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**SUSTAINABLE WATER USAGE IN THE MINING SECTOR THROUGH THE OPTIMISATION OF
COLLABORATIVE IMPLEMENTATION**

By

KAREN FAUL

21276171

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Prepared under the supervision of

Adv Leonardus J. Gerber

Department of Public Law

Faculty of Law

University of Pretoria

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Kind Regards

Karen Faul

ABSTRACT

Freshwater has become a global issue and by the year 2025 the UN predicted that more than half of the world's population would experience water shortages. South Africa themselves predicts a water gap of 17% by the year 2030. The two year draught that started in 2015 due to climate change has been devastating in South Africa with the Western Province experiencing the worst water shortages reported for the last 113 years. Sustainable water usage is the only way for South Africa and the world to attempt and close this gap and ensure sufficient water supply for future generations.

This study aims to prove that the way to achieve sustainable water usage is through collaborations between the state, private industry and the communities. Special attention is given to the mining industry because they are such huge role players in the use of water resources. The world cannot function without the mining industry and the mining industry cannot function without water, therefore it cannot be taken out of the equation of economic and social development. The only option is that mining companies must become an integral part in the fight for water resources in the area in which they operate.

The study also aims to prove that the platform from which good water governance can be successfully launched is from that of the Catchment Management Agencies. The platform for these institutions is already created in the South African legal framework on water and only progressive implementation is needed. The South African legislation together with the Constitutional mandate already contains the spirit of co-operative governance, and the participation of the role players. Running water governance from the Catchment Management Agencies has various benefits for a country and the mining industry which is examined by this study. The only element needed now is to optimise the implementation of planned collaborations between these role players to sustain and ensure the water resources of South Africa.

LIST OF ACRONYMS

AFDB	African Development Bank
CMA	Catchment Management Agencies
DMR	Department of Mineral Resources
DWA	Department of Water Affairs
EWRP	eMalahleni Water Reclamation Plant
GDP	Gross Domestic Product
ICMM	International Council on Mining and Metals
IFC	International Finance Corporation
IRP	Integrated Regulatory Process
IWRM	Integrated Water Resource Management
IWWMP	Integrated Water Waste Management Plan
MPRDA	Minerals and Petroleum Resources Development Act
MWA	Mine Water Atlas
MWCB	Mine Water Coordinating Body
NEMA	National Environmental Act
NWA	National Water Act
NWP	National Water Policy
NWRS2	National Water Resource Strategy 2
SWPN	Strategic Water Partnership Network
VCP	Voluntary Code of Practice
WRC	Water Research Commission

KEYWORDS

Co-operative governance

Collective governance

Sustainable water usage

Catchment Management Agencies

Collaborations

Integrated Water Resource Management

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CHAPTER 1: INTRODUCTION

“Whiskey is for drinking and water is for fighting”

(Mark Twain)

1.1 Introduction to the research problem

One of the most pressing concerns faced in the 21st Century, is the question of water scarcity. The UN reported that water use by the world population is two times more than the rate of population growth.¹ The problem is not that there is not enough freshwater in the world; rather the problem is that the distribution of life-sustaining freshwater is under stress because of unsustainable utilisation in many forms.² Coupled with the problem of climate change, it is predicted that by the year 2025 water shortages will be felt by ⅓ of the world’s population.³

Around 70% of the largest mining companies in the world are operating in areas that are classified as water-stressed.⁴ Mining is a water dependant industry and water has become a contributing factor to conflict; from the year 2000 to 2016, 58% of the complaints received by the International Finance Corporation (IFC) from mining affected communities related to water problems.⁵ Water in the mining industry can no longer be viewed as just another input resource for production, but should be is viewed for the significant value it has for all stakeholder. Consequently, it has become a discussion point on the majority of mining company’s boardroom agendas.⁶

1.1.1 Global influences and trends

The Integrated Water Resource Management (IWRM) approach is understood globally to be the key to successful water management.⁷ The United Nations (UN) launched the *UN Sustainable Development Goals* (SDGs), with Goal 6 in particular relating to water, as well as the goals

¹ UN DESA *International decade for Action:2005-2015. Water for life Decade-Water Scarcity* <http://www.un.org/waterforlifedecade/scarcity.shtml>. (accessed 21 July 2017).

² *Ibid.*

³ WWF *Threats Waterscarcity.Overview* <https://www.worldwildlife.org/threats/water-scarcity> (accessed 21 July 2017).

⁴ ICMM, IFC *Shared Water, Shared Responsibility, Shared Approach: Water in the Mining Sector* at 7-8 <https://www.icmm.com/shared-water-shared-responsibility/> (accessed 21 July 2017)(hereinafter ICMM, IFC *Shared Water Report* 2017).

⁵ *Ibid.*

⁶ *Ibid.*

⁷ Thompson H *Water Law: a practical approach to resource management and the provision of services* (2006) Juta and Co Ltd: Cape Town at 162 (hereinafter Thompson 2006).

needed to be reached in order to address the global water crises. Some of the goals listed read as follows:⁸

- “By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally”
- “By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity”
- “By 2030, implement integrated water resources management_at all levels, including through trans boundary cooperation as appropriate”
- “By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies”
- “Support and strengthen the participation of local communities in improving water and sanitation management”.

The above clearly illustrates the aim to use water sustainably by harvesting the power of both the government and stakeholders as water users.

The global movement on the importance of sustainable development, and the sustainable use of water in particular, have forced mines to broaden their horizons when it comes to the impact of operations on water resources.⁹ Building on the above understanding, mining companies must now look at the operation’s impact on the greater water catchment area, including the taking into account other surrounding mines.¹⁰

Water-related infrastructure is believed to contribute about 10% of the mining industries capital expense.¹¹ The international industry representative organisation, the International Council on Mining and Metals (ICMM), urges its members to become water stewards in their respective areas.¹² Mining companies need to initiate partnering with government and locals in designing a mutually beneficial water management system.¹³ The ICMM believes that mining companies can make significant contribution to the provision of safe and adequate supplies of water to catchment areas.¹⁴

In support of this view, the ICMM compiled a practical guide to water management for the mining industry, which sets out a systematic approach on how to identify and manage water

⁸ UN Sustainable Development Goals. Goal 6: Ensure access to water and sanitation for all <http://www.un.org/sustainabledevelopment/water-and-sanitation/> (accessed 24 July 2017).

⁹ ICMM, IFC Shared Water Report (2017) at 7-8

¹⁰ *Ibid.*

¹¹ *Ibid.*

¹² *Ibid.*

¹³ *Ibid.*

¹⁴ ICMM Environment Report: Water management in mining: a selection of case studies (May 2017) at 5. <https://www.icmm.com/en-gb/search?q=water+management+in+mining/> (accessed 24 July 2017) (hereinafter ICMM Water management Report 2017).

risks within a particular water catchment area.¹⁵ The World Bank and The African Development Bank (AfDB) have also initiated initiatives on sustainable water.

The prominent factor that needs to be emphasised is that all of them require the *bona fide* collaboration between the stakeholders.

1.1.2 The South African perspective and challenges

In South Africa it is estimated that by the year 2030 there will be a 17% deficit in freshwater supply to the population, if serious action is not taken in the short time span left.¹⁶ In order to address this global problem on home soil, South Africa has developed a strong legal framework to govern its water resources in a sustainable manner.¹⁷ This is primarily achieved through the Constitutional mandate on water.¹⁸ The mandate obliges the state to take legislative and other reasonable measures to realise this right.¹⁹ The organs of state responsible for the sustainable management of water must ensure that the reasonable measures employed are so as to respect, promote and fulfil the fundamental rights to water.²⁰

In 1996 the Cabinet approved 28 Principles and objectives to achieve sustainable management of water resources.²¹ The three prominent fundamental principles related to water management include:

- To achieve equitable access to water,
- To achieve sustainable use of water, and
- To achieve efficient and effective water use for optimum social and economic benefit.

These fundamental principles, coupled with National Water Act²² (NWA), resulted in the National Water Policy (NWP)²³. The Constitutional mandate is further codified within the other developed environmental and water laws of the country.²⁴

The involvement of stakeholders is entrenched in the Constitution through the concept of co-operative governance that will be discussed in detail below.²⁵ The Strategic Water Partners Network (SWPN) is an example of the type of collaborations formed when the concept of co-operative governance is applied to the management of the water resources.²⁶ This is a

¹⁵ ICMM *A practical guide to catchment-based water management for the mining and metals industry* (2015) at 4 <https://www.icmm.com/en-gb/search?q=water+management+in+mining/> (accessed 24 July 2017) (hereinafter ICMM *Practical guide* 2015).

¹⁶ Hirschfeld I, *Strategic Partnership Water Network for development* (2011) at 2 www.nbi.org.za/wp-content/uploads/2016/06/Ian-Hirschfeld-SWPN.pdf (accessed 8 July 2017) (hereinafter Hirschfeld 2011).

¹⁷ Thompson (2006) at 1.

¹⁸ *Ibid.*

¹⁹ *Ibid.*

²⁰ Thompson (2006) at 246.

²¹ *Ibid* at 159-162.

²² The National Water Act 36 of 1998 (hereinafter the NWA).

²³ The White Paper on the National Water Policy for South Africa (199

²⁴ *Idem* at 158.

²⁵ Hirschfeld (2011) at 3.

²⁶ *Ibid.*

partnership between prominent mining companies, industries and state departments.²⁷ Its main objective is to work on closing the 17% gap predicted in water supply by 2030 through innovative and cost effective solutions.²⁸ The Water Research Commission (WRC) is an institution created through the Water Research Act (Act No 34 of 1971), which engages stakeholders in solving water-related problems in a sustainable manner.²⁹ In the eMalahleni area, another internationally renowned collaboration between Anglo America and South 32 (previously BHP Billiton) has developed a water treatment plant to treat acid mine water from the Anglo coal mines and the defunct BHP mine into potable water. This potable water is then sold to the local municipality, thus meeting almost 20% of its daily water requirements.³⁰

The *Mine Water Atlas* (MWA) is another collaboration of the public and private sectors, which maps the un-mitigated threat of mining on water resources across the country.³¹ It aims to consolidate existing data on water as a whole in order to support water resource managers in identifying vulnerabilities, and to make coordinated decisions regarding mining and the water resources of the country.³²

Water catchment management agencies are established by the NWA and its main purpose are to drive and co-ordinate water resource planning and management within a catchment area between the different water users. In 1998 with the promulgation of the NWA, 19 catchment agencies were initially identified, 10 years later in 2008 only five have been established of which only one was fully operational.³³

1.2 Aims and objectives of research proposal

In light of the above, the aims of this study are to:

- Examine the South African legal framework and policies on water management;
- Define collaborative governance and co-operative governance, and determine how it is supported within the existing legal framework;
- Examine how the South African legislation governing water management is implemented, specifically through collaboration with the mining industry, and
- Analyse relevant case studies of collaboration in water management in the mining industry from across the world, in order to determine derived benefits.

²⁷ *Idem at* 16.

²⁸ SWPN Programme Manager (10 August 2016) <http://www.ngopulse.org/opportunity/2016/08/10/strategic-water-partners-network-programme-manager/> (accessed 26 September 2017).

²⁹ Water Research Commission *Mandate* (2017) <http://www.wrc.org.za/Pages/AboutUs.aspx/> (accessed 26 September 2017) (hereinafter WRC 2017).

³⁰ Cornish, L *Anglo's eMalahleni water reclamation plant: Taking centre stage on a global platform* Inside Mining (February 2013) at 26-27.

³¹ Water Research Commission *Mine Water Atlas* (2017) <http://www.wrc.org.za/Pages/MineWaterAtlas.aspx/> at 6 (accessed 8 July 2017)

³² *Ibid.*

³³ Colvin, J Ballim, F Chimbuya, S Everard, M Goss, J Klarenberg, G Ndlovu, S Ncala, D Weston D Building capacity for co-operative governance as a basis for integrated water resource managing in the Inkomati and Mvoti catchments, South Africa Water SA 2008 34 IRWM Special Edition at 682 (hereinafter Colvin et al 2008).

1.3 The research question

The primary question of this study, is how the sustainable use of water in the mining industry can be optimised through the implementation of collaboration within the current legislation in South Africa

The secondary questions arising there from, include:

- What is meant with collaborative government and does it differ from co-operative government; alternatively, how do the two concepts slot into one another?
- What is the scope of South African legislation regarding the sustainable management of water resources?
- How exactly is collaboration with industry supported?
- What international collaborations exist between governments and mining companies to achieve sustainable water usage/management?
- What South African collaborations are there between government and the mining industry
- What are the characteristics of successful collaborations?
- What can be done to optimise the implementation of collaboration for sustainable water usage?

1.4 Research methodology and limitations

1.4.1 Methodology

This study is based on desktop research. Contextualisation and background is sourced from various government documents, legislation and current South African water projects in mining specifically and other industries. The paper will also investigate various international case studies on collaborative initiatives to improve sustainable water usage in the mining industry. The case studies that are considered include the water collaboration in the South Gobi area, Mongolia, collaboration in Peru, Australia and Canada, and then lastly the locally based collaboration in South Africa.

1.4.2 Selection of case studies

These specific case studies were chosen because the locations of the mining operations are all located in water scarce/arid areas. Also they are not located close enough to the ocean for it to be used as a water resource. The mining companies and the government had only the option of the available freshwater in the catchment area. The studies are also chosen in specific from a wide group in terms of economic development, to show that fresh water problems are not necessarily something that is limited to developing countries and that developed countries such as Australia, and Canada in particular have similar problems when it comes to water resources.

1.4.3 Limitations and delineations of study

The need for integrated water management has been realised globally and by the South African government. The mining industry also acknowledges that this problem requires the collaboration of all stakeholders to ensure sustainability of the water resources. Though

initiatives and collaborations have commenced, the rate of operationalisation in South Africa is slow due to various reasons. The biggest collaboration that has been initiated by the mining industry in South Africa so far, is the eMalahleni water treatment plant. This particular case dominates available reporting and research. Due to the selected methodology and nature of this research, this case study is accordingly focussed on. Although the study considers water policies and legislation currently in place, it is limited to what has actually been implemented, in order to 1) report on how sustainable water usage is currently achieved, and 2) to identify gaps in the current *status quo*.

1.5 Relevance of study

This study contributes to the discussion on the importance of well implemented legislation, particularly against the backdrop of the use of collaboration to promote the sustainable usage of water resources for the benefit of South Africa. It further shows that a major water user, such as the mining industry, can actually play an important role in helping to achieve the goals on water resources set by the UN and South Africa. Finally, the research assists in identifying existing *lacunae* in the system, particularly where the sustainable use of water is concerned.

1.6 Chapter overview

The content of this study is divided into six chapters. Chapter 2 contextualise the concept of co-operative and collective governance and sustainable water usage, specifically in the mining industry. Chapter 3 continues the study by presenting a brief overview of South African legislation and policies on the regulation of water as a natural resource. Chapter 4 examines a selection of international and domestic case studies to illustrate how sustainable water usage can be achieved by mines in various water scarce countries. Finally, Chapter 5 will examine what collaboration entails, before concluding with certain recommendations in Chapter 6.

1.7 Conclusion

The following chapter lays the foundation for the research, in that it contextualises the concepts of sustainable use of water as a natural resource within the ambit of the mining industry, as well as the concepts of co-operative governance.

CHAPTER 2: DEFINING COLLECTIVE GOVERNANCE IN TERMS OF SUSTAINABLE WATER RESOURCE MANAGEMENT

2.1. Introduction

In order to determine how collective governance is used to manage water resources effectively, the difference between co-operative governance and collective governance must be made. This will reveal how the one is used as a tool to achieve the other. However, even before this distinction is made, it would be worthwhile to define 'governance' and 'government' first. The latter refers to the '*political organisation of society*', and is the political rule of a country through its parliament and bureaucracy.³⁴ Governance, on the other hand, denotes the '*innovative practices of networks, or horizontal forms of interaction*'.³⁵ A holistic definition of the concept as provided by the Commission on Global Governance is as follows: "*governance represents the sum of the many ways in which individuals and institutions, public and private, manage their common affairs*".

Governance can thus be described as the enabling structure that guides collective decision-making through its structured rules.³⁶ The emphasis is placed on the co-ordination and collaboration among several role players.³⁷ The role players are not only the public authorities, but all the stakeholders across the spectrum of experts and professionals, which include the business sector and NGO's.³⁸ Decision making is a comprehensive and varied process in which conflicting interests are accommodated through co-operative action.³⁹

2.2. Co-operative governance

In terms of the South African approach, co-operative governance is one of the many goals that are enshrined within The Constitution.⁴⁰ Government is made up of three spheres; national, provincial and local, and are distinctive and interdependent of each other.⁴¹ This means that each sphere still has its own character and functions, but they are not designed to function alone and in isolation from the other spheres.⁴² In other words, each sphere of government must co-operate with the other, this is to enhance transparency and accountability, which in turn will

³⁴ Ferreira-Snyman MP, Ferreira, GM *Global Good Governance and Good Global Governance* SAYIL (2006) 31 at 52 (hereinafter Ferreira-Snyman 2006).

³⁵ *Ibid.*

³⁶ Ansell C, Gash, A *Collaborative Governance in Theory and Practice* JPART (2007) 18 at 545 (hereinafter Ansell Gash 2007).

³⁷ *Supra see note 34.*

³⁸ *Supra see note 34.*

³⁹ *Supra see note 34 at 53.*

⁴⁰ Nel J, W Du Plessis, W *An Evaluation of NEMA Based on a Generic Framework for Environmental Framework Legislation* SAJELP (2001) 8 at 21-22 (hereinafter Nel Du Plessis 2001).

⁴¹ *Ibid.*

⁴² Bray E *Cooperative Governance in the Context of the National Environmental Management Act 107 of 1998* SAJELP (1999) 6 at 3 (hereinafter Bray 1999).

achieve coherent governance.⁴³ It can be said that a balance must be struck between self-rule and shared-rule.⁴⁴

The effectiveness of co-operative governance depends on the horizontal and vertical functioning of all the spheres.⁴⁵ The fact that the powers are divided between the three spheres of government means that conflict may and will arise.⁴⁶ However the system is so designed that the functions of created institutions and procedures should be able to resolve any conflict.⁴⁷ The policies and legislation together with the respective enabling activities of each sphere must be coordinated to give support to the other; this will foster mutual respect and achieve the principles as set out in the Constitution.⁴⁸ The resources of each sphere must be used to achieve the service delivery goals of the country as a whole.⁴⁹

The democratic values of public administration and public-participation in policy making are supported by the spirit of a co-operative government.⁵⁰ Government of the country is not only achieved by an elected few in positions of power, but cooperation and participation by civil society is a significant requirement.⁵¹ Bray describes the concept of co-operative government as such: *“co-operative relationships within governmental spheres and between government and civil society, forms the backbone of the South African constitutional democracy and its objectives of open, transparent, participatory and accountable government”*.⁵²

Co-operative governance in the ambit of the water sector is described by the National Water Resource Strategy 2nd Edition (NWRS2) as the inter-play between politics, administration and economics.⁵³ Water governance must rely on the activities of all the stakeholders within the sector.⁵⁴ Stakeholder management within the water value chain is indispensable in that not government or industry alone can't solve the water issues the country is staring in the face.⁵⁵

In conclusion, the focus of co-operative governance is the co-operation between the different spheres of government within a country and one of its principles and objectives contains the element of public participation. To highlight the integral part that the principle of public-participation plays within a co-operative government the concept of collective governance must be utilised.

⁴³ Nzimakwe, T Ntshakala, T *Intergovernmental Relations and Cooperative Governance: Two sides of the same coin*. Journal of Public Administration (2015) 50 at 834 (hereinafter Nzimakwe Ntshakala 2015).

⁴⁴ Bray (1999) at 4.

⁴⁵ Nel Du Plessis (2001) at 22.

⁴⁶ Supra n 44.

⁴⁷ *Ibid.*

⁴⁸ Nzimakwe Ntshakala (2015) at 835 .

⁴⁹ *Ibid.*

⁵⁰ *Ibid.*

⁵¹ Supra n 44 at 6.

⁵² *Ibid.*

⁵³ Department of Water Affairs *National Water Resource Strategy 2 Water for an Equitable and Sustainable Future* (June 2013) at 15 (hereinafter NWRS2 2013).

⁵⁴ *Ibid.*

⁵⁵ *Ibid.*

2.3. Collective Governance

The World Economic Forum defines collective governance as ‘...an innovative model of governance that is solution-orientated with a focus on public value, where diverse stakeholders can work in partnership to improve the management of public resources and delivery of services’.⁵⁶

Collective governance is reflected in multi-stakeholder initiatives that involve the efforts of government, private sector and the public to solve development challenges.⁵⁷ It acknowledges that no one group of stakeholders can solve a single problem alone.⁵⁸ It is also important to point out that stakeholder involvement should be continuous and active as opposed to just mere representation.⁵⁹ Another term that has emerged also for collective government is that of collaborative governance and has been defined as: “A governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-orientated, and deliberative and that aims to make or implement public policy or manage public programs or assets”.⁶⁰

There are six core elements to this definition:⁶¹

1. The forum is initiated by the public sector
2. Participants include non-state parties
3. Parties engage directly in decision making in contrast to just being consulted by the state
4. The forum meets collectively and is organised
5. Decision making is aimed at consensus
6. The focus is public policy or public management

This definition aims to enhance the fact that collaborative governance is not consultative.⁶² Stakeholder surveys are not in the essence collaborative because they do not enhance a two-way communication channel.⁶³ Stakeholders must directly participate in decision making and the advice of advisory committees is closely related to the decision-making outcomes.⁶⁴

⁵⁶ World Economic Forum *What is collective governance*
<https://www.weforum.org/agenda/2015/07/what-is-collective-governance/> (accessed 28 August 2017).

⁵⁷ *Ibid.*

⁵⁸ *Ibid.*

⁵⁹ Van Straaten, T (2016) *Partners not adversaries: Adopting the EITI towards collective governance to improve the extractive industry in South Africa* Unpublished LLM dissertation, University of Pretoria.

⁶⁰ Ansell Gash (2007) at 544.

⁶¹ *Ibid.*

⁶² *Idem* at 545.

⁶³ *Ibid.*

⁶⁴ *Idem* at 546.

2.4. The benefit of collaborations as part of co-operative and collective governance

The South African state prescribes to co-operative governance by all stakeholders, as one of the most important structures to achieve integrated and sustainable environmental management.⁶⁵ In South Africa poor service delivery has sparked continuous and frequent violent protest from communities which deteriorates relations between government and the public severely.⁶⁶ From the discussion above it is clear that the concept of co-operative governance is used in the South African context, but the concept of collective governance needs to be optimised to give effect to the true essence of public participation. Collective governance can thus be facilitated through the active collaboration between stakeholders. A process of relationship building between citizens and government must be established that will open communication channels and restore the trust among the stakeholders.⁶⁷ Society of today is complex and culturally diverse, and government needs to adopt the ideology of co-operative and collective governance to implement, monitor and evaluate its policies.⁶⁸ Through the understanding of co-operative/collective governance, stakeholders will realise that they are interdependent upon each other to solve the public problems for the benefit of them all.⁶⁹ Collaboration of stakeholders is the vehicle to facilitate innovate solution design that result in the sharing of expertise and also help to identify gaps in implementation approaches.⁷⁰

2.5. The acknowledgment of collaborations in the mining industry

The ICMM⁷¹ is an institution that is committed to enhance the environmental and social performance of the mining industry. Currently 23 of the largest mining companies in the world are members of the ICMM.⁷² The institution requires its members to adopt the 10 principles of sustainable development.⁷³ Principle one of sustainable development requires members to partner with government and all other stakeholders in the affected area.⁷⁴ In specific, water management policies and practices are an integral part of the Sustainable Development Framework of the ICMM.⁷⁵ They recognise that they have a significant part to play in management of water resources in their respective locations and must be the leaders in water stewardship to adopt a holistic approach to water management.⁷⁶ The only way to achieve a holistic water management system is through the significant collaboration with government, civil

⁶⁵ Bray (1999) at 2.

⁶⁶ E Draai *Collaborative Government for Improved Public Service Delivery in South Africa* Africa Insight (2010) 40 at 131 (hereinafter Draai 2010).

⁶⁷ *Idem* 66.

⁶⁸ Draai (2010) at 137-138.

⁶⁹ Bray (1999) at 2.

⁷⁰ See n 66 at 138.

⁷¹ For a more descriptive discussion on the ICMM refer to chptr 1 at 9 above.

⁷² ICMM *Members* <http://www.icmm.com/en-gb/members/> (accessed 16 September 2017).

⁷³ *Idem*.

⁷⁴ ICMM *Principle 1* <http://www.icmm.com/en-gb/about-us/member-commitments/icmm-10-principles/icmm-principle-1> (accessed 16 September 2017).

⁷⁵ ICMM <https://www.icmm.com/en-gb/members/member-commitments/icmm-10-principles/> (accessed 16 September 2017).

⁷⁶ ICMM *Water Management Report* (2017) at 5.

society, communities and the private sector.⁷⁷ The water stewardship programs focus on 4 key elements to address sustainable water usage.⁷⁸

- proactive and inclusive engagement with other water users to understand their needs and priorities, share plans and collaborate on managing risks
- transparent public reporting on water usage, material water risks and performance
- collaborating with other water users to mitigate shared water risks and support equitable access
- increasing efficiencies in the use of water (eg by maximising water recycling and reuse within mining operations)

2.6. The global importance of sustainable water usage

The concept of sustainable water usage in specific flowed from the concept of sustainable development; and this first needs to be explored in a nutshell. Various troubling world factors such as increasing population densities, the overuse of natural resources and degradation to the environment, to name a few, has led to the birth of the concept of sustainability.⁷⁹ It is commonly known that the concept of sustainable development is said to be coined in 1987 by the UN in 'The Brundland Report'.⁸⁰

It was simply described as *“development that meets the needs for the present without compromising the ability of future generations to meet their own needs”*.

The report advocates that the serious problem of world poverty and nation inequality is interlinked with environmental disturbances.⁸¹ The element of environment forms part as one of the three pillars of sustainable development.⁸² Sustainability infers that environmental protection is achieved by the reasonable spread of wealth and security to less developed nations, and that economic development is complementary to environmental development.⁸³ People who live without basic services will degrade the environment to survive and the benefits of environmentally sound practices of mines will not be welcomed with open arms.⁸⁴ The importance of the sustainable use of freshwater cannot be severed from obtaining sustainable development in a country.⁸⁵ The lack of freshwater can lead to limiting economic growth and

⁷⁷ ICMM *Water Management Report* (2017) at 5.

⁷⁸ ICMM *Water stewardship framework* (April 2014) at 2-3 (hereinafter ICMM WSF 2014).

⁷⁹ Middleton, B *Sustainable development and environmental awareness* Civil Engineering. August (1997) at 19.

⁸⁰ *Ibid.*

⁸¹ Braune, E *The applicability of the concept of sustainable development in South Africa with reference to soil and water resource utilisation* at 79-80.

⁸² *Ibid.*

⁸³ *Idem* at 80.

⁸⁴ Below, MA *Mining in an era of environmentalism* Journal of the South African Institute of Mining and Metallurgy (January 1993) at 9 (hereinafter Below 1993).

⁸⁵ *UNSD United Nations Conference on Environment and Development, Rio de Janeiro, Brazil, 3-14 June 1992 Agenda 21 (1992) Chapter 18.6 at 197 (hereinafter UNSD 1992).*

actually halt its development.⁸⁶ The practical implication of sustainable development can be described as the maximised utility of the resources alongside the conservation of the resource base.⁸⁷

The Rio Conference or Earth Summit was then later held in 1992 which elevated the shift needed in the world's conventional viewing of development.⁸⁸ The summit highlighted that the neglect of proper integration of social and environmental concerns creates a rather alarming gap between countries and nations.⁸⁹ The main objective is the search for alternative ways of development that encompass all three the pillars of sustainability; the economic, the social and the environmental, without sacrificing a country's developmental aspirations.⁹⁰

When the concept of sustainability is applied to water it would mean the use that do not cause long-term deterioration of the resource, not only in terms of quantity but also quality.⁹¹ Sustainability must be the core principle which governs the use of water to achieve water security.⁹² The document called Agenda 21 describing the blueprint of sustainable development was developed during the Rio Conference and signed by over 100 different states, of which South Africa was apart off.⁹³ Chapter 18 in particular dealt in specific with the protection of freshwater resources and how to implement integrated management strategies to achieve sustainable use of water resources.⁹⁴ The document makes the statement that the importance of water resource management for the economic productivity of a country is often not fully appreciated by governments, and they do not delegate this duty clearly within their structures.⁹⁵

2.7. The importance of sustainable water usage in the Extractive Industry

The South African political climate demands the equal redistribution of the country's wealth towards the poor.⁹⁶ Urgent economic development is needed which can be achieved with new mining projects in the country.⁹⁷ However mining projects cannot operate without a continuous supply of suitable water.⁹⁸ Water supports a range of activities in the mining process, from the extraction of minerals, to slurry transport, dust suppression and mineral processing, and

⁸⁶ UNSD (1992).

⁸⁷ Below (1999) at 9.

⁸⁸ Davidson, O *Business Opportunities and Sustainable Development* SAJEMS NS (2002) 5 at 288 (hereinafter Davidson 2002).

⁸⁹ *Ibid.*

⁹⁰ *Idem* at 290.

⁹¹ Wright, KA Xu, Y *A water balance approach to the sustainable management of groundwater in South Africa* Water SA (2000) 26 at 167.

⁹² Soyapi, CB *Water Security and the Right to Water in Southern Africa: An Overview* PER/PELJ (2017) 20 at 4.

⁹³ The National Academic Press *Down to Earth: Geographical Information for Sustainable Development in Africa* (2002) <https://www.nap.edu/read/10455/chapter/4> (accessed on 14 September 2017).

⁹⁴ UNSD (1992) at Chpt 18.

⁹⁵ *Ibid.*

⁹⁶ Below (1993) at

⁹⁷ *Ibid.*

⁹⁸ Scott M *Water conservation and the mining sector Infrastructure news and service delivery* (July 2014) <http://www.infrastructurenews.com/2014/07/29/water-conservation-and-the-mining-sector/> (accessed on 14 September 2017)(hereinafter Scott 2014).

employee needs.⁹⁹ The reality of today is that because of the global crises of freshwater supply for humanity, NGO's and governments are putting serious pressure on industries such as the mines to be more sustainable.¹⁰⁰ In addition investors are also joining the party by having been known to withdraw from mining projects that have a negative impact on ecosystems.¹⁰¹ Pollution of water resources is sadly also not the only concern of mines but they are also the culprits of reducing ground water and negatively effecting surface water in a catchment area.¹⁰² Already by 2013, it was reported that 64% of mining industries have already experienced severe water related business impacts, this causes increase of operating costs and other financial costs.¹⁰³

The sustainability of mining has become an effort of innovation to ensure viability, and mines do not only have to minimise water losses but they must maximise their water recycling.¹⁰⁴ Despite the fact that mining in its nature degrade the environment, it is contended that rational people will support mining operations that is committed to environmental protection.¹⁰⁵ Sustainable development and socio-economic progress is possible with limiting effects on the environment when management is done correctly.¹⁰⁶ Thus, the way forward for the mining industry is to be the leaders in environmental policy and research and to become stewards in water protection.¹⁰⁷ The ICMM has published various documents in support of responsible water usage.¹⁰⁸ Their approach aims to understand the needs and concerns of a catchment area, and the broader political, economic and social and environmental dynamics that will influence water demands.¹⁰⁹ A comprehensive understanding of these will help to mitigate risks and unnecessary conflict within a certain area and country.¹¹⁰

2.8. Conclusion

It can thus be concluded that the primary function or goal of co-operative governance is not cooperating for its sole benefit but to achieve an effective government of the country.¹¹¹ Public participation and stakeholder involvement in decision making is a common element in both the concepts of co-operative and collaborative governance.

Collaborations are a multi-faceted process that shapes the concept of governance.¹¹² From the above discussion it can then be concluded that collective governance forms part of a co-operative government when the element of public participation is given effect to. Collective

⁹⁹ Scott (2014).

¹⁰⁰ Vella, H *Managing water consumption in mining* Mining Technology (Aug 2013) <http://www.mining-technology.com/features/feature-managing-water-consumption-mining-global-shortage/> (accessed on 14 September 2017).

¹⁰¹ *Ibid.*

¹⁰² *Ibid.*

¹⁰³ *Ibid.*

¹⁰⁴ Below (1993 at 10; Scott (2014).

¹⁰⁵ Below (1993) at 10.

¹⁰⁶ *Ibid.*

¹⁰⁷ ICMM *WSF* (2015) at 2.

¹⁰⁸ For a discussion on these documents refer back to chpt 1 at 9 and *infra* 2.5 above.

¹⁰⁹ ICMM *Water Management Report* (2017) at 5.

¹¹⁰ *Ibid.*

¹¹¹ Nzimakwe Ntshakala (2015) at 836.

¹¹² Draai(2010) at 139.

governance is signified by decision-making that is done by groups of individuals or organisations.¹¹³ Public and private participants must work collectively, using processes to establish laws and rules for the provision of public services.¹¹⁴

The last few centuries has seen the reduction in quality of freshwater resources because of unsustainable industrial and agricultural practices.¹¹⁵ Events in the global political realm have emphasised the importance of sustainable development and have enlightened the path of public/private collaboration in areas such as water to promote development.¹¹⁶ The framework of a co-operative government supports collaboration between stakeholders to solve current water problems and achieve sustainable water management. And finally unique opportunities for the mining industry, which are water dependant, exist to catalyse and support collective solution building.

The following chapter will look at how the South African legal framework is drafted to obtain sustainable management of the water resources. It will also investigate whether it is true to the constitutional mandate of co-operative governance within the ambit of water management laws. And lastly will examine if collaboration between government and mining are actively supported.

¹¹³ Ansell Gash (2007) at 545.

¹¹⁴ *Ibid.*

¹¹⁵ Naidoo, D *SA's Water Challenge-cause for despair or competitive advantage? The choice is ours* Water Wheel (May/June 2013) at 4.

¹¹⁶ Davidson (2002) at 288.

CHAPTER 3:

THE LEGISLATION, STRATEGIES AND IMPLEMENTATION TO ACHIEVE SUSTAINABLE WATER RESOURCE MANAGEMENT

3.1. Introduction

In order for a country to have continuous water security the state must manage the resources on a day to day basis.¹¹⁷ The government of a country has the responsibility to not only protect the right to water but to fulfil the right to water.¹¹⁸ The White Paper on the National Water Policy (NWP) of South Africa was the first step in the process and it identified the key principles to which future water laws must adhere. One of the most important objectives of the NWP was to lay the foundation for the drafting of the National Water Act.¹¹⁹ Through the building of a strong legal framework good governance can be facilitated to manage the water resources.¹²⁰

3.2. Legislation

3.2.1. *The Constitutional framework*

The first step to building a strong legal framework is to have a well drafted constitution.¹²¹ Constitutions are understood to be highest law in a country with all other laws and legislation enacted to be subordinate and to be constitutionally sound when measured against it.¹²² The protection of water rights is contained in the South African Constitution in various sections which in turn oblige the state to enact legislation to achieve this objective.¹²³

In Section 24 water resources form part of the 'environment' and states that everyone has the right to an environment that is not harmful to their health or well-being. The environment must be protected for the benefit of present and future generations; and the protection should achieve ecologically sustainable development and sustainable use of water resources.¹²⁴ Some arguments advocate the horizontal application of Section 24 which means that the responsibility of the section is also borne by private persons to each other and not just by the state to its citizens.¹²⁵ Thus the responsibility to protect the water resources for the benefit of all can now be extended to the shoulders of stakeholders i.e. mining companies.¹²⁶

¹¹⁷ Soypi (2017) at 5.

¹¹⁸ *Ibid.*

¹¹⁹ White Paper on a National Water Policy for South Africa (1995) at 7

[http://www.dwa.gov.za/Documents/Policies/nwpwp.pdf/](http://www.dwa.gov.za/Documents/Policies/nwpwp.pdf) (accessed 16 August 2017) (hereinafter NWP 1995).

¹²⁰ Soypi (2017) at 5.

¹²¹ *Ibid.*

¹²² Feris, L Kotze LJ *The regulation of acid mine drainage in South Africa: Law and governance perspectives* PER/PELJ (2014) 17 at 2112-2113 (hereinafter Feris Kotze 2014).

¹²³ *Ibid.*

¹²⁴ Thompson (2006) at 1, 136.

¹²⁵ Feris Kotze (2014) at 2118.

¹²⁶ *Ibid.*

In Section 25 water forms part of 'natural resources' and requires equitable access to the water resources.¹²⁷ In Section 27 water is protected as a socio-economic right in that everyone has right to have access to sufficient food and water, which means that the water should be of a potable standard together with an assurance of supply.¹²⁸

The relevant legislation dealing with the environment and water management will be discussed, followed by the strategy documents created from the enacted legislation.

3.2.2. *The National Environmental Management Act*¹²⁹ (NEMA)

NEMA establishes the overarching framework for environmental legislation, and the other sector-specific legislation was drafted in accordance with its principles.¹³⁰ The purpose of NEMA is to establish co-operative environmental governance.¹³¹ This is done through the creation of institutions to promote and co-ordinate environmental functions.¹³² Section 2(4)(b) of the Act requires environmental management to be integrated. NEMA adheres to co-operative governance through its codified principles and public participation is seen to form an integral part here.¹³³ In terms of the application of NEMA to water in specific, it is included in the definition section under 'environment'.¹³⁴

3.2.3. *The National Water Act*¹³⁵

The NWA is complimentary to NEMA, it is in line with international standards on water management and it gives effect to the National Water Policy mentioned above.¹³⁶ In terms of the purpose of this Act, it acknowledges that the ultimate aim of the water resource management is to ensure the sustainable usage of water resources in the country, and it codifies the concept of integrated resource management.¹³⁷ The Act also established the creation of the National Water Resource Strategy, which in turn must set out the strategies, objectives and plans together with appropriate procedures and institutions to protect and develop and manage the water resources.¹³⁸

The Water Catchment Agencies (CMA's) are also created in terms of this Act, these institutions are meant to take responsibility for the water resource management activities in each area.¹³⁹ In

¹²⁷ Thompson (2006) at 1,138.

¹²⁸ *Ibid* at 145.

¹²⁹ Act 107 of 1998

¹³⁰ Nel Du Plessis (2001) at 1, 19.

¹³¹ *Ibid* at 22.

¹³² *Ibid* at 22.

¹³³ Thompson (2006) at 247; M Kidd *The National Environmental Management Act and Public Participation* SAJELP (1999) 6 at 22.

¹³⁴ S1(xi) of NEMA; Feris Kotze (2014) at 2121.

¹³⁵ Act 36 of 1998.

¹³⁶ Thompson (2006) at 198.

¹³⁷ NWA *Chapter 1 Interpretation and fundamental principles*; Thompson(2006) at 199.

¹³⁸ Thompson (2006) at 201.

¹³⁹ NWA at Chpt 3; Thompson (2006) at 222-223.

terms of involvement of role-players in the decision-making process of water management, it does not expressly prescribe the extent or the manner of involvement is required.¹⁴⁰

3.2.4. *The Mineral and Petroleum Resources Development Act (MPRDA)*¹⁴¹

The MPRDA is not primarily concerned with the management of water resources, but it still is legislation that has an effect on the resource.¹⁴² Mitigating the impact of mining on water must be done through considering alternative mining methods, location of the infrastructure, waste deposit sites, and sources of water.¹⁴³ The Department of Mineral Resources (DMR) has the duty to apply mining policies that adhere to the environmental management policy and other such as the NWP, and this Act recognise that the Department of Water Affairs (DWA) is still the lead agent for the national water resource¹⁴⁴. The Act support integrated environmental management principles to be applied throughout the entire life-cycle of the mine on all aspects that impact the environment.¹⁴⁵ The preamble of the Act adheres to the Constitutional mandate that mineral development must be done in an ecologically sustainable manner. The holder of reconnaissance/prospecting right, a mining right or permit must adhere to the general objectives of NEMA and is also responsible for any and all environmental damage, pollution and ecological degradation caused by the mining operations.¹⁴⁶ The MPRDA is said to also support the principle of Integrated Water Resource Management (IWRM) through the promotion of sustainable development on the mineral resources.¹⁴⁷ Obtaining water licences for mining operations are however dealt with under the NWA.¹⁴⁸

3.3. Policies and strategies on water resources management

3.3.1. *Integrated Water Resource Management (IWRM)*

The Agenda 21 report of the Rio Conference¹⁴⁹, demands that integrated water resources planning and management must be used to address the widespread scarcity, progressive degradation and pollution of water in the world.¹⁵⁰ IWRM is based on the principle of sustainability and views that water forms an integral part in the ecosystem as a natural resource, which contributes to the social and economic good of countries, and of which the quality and quantity determine its utilisation.¹⁵¹ The UN further suggests that IWRM should play an important part in a country's socio-economic development planning.¹⁵² IWRM is defined as "*a process which promotes the co-ordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable*

¹⁴⁰ Thompson (2006) at 248.

¹⁴¹ Act no 28 of 2002.

¹⁴² *Supra n140* at 198,320.

¹⁴³ *Idem* at 320.

¹⁴⁴ *Ibid.*

¹⁴⁵ *Idem* at 321.

¹⁴⁶ *Idem* at 334-335.

¹⁴⁷ *Idem* at 321.

¹⁴⁸ *Ibid.*

¹⁴⁹ For a discussion on this report refer back to chptr 2 at 19 *supra*.

¹⁵⁰ UNSD (1992) Chptr 18.2.

¹⁵¹ *Ibid* at Chptr 18.8.

¹⁵² *Ibid* at Chptr 18.20.

manner without compromising the sustainability of vital ecosystems".¹⁵³ Its main objective is to achieve the very fine balance of using water resources to sustain human livelihoods in terms of the social, environmental and economic, while conserving the resource for the future.¹⁵⁴

The South African NWP and the NWA are founded on the principles of the IWRM, and due to the complexity and interrelated water systems in SA, it is the primary tool recognised and prescribed by the NWP and the NWA to achieve efficient resource management.¹⁵⁵ Due to this the South African water laws are some of the most progressive in the world with the following commitments:¹⁵⁶

- a commitment to a whole catchment approach to water security,
- empowerment of poor communities,
- water for sustainable growth,
- effective governance based on stakeholder ownership and delegation of relevant powers to catchment and local levels.

3.3.2. National Water Resource Strategy 2(NWRS2)

The intention with the development of the NWRS2 *"is to place water at the heart of all planning in the country that any decision that rely on the steady supply of water, factor in water availability adequately"*.¹⁵⁷ The NWRS2 sets out the strategic direction for the water resource management in the country for the next five years, and is the developmental framework for the protection, use, development, conservation and management of water resources.¹⁵⁸ The mining sector is listed in the NWRS2 as one the five major economic sectors dependant on water and reports that mining makes up 5% of the country's current water needs.¹⁵⁹

The DWA states in its foreword to the NWRS2 that they will provide the needed leadership to raise the finances to implement the strategy, but to achieve thus they must rely on the collaborative effort of all sectors and stakeholders.¹⁶⁰ Public participation and collaboration to manage water resources runs like a golden thread through the NWRS2. Part of the objectives is to raise the water profile in development planning by ensuring that water management should be formally rooted in the business sector with accountability.¹⁶¹ Stakeholders must become the strategic partners with government.¹⁶²

South Africa has a significant challenge with regards to Acid Mine Drainage (AMD) water, but it also offers a notable opportunity for the country to treat the AMD water and supplement the

¹⁵³ Thompson (2006) at 162.

¹⁵⁴ *Idem* at 163.

¹⁵⁵ NWRS2 (2013) at IV; 124.

¹⁵⁶ Colvin et al (2008 at 682).

¹⁵⁷ NWRS2 (2013) at 6.

¹⁵⁸ NWRS2 (2013) at 7.

¹⁵⁹ NWRS2 (2013) at 9.

¹⁶⁰ NWRS2 (2013) at ii.

¹⁶¹ NWRS2 (2013) at 15.

¹⁶² *Ibid.*

overall water resource with it.¹⁶³ The treatment should logically be done by the main polluter of the water, and the relevant legislation makes use of the polluter pays principle, but this is only limited to where the owner of the mine can still be identified.¹⁶⁴ The major challenge for the government is to put reliable institutional arrangements in place that will treat the water after the mine closure.¹⁶⁵ Investigations are being done in order to utilise this resource of AMD in the Vaal River Catchment area, Witbank and Olifants River Catchments.¹⁶⁶ The DWA's Reconciliation Strategy has the responsibility to undertake the long-term planning of treating AMD water and creating centres to help in this regard.¹⁶⁷

The DWA (then the former Department of Water Affairs and Forestry) published an operational guideline called 'Integrated water and waste management plan' (IWWMP) to support the application of water licenses of mines in line with the principles and objectives of IWRM.¹⁶⁸ The IWWMP is a process which is based on the essentials of all water management programmes and specialised studies brought into one sustainable plan.¹⁶⁹ The idea with IWWMP is to be implemented and monitored by the water users, which include government and interested and affected parties.¹⁷⁰

DWA further developed a series called the 'Best Practice Guidelines' for water resource protection in the South African Mining Industry that is in line with international principles on sustainability and to be used in conjunction with the IWWMP.¹⁷¹ The guidelines are grouped into three main categories. The first group deals with water management 'Hierarchy' and the topics covered here are:¹⁷²

- Integrated Mine Water Management
- Pollution Prevention and Minimisation of Impacts
- Water Reuse and Reclamation
- Water Treatment

The 'General' group series is about general water strategy techniques to be applied cross-sectorial, and deals amongst other with water monitoring systems.¹⁷³ The last group series called 'Activities' deals with the prevention and impact management of water.¹⁷⁴

¹⁶³ NWRS2 (2013) at 29.

¹⁶⁴ NEMA S2(ii); S2(p); S28; NWA S19

¹⁶⁵ *Supra* n163 at 26.

¹⁶⁶ *Ibid.*

¹⁶⁷ *Idem* at 31.

¹⁶⁸ DWA *Operational Guideline: Integrated Water and Waste Management Plan for the preparation of the Water Quality Management Technical Document to support the Application for Licences for Mining and Industries in Terms of the Requirements of the National Water Act, 1998 (Act 36 of 1998)* 2008.

¹⁶⁹ *Ibid.*

¹⁷⁰ *Idem* at 3-4.

¹⁷¹ DWA *Best Practice Guideline H1: Integrated Mine Water Management* 2008 at 7 (hereinafter DWA H1 2008).

¹⁷² *Ibid.*

¹⁷³ *Ibid.*

¹⁷⁴ *Ibid.*

All of these documents were compiled by experts in the field and consulting with the key role players in the field in order to optimise the content of the documents and ensure successful water management by a mine.

3.4. Institutions for the management of water resources

3.4.1. Catchment Management Agencies (CMA)

The ICMM have come to realise that water risks can still be a reality in certain catchment areas despite the fact that the operation host the most stringent water efficient operations.¹⁷⁵ A complete understanding of the relevant water issues is needed to manage the risk while considering the other water users and communities within an area.¹⁷⁶ The ICMM emphasise the importance for their mining company members to become water stewards within the catchment areas of operation.¹⁷⁷ Members are expected and encouraged to lead collaboration with others, in order to mitigate the risks and impacts associated with water.¹⁷⁸ To address this they have developed a practical guide for catchment based water management to be used by member companies to help them understand and manage complex external water challenges.¹⁷⁹

The water stewardship framework as it is called is defined as *“the use of water that is socially equitable, environmentally sustainable and economically beneficial, and achieved through a stakeholder-inclusive process that involves site and catchment based actions”*.¹⁸⁰ The water stewardship programme has four strategic imperatives that are: transparency and accountability; engaging proactively and inclusively; effective water management; adoption of a catchment based approach.¹⁸¹

The establishment of CMA’s is an integral part prescribed by the Agenda 21 paper and also incorporated into the NWA by government.¹⁸² CMA’s has a very important role to play in the management structure of the country’s water resources.¹⁸³ Its main function is to manage all the water resources within its catchment area, through decentralisation.¹⁸⁴ CMA’s must create awareness around each area’s water problems and then utilise the skill and capabilities of the different role-players to find and design strategies and solutions.¹⁸⁵ CMA’s is said to be responsible to balance the interest of existing and new water users through facilitating the co-operation between all the stakeholders in the management of the resource.¹⁸⁶ The relevant catchment areas are identified in the NWRS2, and currently nine areas has been prescribed.¹⁸⁷

¹⁷⁵ ICMM *Practical guide* (2015) at 5.

¹⁷⁶ *Ibid.*

¹⁷⁷ *Ibid.*

¹⁷⁸ *Ibid.*

¹⁷⁹ *Ibid.*

¹⁸⁰ ICMM *WSF* (2014)

¹⁸¹ ICMM *Practical guide* (2015) at 6.

¹⁸² Thompson (2006) at 164.

¹⁸³ *Ibid* at 615.

¹⁸⁴ *Ibid* at 615, 624.

¹⁸⁵ NWRS2 (2013) at 61.

¹⁸⁶ Pejan, R Cogger, J The application of assignment and delegation within the context of the NWA: The implications for catchment management agencies SALJ (2013) at 129-130.

¹⁸⁷ *Supra* n 185.

The Department of Water Affairs are mainly responsible for establishing these CMAs by publishing announcements in the Government Gazette.¹⁸⁸ Its main functions are listed in S80 of the NWA, and states that it must promote co-ordination of implementation of plans and to promote community participation in the sustainable management of water. Co-operative governance is perceived to be central core that enables CMA's to implement its functions and co-ordinates the activities of the water users and other institutions.¹⁸⁹ Catchments form an integral component of IWRM and are prescribed as the glue that holds IWRM together.¹⁹⁰

3.5. Conclusion

The South African laws designed for the management of the water resources are focused on the sustainable development of the resource. The laws are on par with international trends on sustainable development, and initiatives prescribed by the UN are incorporated within the legislation. The Constitutional mandate of co-operative governance is brought through in the enacted legislation dealing with the environment and the water resources in specific. The crucial integrated water resource management approach advocated by the Rio Conference and Agenda 21 is the foundation on which the South African policies and laws were drafted. Success or failure of a mining operation is often linked to the efficiency of operation's water management.¹⁹¹ To ensure the sustainability of a mine, the management of the mine water should be integrated with other disciplines as an on-going strategy which is often neglected or forgotten, leaving a gap between the feasibility study and the reality.¹⁹²

It is clear that on every front there are efforts put in to manage mine water as a resource sustainably. The guidelines by the ICMM as an international body and the South African government as a country all have designed extensive documentation to implement an integrated water management system to help and guide mines in their water usage. These documents are freely available on the internet for anyone to access and use.

Collective governance is an integral part that gives effect to the public participation element of co-operative governance. Collective governance is signified by decision-making that is done by groups of individuals or organisations, public and private participants working collectively, using processes to establish laws and rules for the provision of public services.¹⁹³

It is important for mining companies to understand how to approach collaborations and what it exactly entails. The following chapter will discuss various case studies where mining companies collaborated with the surrounding stakeholders in the specific catchment area to manage the water resources as a whole. This chapter will then identify the 'core' elements that must be present for successful collaborations.

¹⁸⁸ *Ibid.*

¹⁸⁹ J Colvin et al (2008) at 681.

¹⁹⁰ Pollard, S du Toit, D *Integrated water resource management in complex systems: How the catchment management strategies seek to achieve sustainability and equity in water resources in South Africa* Water SA (2008) 34 IRWM Special Edition at 676.

¹⁹¹ Royle *Integrated Mine Water Management* SRK Consulting News

<http://www.srk.co.za/en/newsletter/mine-water-management/integrated-mine-water-management> (accessed 19 September 2017) (hereinafter Royale 2017).

¹⁹² Royale (2017).

¹⁹³ Ansell Gash (2007) at 545.

CHAPTER 4:

COLLABORATIONS FOR SUSTAINABLE WATER USE BY MINING COMPANIES: A CASE STUDY

4.1. Introduction

The South African government recently launched a National Water and Sanitation Dialogue to discuss the water issues that the country is currently starring in the face.¹⁹⁴ The government realise that in order to sustain the water resources of the country they need the involvement of the private sector to conceptualise and implement a comprehensive master plan.¹⁹⁵ Today it is standard for a mining operation to recycle its water in accordance with national regulations, but the SWPN warns that continuous installation of expensive treatment facilities are in the danger of not being sustainable, and a regional approach should rather be taken.¹⁹⁶ To design a regional approach means that the stakeholders must come together and agree on solutions. The following will discuss how such collaborations on solutions came about in different countries.

4.2. Case studies

4.2.1. *The South Gobi collaboration*

Mongolia is a landlocked country located in eastern Asia between Russia and China, and the land predominately consists of deserts and semi-deserts.¹⁹⁷ The country is predominately known for its simple life-style of animal husbandry and most of the people live a nomadic lifestyle. Mining has also been invited into the country to help build the economy of which most happen within the Gobi region. Currently mining contributes to about 18% of the country's GDP and employ more than 20 000 people.¹⁹⁸

The mining companies in the area are not ignorant about their impacts on water resources and have been progressive to reduce water wastages and usages.¹⁹⁹ One copper mine has successfully minimised its water losses, and its water consumption is reported to be less than half the global average for comparing mines.²⁰⁰ The major problem was that the local

¹⁹⁴ Naidoo (May 2017).

¹⁹⁵ *Ibid.*

¹⁹⁶ *Ibid.*

¹⁹⁷ Encyclopedia Britannica *Mongolia* <https://www.britannica.com/place/Mongolia/Climate-and-soils#toc27442> (accessed on 24 August 2017).

¹⁹⁸ ICMM IFC *Shared Water Report* (2017) at 11-12

¹⁹⁹ *Idem* at 12.

²⁰⁰ *Ibid.*

community did not carry any knowledge of the mines sustainability efforts and saw the mines as competition and not allies in the race for water.²⁰¹ The local people became agitated with the mines believing that the mines and government do not do their part in preserving and protecting the little water resources available which lead to locals starting to petition near water wells and stalling mining operations.²⁰²

Eventually the IFC, World Bank and mining mogul Rio Tinto decided then that collaboration was the only approach to resolve the growing problem.²⁰³ Face-to-face meetings were first arranged between all the mining companies to encourage cooperative engagement and transparent communication.²⁰⁴ Since water gave a competitive advantage for one over another, the companies themselves treaded with caution on the real value of collaboration.

It was clear from the meetings that the mining industry within the area had no choice but to collaborate on water accounting and transparent data sharing to understand the full impact of the mining industry on the water resource.²⁰⁵ Over a period of three years the group of mining companies, government under facilitation of the IFC carved out the document called the Voluntary Code of Practice on Water Management (VCP), which reflects best international practices.²⁰⁶ The code helps the mines to manage their water and relay the data to the community in laymen's terms.

All the signatories to the VCP were committed to its compliance, the companies deepened their skills on how to chart water balances which allowed comparison across the industry and relay relevant water information to communities.²⁰⁷ The communication and engagement with community skills have been improved by the mines and they can effectively respond to their stakeholders.²⁰⁸

The VCP in addition designed a water curriculum that focused on how to integrate social and technical issues and the importance of broad stakeholder participation.²⁰⁹ What was initially meant only as a training course for the government officials, community leaders and the company staff of the VCP has now expanded into training more than 1000 people in the area.²¹⁰

Building skills and understanding of the different stakeholders has laid the foundation for further broader partnership.²¹¹ Mining companies now becomes part of the long-term solution and are on the frontlines to identify opportunities to strengthen collective water governance.²¹² The mines have collaborated with the communities on co-monitoring of water and uses alternative

²⁰¹ *Idem* at 13.

²⁰² *Ibid.*

²⁰³ *Idem* at 14.

²⁰⁴ *Ibid.*

²⁰⁵ ICMC IFC *Shared Water Report* (2017) at 13-14.

²⁰⁶ *Ibid* at 18.

²⁰⁷ *Ibid* at 20.

²⁰⁸ *Ibid.*

²⁰⁹ *Ibid* at 21.

²¹⁰ *Ibid.*

²¹¹ *Ibid* at 22.

²¹² *Ibid.*

measures to suppress mine dust.²¹³ They improved the way data collection and disclosure of water data was relayed to government to support their water governance programme.²¹⁴

4.2.2. *Sociedad Minero Cerro Verde copper mine collaboration, Peru*

The Cerro Verde mine is located about 32km southwest of Arequipa in Peru and operates two pits.²¹⁵ The province of Arequipa is experiencing stringent clean water supply problems, due to the rapid population growth and the limited water resources in an arid region.²¹⁶ The main source of water is from precipitation high in the Andes flowing into the Rio Chili River. The water is then distributed to seven dams and reservoirs to sustain residential, agricultural and industrial water needs.²¹⁷ The Rio Chili has however become contaminated due to untreated residential and industrial sewage discharges into the river.²¹⁸ Wastewater treatment capacity is not efficient within the area to prevent the pollution.²¹⁹ The mining company decided to have discussions with the role-players which included discussion with regional and local governments, civil leaders and development agencies.²²⁰ The mining company proposed investment in a potable water and wastewater treatment plants to help with the water challenges in the area.²²¹ The costs were to be equally shared between the mine and the relevant municipalities.²²² These plants are also considered as one of the most advanced collection and treatment plant in the country done through private/public partnership.²²³ It supplies potable water to the community and lower the impact on the environment and human health by treating up to 90% of the city's domestic and industrial pollution.²²⁴ In addition further agreements have been reached between the mine and the government to build water storage and distribution networks for the city.²²⁵ The mine wanted to expand its operations, meaning an increase on water resources would be needed.²²⁶ A feasibility study was conducted in 2011 for the construction of an additional wastewater treatment plant to feed the mine's expanding operation.²²⁷ This plant now delivers 1cubic metre per second of clean water and also helps with additional water supply for the agricultural sector.²²⁸ Due to the relationship between the mining company and the community the mine had the full support of the local community when the expansion of operations became evident.²²⁹

²¹³ *Ibid* at 22-23.

²¹⁴ *Ibid*.

²¹⁵ ICMM *Water Management* (2017) at 16.

²¹⁶ *Ibid*

²¹⁷ *Ibid*.

²¹⁸ ICMM *Water Management* (2017) at 16.

²¹⁹ *Ibid*.

²²⁰ *Supra n 218* at 16-17.

²²¹ *Ibid*.

²²² *Supra n 218* at 17.

²²³ *Ibid*.

²²⁴ *Ibid*.

²²⁵ *Ibid*.

²²⁶ *Ibid*.

²²⁷ *Ibid*.

²²⁸ *Ibid*.

²²⁹ *Ibid*.

4.2.3. Upper Hunter Valley – Australia

The Upper Hunter Valley in Australia has a very good coal mining industry. However the water quality in the area became a major concern for the local communities and the mining companies realised this.²³⁰ The coal mines in the area realised that the environmental degradation was not condemned to one specific operation, and they as a collective group needed to address the concern.²³¹ A platform called the Upper Hunter Valley Mining Dialogue, which pulled together environmental groups, the community, other industries and the relevant state representatives were established by the mines.²³² The community was now able to connect a person behind a mining operation which was willing to have meaningful conversations with them about relevant concerns.²³³ The dialogue platform was the first step to build trust and good relations between the stakeholders, which was a huge benefit for the mining companies.²³⁴ Practical working groups flowed from the conversations, and the mines identified and developed a water accounting framework with the community over which they took responsibility of.²³⁵ Joint steering committees has been set up since 2015 which include the community in certain decision-making processes, this increases the trust from communities towards the mining companies in that the solving of problems are done for the benefit of all.²³⁶ This allow for the concerns of the community around the mining to be addressed continually and from a good standing point as opposed to the mining companies being in the crossfire having to communicate from a defensive standpoint.²³⁷

4.2.4. Athabasca Working Group, Canada

In the Saskatchewan province of Canada, the Uranium mining companies operating in the area realised in the late 90's already that they needed to start a long-term environmental monitoring programme that was specifically independently operated.²³⁸ The usual corporate culture of privacy was put aside by the mining companies and a round table discussion with the local communities was held.²³⁹ The local communities as can be predicted were concerned about the visible water pollution that was brought on by unsustainable mining.²⁴⁰ The Athabasca Working Group Community Environmental Monitoring Program was set up. This document was a signed commitment by the two mining companies that they will take every effort and care to not pollute the water.²⁴¹ The Monitoring Program is basically responsible for the regular collection of water samples to test for pollution.²⁴² The collection of the samples is done by community members and an environmental group which also supervises the testing with their scientists.²⁴³

²³⁰ ICMM IFC Shared Water Report (2017) at 35.

²³¹ *Ibid.*

²³² *Ibid.*

²³³ *Ibid.*

²³⁴ *Ibid.*

²³⁵ ICMM IFC Shared Water Report (2017) at 35.

²³⁶ *Ibid.*

²³⁷ *Ibid.*

²³⁸ *Ibid at 37.*

²³⁹ *Ibid.*

²⁴⁰ *Ibid.*

²⁴¹ *Ibid.*

²⁴² *Ibid.*

²⁴³ *Idem at 38.*

These efforts initiated by the mines have led to the tremendous building of trust between the mining companies and the affected communities. The relationship between these stakeholders has improved now to such an extent that the original agreement that the mining companies signed were amended by the community to reduce some of the initial stringent obligations on the mines.²⁴⁴ The community in the catchment area are now even supportive of future developments of the mines.²⁴⁵

4.2.5. Fitzroy region partnership - Australia

In 2008 a mine pit in the Fitzroy region of Australia became flooded and high levels of discharges were made into the river.²⁴⁶ Despite the fact that the entire regions water quality was being threatened by various other human activities the mining industry were branded as the main polluting culprit.²⁴⁷ The mining industry immediately realised that they had no choice but to forego the silo solution design and needed to make meaningful contact with all the stakeholders in the area.²⁴⁸ A collaborative solution needed to be presented with the other contributing industries, (irrelevant of how small their pollution impact were), and importantly they needed to include those who were affected to ensure the solution was credible.²⁴⁹ The Catchment Association played a very important role as an independent mediator between the 20 organisations brought together.²⁵⁰ The common vision realised by all that was river quality had to be improved for the benefit of them all, and the designed efforts had to be presented to the community as a united front.²⁵¹ A consistent unified reporting system on pollution control measures was collectively designed.²⁵² The scientific information collected needed to be relayed in such a manner so that the community members could understand exactly how the catchment area worked, and that each and every industry contributed to the sustainable use of the water resource.²⁵³ Since 2008, the collaboration has resulted in some of the social and regulatory pressures lessening for the catchment area, but the potential for water pollution threat is still there that needs to be consistently monitored and managed.²⁵⁴ Continued investment is needed to understand the impact of cumulative pollution, but invested knowledge like this will not only help mitigate potential future disasters, but also reduce the potential of the mining industry being singled out as culprit should something happen again.²⁵⁵

²⁴⁴ *Ibid.*

²⁴⁵ *Ibid.*

²⁴⁶ *Idem* at 43.

²⁴⁷ *Ibid.*

²⁴⁸ ICMM IFC Shared Water Report (2017) at 43.

²⁴⁹ *Ibid.*

²⁵⁰ *Ibid.*

²⁵¹ *Ibid.*

²⁵² *Ibid.*

²⁵³ *Idem* at 44.

²⁵⁴ *Ibid* at 43.

²⁵⁵ *Ibid.*

4.2.6. The eMalahleni Water Reclamation Plant, South Africa

eMalahleni lies within the Mpumalanga province of South Africa, which is characterised as being water stressed due to decreasing rainfall patterns and rapid population growth.²⁵⁶ The local municipality was already in 2006 exceeding its water extraction allowance from the Witbank Dam drawing around 90ML per day for usage.²⁵⁷ The area is also well known for all its coal mining operations and about 90% of South Africa's saleable coal comes from there.²⁵⁸ Coal mining has a certain impact on the environment's hydrological cycle and causes surface water to become contaminated once it is exposed to the sulphur-bearing pyrite when moving to the underground table.²⁵⁹ This water is not only a pollution hazard but also poses various safety risks in that this water threatens to flood active mines in the area.²⁶⁰ Part of any colliery's daily operations is to pump the surface water from excavations daily to reach the coal seam; this water may need to be treated before it can be released into nearby streams and rivers.²⁶¹ Due to the pressures of a shortage of water resources in the area bring, Anglo Coal and South 32 (previously BHP Billiton) decided that long-term collaboration is needed to solve the growing water problem.²⁶²

Anglo-American identified the relevant state level stakeholders and conducted consultations with them on the water challenges and how they as company could contribute towards finding solutions.²⁶³ Through the initial discussions with these bodies it was decided to implement an integrated regulatory process (IRP).²⁶⁴ This system integrates mine water management practices of several operations into the community drinking water resource system.²⁶⁵ To steer the implementation of the IRP, a committee was formed to act as communication platform for between all the stakeholders.²⁶⁶ The IRP also served as the forerunner that obtained the approval from the Department of Mineral Resources, Department of Water and Sanitation and the Department of Environmental Affairs.²⁶⁷ More importantly they already had the support of the local municipalities and communities.²⁶⁸ One of the big drivers during the discussion was to elevate the public's understanding and viewing of the project.²⁶⁹ One of the main concerns they were facing was that the community would be sceptic about drinking treated mine water, but early discussion quickly revealed that the community already lost faith in the municipality's

²⁵⁶ Sergienko, N *The eMalahleni Water Reclamation Plant in South Africa* (2015) http://www.iwa-network.org/filemanager-uploads/WQ_Compndium/Cases/The%20eMalahleni%20Water.pdf/ (accessed on 16 July 2017) (hereinafter Sergienko 2015).

²⁵⁷ Holtzhauzen, L *From Toxic to Tap: Mine-Water Becomes a Commodity* The Water Wheel May/June (2006) at 12 (hereinafter Holtzhauzen 2006).

²⁵⁸ *Ibid.*

²⁵⁹ *Ibid.*

²⁶⁰ *Ibid.*

²⁶¹ *Ibid.*

²⁶² Sergienko (2015) at 2-3.

²⁶³ *Ibid.*

²⁶⁴ *Ibid.*

²⁶⁵ Sergienko (2015) at 2.

²⁶⁶ *Ibid.*

²⁶⁷ *Ibid.*

²⁶⁸ *Ibid.*

²⁶⁹ *Ibid.*

ability to provide potable water and was not opposed to such an initiative from the mine.²⁷⁰ Despite this vantage point a campaign to prove the quality of the water was launched in any case and bottled water from the reclamation plant was distributed in public for tasting.²⁷¹ The profile of the project was further raised with substantial media exposure in local press, which fast tracked the needed approval and ensured continuous public participation.²⁷²

A further Operations Liaison Committee was established that conducted performance reviews against the set targets and production.²⁷³ This managed the water supply contracts and agreements between the stakeholders in an open engaging manner.²⁷⁴

The end result is what is known as the world renowned eMalahleni Water Reclamation Plant which has received various international awards.²⁷⁵ This plant extracts and treats mine-water from existing and abandoned mines to potable water quality for the municipality, and the rest is used by other Anglo operations.²⁷⁶ This plant has made it possible for some of these Anglo mines to become self-sufficient in their water requirements.²⁷⁷ The water is sold to the municipality which helps them to reduce some of the costs of treating the water.²⁷⁸ The treated water bought from the mine is less expensive than having to buy water from a proposed pipeline which then still had to be treated by the municipality in addition.²⁷⁹ It is estimated that the mines hold more water than the Witbank Dam and is thus a huge water resource for the area.²⁸⁰

4.2.7. Mine Water Coordinating Body (MWCB), South Africa

The Strategic Water Partners (SWNP) is a partnership between private industry, the government and civil society organisations.²⁸¹ The mining companies engage with other industries such as SAB Miller, Nestle, and Eskom to name a few. Its sole purpose is to create collaborative partnerships to address the growing water crises in the country.²⁸² The beginning of 2017 marked another collaboration effort borne from the SWNP, called the Mine Water Coordinating Body (MWCB).²⁸³ This is an effort to bring together the mining industry and government to tackle the regulatory, institutional and financial issues halting improved mine water

²⁷⁰ *Ibid.*

²⁷¹ *Ibid.*

²⁷² *Ibid.*

²⁷³ *Ibid.*

²⁷⁴ Sergienko (2015) at 3

²⁷⁵ Anglo American Anglo American's eMalahleni Water Reclamation Plant wins World Coal Association award <http://southafrica.angloamerican.com/media/press-releases/2013/21-11-2013.aspx/> (accessed 23 July 2017).

²⁷⁶ *Ibid.*

²⁷⁷ Holtzhauzen (2006) at 13.

²⁷⁸ *Ibid.*

²⁷⁹ *Ibid.*

²⁸⁰ *Ibid.*

²⁸¹ 2030 Water Research Group *Strategic Water Partners Network Brochure* (2013) at 5 <http://www.2030wrg.org/wp-content/uploads/2014/08/SWPN-SA-brochure-2013.pdf> (accessed 18 July 2017).

²⁸² *Idem* at 22-23

²⁸³ 2030 Water Research Group *Mine Water Coordinating Body established in South Africa* <https://www.2030wrg.org/mine-water-coordinating-body-mwcb-established-in-south-africa/> (accessed 3 October 2017).

treatment.²⁸⁴ Currently they have a few water projects in the making. One is an Irrigation project that is in the research phase to investigate the use of mine saline water to grow certain crops.²⁸⁵ The Green Engine project will attempt to introduce an integrated land stewardship model, that will make use of treated mine water and renewable energy to create business opportunities.²⁸⁶ The Arnot Water Scheme will investigate a mine water treatment plant in the area.²⁸⁷

The MWCB is described as neutral platform for stakeholders to engage with each other to initiate joint solutions to improve water quality and to address mine closures due in the Upper Olifants Catchment area.²⁸⁸ One of the concerns of the SWPN is that the energy and capital intensive water treatment facilities that mines put up in accordance with national regulation will not be sustainable in the long run.²⁸⁹ The selling of the treated water to municipalities will also not be enough to cover the initial costs. The department of Water and Sanitation made a commitment to allocate R600 million a year towards solution building for acid mine drainage, which will supplement the Gauteng region.²⁹⁰ This is said to secure the water supply for the region for the next 30 years and will even defer the Phase 2 of the Lesotho highlands water project.²⁹¹

4.3. Conclusion

Drawing from the experiences from the stakeholders involved in collaborations across the globe to solve water problems, the answer is not as simple as a one size fits all.²⁹² Each situation has its own set of unique circumstances to consider, and the political, environmental and social risks play different roles.²⁹³ Notwithstanding of the fact that each has to design and carve its own solution, it is clear that certain principles and core objectives stay constant in successful collaborations. One of the also more prominent factors that seem to emerge is that the mining company must take the initiative to start dialogue on the water issue with the community and government. This also will go a long way in showing willingness to work together for a better future.

The eMalahleni collaboration is a stellar example for the South African framework on what collaboration can achieve for both the environment and the socio-economic aspects of the country. The SWPN highlights also the importance that when it comes to the sustainable use of

²⁸⁴ *Ibid.*

²⁸⁵ *Ibid.*

²⁸⁶ *Ibid.*

²⁸⁷ *Ibid.*

²⁸⁸ Mining online *Programme manager mine water coordinating body Olifants river catchment* <http://www.miningafricaonline.co.za/index.php/mining-features/energy/124-website-content/3339-programme-manager-mine-water-coordinating-body-olifants-river-catchment> (accessed 3 October 2017).

²⁸⁹ Naidoo, R *Water master plan needs greater private sector involvement* Infrastructure news (May 2017) <http://www.infrastructurenews.com/2017/05/29/water-master-plan-needs-greater-private-sector-involvement/#> (accessed 3 October 2017).

²⁹⁰ Petterson, D *Permanent solution to acid mine drainage in sight* Infrastructure news (May 2016) <http://www.infrastructurenews.com/2016/05/19/permanent-solution-to-acid-mine-drainage-in-sight/> (accessed 3 October 2017).

²⁹¹ *Supra* n 288.

²⁹² ICMC IFC *Shared Water Report* (2017) at 29.

²⁹³ *Ibid.*

the country's water resources all the role-players need to collaborate towards solutions. Because mining companies are such huge role-players when it comes to water impact in an area they have the ability to take the leading reins in initiating collaborations on these problems. The case studies prove that collaborations on the water leads to many long-term benefits for the mining industry themselves.

The following chapter will discuss the common elements that are evident in all the different collaborations on sustainable water management and attempt to set out a framework on what is needed to make collaborations of this nature work.

CHAPTER 5: ANATOMY OF WATER COLLABORATION

5.1. Introduction

The case studies discussed above proved that regardless of where in the world mining companies operate, communities will get disgruntled and increase pressure on the mines should the water resources become under threat. Even in the events where the mining companies were not alone responsible for water quality degradation they were always singled out as the black sheep in pollution and/or water use. When steps were taken to address this issue, several common denominators surfaced from each scenario, the main one off course is that the problem required the collaboration between the stakeholders. This acted as the catalyst towards sustainable water use in the future. These identifiable characteristics for collaboration are discussed in more detail below

5.2. Common denominators

5.2.1. Engage in dialogue – Do not operate in isolation²⁹⁴

When there are water issues in a catchment area, it seems that the mines in the area are the first ones to experience the pressure and concerns from the community. Some of the case studies revealed that despite the mine having sustainable water uses in practice, the communities will still see them as the main adversaries to clean water.²⁹⁵ The main reason for this seems due to the fact that the communities are not necessarily privy to efforts and operations of a mine in regards to water.²⁹⁶ In arid areas such as the South Gobi and Peru water resources becomes a competitive advantage for the mining companies especially when the governments are not financially able to help with the research and sourcing of additional water resources.²⁹⁷ The mines that tried to solve water problems on their own were not successful and realised that collaboration was needed to ensure their own viability, and collaboration meant involving the state and the communities in the area.

Constructive dialogue with the community revealed the main issues of concern regarding the mining and its operations.²⁹⁸ All the case studies showed that when constructive dialogue platforms are formed that engage all the role players of water use, relationships and trust are build that is imperative for success.²⁹⁹ Constructive dialogue will develop the catchment area when information is shared between the stakeholders in the area.³⁰⁰ The stakeholders will understand the water risks they are dealing with and the impact it has on the others and will

²⁹⁴ ICMM IFC Shared Water Report (2017) at 30.

²⁹⁵ ICMM Water Management (2017) at 12-13.

²⁹⁶ *Ibid.*

²⁹⁷ *Idem* at 13.

²⁹⁸ *Supra* n 294.

²⁹⁹ *Idem* at 34-35.

³⁰⁰ *Idem* at 30.

foster joint governance for better water legislation and regulation.³⁰¹ Engaging earlier rather than later is the best option and helps to anticipate the water needs of the entire catchment area.³⁰²

5.2.2. Collaboration leads to joint solution building³⁰³

Collaboration must be seen by both private and public sectors as a strategic necessity and not just something that must be done because it is required by law.³⁰⁴ When problems are shared it is best to also use the creativity and skill each has to offer to find a mutually beneficial solution.³⁰⁵

By 2007, Anglo American had already invested years of research in the development of technology to treat mine water.³⁰⁶ Joint investigation efforts with South 32 lead to the commissioning of the eMalahleni Water Reclamation Plant (EWRP) for the treatment of the several mine water sites.³⁰⁷ Anglo then decided to put agreements in place with the municipality and to provide infrastructure to integrate the water into the municipality's drinking supply.³⁰⁸ The next phase of collaborations is already in the pipeline which will include water from other third-party mines to be treated and used for potable water.³⁰⁹ The consultation process of EWRP revealed that the solution of mine water remediation was key to attain the sustainability goal of replenishing the ecological reserve held by the state.³¹⁰ The collaborations of the EWRP and the MWCB of the SWPN are both seen as replicable solutions for water problems of other catchment areas by the government.³¹¹ Successful collaborations create a virtuous circle, where the environment, water users and mines benefit from.³¹²

5.2.3. Successful internal dialogue leads to successful external dialogue³¹³

It is very important for a mining company to realise that water can affect every department. And that is why it is so imperative for the mine to have all the departments in constant dialogue with each other's strategies and plans surrounding the natural resource.³¹⁴ Water management for the mine's operations and water management for community upliftment and public relations must not be seen as different operations, but as a encompassing whole.³¹⁵ This will align the goal and message of the company as a unit, and prevent the sending of seemingly mixed

³⁰¹ *Ibid.*

³⁰² ICMM, IFC *Shared Water Report* (2017) at 44.

³⁰³ *Idem* at 32.

³⁰⁴ *Ibid.*

³⁰⁵ *Ibid.*

³⁰⁶ ICMM *Water Management* (2017) at 10.

³⁰⁷ *Ibid.*

³⁰⁸ *Ibid.*

³⁰⁹ *Idem* at 11.

³¹⁰ *Ibid.*

³¹¹ *Supra* n 302 at 32.

³¹² *Ibid.*

³¹³ *Idem* at 34.

³¹⁴ *Ibid.*

³¹⁵ *Ibid.*

messages to the other water users in the area.³¹⁶ It will also allow the company to maximise on opportunities to share their water saving practices and efforts with the public.³¹⁷

5.2.4. Joint management and transparency towards building trust³¹⁸

Mining operations have bad reputations when it comes to the impact on the environment, which is why impact on water resources is usually one of the biggest concerns of communities.³¹⁹ The mining companies across the globe reported that the empowering of the community was an essential part in building trust.³²⁰ It is therefore wise to develop a platform where all the stakeholders can collectively identify and resolve issues on a round table manner if such a place is not readily available.³²¹ The information that is communicated from the mining companies and state must be transparent and must be presented in such a manner so that laymen can understand it.³²² When it comes to joint efforts, it means that all the stakeholders must play meaningful part in the management of the water resource which amounts to more than just representation.³²³

A big step that mining companies can take to be transparent, is to allow the community to partake in co-monitoring of the water resources.³²⁴ It is understandable that some companies will be anxious to relinquishing control since it can impact time frames of operations.³²⁵ However the case studies continually revealed that the benefits gained by such efforts outweigh the sacrifices, and the mines usually have the long-term support from the communities.³²⁶ Involving the community will help combat the feeling of powerlessness and improve the sustainability of the collaborations.³²⁷

5.2.5. Transparency on shared information improves sustainable water use³²⁸

The monitoring of water usage of stakeholder in an area will give insight on the impact on the resource.³²⁹ This will anticipate the overall future needs of all the stakeholders and identify potential risks in supply.³³⁰ Good water governance across a catchment area will prevent that mining companies are singled out as pollution culprits and the responsibility of sustainable water

³¹⁶ *Ibid.*

³¹⁷ *Ibid.*

³¹⁸ ICMM IFC *Shared Water Report* (2017) at 41.

³¹⁹ *Ibid.*

³²⁰ *Ibid.*

³²¹ *Ibid.*

³²² *ibid.*

³²³ *Idem* at 37.

³²⁴ *Idem* at 41.

³²⁵ *Ibid.*

³²⁶ *Idem* at 34-37.

³²⁷ *Idem* at 34.

³²⁸ *Idem* at 42.

³²⁹ *Ibid.*

³³⁰ *Idem* at 41.

usage will be carried by all in the catchment area.³³¹ Comprehensive monitoring is essential to evaluate management efforts and to refine water governance structures.³³²

The sharing of data in South Africa is currently insufficient, and comprehensive water management is identified as a problem that needs to be addressed by the South African government.³³³ Initiatives such as the Mine Water Atlas,³³⁴ can play an important role in the successful management of water resources in South Africa.

5.2.6. *Collaboration must be an on-going process*³³⁵

The process of having all the role-players on the same page takes effort and time. Role players in both mining companies and governments can change.³³⁶ Mining companies must ensure that the long-term goals of the company are kept insight across the entire life cycle of the mine.³³⁷ The baton must be passed successfully to any newcomers in the organisation.³³⁸ The lesson here is that it is important for the role-players to maintain relations with other water users despite such changes.³³⁹ Continued involvement in the collaborations have brought about the lessening of obligations that was placed on the mining companies by the governments and communities³⁴⁰

5.2.7. *Successful collaboration is a skill*³⁴¹

Engaging with the stakeholders in good faith does not mean the end of all water problems. Mining companies should never compromise prescribed best practice water management because of good relations.³⁴² Collaborations and communications are time consuming and intense.³⁴³ A very important factor here to take into consideration is that the life cycle of a mine will come to an end at some stage, and the company needs to prepare and communicate the exit process from the collaboration as early as possible.³⁴⁴ The stakeholders that remain after the mine exit must know what such an exit will entail. They must by then have strategies in place to sustain the collaboration especially in cases where the mining companies played a big part in the maintenance of the infrastructures.³⁴⁵ Collaborations must not be seen as a tick box exercise and all the role players must be committed to see a project as a permanent fixture that needs constant care and attention.³⁴⁶

³³¹ *Ibid.*

³³² *Ibid* at 42.

³³³ DWA NWRS2 (2013) at 42-43; 91.

³³⁴ See chptr 1 at 11 for a short discussion on the Mine Water Atlas.

³³⁵ ICMM IFC *Shared Water Report* (2017) at 44.

³³⁶ *Ibid.*

³³⁷ *Ibid.*

³³⁸ *Ibid.*

³³⁹ *Ibid.*

³⁴⁰ *Idem* at 38.

³⁴¹ *Idem* at 44.

³⁴² *Idem* at 41.

³⁴³ *Ibid.*

³⁴⁴ *Ibid.*

³⁴⁵ *Ibid.*

³⁴⁶ *Ibid.*

5.3. Conclusion

It is clear from the above that the silo based approach to water management for mines and for a country is not successful and viewpoints need to change if this is still the case. Water is a scarce resource and the water users need to be able to predict an area's water usage and supply. The water users of an area need to be in constant dialogue with each other to develop suitable water governance collectively. A catchment management institution is a very good platform to draw all the water users in an area together for this purpose. Good water governance requires that data collected on water is done in an open and transparent manner, it is important that the information gained from this are also relayed in an easy understandable format. Collaborations are not an easy overnight process and solution. The main focus that should be kept in mind is the benefit that each and every water user will derive from a successful collaboration.

The following chapter is the concluding chapter with recommendations.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

In 2015 a water stewardship conference was held by the SWPN and over 200 participants showed up of which more than a third was from the private sector.³⁴⁷ This showed that the role players in South Africa are committed to find solutions to use the water resources in a sustainable manner. Collaboration between private, public and community is needed to achieve sustainable water management. By optimising the implementation of collaborative initiatives the sustainable water goals of the United Nations and the three prominent water principles laid down by the South African Cabinet back in the 90's can become a reality. This study contains evidence of case studies across the globe on the benefits that collaborations between mining companies the public and the community can achieve. The eMalahleni water treatment plant is the proverbial pole above water example for South Africa what mining companies can achieve when efforts are joined and collaboration is done correctly.

The good news is that there is no ground breaking work needed to be done to implement this policy or frame of reference so to speak. It is proven that the South African government has already laid the foundation for collaboration through the entrenchment of the spirit of co-operative governance in the Constitution. The primary function of co-operative governance is not co-operating for its sole benefit but to achieve an effective government of the country.³⁴⁸ Within co-operative governance collective governance is given effect to, decision-making is done by groups of individuals from the private and public sector. All of them working together collectively for the provision of public services.³⁴⁹ The South African water laws are on par with international trends and global best practices. The National Water Resource Strategy 2 is very well drafted piece of policy and from its reading it is clear that collaboration is the underlying golden thread to attain sustainable water usage of the country.

As mining companies are one of the biggest users of water in industry and since they contribute a significant amount to the country's GDP, it is important for South Africa to maintain the industry. This has to be however within the parameters of sustainable water use. Collaboration is the vehicle and the platform that must be utilised by mining companies to become meaningful water stewardship leaders in South Africa and the world.

Collaborations are not a one size fits all solution and each situation always has its unique circumstances within the constraints of the economic, social, environmental and political construct. Collaborations take *bona fide* effort and time from all the stakeholders and needs to be tailored made for each area. However the benefits of successful collaboration outweigh the sacrifices made not only for the country or area, but also for the mining company. Mining in the world and in South Africa has a bad reputation when it comes to the environmental and water

³⁴⁷ ICMM IFC *Shared Water Report* (2017) at 46.

³⁴⁸ Nzimakwe Ntshakala (2015) at 836.

³⁴⁹ Ansell Gash (2007) at 545

issues in specific, and the mining companies seem to be always the first in the firing line of the community when things get out of hand. The suggestion this study makes is that if collaboration is done transparently and successfully this will actually help the mining companies' reputation in the long run.

6.2. Recommendations

The one recommendation that this study will make in light of all of the above is that the proclamation and development of Catchment Based Agencies needs to be invested and is the key to kick start sustainable water usage. The Catchment Agencies form the second tier after the organisational framework of water management in South Africa.³⁵⁰ It is the instrument that is used to implement and manage the water strategies etc. as set out in the NWRS2.³⁵¹ The agenda 21 document of the Rio Conference state that IRWM should be carried out on the catchment level.³⁵² The CMA's have been reduced from the initial 19 areas in 1999 to nine in 2012, but still only two are established since 1999, the Breede-Gauritz and Inkomati-Usutu CMA.³⁵³ The others are described as being in process of being established four years later.³⁵⁴ The NWA deals with the progressive establishment of the CMA's by the Minister of Water Affairs. The Act further clearly states in the preamble to Section 78 that the intention is to delegate the water management to regional and/or catchment level and to involve the local communities. Section 78(1) of the Act states that a person, apart from the Minister can also make a proposal for the establishment of a Catchment Management Agency. Public participation underlies the process to develop a proposal for a CMA, and various statutory and non-statutory bodies must be established that contribute to the proposal.³⁵⁵ These established bodies with representation from all the role players will then be incorporated into the CMA to ensure the implementation of the CMA strategy.

From the case study discussion above it transpired in more than one occasion that government did not attract all the role-players in a catchment area to start discussion on the water issues timely, and the mining companies could not afford to sit and wait for government to do that. The mining companies had to create the platform and start the dialogue on the water issues and possible collaborations. Since it is obvious that the South African government is slow to establish these catchments, it seems again that the role players such as the mining companies need to take leadership and create the dialogue platforms around the water issues. Therefore it is suggested that the organisation such as the Chamber of Mines should identify the area where there are not functional CMA's and start the process of establishing a functional CMA on behalf of its members. A mining company as a part of a water user association could also initiate the process on its own.

³⁵⁰ Thompson (2006) at 615.

³⁵¹ *Ibid.*

³⁵² UNSD Agenda 21 at 18.9

³⁵³ Meissner R., Stuart-Hill S., and Nakhooda Z., 'The Establishment of Catchment Management Agencies in South Africa with Reference to the Flussgebietsgemeinschaft Elbe: Some Practical Considerations', in *Freshwater Governance for the 21st Century* (Springer, 2017) 15-18.

³⁵⁴ *Ibid.*

³⁵⁵ Thompson (2006) at 616.

The advantage working from the platform of the CMA's is obvious from the discussion above. The CMA's have the advantage of identifying all the water users for the area and bring them all together to discuss issues and concern on an equal footing. From there on the water demand could be determined and the type of collaboration needed can be determined. It could lead to cost savings for the mining companies if water treatment infrastructure could be shared with others. Stakeholders would be able to discuss exit strategies of the mining companies well in advance and have parameters in place to sustain a good water governance in the catchment area when a big role player such as a mine close. The CMA would then still be representative of all the major 'surviving' role-players and the exit of a mine would not leave a potential gap in the process.

The CMA would provide the opportunity to the mining companies to show the other stakeholders the efforts that it actually undergoes to use water sustainably. This would improve the image of the mine from the start. In the event that a mining company plans an expansion phase the possibility would exist that they would then already have the support from community.

Mining companies are increasingly partaking in initiatives amongst each other to manage water resources. The government are continuously setting up platforms to attract the private sector in the management of water. The government strategies identify the need for a unified monitoring system of the water resources, there are various initiatives and organisations that collect and interpret information on the water resources. As mentioned above the state plans to conceptualise a master water plan for the country and require the help of the private sector.

A platform is required to bring all of these together. This study recommends that the platform to implement good water governance and to optimise implementation of collaborations would be a CMA for each prescribed area. Through each individual CMA transparency, continuous dialogue and trust would be maintained much easier between the state, private sector and communities.

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