which leads to water reservoirs.²¹ However, when a mine closes because it is no longer profitable, the rehabilitation fund in terms of section 41 of the MPRDA might not be adequate to

¹⁶ Truter, J South Africa: Mining Rehabilitation-A regulated activity. Werksmans incorporated. Accessed 23/03/2017.

¹⁷24. (1) In order to give effect to the general objectives of integrated environmental management laid down in this Chapter. the potential impact on—(a) the environment;(b) socio-economic conditions: and (c) the cultural heritage, of activities that require authorization or permission by law and which may significantly affect the environment, must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorizing. Permitting, or otherwise allowing the implementation of an activity. Section 24 (1) of NEMA.

¹⁸The Universal Declaration of Human Rights (UDHR) UN General Assembly in Paris 10 December 1948.

¹⁹ Wolfgang F (2003): Water control and mining grouting a South African historical perspective. Accessed 04/05/2017.

²⁰ UDHR

²¹ McCarthy T.S (2011): The impact of acid mine drainage in South Africa. Accessed 09/08/2017.

fund the required pumping for more than a few months at most²² because sometimes the retained financial provision is always never enough to cover the damage caused to the environment for restoration, rehabilitation and management necessary as contemplated in NEMA and the MPRDA. From an administrative and practical perspective, mining companies are required to re-evaluate their rehabilitation liabilities and ensure that they must be able to provide upfront for any shortfall in the provision for such rehabilitation liabilities.

The question of who is responsible for funding in terms of section 41 of the MPRDA which states that an applicant for a prospecting right, mining right or mining permit must before the minister approves the environmental management plan or environmental management programme, make the prescribed financial provision for rehabilitation or management of negative environmental impacts, the continued pumping then arises. Presently the options are rather limited. Either the neighboring mines will need to carry this cost (so as to prevent their shafts from flooding) or Government will need to exercise its powers²³ under the relevant legislation by intervening (to prevent environmental degradation and pollution from occurring) and then recovering the costs²⁴ proportionately from those that benefited from the measures taken.²⁵

3. Background to the problem

Before the end of the 1980s and early 1990s, the governmental policies on minerals and mining shifted. Mining policy became much more focused on privatization and deregulation of mineral resources.²⁶ Various reasons were advanced for the turnaround in mineral policy that eventually resulted in the enactment of Mineral Act 50 of 1991(MA). One consideration was that it would be in the interest of the economy to

²²UDHR

²³Section 16 of NEMA which gives the government the power to intervene to prevent environmental degradation and the Section 3 of the MPRDA which bestows the duty of custodianship of nation's minerals and petroleum resources.

²⁴Section 16 of NEMA which gives the government the power to intervene to prevent environmental degradation and the Section 3 of the MPRDA which bestows the duty of custodianship of nation's minerals and petroleum resources

²⁵ Truter, J *Mining rehabilitation- a regulated activity- natural resources* 28 November 2011. Accessed 03/03/2016.

²⁶Badenhorst, PJ 'The re-vesting of state-held entitlements to exploit minerals in South Africa: privatization or deregulation' 1991 TSAR 113, 133 "hereafter "Badenhorst". Accessed 03/03/2016

attract foreign investment, and that this would be promoted by simplifying the existing body of mining laws.²⁷ It was purportedly in line, moreover with the desire of the government in the late 1980s to privatize and deregulate the economy.²⁸ To this end, Walde suggested that the MA represented an attempt by the white minority “to cement their position of privilege by changing the mining law in their favor shortly before a black government came to power”.²⁹ After two years of Debates of Parliament Minerals Bill second reading Debate proceedings of the extended committee-Assembly³⁰ and trade unions³¹ the new law on minerals, the MA, was enacted at a time when transition of the political system was already imminent. The MA came into force on 1 January 1992. The Precious Stones Act 73 of 1964 and large parts of Mining Rights Act 20 of 1967 were repealed in their entirety.³² The statute creating the infrastructure for establishing title security over mining rights, the Mining Title Registration Act 16 of 1967³³ was retained to a limited extent, for purposes of the transitional measures in Chapter VII of the MA, which pertained to statutory rights registered or registrable in the Mining Titles Office.

The goal of the MA was to achieve uniform regulation of minerals.³⁴ As opposed to the previous system of regulatory control through ‘conferral’ of rights the system introduced in 1991 aimed to achieve the regulatory objectives of the state by imposing a system of ‘authorization’. It simplified the complex multiplicity of the prospecting, mining and surface right forms that had existed before its commencement. It also consolidated the rules regarding the exercise of mineral rights and those regarding the achievement of

²⁷ Badenhorst, Mostert & Dendy (1991) the re-vesting of state-held entitlements to exploit minerals in South Africa: privatization or deregulation’ 1991 TSAR 113, 133 “hereafter “Badenhorst”. Accessed 17/03/2016.

²⁸ Badenhorst (1986) with reference to the white paper on the mineral policy of the Republic of South Africa. 03/03/2016

²⁹ Walde, T (2002) ‘Mining law reform in South Africa’ (17) *Minerals & Energy* 10. Accessed 08/05/2016

³⁰ Debates of Parliament (Hansard) Minerals Bill second reading Debate (proceedings of the extended committee-Assembly) (1991) Cape Town.

³¹ Badenhorst, (1989).

³² The Diamonds Act 56 of 1986 at that point already had been repealed. It has placed some of the earlier laws dealing with the Diamond Industry specifically, concerning matters such as dealing in and possession of unpolished diamonds. The Minerals Act 50 of 1991 expended the scope of the Diamonds Act by adding provisions dealing with the powers of search. See s25A, Minerals Act of 1991.

³³ Badenhorst *PJ: Schoeman’s The Law of Property* 5 ed (2006) 668 (The Law of Property”).

³⁴ Kaplan, M & Dale, M O *A Guide to the Minerals Act 50 of 1991* (1992) 10 (Kaplan & Dale).

prescribed health and safety standards.³⁵ Furthermore, it dealt with rehabilitation, surface use and acquisition of land and payment of compensation in respect to open-cast mining operations, as well as underground mining operations and prospecting or mineral recovery operations in respect of tailings.³⁶ All pre-existing classification of and minerals became irrelevant with the introduction of the MA. The Act referred to minerals in uniform fashion. It did likewise with land.³⁷ The MA pursued a trinity of objectives, namely (i) optimal utilization of country's mineral resources; (ii) mining safety and health; and (iii) rehabilitation.³⁸ It was the task of government to regulate the prospecting, optimal exploitation, processing and utilization of miners and to ensure rehabilitation of the land and safe mining practices.³⁹ Its stated purpose was to ensure adherence to these principles by imposing a system of 'authorizations'. Only three different forms of authorizations namely prospecting permits, mining permits or mining licenses existed.

This constituted a significant reorientation of the previous dispensation, which acknowledged about 40 types of permits, licenses, concessions and so on.⁴⁰ No person could prospect for minerals without having been granted the necessary authorization in accordance with the Act.⁴¹ The applicant had to provide proof of the right to the mineral and had to comply with certain environmental requirements pertaining to rehabilitation of surface disturbances and the ability to rehabilitate such disturbances.⁴² The applicant also had to demonstrate the ability to prospect in a healthy and safe manner, to the satisfaction of the Chief Inspector of Mines.⁴³

³⁵ Kaplan & Dale (1999) In this way, it extended beyond the Mines and Works Act 27 of 1956, which dealt only with rehabilitation of open-cast mines. Accessed 27/06/2016

³⁶ Ashton P, Love D, Mahachi H & Dirks P (2001): Overview of the impact of mining and mineral processing operations on water resources and water quality in the Zambezi, Limpopo and Olifants catchments in Southern Africa. Accessed 10/08/2017.

³⁷ McCorquodale J (1986): The legal classification of race in Australia. Accessed 10/08/2017.

³⁸ Kaplan & Dale (1999)

³⁹ , Minerals Act 50 of 1991

⁴⁰ Debates of Parliament (Hansard) Minerals Bill second reading Debate (proceedings of the extended committee-Assembly) (1991) Cape Town.

⁴¹ Section 5(2), Minerals Act 50 of 1991.

⁴² Section 6(2)

⁴³ Section 9(8)

One of the aims of the MA was surface rehabilitation. Accordingly the Act placed a particular focus on environmental regulation, and the system of authorizations operated to support the goal of surface rehabilitation. This was achieved mainly through subsection 38 to 42, read where appropriate s9 of the MA. Initially these provisions were supplemented by regulations⁴⁴ in terms of Mines and Works Act 27 of 1956⁴⁵ which remained intact⁴⁶ until more stringent and adequate programs were promulgated to replace them in 1993.⁴⁷ The ability to rehabilitate is relevant for applications of mining rights.⁴⁸ Rehabilitation was a factor considered in determining where additional prospecting permits on mining authorizations could be issued in respect of land permits or authorizations had already been issued.⁴⁹ Moreover, non-compliance with the rehabilitation duties will result in the compulsory suspension or cancellation of the prospecting permit or authorization.

The rehabilitation provisions in the MA and other regulations exhaustively regulated the discretion of the officials assigned with considering applications for prospecting permits and mining authorizations to make environmentally sound decisions. The Environment Conservation Act 73 of 1989 did not identify prospecting and mining as activities that might be detrimentally affect the environment in terms of its section 21, and hence was not applicable to prospecting and mining. The National Environmental Management Act 107 of 1998 ('NEMA'), although not directly applicable to prospecting and mining under the 1991 dispensation, it sets out principles in its section 2 which apply throughout the Republic. These principles reinforce the entrenched environmental rights section 24 of the 1996 Constitution. The mining regime brought about by the MA, mechanisms had

⁴⁴ In particular chapter 5 of the regulations, inserted by Proclamation R537, 1980 Government Gazette 6892(21.03.1980)

⁴⁵ Franklin, BLS: 'Mining and Minerals' in WA Joubert (ed) LAWSA Vol 18 (1983) para 58.

⁴⁶ Kaplan & Dale: "The revisiting of state-held entitlements to exploit minerals in South Africa: privatization or deregulation" 1991 TSAR 113, 133 "hereafter "Badenhorst". Accessed 26/07/2016

⁴⁷ Minerals Amendment Act 103 of 1993, which provided for the furnishing of certain particulars about the ability of an applicant for a prospecting permit to rehabilitate surface disturbances, and enabled the Regional Director to suspend mining operations pending rectifying steps to be taken in respect of rehabilitation measures, or to suspend or cancel permits permission authorizations in the event of non-compliance rehabilitation provisions.

⁴⁸ Section 9(3) (c), read with s 9(5) (c) and (e), Minerals Act 50 of 1991.

⁴⁹ Section 15, Minerals Act 50 of 1991.

been introduced that could significantly influence the fulfillment of the environmental objectives of this Act.⁵⁰

The impact of the constitutionally entrenched environmental rights on the operation of the MA is illustrated well in the decision of *Director: Mineral Development, Gauteng v Save the Vaal*.⁵¹ The case involved the objections of a group of environmentalists and landowners to intended open-cast coal mining by Sasol, close to the southern bank of the Vaal River. The group instead of being heard by the Regional Director who had to consider the mining license application by the holder of mineral rights, in terms of s9 of the Minerals Act. The group relied on their constitutionally protected environmental rights in terms of section 24 of the 1996 Constitution and argued that the Director in this instance should have applied the *audi alteram partem* rule⁵² to consider their objections to the application.

The set of requirements in section 9 of the Minerals Act, which originally may have amounted to an exhaustive definition and a restriction on the discretionary powers of the Director, was not regarded as such by the Supreme Court of Appeal. The court acknowledged the environmental concerns of the respondents,⁵³ and proceeded to consider the stage at which these had to be heard by the Director. The court rejected an argument based on a separate reading of subsection 9 and 39. Instead, it indicated that the granting of the section 9 license opens the door to the licensee and sets in motion a chain of events which can, and in the ordinary course of events might well, lead to the commencement of mining operations. Pointing out that it is trite that preliminary decisions can have serious consequences in particular cases; the court then found that the *audi alteram partem* rule was applicable at the point where the preliminary decision in terms of section 9 had to be taken, and not only once the environmental impact was

⁵⁰ Herbert TL: *The Impact of Environmental Protection on the Acquisition, Transfer and Renewal of Mineral Rights* (2000) LLB thesis, University of Cape Town, at www.landlawwatch.co.za(06.07.2011)

⁵¹ *Director: Mineral Development, Gauteng Region v Save the Vaal Environment* 1999 (2) SA 709 (SCA).

⁵² *Audi alteram partem* is a Latin phrase meaning "listen to the other side", or "let the other side be heard as well". It is the principle that no person should be judged without a fair hearing in which each party is given the opportunity to respond to the evidence against them. S 33 of the Constitution provides that :“(1) Everyone has the right to administrative action that is lawful, reasonable and procedurally fair. (2) Everyone whose rights have been adversely affected by administrative action has the right to be given written reasons.

⁵³ Section 33 of Promotion of Administrative Justice Act 2 of 2000.

considered under section 39. In this manner, the environmental regulations of mining were rendered even more stringent than was originally envisaged by the drafters of the MA. Under the provisions on environmental protection in the constitution and the National Environmental Management Act 107 of 1998, obtaining mining authorisation became more complicated and subject to submission by interested parties.

In *Mtunzini Conservancy v Tronox KZN Sands (Pty) Ltd & another*,⁵⁴ Vahed J was called upon to decide whether Tronox required a land use planning authorisation before it could start mining. The case thus invoked the Constitutional Court's decision in *Maccsand (Pty) Ltd v City of Cape Town & others*⁵⁵ in which the relative powers of the national and local spheres of government vis-à-vis mining and land use planning were apparently settled.⁵⁶ The distinguishing fact in this case from *Maccsand* was deciding that Tronox was *not* required to obtain a land use planning authorization. The judgment also implies that the scope of power exercised by local government should be determined with reference to pre-1994 legislation such as the MA, which is completely at odds with the affirmation given by the Constitution of the Republic of South Africa, 1996 of the distinctiveness, interdependence and interrelatedness of the local sphere.

4. Statement of research problem

The environmental and mining legislation such as NEMA⁵⁷, MPRDA⁵⁸, and Mine Health and Safety Act⁵⁹ among others compel the mining companies to comply and implement laws and policies that protect the environment from degradation prior, during and after mining operations. However, due to non-compliance with the environmental laws, policies and documents aimed at protecting and restoring the environment to its original state after the mining activities; the environment is hugely been degraded and the mining communities continue to experience health and environmental hazards; such as

⁵⁴ 2013 JDR 0026 (KZD).

⁵⁵ 2012 (4) SA 181 (CC).

⁵⁶ Humby, T 'Maccsand: Intergovernmental relations and the doctrine of usurpation' (2012) 27(2) SA *Public Law* 628–638. Accessed 07/07/2016

⁵⁷ The National Environmental Management Act 107 of 1998.

⁵⁸ Minerals and Petroleum Resources Development Act 28 of 2002.

⁵⁹ Mine Health and Safety Act 29 of 1996.

black lung cancer, air, water and soil pollution resultant from the mining activities.⁶⁰ This degradation can be effectively controlled, prohibited or curbed if there is stringent enforcement of laws and measures aimed at rehabilitation of the environment so as to minimize environmental degradation.

5. The purpose of the study

5.1. The aim

This mini-dissertation is aimed at ensuring pro-active radical compliance and implementation of laws and policies that regulate, promote and protect the environment prior, during and after mining operations in the communities they operate in South Africa by the mining industry.

5.2. The objectives

The key objective is to examine compliance and enforcement of the laws, regulations and frameworks aimed at ensuring that mining companies promote environmental restoration, rehabilitation and protection prior, during and after conducting mining operations. The other objectives relevant to the key objective are:

- To ensure that harsher punishment/penalties are imposed to the perpetrators and ensure that they are held accountable.
- The minister of mineral resources not to hesitate to revoke licenses or mining rights of the mining companies that are not complying or putting in place environmental rehabilitation, restoration and protection plans to restore the environment to its productive state.+ This will serve as a mode of deterring the perpetrators from continuously degrading the environment.
- The communities are availed justice for environmental degradation.

6. Definitions of key concepts

6.1. Environment

⁶⁰Kaplan & Dale (1991): The revisiting of state-held entitlements to exploit minerals in South Africa: privatization or deregulation' 1991 TSAR 113, 133 "hereafter "Badenhorst". Accessed 26/06/2016.

Environment is living things and what is around them. It includes physical, chemical and other natural forces. Living things do not simply exist in their environment. They constantly interact with it. Organisms change in response to conditions in their environment. In the environment there are interactions between plants, animals, soil, water, temperature, light, and other living and non-living things.⁶¹

The word 'environment' is used to talk about many things. People in different fields of knowledge (like history, geography or biology) use the word differently. An electromagnetic environment is the radio waves and other radiation and magnetic fields. The galactic environment refers to conditions between the stars.

6.2. Land Degradation

Land degradation is a process in which the value of the biophysical environment is affected by a combination of human-induced processes acting upon the land.⁶²

6.3. Mining communities

Mining communities refers to communities where mining takes place and labor sending areas.⁶³

6.4. Environmental management plan

Plan to manage and rehabilitate the environmental impact as a result of prospecting, reconnaissance, exploration or mining operations conducted under the authority of reconnaissance permission, prospecting right, reconnaissance permit, and exploration right of mining permit, as the case maybe.⁶⁴

6.5. Land Rehabilitation

Land rehabilitation is the process of returning the land in a given area to some degree of its former state, after some process (industry, natural disasters, etc.) has resulted in its

⁶¹ Section 1 of MPRDA.

⁶² Section 1 NEMA of 1998.

⁶³ Broad-Based Black Socio-Economic Empowerment Charter for the South African mining and minerals industry, 2017

⁶⁴ Section 39 of Mineral National Management Act 107 of 1998.

damage. Many projects and developments will result in the land becoming degraded, for example mining, farming and forestry.⁶⁵

6.6. Biodiversity

Biodiversity, a contraction of "biological diversity," generally refers to the variety and variability of life on Earth. One of the most widely used definitions defines it in terms of the variability within species, between species, and between ecosystems.⁶⁶

6.7. Mining health and safety

It means free from illness or injury attributable to occupational causes such as mining.⁶⁷

7. Literature review

Government has introduced pieces of legislation on the issue of responsible and sensible mining and the protection of the integrity of the environment, however there seems to be poor implementation hence the act of degradation continues. There are several shortcomings in the machinery for regulating mining environmental. It is important to point out that institutional arrangements were better suited to regulating exploitation of the environment such as Department of Environmental Affairs and Tourism (DEA) and the Reconstruction and Development Programme (RDP) to enforce effective and efficient protection.

Different spheres of government need to work together to protect the environment from harm, for instance the Department of Mineral Resources (DMR) in Mpumalanga, granted prospecting and mining rights even in the face of vehement opposition from other organs of state like conservation and tourism authorities. The DMR is also responsible for policing the environmental impacts of mining and it is failing dismally at this task as Mpumalanga is experiencing the worst environmental degradation caused by mining activities, in the whole of South Africa in that most of its land is no longer conducive and there is water shortage caused by the mining activities. The Departments of Environmental and Water Affairs, and local and district municipalities,

⁶⁵ Section 39 of Mineral Act 50 of 1991.

⁶⁶ Section 1(1) (b) National Environment Management: Biodiversity Act 10 of 2004.

⁶⁷ As contemplated in Mine Health and Safety Act 29 of 1996.

that have integral role to play in regulation that effectively balances the province's different priorities, are either unwilling or incapable of making a dent in this onslaught,⁶⁸ as the DMR generally accepts applications for rights, no matter how sensitive or protected the area in which mining is proposed. *Mabola protected environment* in the Wakkerstroom is one of the five important water source in Mpumalanga and it was proclaimed protected environment, however *Atha-Africa Ventures (Pty) Ltd*⁶⁹ group, an Indian company that has been granted the right to mine coal from the area. This means that the so-called protected area does not enjoy the benefits of been protected and renders the protection useless. The DMR ignores the opposition environmental and water authorities when granting rights,⁷⁰ in that the protection of areas is not considered.

The Minister of Mineral Resources has the power to declare "no go" areas for mining, but has so far refused to do so without a valid reason or communication with the communities affected by the activities.⁷¹ The permission to mine which was granted to *Atha-Africa Ventures (Pty) Ltd* is a demonstration of the failure to consult parties involved. Organizations such as Centre for Environmental Rights and The Mpumalanga Tourism and Parks agency (an organ of state) have called on government to undertake an assessment of the cumulative impacts of mining on environment, and that relevant government departments agree to restrict mining in areas which contain critical water sources and biodiversity, or which are important for South Africa's future food security.⁷² This ignorance demonstrates that the protection of areas is not taken seriously because if it was, no matter the circumstances, no mining right would ever be granted on such land.

7.1. Challenges of mining rehabilitation

⁶⁸ Davies, T: Environmental crisis in Mpumalanga: why is nobody listening? 15 September 2014. Centre for Environmental Rights. Cer.org.za. Accessed on 03/03/2016.

⁶⁹ Atha-Africa Ventures (Pty) Ltd (A-AV) is a subsidiary of Atha Group, India, and is the flagship Company of the Group in South Africa. AAV has a registered office in Sandton, Johannesburg, with a dedicated team.

⁷⁰ Cullinan K, Health E-News: Mining- the fox is in charge of the hen house. *Daily Maverick*- 18 Oct 2015. Accessed 06/04/2016.

⁷¹ *Mtunzini Conservancy v Tronox KZN Sands (Pty) Ltd & another* 2013 JDR 0026 (KZD).

⁷² Tracey Davies: A desperate battle is raging across vast tracts of Mpumalanga between coal mining on the one hand and water preservation, food security and tourism on the other, 15 September 2014.

The challenges facing rehabilitation are poor compliance with legal and regulatory requirements for environmental protection and the almost total lack of compliance monitoring and enforcement by the Department of Mineral Resources. The legislations, regulations and policies are available however; the lack of implementation and enforcement is horrifying because there are still some mining companies that do not adhere to the restoration and rehabilitation of the land after the activities e.g. a 5 year old boy fell into a mining shaft in Boksburg which has been closed since 1950's,⁷³ had the mine been properly closed and the land rehabilitated and restored the boy would never have fallen into the shaft.

The livelihoods of mining communities are changed undesirably by the mining companies that extract the minerals from their once arable land; Witbank was once an agricultural land before the extraction of coal. Now what are left of once arable are a black dust, dry rivers, and polluted air. The mining industry has seen the non-enforcement and is exploring it by not complying with regulations. There is poor communication with the communities by the companies in regard to relocation and compensation. There is little or no consultation with affected communities. One of the country's first post-apartheid environmental struggles involved the Clewer community in Emalahleni (Witbank), when an open-cast coal mine had been approved a mere 30 metres from some of people's houses, bringing a plague of noise and dust, cracked houses and a host of health problems.⁷⁴

In many small towns, the communities have continued to live in the harsh conditions brought on them by the activities of the mines with no escape. The companies have realized that it would be costly to relocate and compensate the community members, so they promised them developments that almost never really happened, Modikwa Platinum mine at Hwashi area (a rural area where their livelihood depends on crops and livestock) in Burgersfort is one example of the companies exploiting small communities. Promises were made to the community that the mine will bring development; build stadiums, shopping complex and tar road amongst others; however the community is in

⁷³ Times live: Rescue bid underway for boy (5) in Boksburg mineshaft 01/03/17. Accessed 23/03/2017.

⁷⁴ Cullinan K, Health E-News: Mining- the fox is in charge of the hen house. *Daily Maverick*- 18 Oct 2015. Accessed 06/04/2016.

a worse position than they were when the mining activities began. Their houses are now cracked; the once arable land is no longer conducive and most of them are struggling to rebuild their houses. The mining industry exploit the illiteracy of the community members and bribed the few that are literate to use them against their own. In small mining towns such as Mokopane, the communal land in the rural areas is held in trust under the authority of the traditional leaders. Mining companies have allegedly bought off traditional leaders in a number of areas to get their hands on mineral wealth. Titanium mine is situated in one of the areas in the former Transkei coast where the government has played a hand in replacing a chief opposed to the mine with another who supports it.⁷⁵ In a similar development in Limpopo, Mokopane's Chief Vaaltyn Kekana was paid by a Canadian platinum mining company, *Ivanhoe*, while it was prospecting on communal land. Many of his 'subjects' stand to lose their ancestral land and are opposed to the mine.⁷⁶

All ARM-managed⁷⁷ operations have environmental management systems in line with ISO14001⁷⁸ in place and are ISO14001 certified. However Nkomati Mine does not have this management system implementing ISO14001, while Two Rivers Platinum Mine was still considering the implementation of this system at the time. No fines were issued to the company during the year in respect of environmental noncompliance in accordance with approved Environmental Management Plan; this is without a known reason as clearly the company has overlooked the safety of its employees and the neighboring communities.⁷⁹ Poor regulatory compliance, and in some instances weak or inconsistent enforcement not only undermine the constitutional right to safe environment but places community welfare in jeopardy.

⁷⁵ Mine Health and Safety Act 29 of 1996

⁷⁶ *Ibid*

⁷⁷ African Rainbow Minerals (ARM) is a mining company based in South Africa. Patrice Motsepe is the executive chairman; Mike Schmidt is CEO. ARM has interests in a wide range of mines, including platinum and platinum group metals (PGMs), iron, coal, copper, and gold.
https://en.wikipedia.org/wiki/African_Rainbow_Minerals

⁷⁸ The ISO 14001 standard is the most important standard within the ISO14000 series. ISO 14001 specifies the requirements of an environmental management system (EMS) for small to large organizations. An EMS is a systemic approach to handling environmental issues within an organization. whatis.techtarget.com/definition/ISO-14000-and-14001. www.google.com.

⁷⁹ "Two Rivers plant improvement on track". Mining Weekly. Retrieved 2010-09-13. Accessed 08 March 2016 www.arm.co.za/environmental-commitment.

This is one of the challenges among many others of non-compliance resulting in failure of the environmental rehabilitation in terms of NEMA, MPRDA, EMP and many other policies. The environmental degradation resulting from derelict mines continues to be a major concern in South Africa because of failure to monitor the mining rehabilitation processes.

Sustainability of any remediation system is a factor that is becoming increasingly critical in decision making.⁸⁰ An urgent and pressing priority spawned by mining activity in South African and Gauteng in particular is Acid Mine Drainage.⁸¹ AMD (also sometimes referred to as acid rock drainage) has been described as a ticking time bomb and a political hot potato.⁸² Lasting and cost effective solution to problem of ADR remains a headache for the DWA.⁸³

Mining regulations and statutory frameworks

7.1.1. NEMA

The purpose of environmental implementation and management plans is to - (a) coordinate and harmonize the environmental policies, plans, programmes and decisions of the various national departments that exercise functions that may affect the environment or are entrusted with powers and duties aimed at the achievement, promotion, and protection of a sustainable environment, and of provincial and local spheres of government, in order to - (i) minimize the duplication of procedures and functions; and (ii) promote consistency in the exercise of functions that may affect the environment; (b) give effect to the principle of cooperative government in Chapter 3 of the Constitution; (c) secure the protection of the environment across the country as a whole; (d) prevent unreasonable actions by provinces in respect of the environment that are prejudicial to the economic or health interests of other provinces or the country as a

⁸⁰ Bobbin, K "Acid Mine Drainage and its Governance in the Gauteng City-Region" 2015 *Occasional Paper* for the GCRO. Accessed 07/07/2017.

⁸¹ McCarthy, TS "The impact of acid mine drainage in South Africa" 2001 *South African Journal of Science* 712 Accessed 07/07/2017.

⁸² Ferris, L & Kotze, LJ "The Regulations of Acid Mine Drainage in South Africa: Law and Governance Perspectives" 2014 *PER/PELJ* 2105. Accessed 07/07/2017.

⁸³ Johnson, DB & Hallberg, KB "Acid mine drainage remediation options; review" 14.03.2005 ("Johnson & Hallberg"). Accessed 26/03/2016.

whole; and (e) enable the Minister to monitor the achievement, promotion, and protection of a sustainable environment.⁸⁴

Section 28: Duty of care and remediation of environmental damage (1) Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorized by law or cannot reasonably be avoided or stopped, to minimize and rectify such pollution or degradation of the environment. (1A) Subsection (1) also applies to a significant pollution or degradation that- (a) occurred before the commencement of this Act; (b) arises or is likely to arise at a different time from the actual activity that caused the contaminating; or (c) arises through an act or activity of a person that results in a change to pre-existing contamination.⁸⁵

The Act is aimed at ensuring that every person part-take in the protection of the environment and upholds the right enshrined in the Constitution to health and well-being.

7.1.2. Mineral and Petroleum Resources Development Act 2002

The Environmental Management Programme is a section 39 requirement of the MPRDA can be used to address all the legal requirements (in short referred to as the s39 EMPR). Updates with regards to the legal requirements are addressed through the annual updates required under Regulation 55 of the MPRDA. The changes made in the statute will result in a change of this mechanism.

The statute deals with the responsibilities of holders of mining rights, permits, or permissions and states in section 38(1)(e) that such holder, whose mining causes or results in ecological degradation, pollution, or environmental damage that may be harmful to the health or well-being of anyone,” is responsible for any environmental damage, pollution or ecological degradation as a result of his or her operations and which may occur inside and outside the boundaries of the area to which such right,

⁸⁴ Section 2 of NEMA of 1998.

⁸⁵ Section 28 of NEMA of 1998

permit or permission relates”, and in terms of section 43(1), “remain responsible for any environmental liability, pollution or ecological degradation and the management thereof until a closure certificate has been issued”. The minister only issues the certificate after he is completely satisfied that the holder of the right has adhered to the regulations provided in the EMP and the EMPR. If he is not satisfied that not all the requirements are met then the holder of the right will be held liable. If this is stringently enforced, it can reduce any further degradation to the mining area after the fact. The holder will have to restore the land to its state before the activities meaning that there could still be vegetation on the land to be used for productive official trade purpose.

The granting of a closure certificate as contemplated in section 43 of the MPRDA does not imply that ‘walk-away will be possible. Section 43(6) stipulates that: “When the Minister issues a certificate, he or she must return such portion of the financial provision contemplated in section 41 as the Minister may deem appropriate to the holder of the prospecting right, mining right, retention permit or mining.” This means that before granting of the closure certificate the Minister must be satisfied that indeed the holder of the right has complied with all the regulations in section 43. In order for regulators, mining companies and society to evaluate the success and reliability of closure measures⁸⁶ and the relative and cumulative impacts of a mine post closure, criteria are typically applied to 'test' the performance of those measures. The assessment criteria, as to what constitutes 'a reasonable level of post closure social, environmental and aesthetic impact, land use, active and/or passive care, costs and environmental risk' will differ for the various stakeholders with interests in the mining operations and the surrounding impacted region.

7.2. The effects of mining

The awful living conditions of mine-affected communities and the shocking failure of mining companies to meaningfully or positively engage with them. The devastating

⁸⁶ For most decision-making processes, there are a number of decision 'drivers', i.e. issues that are so important they tend to determine the conclusions of the decision process. These are often related to: • Surface and groundwater quality and impacts on the receiving environment, • Long term stability and erosion of structures that will remain on the site, • Land use and post closure aesthetics, • Social and economic impacts related to a potential reduction in economic potential of an area and the potential long term burden placed on future generations related to post mining maintenance, • Economic consequences to both the mining company and financial stakeholders of closure costs.

impact of coal mining on previously arable land; the impact of air, water and soil pollution on farming activities and human health; mining companies' poor compliance with legal and regulatory requirements for environmental protection. The almost total lack of compliance monitoring and enforcement by the Department of Mineral resources and the “extremely cavalier attitude of the South African mining industry towards the closure of mines and the rehabilitation of the environment “is what causes these small communities to suffer the fate imposed upon them by the mining companies.”⁸⁷

7.2.1. Destruction and poison linger

Bad mining practices can ignite coal fires, which can burn for decades, release fly ash and smoke laden with greenhouse gasses and toxic chemicals.⁸⁸ Furthermore mining releases coal mine methane, a greenhouse gas 20 times more powerful than carbon dioxide.⁸⁹ Coal dust inhalation causes black lung disease among miners and those who live nearby, and mine accidents kill thousands every year.⁹⁰ Coal mining displaces whole communities, forced off their land by expanding mines, coal fires, subsidence and contaminated water supplies.⁹¹

The communities are forced to evacuate their homes as the conditions of the degraded land worsen. Their livestock die and they can never grow crops on the said land. Ground water decreases and rivers dry up and the cloud of black dust lingers in the chemically polluted air and the noise from the huge trucks and the blasting. Mmadithlokwa village located in Marikana was relocated by Tharisa Minerals just a few kilometers from the mining operations and now the community is negatively impacted by these mining activities, some residents are relocating from the chosen area as they no longer feel safe.⁹² Those who are too poor to rebuild their homes have remained because they have no other option, the mine requires prove that indeed the dilapidation of the houses are caused by the mining activities and the residents have nothing to

⁸⁷ Bench Marks Foundation: Policy Gap 9 “South African coal mining”, August 2014.

⁸⁸ Obama B, U. S. Senator (2006): Coal, Natural Gas, Tar Sands: More Greenhouse Gases at Higher Cost, The Coming Storm, April 3, 2006. Accessed 10/08/2017.

⁸⁹ *The effects of mining: Environment News. 20 April 2015.* www.environment.co.za/environmental-issues-news. Accessed 07/03/2016.

⁹⁰ Derickson A (1998) Black Lung: Anatomy of a Public Health Disaster. Accessed 10/08/2017.

⁹¹ *Ibid.*

⁹² Olebogeng Motene; Madithlokwa, Marikana. Action voices. www.communitymonitors.net Accessed 24/03/2017.

show except for their cracked houses which are not enough for the company to carry the responsibility of relocating them. This problem can be avoided by proper communication with the communities and relocation to newly developed areas for them and their families including livestock.

There are two widely used ways of mining: strip mining and underground mining.

7.2.2. Strip mining

Strip mining (also known as open cast, mountaintop or surface mining) involves scraping away earth and rocks to get to coal buried near the surface.⁹³ In many cases, mountains are literally blasted apart to reach thin coal seams within, leaving permanent scars on the landscape as a result.⁹⁴ Strip mining accounts for about 40 percent of the world's coal mines but in some countries, such as Australia, open cast mines make up 80 percent of mines. Even though it's highly destructive, industry often prefers strip mining as it requires less labour and yields more coal than underground mining. Underground mining will require engineers to ensure that it is safe for mineworkers to go underground to extract the coal.

Impacts of strip mining:

Strip mining destroys landscapes, forests and wildlife habitats at the site of the mine when trees, plants, and topsoil are cleared from the mining area.⁹⁵ This in turn leads to soil erosion and destruction of agricultural land. When rain washes the loosened top soil into streams, sediments pollute waterways. This can hurt fish and smother plant life downstream, and cause disfiguration of river channels and streams, which leads to flooding.⁹⁶ There is an increased risk of chemical contamination of ground water when minerals in upturned earth seep into the water table, and watersheds are destroyed

⁹³ Montrie C (2001): To save the land and people: a history of opposition to coal surface mining in Appalachia. Accessed 10/08/2017.

⁹⁴ Dontalaa S.P, Reddy B, Vadde R (2015): Environmental Aspects and Impacts its Mitigation Measures of Corporate Coal Mining. Accessed 10/08/2017.

⁹⁵ Brennan K.F.C, Nicholas O.G & Majer J.D (2005): Innovative techniques for promoting fauna return to rehabilitated sites following mining. Accessed 23/05/2016.

⁹⁶ Padmalal, D, Maya K (2014): Impacts of river sand mining. Accessed 17/03/2017.

when disfigured land loses the water it once held.⁹⁷ Strip mining causes dust and noise pollution when top soil is disrupted with heavy machinery and coal dust is created in mines.⁹⁸ The result of all this is barren land that stays contaminated long after a coal mine shuts down.⁹⁹

Although many countries require reclamation plans for coal mining sites, undoing all the environmental damages to water supplies, destroyed habitats, and poor air quality is a long and problematic task.¹⁰⁰ This land disturbance is on a vast scale. In Emalahleni (Witbank), coal mining has degraded the quality of land of an estimated 3.2 million hectares. The overall restoration rate (the ratio of reclaimed land area to the total degraded land area¹⁰¹) of mine wasteland was only about 10–12 percent.¹⁰² The legal regulations can be used to ensure that the land is rehabilitated and restored, as well to enforce compliance with the other processes of restoration of the land.

7.2.3. Underground mining

The majority of the world's coal is obtained through underground mines. While underground mining, which allows coal companies to extract deeper deposits of coal, is viewed as less destructive than strip mining, it still causes widespread damage to the environment. In room-and-pillar mines, columns of coal are left to support the ground above during the initial mining process, then they are often taken out and the mine is left to collapse, which is known as subsidence. In longwall mines, mechanical shearers strip the coal from the mines. Support structures that enable the shearers' access to the mine are eventually removed, and the mine collapses. Lannex mine in Eerstegeluk, Steelpoort just outside of Burgersfort experienced one of the most frightening moments in the area when a mountain sunk in while the community watched in fear. This

⁹⁷ Witze A, Kanipe J (2015): Island on fire: the extraordinary story of a forgotten volcano that changed the world. Accessed 20/12/2016.

⁹⁸ Igoe LT (2014): The opulent city and the Sylvan state: Art and environmental embodiment in early national Philadelphia. Accessed 05/02/2017.

⁹⁹ Rai VR, Raman NS, Choudhary SK, (2015): Development of Indian Coal Industry Specific Environment Audit Format. Accessed 20/03/2016.

¹⁰⁰ Davies: Environmental crisis in Mpumalanga: why is nobody listening? 15 September 2014. Centre for Environ, Tentel Rights. *Cer.org.za*. Accessed on 03/03/2016.

¹⁰¹ Johnson DB & Hallberg KB (2005): Acid mine drainage remediation options: a review. Accessed 23/06/2016.

¹⁰² MPRDA

according to reports was due to pillars that help to keep the table rock intact and possible for mine workers to work underground.¹⁰³

Impact of underground mining

Underground mining causes huge amounts of waste earth and rock to be brought to the surface – waste that often becomes toxic when it comes into contact with air and water.

It causes subsidence as mines collapse and the land above it starts to sink. This causes serious damage to buildings .It lowers the water table, changing the flow of groundwater and streams.¹⁰⁴ Only a small percentage of this is used by industry or local towns – the rest is wasted. What's worse is that removing so much water creates a kind of funnel that drains water from an area much larger than the immediate coal-mining environment. Coal mining produces also greenhouse gas emissions.

Coal mine methane, less prevalent in the atmosphere than CO₂, but 20 times as powerful as a greenhouse gas, forms during the geological formation of coal, and is released during the coal mining process.¹⁰⁵ Most coal mine methane come from underground mines.¹⁰⁶ This method of mining requires that the water found underground be pumped out in order to allow the mining operations to take place, thus it reduces underground water and contaminates the nearby rivers with the toxins and other chemicals when the pumped water flows into the streams.

Coal fires – burning or smoldering coal seams, coal storage piles or coal waste piles – are a significant environmental problem in many countries, including China, Russia, the US, Indonesia, Australia and South Africa.¹⁰⁷ Underground coal fires can burn for centuries, filling the atmosphere with smoke laden with carbon-monoxide (CO), carbon-

¹⁰³ Motseo G: A mountain caves in, Lannex. Steelburger local newspaper September 2013. Accessed 24/03/2017.

¹⁰⁴ Davies, T.A desperate battle is raging across vast tracts of Mpumalanga between coal mining on the one hand and water preservation, food security and tourism on the other, 15 September 2014. Accessed 05/03/2016.

¹⁰⁵ Schmitz JA (2005): What determines productivity? Lessons from the dramatic recovery of the US and Canadian iron ore industries following their early 1980s crisis. Accessed 29/05/2016.

¹⁰⁶ Ramanujan, K "Methane's Impacts on Climate Change May Be Twice Previous Estimates," Goddard Space Flight Center, July 18, 2005. Accessed 8/03/2016.

¹⁰⁷ The effects of mining: Environment News. 20 April 2015. www.environment.co.za/environmental-issues-news. Accessed 07/03/2016

dioxide (CO₂), methane (CH₄), sulphur dioxide (SO₂), nitrous oxides (NO_x) and other greenhouse or toxic gases – as well as fly ash from vents and fissures.¹⁰⁸

Mining creates pathways through which air can be carried to coal.¹⁰⁹ However, the retention of heat by the coal is largely dependent on the air flow, in such away that there is a critical velocity which varies with the other factors mentioned above which the coal is oxidized but the air flow is not capable of removing the heat generated. Such conditions commonly exist in partially collapsed mines.¹¹⁰ Furthermore, in old abandoned workings, the sides of the pillars normally are fractured and fine coal commonly is strewn in the roadways.¹¹¹ Hence, a large surface area of coal is available for oxidation and the exothermic reaction produces a rise in temperature, which eventually becomes self-generating.¹¹² The mining regulations provide for duty of care, these regulations don't only bind mining companies but as well the citizens of the country. The mining company should properly close the mines after the extraction of the minerals and the community should also respect the closure of such shafts. However, sometimes even after proper closure of a mine (which rarely happens) illegal miners would open the mine to get to the residue of the mineral to sell on the black market. This means that a closed mine is now open and may endanger the lives of the mining community and those of the illegal miners. The people or companies who fail to adhere in accordance with the law should be severely punished.

7.2.4. Acid mine drainage

¹⁰⁸ IBE E.E (2015): Perception of Nigerians on the negative impact of electricity generation on the environment in Nigeria. www.environment.co.za/mining-2/effects-of-mining.html. Accessed 08/03.2016

¹⁰⁹ Bell F.G, Bullock S.E.T, Haibich T.F.J., Lindsay P. (2001) "Environmental impacts associated with an abandoned mine in the Witbank Coalfield, South Africa" 2000 *International Journal of Coal Geology* 195–216. Received 15 December 1999; accepted 15 May 2000. Accessed 26/03/2016.

¹¹⁰ Bell FG, Stacey TR, Genske DD (2000): Mining subsidence and its effect on the environment: some differing examples. Accessed 10/08/2017.

¹¹¹ Bell FG "Environmental impacts associated with an abandoned mine in the Witbank Coalfield, South Africa" 2000 *International Journal of Coal Geology* 195–216. Received 15 December 1999; accepted 15 May 2000. Accessed 26/03/2016.

¹¹² *Ibid.*

Acid mine drainage is created when water mixes with coal and other rocks unearthed during mining, taking on toxic levels of minerals and heavy metals.¹¹³ This toxic water leaks out of abandoned mines to contaminate groundwater, streams, soil, plants, animals and humans.¹¹⁴ As a result an orange colour can blanket the river, estuary or sea bed killing plants and making surface water unusable as drinking water.¹¹⁵ Sources of acid mine drainage can remain active for decades or centuries after a mine closes if not properly closed or managed during the mining operation.¹¹⁶ The after operation care is costly but necessary to ensure that the impact on the mining communities is at least at a minimal.

Harmony Gold Mining Company Limited¹¹⁷ was one of a few remaining companies operating mines in the KOSH (Klerksdorp – Orkney – Stilfontein – Hartebeespoort) basin (one of the other remaining players being AngloGold). Operations at the northernmost mines in the KOSH basin (Stilfontein, Hartebeesfontein and Buffelsfontein) had ceased. Because groundwater moved from the northernmost to the southernmost mines, dewatering at these mines had to continue to ensure the economic value and safety of Harmony and AngloGold's operations and to prevent the formation of acid mine drainage (AMD – though the court refrains from using this term, see para 2). The northern mines were equipped with infrastructure able to extract a greater amount of water than the pumps maintained at the Harmony and AngloGold mines.

The litigation was precipitated by the provisional liquidation of the company controlling the Buffelsfontein mine (which company was, in turn, controlled by DRD Gold). The

¹¹³ Salomons: W “Environmental impact of metal derived from mining activities: processes, predictions, prevention”. Grss Research institute Geesthacht. Received 19 May 1994; accepted 04 August 1994. Accessed 04 April 2016 (“Salomons”).

¹¹⁴ Salomons, W “Environmental impact of metal derived from mining activities: processes, predictions, prevention”. Grss Research institute Geesthacht. Received 19 May 1994; accepted 04 August 1994. Accessed 04 April 2016 (“Salomons”).

¹¹⁵ Pinetown K.L, Ward C.R & Van Der Weisthuisen W.A I, “quantitative evaluation of Mineral in coal deposits in the Witbank and Highveld coalfields, and the potential impact on acid mine drainage”; received 14 February 2005, accepted 21 February 2006. Accessed 25 March 2016

¹¹⁶ The effects of mining: Environment News. 20 April 2015. www.environment.co.za/environmental-issues-news. Accessed 07/03/2016 www.environment.co.za/acid-mine-drainage-amd

¹¹⁷ *Harmony Gold mining company Ltd v Regional Director: Free State Department of Water Affairs & others* 2014(3) SA 149 (SCA).

provisional liquidators let it be known that the Buffelsfontein mine had no funds to pay for continued pumping and that Eskom had threatened to cease supplying electricity to the Buffelsfontein and Hartebeesfontein mines after 12 April 2005. Pumping after that date could only continue if DRD Gold (which also controlled the company operating the Hartebeesfontein mine) joined forces with Stilfontein, Harmony and AngloGold to continue dewatering at the defunct mines. The court held that Harmony Gold bears the duty to ensure that the land is rehabilitated and this meant that until such rehabilitation have taken place the company has the liability to manage the mine. Their application was dismissed without costs.

Common health threats posed by coal mining:

Pneumoconiosis, aka black lung disease or CWP,¹¹⁸ is caused when miners breathe in coal dust and carbon, which harden the lungs. Cardiopulmonary disease, chronic obstructive pulmonary disease, hypertension, lung disease, and kidney disease have been found in higher-than-normal rates among residents who live near coal mines, according to a 2001 US study.¹¹⁹ In Witbank, there have been reports that the residents suffer from the black lung disease caused by inhaling the air infested with the residue dust from the coal.¹²⁰ Toxic levels of arsenic, fluorine, mercury, and selenium are emitted by coal fires, entering the air and the food chain of those living nearby.

8. Research methodology

The research utilizes the review of existing literature sources such as NEMA, MPRDA and others from the library and the internet that include but are not limited to: textbooks, reports, legislations, regulations, charters, policies, amendments to the legislations, journals or academic journals, government gazette, constitution, sites, international or national and local journals.

9. Significance of the proposed research

¹¹⁸ Means: Coal worker's pneumoconiosis *medical-dictionary.thefreedictionary.com/CWP*.

¹¹⁹ Hendry M & Ahem M (2008): Relations Between Health Indicators and Residential Proximity to Coal Mining in West Virginia. Accessed 31 march 2016.

¹²⁰ Douglas F. Scott Spokane Research Laboratory, National Institute for Occupational Safety and Health, Spokane, WA R. Larry Grayson University of Missouri, Rolla, MO. www.cdc.gov/niosh/mining/userfiles/works/pdfs/shiim.pdf

This mini-dissertation is important because it seeks to address the issues and challenges of environmental degradation from mining activities in the mining communities and their farmers, animals and most importantly the preservation of the environment by implementing and enforcing of effective environmental plan for a conducive environment, reducing environmental degradation, minimizing air, water and soil pollution and improving healthy living standards of the mining communities.

CHAPTER 2: REGULATIONS PROHIBITING ENVIRONMENTAL DEGRADATION IN MINING ENVIRONMENT.

South Africa has numerous environmental laws, policies and legislation. They are in place and from time to time amended and others are repealed by new and better ones, however implementation and enforcement of these laws is poor because although the legislation is now better, the prohibition of environmental degradation is still at its high. The South African mining regulations such as the MPRDA, NEMA and EMP to mention a few provide that every mining right should be accompanied by remedial plans to rehabilitate the land and restore it to its former state. Although, it is impossible for the land to be restored to its former state, it is worth the attempt to do so. Failure to adhere to these laws carries a heavy fine not exceeding R 1 million or even imprisonment if not both. NEMA, which provides that anyone criminally convicted of an offence under a statutory provision listed in NEMA Schedule 3 can be subject to civil liability (section 34(1), NEMA). Fines can also be imposed for certain offences, for example a contravention of the environmental duty of care can invoke a fine of up to ZAR1 million and/or one year's imprisonment. The contravention of a condition in an environmental authorisation, or a failure to obtain such an authorisation can invoke a fine of up to ZAR5 million and/or ten years' imprisonment (sections 28 and 24 F, NEMA).

2.1. ENVIRONMENTAL MANAGEMENT PLAN

The holder of a prospecting permit or mining authorization shall demonstrate in his environmental management programme that he has the financial means and has made sufficient and acceptable pecuniary provision to the satisfaction of the Director: Mineral

Development to carry out such programme.¹²¹ Where the holder of a prospecting permit or mining authorization is not required to have an environmental management programme, the Director: Mineral Development may order such holder to make, to his satisfaction, provision for (a) the rehabilitation of the surface of the mining area;(b) the prevention of pollution of the atmosphere (c) the prevention of pollution of water and the soil; and (d) the final closure of the mine.¹²²

This EMP binds the holder of the right to rehabilitate the land after degrading it and during the mining operations the holder must keep the degradation at a minimum. The holder outlines the steps he will follow in order to successfully reach the goals set in the EMP to rehabilitate and restore the land.

2.2. MINE HEALTH AND SAFETY ACT 29 OF 1996

This Act is administered by the Mine Health and Safety Inspectorate of the Department. The following sections apply to mine closure: Sections 2 and 5 where the employer must ensure and maintain a safe and healthy environment at the mine, during commissioning, operation, decommissioning and closure.

This act demonstrates that it is important to start the rehabilitation process at early stages of the mining activities in order to achieve the goals set in the EMP.

2.3. NATIONAL ENVIRONMENTAL MANAGEMENT ACT 107 OF 1998

The purpose of this Act is to provide for co-operative, environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-

¹²¹Regulation 5.15 amended by Regulation 2 of Government Notice R847 in Government Gazette 18078, dated 21 June 1997.

¹²²(Regulation 5.16.2 added by Regulation 2(b) of Government Notice R398 in Government Gazette 13038, dated 1 March 1991. Commencement date: 1 March 1991), (Regulation 5.16.2 amended by Regulation 4 of Government Notice R814 in Government Gazette 13811, dated 13 March 1992), (Regulation 5.16.2 substituted by Regulation 3(a) of Government Notice R31 in Government Gazette 16214, dated 13 January 1995), (Regulation 5.16.2 amended by Regulation 2(d) of Government Notice R94 in Government Gazette 17725, dated 15 January 1997).

coordinating environmental functions exercised by organs of state; and to provide for matters connected therewith.¹²³

The purpose of environmental implementation and management plans is to (a) coordinate and harmonize the environmental policies, plans, programmed and decisions of the various national departments that exercise functions that may affect the environment or are entrusted with powers and duties aimed at the achievement, promotion,¹²⁴ and protection of a sustainable environment, and of provincial and local spheres of government, in order to (i) minimize the duplication of procedures and functions; and(ii) promote consistency in the exercise of functions that may affect the environment;¹²⁵(b) give effect to the principle of co-operative government in Chapter 3 of the Constitution;¹²⁶ (c) secure the protection of the environment across the country as a whole;¹²⁷(d) prevent unreasonable actions by provinces in respect of the environment that are prejudicial to the economic or health interests of other provinces or the country as a whole;¹²⁸ and (e) enable the Minister to monitor the achievement, promotion, and protection of a sustainable environment.¹²⁹

Whereas many inhabitants of South Africa live in an environment that is harmful to their health and well-being: the Constitution provides that everyone has the right to an environment that is not harmful to his or her health or well-being.¹³⁰The State must respect, protect, promote and fulfill the social, economic and environmental rights of everyone and strive to meet the basic needs of previously disadvantaged communities; inequality in the distribution of wealth and resources, and the resultant poverty, are among the important causes as well as the results of environmentally harmful practices;¹³¹sustainable development requires the integration of social, economic and environmental factors in the planning, implementation and evaluation of decisions to

¹²³ Section 12 of NEMA

¹²⁴Section 12 (1)(a) of NEMA

¹²⁵ Section 12 (1)(a)(i) &(ii).

¹²⁶ Section 12 (1)(a)(ii).

¹²⁷ Section 12 (1)(a).

¹²⁸ Section 12 (1)(a).

¹²⁹ Section 12(1)(a).

¹³⁰ Section 12 (1)(b).

¹³¹ Section 12 (1)(c).

ensure that development serves present and future generations;¹³² everyone has the right to have the environment protected, for the benefit of present and future generations.¹³³

Sustainable development requires the consideration of all relevant factors including the following: (i) that the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimized and remedied.¹³⁴ (ii) that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimized and remedied; (iii) that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimized and remedied.

Through reasonable legislative and other measures, the State must prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development: the environment is a functional area of concurrent national and provincial legislative competence, and all spheres of government and all organs of state must co-operate with, consult and support one another. The law should be enforced by the State and that the law should facilitate the enforcement of environmental laws by civil society and establish procedures and institutions to facilitate and promote public participation in environmental governance.

2.4. NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT NO. 592008

Minister of Environmental Affairs, made regulations regarding the planning and management of residue stockpiles and residue deposits from a prospecting, mining, exploration or production operation, under section 69(1)(iA) of the National Environmental Management Waste Act:¹³⁵

Impact Management

¹³² Section 12(1)(d).

¹³³ Section 12 (1)(e).

¹³⁴ Section 4(a) of NEMA.

¹³⁵ *Minister for Environmental Affairs & another v Aquarius Platinum (SA) (Pty) Ltd & others* 2016 (5) BCLR 673 (CC).

The owner of the mine must determine and manage the impacts of the residue management and facilities in the following manner-¹³⁶ identify all residue materials and residue management practices with a potential to contaminate water,¹³⁷ conduct statistical defensible and representative characterization programme of relevant materials;¹³⁸ and conduct an impact prediction study to assess the potential impacts of such actions or activities on the water resource over the full life cycle of the mining operations and until the impact from the operation is acceptable, which includes a monitoring programme and an evaluation of the effect of the mitigatory measures to demonstrate acceptable levels of impact.¹³⁹

Proper management the waste from mining activities will ensure that waste is not dumped everywhere, including on land that the mining communities utilize for crop cultivation, grazing for their livestock and water resources.

2.5. MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT 28 OF 2002

One of the objectives of this Act is to give effect to section 24 of the Constitution by ensuring that the nation's mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development.¹⁴⁰ A prospecting right, mining right, exploration right or production right granted in terms of this Act is a limited real right in respect of the mineral or petroleum and the land to which such right relates.¹⁴¹ The holder of a prospecting right, mining right, exploration right or protection right is entitled to the rights referred to in section 5, and such other rights as may be granted to, acquired by or conferred upon such her under this Act or any other law.¹⁴² Any holder of prospecting right, a mining right,

¹³⁶ Section 8 National Environmental Management Waste Act 59 of 2008.

¹³⁷ Section 8 (a) of Act 59 of 2008.

¹³⁸ Section 8 (b).

¹³⁹ Section 8(c).

¹⁴⁰ Chapter 2 section 2(h).

¹⁴¹ Section 5 (1).

¹⁴² Section 5(1)

exploration right or production right may take position of the land, remove or dispose of minerals.¹⁴³

No person may prospect for or remove, mine, conduct technical co-operation operations, reconnaissance operations, explore for and produce any mineral or petroleum or commence with any work incidental thereto on any area without an approved environmental management plan, as the case may be;¹⁴⁴ a reconnaissance permission, prospecting right, permission to remove, mining right, mining permit, retention permit, technical co-operation permit, reconnaissance permit, exploration right or production, as the case may be;¹⁴⁵ and notifying and consulting with the land owner or lawful occupier of the land in question.¹⁴⁶

If any prospecting, mining, reconnaissance or production operations cause or results in ecological degradation, pollution or environmental damage which may be harmful to the health or well-being of anyone and requires urgent remedial measures, the Minister may direct the holder of the relevant right, permit or permission to investigate, evaluate, assess and report on the impact of any pollution or ecological degradation;¹⁴⁷ take such

¹⁴³Section 3 subject to this Act, any holder of a prospecting right, a mining right, exploration right or production right may-

- a. Enter the land to which such right relates together with his/her employees, and may bring onto that land any plant, machinery or equipment and building, construct or lay down any surface, underground or under sea infrastructure which may be required for the purposes of prospecting, mining, exploration or production, as the case may be;
- b. Prospect, mine, explore or produce, as the case may be, for his or her own account on or under that land for the mineral or petroleum or which such right has been granted.
- c. Remove or dispose of any such mineral found during the course of prospecting, mining, exploration or production, as the case may be;
- d. Subject to the National Water Act, 1998, use water from any natural spring, lake, river or stream, situated on, or flowing through such land or from any excavation previously made and used for prospecting, mining, exploration or production purposes, or sink a well or a borehole required for use relating to prospecting, mining, exploration or production on such land; and
- e. Carry out any other activity incidental to prospecting, mining, exploration or production operations, which activity does not contravene the provisions of this Act.

¹⁴⁴Section 4 (a).

¹⁴⁵Section 4 (b).

¹⁴⁶Section 4 (c).

¹⁴⁷Section 45(1) (a).

measures as may be specified in such directive;¹⁴⁸ and complete such measures before a date specified in the directive.¹⁴⁹

If the holder fails to comply with the directive, the Minister may take such measures as may be necessary to protect the health and well-being of any affected person or to remedy ecological degradation and to stop pollution of the environment.¹⁵⁰ If the minister directs that measures contemplated in section 45 must be taken to prevent pollution or ecological degradation of the environment or to rehabilitate dangerous occurrences but establishes that the holder of the relevant reconnaissance permission, prospecting right, mining right, retention permit or mining permit, as the case may be, or his or her successor in title, is deceased or cannot be traced or, in the case of a juristic person, has ceased to exist, has been liquidated or cannot be traced, the Minister may instruct the Regional Manager concerned to take the necessary measures to prevent further pollution or degradation, or make the area safe.¹⁵¹

The measures contemplated in subsection(1) must be funded from the financial provisions made by the holder of the relevant rights, where necessary appropriate, or if there is no such provision or if it is inadequate, from money appropriated by the Parliament for the purpose.¹⁵² Upon completion of the measures contemplated in subsection (1), the Regional Manager must apply to the registrar concerned that the title deed of the land in question be endorsed to the effect that such land had been remedied.¹⁵³ The registrar concerned must, on receipt of the application contemplated in paragraph (a) make such endorsements as he or she may deem necessary so as to give effect to provisions of that paragraph, and no office fee or other charge is payable to the registrar in respect of such endorsement.¹⁵⁴

The MPRDA is the backbone of the mining legislation as it provides for the negotiation stages, prospecting stages, closure and rehabilitation and restoration of the land prior,

¹⁴⁸Section 45(1) (b).

¹⁴⁹Section 45(1) (c).

¹⁵⁰Section 45(2) (a).

¹⁵¹Section 46(1).

¹⁵²Section 46(2).

¹⁵³Section 46(3)(a).

¹⁵⁴Section 46(3)(b).

during and after the mining activities. This Act gives the Minister the power to intervene to prevent environmental degradation and where necessary revoke a mining right, all to protect and minimize environmental degradation.

In the case of *Fuel Retailers Association of Southern Africa v Director-General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province & others* 2007 (6) SA 4 (CC). The case involved an application for a filling station in White River, Mpumalanga. Inama Trust applied to the Mpumalanga environmental authorities for authorisation to construct a filling station in White River, Mpumalanga. Fuel Retailers Association of Southern Africa, an organisation which represents the interests of fuel retailers, the applicant in the proceedings in the Constitutional Court, objected to the construction of the filling station on various grounds, including that the construction of the filling station will have an adverse impact on the environment. The applicant insisted that the environmental authorities should consider whether the proposed filling station would be socially, environmentally and economically sustainable as required by the laws governing the protection of the environment. Despite this objection, the environmental authorities granted authorisation to the Inama Trust to construct the filling station. An internal appeal by Fuel Retailers Association was unsuccessful.

The applicant thereafter approached the Pretoria High Court seeking an order setting aside the granting of the authority to construct the filling station. It alleged that the environmental authorities did not consider whether the proposed development would be socially, environmentally and economically sustainable. It further alleged that the evaluation that had been conducted by the Town Planning Authorities some seven years earlier, when an application for rezoning for the purposes of establishing the filling station was considered, does not satisfy the requirement of the environmental legislation. The environmental authorities and Inama Trust opposed the application alleging that the socio-economic aspects of the construction of a filling station had been duly considered by the local authority when it considered the rezoning of the property for the purposes of constructing the filling station in question.

The Pretoria High Court dismissed the application. The appeal of Fuel Retailers Association to the Supreme Court of Appeal was equally unsuccessful.

In a judgment concurred in by all the justices except Sachs J, Ngcobo J held that the Constitution recognises the interrelationship between the protection of the environment and socio-economic development. It contemplates the integration of environmental protection and socio-economic development and envisages that the two will be balanced through the ideal of sustainable development. He held that sustainable development provides a framework for reconciling socio-economic development and environmental protection and thus acts as a mediating principle in reconciling environmental and developmental considerations.

2.6. NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT NO. 10 OF 2004

The Biodiversity Act is fundamental to the notion of sustainable development. International guidelines and commitments as well as national policies and strategies are important in creating a shared vision for sustainable development in South Africa.¹⁵⁵

The function of the South African National Biodiversity Institute is established by this Act¹⁵⁶, the institute; may coordinate and implement programmes for-¹⁵⁷ the rehabilitation of ecosystems;¹⁵⁸ and the prevention, control or eradication of listed invasive species. The institute may coordinate programmes to involve civil society,¹⁵⁹ in the conservation and rehabilitation of the ecosystem.¹⁶⁰

This act protects areas where endangered species can be found, it protects against environmental degradation and promotes rehabilitation where prevention cannot be

¹⁵⁵Such as the Johannesburg Plan of Implementation, agreed at the World Summit on Sustainable Development in 2002, the Mining, Minerals and Sustainable Development (MMSD) reports and the National Strategy for Sustainable Development (2011- 2014).

¹⁵⁶ Section 11 of National Environmental Management: Biodiversity Act 10 of 2004.

¹⁵⁷ Section 11 (m).

¹⁵⁸ Section 11(m)(i) .

¹⁵⁹ Section 11(n).

¹⁶⁰ Section 11 (n)(ii).

possible. The mining companies are not granted mining or prospecting right to mine just anywhere, if there are minerals on a land where endangered species is found and cannot be rescued or relocated to another area then such mining right for that particular area cannot be granted.

2.7. CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1996

The Constitution of South Africa supports the initiative to protect and preserve the environment that everyone has a right to a clean and safe environment. It states that everyone has the right- to an environment that is not harmful to their health or wellbeing.¹⁶¹To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measure that- prevent pollution and ecological degradation;¹⁶²promote conservation;¹⁶³and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.¹⁶⁴ The constitution is the supreme law of the country,¹⁶⁵ the NEMA, MPRDA and any environmental management plan is based and is in support of the constitution. These regulations have detailed what is already in the Constitution that includes the plan to rehabilitate, restore and protect.

2.8. AMENDMENT OF THE BROAD-BASED SOCIO-ECONOMIC EMPOWERMENT CHARTER FOR THE SOUTH AFRICAN MINING AND MINERALS INDUSTRY

Declaration on strategy for the sustainable growth and meaningful transformation of South Africa's mining industry of 30 June 2010 and in compliance with all relevant legislation; as follows:¹⁶⁶ improvement of the industry's environmental management by; implementing environmental management systems that focus on continuous improvement to review, prevent, mitigate adverse environmental impact; undertake continuous rehabilitation on land disturbed or occupied by the mining operations in accordance with appropriate regulatory commitments; provide for the safe storage and

¹⁶¹ Section 24(a) of the Constitution of South Africa, 1996.

¹⁶² Section 24(b)(i).

¹⁶³ Section 24(b)(ii).

¹⁶⁴ Section 24(b) (iii).

¹⁶⁵ Chapter 1 (2) of the Constitution, 1996.

¹⁶⁶ Provision 2.8 of amendment of the broad-based socio-economic empowerment charter for the South African mining and minerals industry.

disposal of residual waste and process residues; and design and plan all operations so that adequate resources are available to meet the closure requirements of all operations.

Proper closure of the mines prevents further degradation of the land and the broad-based socio-economic empowerment charter for the South African mining and mineral industry. Not only does the charter promote black empowerment and nationalization of the mines but also protects and promotes the rights of the mining community and ensures that the mining companies adhere to their obligation vested in mining regulations such as MPRDA and NEMA.

South Africa has legislation that is well formulated to cover all the shortfalls that may arise from mining activities, prior, during and after. The mining charter provides for all South African citizens to be economically covered, no matter the race. These pieces of legislation are to protect, minimize (if not prevent), rehabilitate and restore the land. They are to ensure that the economy of the country does not grow at the expense of the biggest asset being the environment.

CHAPTER 3: COMPARATIVE ANALYSIS OF LAND RESTORATION AND REHABILITATION BETWEEN AUSTRALIA, CHINA AND SOUTH AFRICA

3.1. Introduction

South Africa has environmental laws and policies in place to manage, protect and prevent land degradation, and where the prevention is impossible there are laws and policies to enforce on restoration and rehabilitation of the already degraded land. These laws and policies also exist in other countries; in this chapter the comparison is on how these countries have managed to enforce the laws on environmental restoration and rehabilitation. The implementation however, determines the success or failure of such legislation. In this chapter the success of different countries will be explored and compared with those of South Africa. Environmental degradation is basically a result of development measures undertaken without due consideration being paid to the maintenance of a clean state of the environment, therefore causing irreparable damages. Development and the maintenance of the environment in a clean state may appear contradictory, since it is evident that throughout man's production history his actions have increasingly worked against the valued composition of the environment. It is, however, important to observe that development and the protection of the environment should actually be regarded as complementary.

A clean state of the environment is necessary and assures mankind of the natural support for his development aspirations.¹⁶⁷ When misused, the environment's capacity to absorb man's harsh attacks on it get limited and its role in offering various support on development engagements or its capacity to absorb dangerous waste, thus cleaning itself, is equally reduced, and the results have tended to be disastrous to the existence of mankind.¹⁶⁸ Since the essence of development is, *inter alia* the betterment of mankind as well as the prolongation of mankind on earth, the protection of the environment is therefore imperative.¹⁶⁹ The mining industry has benefited from a global boom in demand for minerals in recent years, and is expanding, as a result of a high demand for raw materials for different industrial use.¹⁷⁰

3.2. Australia

The Australian system is common law-based. Its laws are based on a combination of legislation made by parliament and decisions made by an independent judicial system that adheres to the rule of law and due process.¹⁷¹ The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) is an Act of the Parliament of Australia that provides a framework for protection of the Australian environment, including its biodiversity and its natural and culturally significant places. It established a range of processes to help protect and promote the recovery of threatened species and ecological communities, and preserve significant places from decline. The EPBC Act replaced the National Parks and Wildlife Conservation Act 1975.

Laws are made and regulated by three tiers of government – federal, state and territory, and local government. The federal government (the Commonwealth) represents a federation of the six Australian states (New South Wales, South Australia, Queensland, Tasmania, Victoria and Western Australia) and the Commonwealth's territories (including the Northern Territory and Australian Capital Territory). The Commonwealth

¹⁶⁷ Mahalu C.R (1989): Environmental Degradation and The Law in Tanzania Stable URL: <http://www.jstor.org/stable/43109907> Accessed: 24/06/2016.

¹⁶⁸ Pfeiffer J.W (1999): Conditions that hinder effective communication. Accessed 25/06/2016.

¹⁶⁹ Ajei M.O (2007): Africa's Development: the imperatives of indigenous knowledge and values Accessed: 24-06-2016.

¹⁷⁰ Livesley, K (2010): Mine rehabilitation in the Australian minerals industry. Accessed 22-03-2017

¹⁷¹ Livesley, S, 2016 conserving herbivorous and predatory insects in urban green spaces. Accessed 02/02/2017.

has the power to make laws under the Australian Constitution. The Commonwealth has power to legislate in areas such as corporations, taxation, native title, overseas trade, trade practices, foreign investment and foreign affairs.¹⁷² However, using such power, the Commonwealth also legislates on broader issues including environmental issues and native title.¹⁷³

The purpose of an environmental impact assessment (EIA) shall be, with public participation and on a basis of expertise,¹⁷⁴ to identify, describe and assess the direct and indirect effects that a project will or may have on (a) human beings, fauna, flora and their habitats,(b) on soil, water, air, and climate,(c) on the landscape, and (d) material assets and the cultural heritage, including interactions of several effects.¹⁷⁵ To examine measures that prevent or mitigate harmful, disturbing or adverse effects of a project on the environment or that enhance its beneficial effects,¹⁷⁶to document the advantages and disadvantages of the alternatives examined by the project applicant as well as the environmentally relevant advantages and disadvantages of not proceeding with the project,¹⁷⁷ and to document the environmentally relevant advantages and disadvantages of the alternative sites or routes examined by the project applicant in case of projects for which the law foresees compulsory purchase.¹⁷⁸

The Jarrah forest¹⁷⁹ has high conservation value and is managed by the Western Australian State Government authorities for multiple uses including mining, forestry,

¹⁷²The act incorporated a three-tiered system of state, regional (now repealed) and local levels of significance, and required the *relevant planning authority* to take into consideration the impacts to the environment (both natural and built) and the community of proposed development or land-use change. Most development requires a *Statement of Environmental Effects* detailing the impacts to both natural and human environments, which should be taken into consideration by the regulatory authority, while larger projects require a more thorough *Environmental Impact Assessment* and greater public scrutiny.

¹⁷³ Neate G (2001): Review of conference: emerging issues and future directions. Accessed 02/03/2016.

¹⁷⁴ Section 1, Article 1 of Federal Act on Environmental Impact Assessment Act 2000. Purpose of environmental impact assessment and public participation.

¹⁷⁵ Article 1(1).

¹⁷⁶ Article 1(2).

¹⁷⁷ Article 1(3).

¹⁷⁸ Article 1 (4).

¹⁷⁹The Jarrah forest is part of the South-western Botanical District, recognized by Myers *et al.* (2000) as one of the biodiversity hotspots of the world and ranking alongside tropical rainforest for animal and plant diversity. Unlike the areas to the east and west of the forest, the Jarrah (*Eucalyptus marginata*)-dominated area is relatively intact because of its historical unsuitability for agriculture. The entire Jarrah forest is home to more than 780 native plant species. In the 80-m² sampling plots used in Alcoa's monitoring programs the mean number of native plant species range from 53 to 78. The Jarrah forest is

biodiversity conservation and recreation. It has a diverse flora of more than 780 species¹⁸⁰ with an estimated 79% of species being endemic to the south-west region.¹⁸¹ The bauxite ore is relatively shallow, averaging 4–5 m in depth, and is usually located less than 1 m below the soil surface.¹⁸² After timber harvest, mining involves clearing the remaining vegetation, removing the soil, blasting the cemented duricrust layer (which is part of the bauxite ore), removing and crushing the bauxite, and transporting it to the refineries.¹⁸³ Like other open-cut mining operations, this means that the soil profile will necessarily be disturbed in the short term and changes occur in the surface geology and hydrology of the sites.¹⁸⁴

In terms of article 1 of Federal Act on Environmental Impact Assessment (Environmental Impact Assessment Act 2000) the purpose of an environmental impact assessment (EIA) shall be, with public participation¹⁸⁵ and on a basis of expertise.¹⁸⁶

The practice of mine rehabilitation and environmental management in natural ecosystems is a relatively new area of science.¹⁸⁷ Particularly in Australia, much of the basic biological information required to restore native plants has been investigated only

also home to at least 235 vertebrate species (excluding fish). Invertebrate diversity is unknown but studies of particular taxa indicate that total invertebrate diversity will be in the order of tens of thousands.

¹⁸⁰Bell D. T. and Heddle E. M. (1989) Floristic, morphologic and vegetational diversity. In: *The Jarrah Forest: A Complex Mediterranean Ecosystem*, pp. 53–66. Kluwer, Dordrecht, The Netherlands. Accessed 26/01/2017.

¹⁸¹Paczkowska, G & Chapman, AR (2000): *The Western Australian Flora. A Descriptive Catalogue*. Accessed 26/01/2017.

¹⁸²Grant, C & Koch, J (2007) Decommissioning Western Australia's First Bauxite Mine: Co-evolving vegetation restoration techniques and targets. Accessed 26/01/2017.

¹⁸³Lalor B.M (2008): An assessment of the recovery of the microbial community in Jarrah forest soils after Bauxite mining and prescription burning. Accessed 31/03/2016.

¹⁸⁴*Ibid.*

¹⁸⁵Article 1. (1) Federal Act on Environmental Impact Assessment (Environmental Impact Assessment Act 2000)

¹⁸⁶Article 1. (1) The purpose of an environmental impact assessment (EIA) shall be, with public participation and on a basis of expertise, 1. to identify, describe and assess the direct and indirect effects that a project will or may have on a) human beings, fauna, flora and their habitats, b) on soil, water, air, and climate, c) on the landscape, and d) material assets and the cultural heritage, including interactions of several effects, 2. to examine measures that prevent or mitigate harmful, disturbing or adverse effects of a project on the environment or that enhance its beneficial effects, 3. to document the advantages and disadvantages of the alternatives examined by the project applicant as well as the environmentally relevant advantages and disadvantages of not proceeding with the project, and 4. to document the environmentally relevant advantages and disadvantages of the alternative sites or routes examined by the project applicant in case of projects for which the law foresees compulsory purchase.

¹⁸⁷Article 1. (1) Federal Act on Environmental Impact Assessment (Environmental Impact Assessment Act 2000)

over the last three decades. For this reason, Alcoa has had its own research group since the 1970s. This in-house research capacity is unique in Western Australia and lends a high degree of integration of the outputs of research with operational practice. There are also significant benefits of information flow from practice back to research. The research team has carried out short- and long-term mine environmental improvement research and direct consulting to the mine operations staff at the Jarrahdale, Huntly and Willowdale mines.¹⁸⁸ Over time, the team has expanded to more than 10 researchers and acts as a central environmental research and advisory group to three other groups of environmental staff involved in Alcoa's mines.

The three groups of environmental staff in Alcoa's mines comprise (i) on-site environmental staff who oversee daily environmental and mine-rehabilitation issues and operations and who provide environmental training to production personnel; (ii) a central mine environmental operations group who carry out planning and liaise with government and statutory authorities; and (iii) the nursery operation staff who are responsible for seed collection and plant propagation for mine restoration. This adds up to more than 30 environmental staff within Alcoa's mining group. The research department has also strengthened Alcoa's ability to create effective research partnerships with all five WA universities, the Botanic Gardens and Parks Authority (Kings Park), and CSIRO.

There is a two-way relationship between evolving standards and evolving techniques – and both are informed by interactions between research and practice.¹⁸⁹ That is, high targets could not be devised unless feasible techniques could be developed. Similarly, improved techniques could not be driven without high targets. An example is the development of a tissue culture laboratory that produces over 100 000 plants each year for the purpose of meeting the target of 100% species richness, including the 20% of species that are 'recalcitrant'. High targets and advanced techniques are therefore

¹⁸⁸ Yang X, Zhang K, Jia L, Ci L (2002) Desertification assessment in China: An overview. Accessed 15/12/2016.

¹⁸⁹ Li W (2004), Degradation and restoration of forest ecosystems in China. Accessed 15/12/2016.

synergistic and creatively interact, enabled by strong links between research and practice.¹⁹⁰

Restoration standards and techniques have improved over time. For example, when rehabilitation of mined areas at Jarrah dale commenced in 1966, the expectation for mine site restoration were typical of the era.¹⁹¹ Early prescriptions involved planting exotic pine trees with little site preparation. Later (up to 1988), non-native eucalypt species were used in most areas, because of the unknown impact that dieback caused by *Phytophthora cinnamomi* was going to have on the susceptible forest dominant Jarrah.¹⁹²

Research conducted through the 1980s, however, indicated that Jarrah would survive well in rehabilitated areas even if the soil contained the dieback fungus. As a result, only native over storey species, including Jarrah, have been used in rehabilitation since 1988.¹⁹³ This important change in the composition of the over storey has led to the splitting of rehabilitation into the pre and post-1988 eras, with different completion criteria used for each era.¹⁹⁴ Similarly, technologies for topsoil return and direct seeding were in their infancy in the 1960s and it was not until 1975 that it was recognized that the potential to reinstate the forest would be enhanced by using the seed and nutrient resources of the existing forest.¹⁹⁵ Restoration prescriptions also began to include deep ripping and improved landscaping of pits, return of topsoil and ultimately seeding of an understorey. A process of adaptive management led to improvements over time that influenced the quality of restoration at Jarrahdale and elsewhere in Australia.

¹⁹⁰ Colquhoun I. J. and St Hardy G. E. (2000) managing the risks of *Phytophthora* root and collar rot during bauxite mining in the *Eucalyptus marginata* (Jarrah) forest of Western Australia. *Plant Disease* 84, 116–127. Accessed 26/01/2017.

¹⁹¹ Gardner JH, Bell DT - *Restoration Ecology*, (2007): Bauxite mining restoration by Alcoa World Alumina Australia in Western Australia: social, political, historical, and environmental contexts. Accessed 26/01/2017.

¹⁹² Cahill DM, Rookes JE, Wilson BA, Gibson L (2008) *Phytophthora cinnamomi* and Australia's biodiversity: impacts, predictions and progress towards control. Accessed 26/01/2017

¹⁹³ Norman MA, Koch JM, Grant CD, Morald TK (2006): *Vegetation Succession After Bauxite Mining in Western Australia*. Accessed 26/01/2017

¹⁹⁴ *Ibid.*

¹⁹⁵ Johnson MS, Putwain PD(1981): *Restoration of native biotic communities on land disturbed by metalliferous mining*. Accessed 26/01/2017.

Australian law holds the person or the holder of a mining right criminally liable if he/she fails to adhere to the EIA submitted during the application of the mining right. Although each one of its states or provinces have different laws and pieces of legislation, the legislation and laws on environmental are generally provided for in the Australian common law.

3.3. Botswana

In Botswana like in South Africa, a person who wishes to commence with activities that may have an impact on the environment (such as mining) needs to lodge an application with the minister. However, unlike South Africa the Minister has the discretion to determine whether the activity intended to be carried out must have an environmental impact assessment plan or not. In terms of the Act no person shall undertake or implement an activity with adverse environmental impact unless such impact of the proposed activity is fully taken into account in accordance with the provisions of the Act.¹⁹⁶ Authorisation of the permit to carry on the activity will be determined by the mitigation measures to avoid or minimise the potential environmental impact.¹⁹⁷ If they are insufficient and ineffective, the developer is then afforded an opportunity to comply.¹⁹⁸ The provisions are (a) a list of activities which are likely to cause significant adverse effects on the environment, or the locations that may be environmentally sensitive, in respect of which a statement shall be mandatory;¹⁹⁹ (b) threshold determinations of environmental impact assessment with respect to the activities shall be used to determine the likely effects of a proposed activity in order to further determine whether or not a statement is required for the activity.²⁰⁰ The minister would then begin the screening stage which is the environmental impact assessment process where the Minister determines whether an activity should be subjected to an environmental impact assessment or not.²⁰¹

¹⁹⁶ Section 4(1) of Chapter 65:07 Environmental Impact Assessment.

¹⁹⁷ Section 14 (a).

¹⁹⁸ Section 14(b) (ii).

¹⁹⁹ Section 3 (2) (a).

²⁰⁰ Section 3(3) (b).

²⁰¹ Section 3(3).

No mineral concession shall be granted to or held by a person not being a citizen of Botswana, has not been ordinarily resident in Botswana for a period of four years or such other period as may be prescribed.²⁰² South Africa however, grants prospecting or mining right to even foreigners, this is proven in the case of *Atha-Africa Ventures (Pty) Ltd* which is an Indian company. This company was granted mining rights over a declared protected area in Mpumalanga.

The holder of a mineral concession shall, in accordance with the law in force from time to time in Botswana and in accordance with good mining industry practice, conduct his operations in such manner as to preserve in as far as is possible the natural environment, minimize and control waste or undue loss of or damage to natural and biological resources.²⁰³ To also prevent and where unavoidable, promptly treat pollution and contamination of the environment and shall take no steps which may unnecessarily or unreasonably restrict or limit further development of the natural resources of the concession area or adjacent areas.²⁰⁴ During and at the end of operations in any mine, excavation, waste dump or pond, the holder of a mineral concession shall take such measures as are required from time to time to maintain and restore the top soil of affected areas and otherwise to restore the land substantially to the condition in which it was prior to the commencement of operations.²⁰⁵ In the event that a holder of a mineral concession fails to fulfil his obligation to rehabilitate the environment the Minister may, after having notified the holder of his default and having given the holder a reasonable period of time to carry out the necessary restorations, carry out the necessary restoration whereupon the cost of such restoration shall be a debt due to Government by the holder and shall be recoverable in a court of competent jurisdiction.²⁰⁶

South Africa can learn a few lessons from Botswana. Firstly; that a mining right be granted to citizens as they may feel the need to properly rehabilitate the environment because they would also be affected by the negative impacts of the mining activities. Foreign mining companies would possibly extract the minerals and leave the country

²⁰² Section 6 (1) (a) of Chapter 66:01 Mines And Minerals.

²⁰³ Section 65 (1).

²⁰⁴ Section 65(1).

²⁰⁵ Section 65(4).

²⁰⁶ Section 65(6).

which would mean that they would not be affected by the environmental impacts. Secondly; the South African government jump in and rehabilitate the environment after the mining activities if the holder fails to do so. This would be so that the health and well-being of mining communities are not negatively affected. However, this second lesson can only be a success if the first lesson is taken into consideration so that the government can at a later stage claim for all the costs towards the rehabilitation process from the mining right holder who would be a citizen of the country.

3.4. China

The All-China Environment Federation (ACEF)'s main tasks is to organize and utilize the resources from all social forces to jointly participate in the undertaking of environmental protection, intensify social supervision, safeguard environmental rights and interests of the general public, coordinate and facilitate the government to fulfil the national goals on environmental protection so as to enhance the development of environmental protection in China.²⁰⁷ It also aims to organize and participate in international non-governmental exchange and cooperation related to environment, safeguard the sound international environment image of China, establish the proper international position of Chinese environmental protection organizations and promote the development of the environment undertaking of human kind. The chairman of the Standing Committee of National People's Congress stated that legislation should emphasise on strengthening dynamics of resource and environmental protection, and attached importance to the development of ecological agriculture. 'Only when China pays more attention to sustainable development will China be capable of solving environmental and resource problems'.²⁰⁸ This will result in protection of the population, resources and environment and have consequences for the whole of the world. The specific business scope of All-China Environment Federation is as follows:(i) To fully exert our role of acting as a bridge between the government and the society and to offer recommendations on decision-making to governments at all levels and relevant administrative competent departments of environmental protection in the light of the

²⁰⁷ Chapter II. Business Scope: Article 6.

²⁰⁸ Li P, chairman of the Standing Committee of the National People's Congress (1998) CCTV News.

targets and tasks set for national environment and development. (ii) To actively promote the legislation on the protection of environmental rights and interests, establish and improve the security system on environmental rights and interests, organize relevant activities and legal aid in the area of safeguarding environmental rights and interests and safeguard the legitimate environmental rights and interests of the general public.(iii) To develop and create favourable conditions for public participation and social supervision in the field of environment through diversified channels and perspectives and to set up a new platform for public participation and social supervision in this area. (iv) to offer consultation services on environmental policies, laws and regulations and technologies. (v) To unite all social forces and organizations in a bid to jointly promote the development of environmental protection undertaking in China. (vi)To launch relevant publicity and education activities on environmental protection (with special focus on protecting environmental rights and interests), to popularize the knowledge of environmental protection and safeguarding of environmental rights and interests and to raise the environmental awareness of the entire society. (vii) To organize and participate in international non-governmental exchange and cooperation related to environment, to seek more international support for the environmental protection undertaking of China and to enhance the development of the environment undertaking of human kind.(viii) To carry out various activities for the benefits of the public and conducive to the environment and to undertake other works assigned by the government and other relevant institutions.²⁰⁹

Article 1 of Law of the People's Republic of China on Prevention and Control of Water Pollution is enacted for the purposes of preventing and controlling water pollution, protecting and improving the environment, safeguarding human health, ensuring effective utilization of water resources and promoting progress of the socialist modernization drive.²¹⁰ This makes this part of the law similar to that of the South African Constitutions which states that “everyone has right to a clean and safe environment.”

²⁰⁹Section 11(m) (i).

²¹⁰Article 1 Law of the People's Republic of China on Prevention and Control of Water Pollution.

China has introduced theories and methods for restoration of mines and presented a case study of the ecological restoration, an integrated technical system consisting of stripping mining, peeled-off and rehabilitation was established with the integration of engineering reclamation and biological reclamation, some techniques such as advanced farming techniques and biotechnology were also employed.²¹¹ These measures apparently improved crop yield and soil fertility of the mine, accelerated ecological rebuilding processes and controlled soil erosion effectively.²¹²

Exploitation of mineral resources has resulted in the destruction of vast amounts of land and has caused very serious environmental problems which have received attention from most countries in the world, including China.²¹³ Ecological restoration and mine reclamation have become important parts of the sustainable development strategy of many countries.²¹⁴ Theories of ecological succession can be applied to mine reclamation and when grassland is converted into bare land, natural succession subsequently proceeds from weeds to sparse herbs to dense herb grassland.²¹⁵ After deforestation, the natural succession of *Picea* forest proceeds from cut land to grassland, to *Betula* forest, to *Populus* forest and finally to *Picea* forest. This process can last for several decades. However, human activities may regulate the process and thus expedite succession or change its direction.

Rehabilitation of mining wasteland is a complicated systematic project.²¹⁶ The following six fundamental principles should be observed: (1) legislation; (2) ecological risk evaluation; (3) minimization; (4) resource regeneration; (5) harmlessness and purification; (6) restoration of ecosystem. Reclamation of open-pit mines includes two

²¹¹ Gao L, Miao Z, Bai Z, Zhou X, Zhao J, Zhu Y - Ecological Engineering, (1998) "A case study of ecological restoration at the Xiaoyi Bauxite Mine, Shanxi Province" China1, 1997. Accessed 22/03/2017.

²¹² Mahalu C.R (1989).

²¹³ Costa R. *Mahalu: Environmental Degradation and The Law in Tanzania* Stable URL: <http://www.jstor.org/stable/43109907> Accessed: 24-06-2016.

²¹⁴ Robert, E.D. (1992). Prime Farmland Reclamation. In: Dept. Agronomy, IL Agric. Experiment Station, editors. University of Illinois Press, Urbana, 184.

²¹⁵ Pinetown et al (2006)

²¹⁶ Liu, R., 1995 "Review of reclamation of waste land in China. Reclamation and Greening of Waste Land of Mine" 1–6. Accessed 22/03/2017.

stages, engineering reclamation and biological reclamation. Also, it requires that mining technology, ecological technology and biotechnology be integrated.²¹⁷

To increase the efficiency of industrial land use and land reclamation processes it is essential that an integrated system of mining and reclamation be initiated.²¹⁸ Both the interior and exterior peeled-off fields use truck and bulldozers to peel off at the mine field, and loosener and scraper are also used at the minefields to ensure that easy access to drill and dig where necessary. The upper rock layer covering the mined ore makes up about one third of the stripping topsoil and is adequate for use as reclamation material. This makes it possible for mining and land reclamation to be carried out simultaneously. Its features include; using the same equipment by engineering reclamation and peeled-off, a close combination of stripping, peeled-off and land reclamation in time, space and process, the regulation of working plan of peeled-off field in accordance with the principle of shortening the period of occupying land and restoring waste land to cultivated land in advance.

In terms of Article 31 of Law of the People's Republic of China on the Environmental Impact Assessment where any construction entity fails to submit its environmental impact appraisal documents of the construction project concerned or fails to submit environmental impact documents for examination and approval anew or for inspection anew according to the provisions of Article 24 of the present Law and unlawfully starts the construction, it shall be ordered by the administrative department of environmental protection that is entitled to examine and approve the environmental impact appraisal documents to stop the construction and go through the relevant procedures within a prescribed time period.²¹⁹ If it fails to go through the relevant procedures within the time period, it may be fined not less than 50,000 yuan but not more than 200,000 yuan, and the person in-charge and other personnel of the construction entity who are held to be directly responsible shall be given an administrative punishment.

²¹⁷ Ma, Z., 1995. Research on Reclamation of Surface-Mined Lands in the Loess Plateau (No 1). Scientific Press, Beijing, 199. Accessed 22/03/ 2017.

²¹⁸ Hilson G, Murck B (2000): Sustainable development in the mining industry: clarifying the corporate perspective. Accessed 22/03/ 2017.

²¹⁹ Article 31 of Law of the People's Republic of China on the Environmental Impact Assessment.

Where any construction entity unlawfully starts construction without obtaining approval for its environmental impact appraisal documents or without obtaining new approval of the original examination and approval department, it shall be ordered by the administrative department of environmental protection that is entitled to examine and approve the environmental impact appraisal documents to stop construction, and may be fined not less than 50,000 yuan but not more than 200,000 yuan, and the person in-charge and other personnel of the construction entity who are held to be directly responsible shall be given an administrative punishment.

A whole set of engineering and biological reclamation approaches were applied to land reclamation of the Xiaoyi Bauxite mine. After 4–5 year cultivation, the original soil has matured, and its properties have reached the fertilizer level of local matured soil, close to the fourth standard of Chinese soil fertilizer. The results of land reclamation are summarized as follows: (1) there is a remarkable increase in organic matter, active P and quick-acting inarable layer. (2) During cultivation, as a result of the return of plant root systems and leaves restoring to the soil as well as acid manure being applied, soil porosity increased. After 3 years of reclamation, some granular structure developed. (3) After a 3- and 5-year cultivation period, the amount of bacteria, fungus and actinomyces have reached the level of local farm fields. (4) After the 4-year reclamation on the Xiaoyi Bauxite mine, the fertility of the soil arable layer has reached the middle and upper level of local farm fields. Crop yields of the reclaimed lands are also close to, or more than, local fields. In general, they increased by 10%. (5) After reclamation of slopes and platforms of the peeled-off field, the vegetation recovery rate of the platform was 90%, the slope reached 50–60%. Due to the developed root system of slope herbage and its good network properties and high mechanic strength, it possessed a strong capability of soil-conservation and slope-protection. After slope management, the amount of soil erosion decreased by as much as 60%, so soil erosion was controlled effectively.²²⁰

South Africa can utilize the methods used in China to restore, rehabilitate and even prevent further degradation to the land after the mining activities. China has shown a

²²⁰ Gao L, Miao Z, Bai Z, Zhou X, Zhao X, Zhu Y(1995): "Reclamation of mining land in China: Policies and practices" in: Wang, R. (ed.), *Wealth, Health and Faith. China Environmental Science* (1995) 130–141. Accessed 22/03/2017.

success rate in as far as restoring and rehabilitating the land after the mining activities especially where the mining company used strip mining, as this according to Ma Z, is the most effective because the rehabilitation process will be conducted on the upper layer and underground simultaneously.²²¹ Natural succession as one of the methods can take decades to fully rehabilitate the land; typically a degraded grassland habitat gradually changes from sparse herb grassland to dense herb grassland, then to shrub-grass ecosystems, and finally into a forest.²²² Although it will take some time, probably even exhaust the retained financial provision from mining companies by the minister the natural succession is low cost and promotes for natural rehabilitation of the land, by planting drought resistance vegetation with low maintenance.

Article 9, para 1 of the Constitution of the People's Republic of China²²³ specifies that: "All mineral resources, waters, forests, mountains, grasslands, unreclaimed land, beaches and other natural resources are owned by the state, that is, by the whole people, with the exception of the forests, mountains, grasslands, unreclaimed land and beaches that are owned by collectives in accordance with the law." Therefore, assuming that the potential resource of greenhouse gas reduction may be regarded as a kind of natural resource within the meaning of the Constitution, it can be said to be state-owned, i.e. owned by the whole people. Thus, strictly speaking, the statement in the Measures for Administration that the emission reduction resource is owned by the Chinese government²²⁴ is not accurate. In addition, there is no clear indication in law that the emission reduction resource is correctly classified as a natural resource. Thus it is open to conclude that, in making rules relating to the ownership and profit distribution of emission reduction resources, which have the character of property rights, the Measures for Administration are in violation of the provisions relating to legal authority stipulated in the *Legislation Law*.²²⁵

²²¹ Section 12 (1)(a).

²²² Miao Ze-Wei, Gao, L., Zhang, W, 2002. Ecological rebuilding and land reclamation in surface mines in Shanxi Province, China. Accessed 23/03/2017.

²²³ Office of the National Coordination Committee on Climate Change (2007) "CDM projects recently approved by National Development and Reform Commission"

²²⁴ Measures for Administration, Art. 24.

²²⁵ Legislation Law of the People's Republic of China (adopted at the Third Session of the Ninth National People's Congress, in force 1 July 2000)

Article 29, states that there any program formulating organ violates the any of the provisions of the present Law by practicing fraud or neglecting its duties in organizing environmental impact appraisals so that the environmental impact appraisal is seriously inconsistent with the facts, the person in-charge and other personnel who are held to be directly responsible shall be given an administrative punishment by the superior organ or the government supervision organ according to law.²²⁶

Perhaps, if South Africa adopts the Chinese methods of charging the people in charge directly and indirectly impacting on the environment negatively, for instance charging the Minister of environmental affairs for a fine or even imprisonment for failure to act in accordance with his office powers to intervene, protect and even revoke mining rights where the holder of such right is in violation of the environmental laws, the non-compliance and lack of enforcement would drastically improve.

3.5. South Africa

DMR, as custodian of South Africa's mineral resources, is tasked with enabling the sustainable development of these resources. This includes giving effect to the constitutional requirement to "prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development".²²⁷

The primary environmental objective of the MPRDA is to give effect to the 'environmental right'.²²⁸The MPRDA further requires the Minister to ensure the sustainable development of South Africa's mineral resources, within the framework of national environmental policies, norms and standards, while promoting economic and social development.

²²⁶ Chapter IV Legal Liabilities Article 29 of Law of the People's Republic of China on the Environmental Impact Assessment.

²²⁷ Constitution of the Republic of South Africa, 1996.

²²⁸ Section 24 of the Constitution states that "everyone has the right (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that: prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

With regard to the environment, section 37(1) of the MPRDA provides that the environmental management principles listed in section 2 of the NEMA must guide the interpretation, administration and implementation of the environmental requirements of the MPRDA, and makes those principles applicable to all prospecting and mining operations. The NEMA principles apply throughout South Africa to the actions of all organs of state that may significantly affect the environment, and thus to decision making on mining applications. These principles require that impacts on biodiversity and ecological integrity are avoided, and if they cannot altogether be avoided, are minimized and remedied. They also specify that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.²²⁹ Moreover the responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.

Furthermore, section 37(2) of the MPRDA states that “any prospecting or mining operation must be conducted in accordance with generally accepted principles of sustainable development by integrating social, economic and environmental factors into the planning and implementation of prospecting and mining projects in order to ensure that exploitation of mineral resources serves present and future generations”.²³⁰

²²⁹Sections 2 (4)(e) and 2(4)(p) NEMA.

²³⁰NEMA principles of particular relevance to biodiversity

- Section 2(4)(a)(i): the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied.
- Section 2(4)(a)(ii): pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied.
- Section 2(4)(a)(vi): the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised.
- Section 2(4)(a)(vii): a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions.
- Section 2(4)(e): responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.
- Section 2(4)(o): The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.
- Section 2(4)(p): The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.

In the *S v Blue Platinum Ventures (Pty) Ltd & Maponya*²³¹ During October 2007, in the Mopani district in Limpopo Province, Blue Platinum Ventures (Pty) Ltd commenced with a listed activity (more specifically item 1(e) of Listing Notice 2 of 2006: the construction of facilities or infrastructure, including associated structures or infrastructure, for any process or activity which requires a permit or licence in terms of legislation governing the generation or release of emissions, pollution, effluent or waste which has not been identified in Listing Notice 1 of 2006) without first obtaining the necessary environmental authorization as it was obliged to do in terms of Section 24 of NEMA. This activity, and in particular the clearance of vegetation and the excavation of large holes and pits caused large scale soil erosion and other serious harm to the surrounding environment; including health and safety implications for the neighboring village and its livestock.

Charges against the company were laid by a community representative of the neighboring village at the Maake Police Station. The Police notified the Inspectorate about the matter and a joint investigation team was formed between DEA and the Limpopo Commercial Crime Unit. On 17 October 2010, the company was formally charged in terms of, inter alia, section 24F of NEMA. In addition, section 34 of NEMA was utilized to charge the managing director, Mr Maponya, in his personal capacity, for failing to take all reasonable steps that were necessary in the circumstances to prevent the commission of the offence by the company (i.e. for failing to ensure that the company obtained the necessary environmental authorization prior to commencing with the listed activity in question). Knowing that authorization was required prior to commencing with the listed activity, Mr Maponya nevertheless allowed, or caused, the company to act in contravention of the relevant laws.

On 9 January 2014, Mr Maponya pleaded guilty to this charge in the Lenyenyé Magistrates' Court, Limpopo. The matter was postponed to 14 January 2014 for sentencing. The parties entered into a plea and sentence agreement in terms of section

• Section 2(4)(r): Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal habitats including dunes, beaches and estuaries, reefs, wetlands, and similar ecosystems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

²³¹ Unreported Rn126/13.

105A of the Criminal Procedure Act, 1977 in terms of which Nkomati Anthracite was sentenced to a fine of one million Rand (R 1 000 000) suspended for a period of 5 years.

In addition, and in terms of section 34(3)(b) read with Schedule 3 of NEMA, Nkomati Anthracite was ordered to pay, as a remedial measure, an amount of four million Rand (R4 000 000) (within 14 days from the date of the sentence) to the Environmental Management Inspectorate within DEA to be used to further the execution of the Inspectorate's enforcement mandate; including environmental rehabilitation and enforcement training.

Other countries are making this policy choice as well. Under the Canadian Environmental Protection Act of 1988, the federal government can impose criminal penalties ranging from fines of \$200,000 and up to six months in jail to \$1 million and three to five years' imprisonment.

Certain sanctions associated with the criminal law can have systemic effects. For example, disqualification of a corporate officer can prevent future violations, change the defendant's attitude toward crime, increase the relative authority of law-abiding personnel, and send a message through the firm that company loyalty is not a higher obligation than compliance with law.

Blue Platinum Ventures has shown that a right to environment is indeed one of the fundamental rights as enshrined under section 24 of the constitution. It has never been heard of where an environmental law is adjudicated in the criminal courts. The lack of this kind of commitment has been the loophole in our environmental law in South Africa. The fact that Maponya and his company were given a penalty of a suspended sentence for 5 years and that of a fine, demonstrates the seriousness of the environment and the consequence of contravention of the laws in place.

According to Article 45 of the Australian Federal Act states that unless an act constitutes a criminal offence, for which the courts have jurisdiction, persons commit an administrative offence punishable by the authority with a fine of up to € 30,000 if they

implement or operate a project subject to EIA²³² without the development consent required by this Federal Act.²³³ Sometimes a fine of up to € 15,000 a) if they do not comply with ancillary provisions (obligations and other requirements) in accordance with Article 17 (2) to (4) and (6) or Article 20 (4), b) if they do not fulfil the notification duty in accordance with Article 20 (1), c) if, in violation of Article 23 (1) and (2), they do not allow, or obstruct investigations, controls or the taking of samples, do not provide information or do not make available documents requested.²³⁴

In China anyone who, in violation of the provisions of the environmental law, commits any of the following acts, shall, in light of the seriousness of the case, be warned or fined by the environmental protection department or by the navigation administration office of the communications department.²³⁵ If any unit is in violation of the provisions of Article 13 of this Act, puts into production or to use a construction project for which the construction of facilities for prevention and control of water pollution has not been completed or whose facilities for prevention and control of water pollution fail to meet the requirements laid down by the State, the environmental protection department that approved the environmental impact statement of the said project shall order the unit to suspend production or use, and may also impose a fine on it.²³⁶ Where any program formulating organ violates the any of the provisions of the present Law by practicing fraud or neglecting its duties in organizing environmental impact appraisals so that the environmental impact appraisal is seriously inconsistent with the facts, the person in-charge and other personnel who are held to be directly responsible shall be given an administrative punishment by the superior organ or the government supervision organ according to law.²³⁷ Where any program examination and approval organ unlawfully approves any program draft for explanation of the environmental impacts should have been drafted or any special program draft to which an environmental impact report should have been attached, the person in-charge or other personnel who are held to be

²³² Articles 3, 3a, 23a and 23b of Environmental Impact Assessment.

²³³ Article 17 and Article 24 (1) of Federal Act.

²³⁴ Article 45 of Federal Act on Environmental Impact Assessment (Environmental Impact Assessment Act 2000).

²³⁵ Article 46.

²³⁶ Article 47.

²³⁷ Article 29 of Environmental Assessment Law-China.

directly responsible shall be given an administrative punishment by the superior organ or the government supervision organ.²³⁸

China holds the person in charge within the government who approves for instance mining rights on protected area, criminally liable or for a fine. South African can implement these laws and start charging the Ministers who neglect their duty and turn a blind eye on the environmental degradation.

CHAPTER 4: ADDRESSING ENVIRONMENTAL REHABILITATION CHALLENGES FACING THE MINING INDUSTRY IN SOUTH AFRICA

4.1. Introduction

In South Africa the mining industry contributes immensely to the economic growth and development. However this comes at a price. The extraction of the minerals from the earth has negative impacts on nature as we know it; hence there are laws in place in attempt to curb the damage caused by the mining activities.

The impacts on biodiversity typically associated with mining vary significantly depending on the type of mining, the scale and extent of mining, the environmental management approach adopted (detailed in an EMP), and the area and type of biodiversity being affected. Different types of mining include opencast, underground, and alluvial mining for each example, each of which has very different levels of impact on biodiversity. Additionally, each stage of the mining project can have adverse effects on the environment and biodiversity.

²³⁸ Article 30 of Environmental Assessment Law-China.

The impact is likely to increase in severity as a mining project develops through reconnaissance, to prospecting and then mining. When the mine closes activities that result in biodiversity impacts may draw to an end and the disturbance footprint of the mine needs to be rehabilitated. There may be long-term or latent impacts that continue to impact on biodiversity and ecosystem services after mine closure. Impacts of mining and related activities on biodiversity can be grouped into four broad categories. Impacts may be direct, indirect, induced or cumulative, as described below: include permanent changes in the surface water or groundwater regime, and/or the loss of biodiversity where mitigation measures are inadequate.

4.2. Effects or Consequences

The assessment of the magnitude of the Effects (or Consequences) of specific failure modes should be based on evaluations or analyses of the systems responses following failure. Adverse effects may have physical, biological or health and safety consequences. It is often necessary to make first estimates of consequences based on a professional judgment of the anticipated impact of that failure. For each Effect, the consequence can be assessed separately in each of four different concern areas.²³⁹ For each concern area, there are various scales and thresholds that may apply, such as scales based on the severity of injury, community well-being, environmental impact, operational impact etc. The scales that we have found most applicable for mine closure assessments are Unable to meet regulatory obligations; shut down or severe restriction of operations.²⁴⁰

For mine closure purposes, it will be useful for the assessment to be observed in separate categories of possible impacts caused by the mine activities under biological Impacts, Land Use and health and safety of the mining community.²⁴¹

Regulatory impacts have been found to have a profound influence on risk. Changes in regulation or regulatory enforcement practices following failures, or perceptions of potential failures can have severe consequences. Public concern and activism following

²³⁹ Shaw S and Robertson A (2012) Failure Modes and Effects Analysis - Robertson Geo-Consultants Inc., Canada. Accessed 05/05/2017.

²⁴⁰ *Ibid.*

²⁴¹ Allan RJ - Heavy Metals, (1995): Impact of mining activities on the terrestrial and aquatic environment with emphasis on mitigation and remedial measures. Accessed 06/07/2016.

failures have also had severe impacts, including impacts on public company share value and abilities to permit new mines.

4.3. Minimizing impacts

Minimizing impact of the land degradation requires consideration of alternatives in the project location, siting, scale, layout, technology and phasing that would minimize impacts on biodiversity and ecosystem services. Even in areas where the environmental and social constraints are not particularly high for mining to proceed/take place every effort should still be made to minimize impacts.

4.4. Rehabilitate impacts

The rehabilitation of areas where impacts were unavoidable and measures are taken to return impacted areas to a condition ecologically similar to their 'pre-mining natural state' or an agreed land use after mine closure.²⁴² Although rehabilitation is important and necessary, unfortunately even with significant resources and effort, rehabilitation is a limited process that almost always falls short of replicating the diversity and complexity of a natural system. Instead rehabilitation helps to restore some resemblance of ecological functioning in an impacted landscape, to avoid on-going negative impacts, and/or to provide some sort of aesthetic fix for a landscape. Rehabilitation should occur concurrently or progressively with the proposed activity, and/or on cessation of the activity.²⁴³

²⁴²Rehabilitation, in the context of the mitigation hierarchy, has to refer to reducing residual impact on biodiversity. In which case, the goal of rehabilitation would be the restoration to some pre-existing reference point, the biotic integrity in terms of species composition and community structure, as well as the reparation of ecosystem processes, productivity and services. However caution is required in incorporating rehabilitation in reducing residual impact calculations, given that the likelihood of success is limited. A distinction in the intent of rehabilitation can be made: (a) to repair of the affected area to what, within the regional context, is considered to be a useful purpose through the stabilization of the terrain, assurance of public safety, aesthetic improvement; (b) to restore an affected area or ecosystem to where it can sustain itself structurally and functionally, demonstrate resilience to normal ranges of environmental stress and disturbance, and interact with contiguous ecosystems in terms of biotic and abiotic flows and cultural interactions (see Cooke and Johnson (2002) for more on distinction between rehabilitation and restoration). The feasibility of rehabilitating biodiversity to a desired level should be determined during the scoping phase of a project with input from specialists. With growing concern of the likelihood of failing to rehabilitate, the precautionary principle should apply in biodiversity priority areas.

²⁴³ Cooke and Johnson (2002); "the distinction between rehabilitation and restoration". Accessed 05 May 2017

In the case of *Escarpment Environmental Protection Group & Langkloof Environmental Committee v Department of Water Affairs & Wer Mining(Pty) Ltd*,²⁴⁴ the case relative to water uses at the proposed Langkloof Colliery, situated in Emakhazeni (Belfast District), Mpumalanga. The Langkloof Colliery is an existing coalmine that had been partially mined by open pit methods. The mining area was abandoned in 1987 and no rehabilitation was undertaken. The new proprietors of the mine undertook to take both the rehabilitation of the defunct aspects of the mine with those impacts resulting from the new venture. The court held that the new proprietors had the duty to rehabilitate the impact caused by the previous proprietors as well as the impact to be caused by the new proprietors at their own cost. The court dismissed the appeal.

The duty to rehabilitate does not only start when the mining operations begin, the state of the land before mining activities does not limit the extent of the rehabilitation process by the new holder of the prospecting or mining right. The purpose of the rehabilitation process is to ensure that the land becomes fertile and useful again.

In the case of *Shear v The Regional Head: Gauteng Regional Department of Water Affairs & Eye of Africa Development (Pty) Ltd*²⁴⁵ the Tribunal had set out what is considered to be the 'whole appeal scheme' of the NWA, viz. that appeals may only be lodged by persons mentioned in s 148(1); that where no notice was published in the media as contemplated by s 41(4) of NWA, no right of appeal in terms of s 148(1)(f) of the NWA arises in favour of any objector.

Such interpretation does not offend the Constitution and only recognizes the extension of the right of appeal to the Tribunal to a class of persons specified in the NWA.

There exists no justification for subjecting the provisions of the NWA to the National Environmental Management Act 107 of 1998, particularly the principle set out in s 2(4) (g) which provides that the interests, needs and values of all interested and affected parties must be taken into account when decisions are made. Both statutes are of equal standing and seek to regulate different situations.

²⁴⁴2011 (Unreported, WT 25/11/2009).

²⁴⁵(unreported WT 19/02/2009).

The Promotion of Administrative Justice Act does not confer or make provision for the right to internal appeal procedures. The Tribunal is not a tribunal established for purposes of administrative review, and anyone who wishes to review an administrative action is free to approach the courts to do so.

Any interpretation which extended the right of appeal to any person or objector other than those contemplated in s 148(1) (f) of the NWA would unduly strain the words of the statute and cannot be ascribed to that section. The appeal was dismissed and the file closed.

The mining activities have impacts on the environment that could be calculated or roughly estimated and the total damage caused is referred to as Offset impacts which is compensating for remaining and unavoidable negative effects on biodiversity. When every effort has been made to minimize and then rehabilitate remaining impacts to a degree of no net loss of biodiversity against biodiversity targets, biodiversity offsets can provide a mechanism to compensate for significant residual negative impacts on biodiversity.²⁴⁶

The mitigation hierarchy is inherently proactive, requiring the on-going and iterative consideration of alternatives of project location, siting, scale, layout, technology and phasing until the proposed development best 'suits' and can be accommodated without significant negative impacts in the receiving environment. In cases where the receiving environment cannot support the development (e.g. there is insufficient water) or where the project will destroy the natural resources on which local communities are wholly dependent for their livelihoods or eradicate unique biodiversity, the development may not be feasible; the earlier the mining company knows of these risks, and can plan to avoid them, the better. In the case of mining, where biodiversity impacts can be severe,

²⁴⁶Biodiversity offsets are defined as measurable conservation actions intended to compensate for this residual impact so as to achieve no net loss of biodiversity and preferably a net gain on the ground (BBOP 2009)

the guiding principle should be “anticipate and prevent” rather than “assess and repair”.²⁴⁷

South Africa has sound environmental legislation aimed at achieving sustainable development, including laws that promote public participation, impact assessment and environmental management. The mining company will prepare a proposal for mining operations, along with the potential environmental impacts and how they will be managed. The relevant government departments will then decide whether the project is environmentally significant and the extent of environmental assessment necessary (if at all) before giving approval for the proposal.²⁴⁸ Assessment may involve public environmental reports, environmental impact statements, and community consultation and public inquiries. The time it takes to obtain the necessary permits will depend on whether the project is complex or controversial. Mining tenements are ordinarily granted within six months. If public consultation is needed then the time taken will increase, with some projects taking several years for the necessary permits to be obtained.

The Mineral and Petroleum Resources Development Act²⁴⁹, referred to in this Guideline as the MPRDA, is the main piece of legislation governing all stages of the mining and petroleum production process in South Africa, primarily through the granting of regulatory authorizations for mining and mining-related activities. The MPRDA is part of a network of legislation geared towards sustainable development and the conservation and management of South Africa’s rich biodiversity.

The Minister of Mineral Resources is the authority responsible for granting any reconnaissance permission, prospecting right, mining right or mining permit (here forward shortened to permission/right/permit). In practice this authority is often delegated to the relevant Regional Manager in DMR. The Minister is specifically tasked to “ensure the sustainable development of South Africa’s mineral and petroleum resources within a framework of national environmental policy, norms and standards

²⁴⁷Proceedings of Workshop on Impact Assessment, Biodiversity and the Extractive Industries, Beijing, China. ICM, IPIECA, CNOOC, IAIA conference, 24-26 March 2009.

²⁴⁸ S Livesley, 2016 Conserving herbivorous and predatory insects in urban green spaces. Accessed 02 February 2017.

²⁴⁹ Act No. 28 of 2002.

while promoting economic and social development”.²⁵⁰ To ensure this, the MPRDA stipulates that; The NEMA principles apply to all mining and serve as guidelines for the interpretation, administration and implementation of the environmental requirements of the MPRDA²⁵¹.The holder of a permission/right/permit:²⁵² (i) must consider, investigate, assess and communicate the impact of his or her prospecting or mining on the environment. (ii) must manage all environmental impacts. (iii) must – as far as is reasonably practicable, rehabilitate the environment to its natural or predetermined state, or to a land use which conforms to the generally accepted principle of sustainable development. (iv)is responsible for environmental damage, pollution or ecological degradation as a result of reconnaissance, prospecting or mining operations which may occur inside and outside the boundaries of the areas to which such right, permission or permit relates. (v)The permission/right/permit may be issued if the Minister is satisfied that it will take place within the framework of national environmental management policies, norms and standards.²⁵³

The guideline of the mining closure was demonstrated in the case of *Harmony Gold Mining Company Limited v Free State, Department of Water Affairs and Forestry*,²⁵⁴ this is a very important case (and one of the very few) dealing with the interpretation of s 19 of the National Water Act. The precedent established by the case is that the obligation to take ‘reasonable measures’ to prevent pollution in terms of s 19(1) is not confined to reasonable measures that can be effected on one’s own land, but extends to land owned, controlled or used by another. However, the court also introduces an interesting distinction between measures that are *preventative* (which he holds is the focus of s 19(1) and (2) of the NWA) and measures which are *necessary* (which he links with s 28(6) of NEMA). The implications of this distinction have not been fully explored in the literature.

The case set a precedent ensuring a long-term stability with no overtopping monitor or maintenance, although it cannot be estimated as to how long the holder of a right

²⁵⁰Section 3(3) of the Mineral and Petroleum Resources Development Act.

²⁵¹ Section 37(1) of National Environmental Management Act 107 of 1998.

²⁵²Section 38 of NEMA.

²⁵³ Section 48(2) of NEMA.

²⁵⁴2005 JDR 0465 (SCA).

should maintain the mine after closure, however the dangers imposed by the cease of such maintenance should be an indicator until such threat is removed.

Harmony Gold Mining Company Limited was one a few remaining companies operating mines in the KOSH basin (one of the other remaining players being AngloGold). Operations at the northernmost mines in the KOSH basin (Stilfontein, Hartebeesfontein and Buffelsfontein) had ceased. Because groundwater moved from the northernmost to the southernmost mines, dewatering at these mines had to continue to ensure the economic value and safety of Harmony and AngloGold's operations and to prevent the formation of acid mine drainage (AMD – though the court refrains from using this term. The northern mines were equipped with infrastructure able to extract a greater amount of water than the pumps maintained at the Harmony and AngloGold mines.

The litigation was precipitated by the provisional liquidation of the company controlling the Buffelsfontein mine (which company was, in turn, controlled by DRD Gold). The provisional liquidators let it be known that the Buffelsfontein mine had no funds to pay for continued pumping and that Eskom had threatened to cease supplying electricity to the Buffelsfontein and Hartebeesfontein mines after 12 April 2005. Pumping after that date could only continue if DRD Gold (which also controlled the company operating the Hartebeesfontein mine) joined forces with Stilfontein, Harmony and AngloGold to continue dewatering at the defunct mines.

On 11 April 2005 AngloGold applied for an interdict at the Witwatersrand Local Division (WLD) compelling the Minister of Water Affairs and Forestry to direct DRD Gold, the Stilfontein Company and the liquidators of the Buffelsfontein company to continue the dewatering of the three northern mines.

While this application was still pending, the Regional Director of Water Affairs: Free State issued a directive on 13 and 15 April respectively. The directives, issued in terms of s 19(3) of the NWA, were addressed to Harmony, DRD Gold, AngloGold and the company operating the Stilfontein mine and essentially compelled them to share the cost of pumping and treating water in the KOSH basin at the most appropriate locations. To this end, they were to provide the Regional Director with a determination of their

financial capacity to contribute to the cost of dewatering at the three northern mines, given the respective surface and underground areas exposed by their operations. The later directive contained more detailed provisions of the shafts at which particular volumes of water needed to be treated, and the obligations of Harmony and the other mines in this regard.

Harmony subsequently applied to the Johannesburg High Court (former WLD) for the review and setting aside of the directive in terms of the PAJA. The application was dismissed but leave to appeal to the Supreme Court of Appeal (SCA) was granted. Even though the second directive had expired by the time the matter was heard in the SCA, the court decided the issue on the basis that subsequent directives between the same parties would be based on the proper interpretation to be accorded to s 19(3) of the NWA.

Section 19(1) of the NWA²⁵⁵ provides that an obligation to take measures to prevent pollution rests upon an owner of land of which any activity or process was undertaken or any situation exists. The appellant thus argued that a directive issued in terms of s 19(3) to a person who fails to take such measures is confined to the taking of reasonable measures on the land owned, used or occupied by the person concerned – thus s 19(3) cannot be used to compel a person to take anti-pollution measures on the land of another. The nub of the appellant's argument was therefore that there was a territorial limit to the measures referred to in s 19(1). The appeal was dismissed.

The case has demonstrated the avoidance and blame shifting strategies used by the mining companies in order to evade the responsibility of rehabilitating and restoring the land to its original position. The companies are not compelled to go beyond the mining borders, which leaves the neighboring communities in a crisis as they can no longer have a conducive land for farming, livestock and even for themselves as water, air and soil will be contaminated by the mining activities. The mining and environmental legislation clearly holds the holder of a mining right liable for the maintenance of the mine after closure or cease of mining activities.

²⁵⁵ National Water Act 36 of 1998

The maintenance of mines should not be an exercised that needs constant reminding of the holder, it is a given as much as the right to mine is given the moment the permission to mine is granted. The fact that the holders of the mining right seem to only want to perform the duty of rehabilitation when threatened by a law suit or even ordered by the court to rehabilitate is highly concerning. There should be law that add to the court order a heavy fine from the holder for wasting the government resources evading what is his duty.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

The extent of the effects of mining activities on the communities in South Africa is an infringement of the right to environment that is not harmful to health and well-being. Remediation priority areas and actions need to be identified based on location and extent of mine pollution impacts. AMD follows the same flow pathways as water, and can therefore best be controlled by controlling water entry into the site of acid formation, by diversion of surface water away from the residue storage areas, prevention of groundwater infiltration into the mine workings, prevention of hydrological seepage into the affected areas and controlled placement of acid-generating waste.²⁵⁶

²⁵⁶Akcil, A & Koldas, S. "Acid Mine Drainage (AMD): causes, treatment and case studies" 2006 *Journal of Cleaner Production* 1139-1145.

Regulations made in terms of section 97 of NEMA may provide that any person who contravenes or fails to comply with a provision thereof is guilty of an offence and liable on conviction to²⁵⁷ - imprisonment for a period not exceeding five years;²⁵⁸ an appropriate fine;²⁵⁹ or both a fine and such imprisonment.²⁶⁰

The practice of mine rehabilitation and environmental management in natural ecosystems is a relatively new area of science.²⁶¹ Particularly in Australia, much of the basic biological information required to restore native plants has been investigated only over the last three decades, since the 1970s.²⁶² This in-house research capacity is unique in Western Australia and lends a high degree of integration of the outputs of research with operational practice.²⁶³ There are also significant benefits of information flow from practice back to research.²⁶⁴ The research team has carried out short- and long-term mine environmental improvement research and direct consulting to the mine operations staff at the Jarrahdale, Huntly and Willowdale mines.²⁶⁵ Over time, the team has expanded to more than 10 researchers and acts as a central environmental research and advisory group to three other groups of environmental staff involved in Alcoa's mines.²⁶⁶ The other three groups comprise (i) on-site environmental staff who oversee daily environmental and mine-rehabilitation issues and operations and who provide environmental training to production personnel; (ii) a central mine environmental operations group who carry out planning and liaise with government and statutory authorities; and (iii) the nursery operation staff who are responsible for seed collection and plant propagation for mine restoration.²⁶⁷ This adds up to more than 30 environmental staff within Alcoa's mining group.²⁶⁸

²⁵⁷ Section 98(2) of the National Environment Management: Biodiversity Act 10 of 2004.

²⁵⁸ Section 98(2) (a).

²⁵⁹ Section 98(2) (b).

²⁶⁰ Section 98(2) (c).

²⁶¹ Section 98(2) (d).

²⁶² Section 98(2)(e).

²⁶³ Section 98(2)(f).

²⁶⁴ Section 98(3).

²⁶⁵ Section 1 Biodiversity Act 10 of 2004.

²⁶⁶ Section 1(a).

²⁶⁷ Section 1(b).

²⁶⁸ Section 1 (c).

Under the repealed Mining Rights Act, 1967, and the Precious Stones Act the State retained the right to grant permission to prospect for or to mine *precious metals and precious stones* respectively.²⁶⁹ This meant that any intending prospector or miner first had to obtain the right to prospect or mine from the State, even if he owned the mineral. Consequently the State knew of every such prospector or miner involved with precious metals or stones. The owner of the right to a *base mineral* or a person with his permission could prospect and mine without any official authorization. The only way that the State would become aware of such operations was if the prospector or miner complied with the provisions of Mines and Works Regulation 2.1 of the Mining Rights Act which required him to notify the then Inspector of Mines of his operations.²⁷⁰ This was most unsatisfactory because many a small operator slipped through unnoticed, leaving behind unsightly unwanted landmarks. Then in 1980 regulations were promulgated to control the rehabilitation of land disturbed by opencast mines. That improved the situation somewhat but was still totally unsatisfactory, mainly because of the inadequate penalties, a fine of R300, which was no deterrent to any culprit.²⁷¹

In China an ecological approach is beneficial for land reclamation on land degraded by mining. Currently most reclaimed land is used for agricultural purposes and forestry. Ecological restoration should at least include: legislation systems, ecological risk evaluation, ecological assessment, ecological planning; financial investment and benefit distribution; clean production techniques; resource regeneration, and restoration and rebuilding of ecosystems on mine waste land.²⁷² For successful restoration, new land construction is the fundamental framework, should involve ecological planning, contour terrace building, control of soil erosion, the prevention and treatment of toxic substances, and covering spoil with loss. This must be integrated with ecological engineering aimed at vegetation establishment and ecosystem creation in order to optimize land productivity and soil fertility.

²⁶⁹ Ayres, T "Legal Requirements - The Environmental Management Programme (EMP) -A Critique" Accessed 24/03/2017

²⁷⁰ Article 47 of Federal Act on Environmental Impact Assessment.

²⁷¹ Article 47 of Federal Act on Environmental Impact Assessment.

²⁷² Miao Z et al (2000).

As in China and Australia the effective decision making processes aimed at optimizing design is a key step to successful practice and requires consultation with all involved including the local people. In order to make ecological restoration successful emphasis must be placed on the use of fiscal policies, both rewards and penalties, through a legally binding system with strict enforcement. South Africa should adopt these processes in order to make rehabilitation process a success.

Botswana has one of the best solutions to the environmental rehabilitation challenge because they only grant a mining right to the citizens of the country, should the person holding the mining right fail to rehabilitate the government jumps in and rehabilitate the land. The holder will however owe the government the cost of the rehabilitation process. South African can adopt this method in order to ensure that innocent community members around mining areas are not denied the right to a healthy environment and well-being as enshrined in the Constitution.

5.2. Recommendations

- The government must appoint representatives to different districts where mines are operating to assess and monitor whether mining companies are complying with the regulations as far as rehabilitation is concerned and report to the relevant authority. This will enable relevant authority to take appropriate decision on whether to impose sanctions, penalties or withdrawal or cancellation of the mining rights.
- The MPRDA must include the clause which states clearly that mining companies must provide rehabilitation even during the mining activities but it doesn't force for the companies to do so except for the provision made for rehabilitation and restoration after the mining activities.

- The first recommended action is that mines improve communications with communities:
 - Arranged visits to mines the aim of which would be to show residents how the mine is making use of the land, and what environmental protection measures are being used to prevent contamination.
 - Attitudinal surveys the process of obtaining base line information from communities on key land impact studies.
 - Partnership links the process of developing formal links between mineral operations and local schools, which can be important in helping a community gain better understanding of land use issues.
 - Liaison groups forming groups that specifically interact with the community and provide direct feedback to mine management.
 - Public meetings perhaps the most obvious and useful of strategies, whereby communities are informed about a formal gathering with representatives from government, the mine, and local environmental agencies, and where residents can voice concerns.
- The MPRDA must impose a duty on the mining companies to relocate the mining communities to newly constructed townships in non-mining areas by building new houses for every family that is within the mining community and who the mining activities will negatively impact on. This should be within the mining company's EMP.
- The government must invest in research for more methods of rehabilitation of land during and after the mining operations, they can do so by funding universities in the country that have interest in the rehabilitation and restoration of the land.
- Research is also required on strategies to utilize the storage potential of defunct/closed underground mine voids in optimally managing the generation of AMD in order to control its potential impact on the receiving surface and groundwater environments. Research is required on the further field impacts of AMD on potentially receiving dolomitic (karst) K environments and the re-activation of springs dried-up due to dewatering.

- Hold the people in office personally and criminally liable for all the overlooked factors, such as public participation. This would mean that the person who grants mining rights, for instance on protected areas should be held criminally liable.
- In openings to Surface mining the goal is to prevent inadvertent access, so what should be adopted is minimizing number of openings, permanently plug or seal openings to surface, backfill shafts, raises and slopes open to surface and vent water and gas pressures, use mining method resulting in stable surface.
- The South African government can start giving mining/ prospecting permits to citizens of the country, to ensure that the mining company cannot evade the rehabilitation stage.
- The government can also step in and rehabilitate the mined land if the person liable is unable to do so, then later claim from the person in the court of law.

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