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# Role of state-owned development finance institutions in fostering environmental compliance by small-scale miners in South Africa

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# *Role of state-owned development finance institutions in fostering environmental compliance by small-scale miners in South Africa*

*by*

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*A research report submitted to the Faculty of Science, University of Witwatersrand, Johannesburg in partial fulfilment of the requirements for the degree of Master of Science (Environmental Science)*

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*Johannesburg, 2017*

# DECLARATION

I declare that this research report is my own, unaided work. This research report is being submitted as part of the requirements for the degree of Masters in Science (Environmental Science) at the University of the Witwatersrand, Johannesburg. It has not been submitted previously for any degree or examination at any other university.



15 July 2017

Signature of Candidate Date

# ABSTRACT

South Africa's SDFIs have potential to play a critical role in fostering environmental compliance in the mining industry. Their role is particularly important in the small-scale and junior mining sector which is usually shunned by private finance institutions because of high environmental credit risk. Equipped with knowledge and experience of working with clients across different sectors and their potential leadership role in technology transfer, SDFIs can leverage their position in acting as trusted third party environmental regulation enforcers. Financial institutions have long been criticised for showing little interest in environmental impacts of their clients while concentrating on profit maximisation. This study sought to investigate the response by financial institutions to this criticism through evaluating the role of SDFIs in fostering environmental compliance by small-scale and junior mining companies which are generally viewed as having a poor environmental compliance record. Through the twin qualitative research methods of interviews and document analysis, the role of three state-owned development finance institutions in fostering environmental regulation compliance by small-scale mining enterprises in South Africa was evaluated. The study revealed that SDFIs explicitly and implicitly provide a wide range of products and services which help small-scale and junior miners in complying with environmental regulations. The study also found that, while SDFIs are beginning to adopt market-based mechanisms to encourage environmental compliance, they still heavily rely on command and control mechanisms as a way of mitigating environmentally related risks arising from financing mining companies.

## DEDICATION

# I dedicate this work to:

My lovely wife Maureen

My daughter Shantel

My son Brandon

# ACKNOWLEDGEMENTS

I want to express my profuse gratitude to my supervisor Douglas Taylor for his constant guidance during this research. His assistance was invaluable and indispensable!

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# ABBREVIATIONS

| | |
|---|---|
| BASA | Banking Association of South Africa |
| CERCLA | Comprehensive Environmental Response, Compensation and Liability Act |
| DTI | Department of Trade and Industry |
| DWAF | Department of Water and Forestry Affairs |
| EIA | Environmental Impact Assessment |
| EMP | Environmental Management Plan |
| IDC | Industrial Development Corporation |
| INECE | International Network for Environmental Compliance and Enforcement |
| NEF | National Empowerment Fund |
| NEMA | National Environmental Management Act |
| NEMWA | National Environmental Management Waste Act |
| NWA | National Water Act |
| SAMAF | South Africa Mining Apex Fund |
| SAMREC | South African Minerals Code |
| SDFIs | State-owned Development Finance Institutions |
| SEFA | Small Enterprise Finance Agency |
| UNEP FI | United Nations Environmental Programme Finance Initiatives |

# CHAPTER 1. INTRODUCTION

## 1.1 Purpose of the study

The purpose of this research was to investigate the role of state-owned development finance institutions (SDFIs) in fostering environmental compliance by small-scale and junior mining enterprises in South Africa. The study sought to identify the type of assistance that SDFIs currently provide to small-scale and junior mining enterprises and examine how this assistance influences environmental compliance by these entities. Further, extant mechanisms used by SDFIs in promoting environmental compliance by junior and small-scale mining enterprises were investigated and the decisions underlying the choice thereof analysed. Lastly, the study sought to investigate the resources drawn upon by SDFIs in fostering environmental compliance by small-scale and junior mining enterprises.

## 1.2 Context of the study

Small-scale and junior mining companies play an important role in improving the livelihoods of many communities in South Africa (McGill & Theart, 2006). The adoption of the mining charter in the post-1994 democratic era opened up the mining sector to previously disadvantaged groups who mostly started their mining concerns as small-scale miners and junior miners (Mkubukeli & Tengeh, 2015). Thus the small-scale and junior mining sector presents an opportunity for social and economic upliftment of the poor communities (McGill & Theart, 2006). Based on a study by Dreschler (2001), small-scale mining enterprises contributed 1.1 % to mining sector employment and 2.5 % sector revenue. Moreover, the continued depletion of large mineral reserves threatens to render large-scale mining operations unprofitable, thus strengthening the case for developing a vibrant and sustainable small-scale and junior mining sector (Department of Forestry and Water Affairs (DWAF), 2006).

The realisation that small-scale and junior mining enterprises could be a vehicle for economic development in rural communities, a catalyst for employment creation, and a basis for skills development capable of being transferred to other sectors has seen

government and various organisations servicing the small-scale and junior mining sector, adopting new strategies in an endeavour to provide effective support in fostering the development of this important sector (McGill & Theart, 2006; Mutemeri, Sellick & Mtegha, 2010).These include the decision by the South African government to create a directorate for small-scale mining within the Department of Mineral Resources and the opening of credit lines for small businesses through the creation of financial institutions tailor-made to cater for this sector. These financial institutions include the Industrial Development Corporation and its subsidiary, the Small Enterprise Finance Agency (SEFA) as well as the National Empowerment Fund (NEF) and many other state-owned development financial institutions overseen by the Department of Trade and Industry (DTI).

Despite the importance of small-scale and junior mining companies, these miners face financial constraints and often struggle in dealing with their environmental impacts. If the negative environmental impacts of small-scale and junior mining are not properly addressed, they can easily outweigh the benefits which such mining operations bring communities (Hilson, 2002). The environmental impacts, particularly of small-scale mining, have been generally ignored and often mistakenly dismissed as inconsequential (DWAF, 2006). Poor environmental practices in this sector are a consequence of lack of knowledge, use of antiquated technology and lack of capital (Mutemeri & Petersen, 2002). This is further exacerbated by the inability of regulators to effectively monitor and enforce compliance in the sector due to lack of resources and inaccessibility of small-scale miners (Hentschel *et al*, 2003).

Small-scale and junior mining enterprises in South Africa operate in a sector with strict environmental regulations (Dreschler, 2001) and non-compliance therewith has serious financial repercussions. Section 49B (1) of South Africa's National Environmental Management Act (NEMA) 108 of 1998 prescribes a hefty fine of R10 million for some environmental offences. Considering that small-scale mining enterprises have an annual turnover of below R7.5 million while junior miners are generally financially constrained, such a hefty fine can severely compromise their finances, resulting in failure to service their debts in cases where loans were provided by financial institutions.

These financial, social and environmental risks make it almost impossible for small-scale and junior mining enterprises to secure debt or equity finance from private financial

institutions whose main goal is profit maximisation. This has resulted in a finance gap in the sector. However, with the increasing importance of the small-scale and junior mining sector in South Africa, it is natural to expect SDFIs to fill in this gap (Griffith & Evans, 2012). A few SDFIs have warmed to the idea that small-scale and junior miners hold the future of South Africa's mining industry and have started funding them provided the projects are "bankable". Mkubukeli and Tengeh (2015) cite IDC, NEF and SAMAF as some of the SDFIs that are providing financial assistance to small-scale and junior miners. IDC and its subsidiary, the Small Enterprise Finance Agency also fund junior miners. Kingombe, Massa and te Velde (2011) contend that it is the mandate of SDFIs to finance high risk sectors which are deemed to be important to the socio-economic development of their host countries but are underserviced by private financial institutions. Thus SDFIs face the challenge of promoting a sector with high social and environmental risks which can easily translate to financial losses and reputational damage.

In countries with relatively weak environmental governance structures such as South Africa, SDFIs are potentially an important role player in fostering environmental compliance. SDFIs, as the main source of funding for small-scale and junior mining enterprises besides the capital injected by the owners, can leverage this limited access to funding to foster environmental compliance by these entities through setting conditions and standards that have to be met for funding to be approved. Further, their long term loans at lower interest rates in comparison to private financial institutions can give small businesses some flexibility in paying back loans, thus allowing them to commit some of their resources towards improving their environmental performance. However, despite the foregoing, in addition to their potential role as leaders in technology transfer and the need to guard against financial losses arising from environmental risks, a scan of literature shows that limited research has been conducted on the role of SDFIs in promoting environmental compliance in high risk sectors where the influence of risk averse private financial institutions is absent.

## 1.3 Problem Statement

SDFIs play an important role in promoting social and economic development in their countries. They finance high risk sectors that are of importance to national development

but underserviced by private financial institutions and government aid. These sectors also tend to have high environmental risks. One of the sectors in South Africa where the intervention of SDFIs is required is the small-scale and junior mining sector. Financial institutions operating in this sector are exposed to high environmental credit risk due to undercapitalisation, use of antiquated technology and lack of knowledge on the part of small-scale and junior miners. This situation is compounded by the fact that governments in developing countries do not have the capacity to monitor and enforce environmental compliance in the sector. However, SDFIs could leverage their position as banks of last resort, their close ties with entrepreneurs in the sector and relevant government departments, their sector-specific knowledge across various economic sectors, their links with multinational development finance institutions as well as their potential leadership role in technology transfer to foster environmental compliance in the small-scale and junior mining sector. Despite this potential, there has been limited research on the role of SDFIs in fostering environmental compliance in sectors with high environmental credit risk. This study evaluates the role of SDFIs in fostering environmental compliance by small- scale and junior mining enterprises.

### 1.3.1 *Main problem*

Evaluate the role of SDFIs in fostering environmental regulation compliance by small-scale and junior miners in South Africa.

### 1.3.2 *Sub-problem 1*

The first sub-problem is to investigate the type of assistance that SDFIs currently provide small-scale and junior miners in South Africa and analyse the effects thereof on environmental compliance.

### 1.3.3 *Sub-problem 2*

The second sub-problem is to investigate the extant mechanisms employed by SDFIs in promoting environmental compliance by small-scale and junior miners in South Africa and analyse the factors that inform the choice of such mechanisms.

### 1.3.4 *Sub-problem 3*

The third sub-problem is to identify the resources drawn upon by SDFIs in fostering environmental compliance by small-scale and junior miners in South Africa.

## 1.4 Significance of the study

This research addresses the knowledge gap on the role of SDFIs in fostering environmental compliance by small-scale and junior mining enterprises in South Africa. Literature survey covering the past three decades shows that there is limited research on the role of SDFIs in fostering environmental compliance in South Africa. By evaluating the role of SDFIs in fostering environmental compliance by small-scale and junior mining enterprises in South Africa, this study will contribute to the discourse on two areas that have received little research attention in South Africa. Firstly, the study contributes to knowledge on the relatively new phenomenon of sustainable banking as it pertains to SDFIs in South Africa. Research on sustainable banking has, thus far, mainly focused on private commercial banks, regional and multilateral financial institutions (Zemek, 2002). Secondly, the study contributes to the discourse on environmental management in the small-scale mining sector in South Africa. Further, the study gives some recommendations on how SDFIs in South Africa may enhance their role in fostering environmental compliance by small-scale mining enterprises. Thus, the study may form a basis upon which SDFIs and other financial institutions can draw comprehensive guidelines which can be adopted in fostering environmental compliance.

## 1.5 Scope of the study

This study focused on SDFIs which were identified in literature to be the most active in providing finance to small-scale and junior mining enterprises. Further, the study also focused on small-scale and junior mining enterprises that are beneficiaries of financing from the SDFIs under study. The mining enterprises chosen had to have a “bankable” mining operation, which is the most important determinant used by SDFIs in deciding whether to finance or not. Because of time and financial constraints as well as client confidential issues, the sample of owners and/or managers of small-scale and junior

enterprises who are currently in the mining portfolios of the SDFIs under study was drawn from a very small population. Table 1 shows the classification of small and medium enterprises in mining sector. For purposes of this study, only class 2 to class 4 (shaded in grey in table 1) and larger junior mining enterprises, following the definition of junior mining companies by Landu (2014), were considered because only these and bigger projects were considered bankable by the two SDFIs under investigation.

**Table 1: Classification of mining and quarrying operations**

| **Category** | **Micro Class 1** | **Very Small Class 2** | **Small Class 3** | **Medium Junior Class 4** |
|---|---|---|---|---|
| Number of employees | <5 | <20 | <50 | <200 |
| Assets (property excluded) | <R100 000 | < R 1.8m | < R 4.5m | <R 18m |
| Annual Revenue | <R 150 000 | < R 3m | < R 7.5 m | <R 30m |
| Description of operation | Commonly informal (i.e. not registered for purposes of mining, taxation or labour legislation. Commonly part-time. | Locally based producers. | Provincially based producers. | South African based contractors, production and exploration companies. |
| Level of technology and mechanization | Artisanal, rudimentary and non-mechanised equipment. | Simple technology, simple mechanised equipment. | Low to medium technology and levels of mechanisation. | High levels of technology and mechanisation. |

Source: Mutemeri and Petersen (2002)

## 1.6 Definition of terms

***State-owned DFIs*:** Any financial intermediary with the aim of improving social welfare by lending to priority sectors or target clientele while benefiting from some levels of concessionary resources received from the state and / or donors (Yarn, 2004, p. 4).

***Environmental compliance:*** In this study, environmental compliance means meeting the requirements stipulated in environmental laws, regulations, standards and other obligations.

***Junior Mining Enterprise:*** A small to medium sized mining company with a capitalisation of between $20 million to $ 1 billion (Landu, 2014)

***Small and Medium Enterprise****:* Any business employing less than 200 people and has an annual revenue of less than R30 million (Mutemeri and Petersen, 2002).

***Sustainable banking*****:** The modus operandi in which the internal activities (of a bank) meet the requirements of sustainable business and in which external activities (such as lending and investments) are focused on valuing and stimulating sustainability among customers and other entities in the society (Jeucken, 2010, p. 73).In this study, the definition of sustainable banking is narrowed to mean the incorporation of environmental issues in financing of socio-economic development activities with the aim of preventing or minimising environmental damage resulting from such activities.

***Small-scale mining enterprise***: For the purpose of this study, a small mining enterprise is any mining concern that employs less than fifty people and has an annual revenue of less than R7.5 million (Mutemeri& Petersen, 2002)

## 1.7 Assumptions

The following assumptions have been made regarding this research:

i. SDFIs are mandated to champion sustainable development and thus consider the triple bottom line issues (social, economic and environmental factors) when financing small-scale and junior mining enterprises and therefore will have the necessary information required for this study.
ii. Mining operations pose serious environmental risk which exposes SDFIs to financial and reputational risks and as such SDFIs consider environmental issues when financing small-scale and junior mining operations (Zemek, 2002).
iii. Environmental requirements necessary for loan approvals and equity investment are contained in the SDFIs credit policies, standards and guidelines therefore access to this documentation will give an insight into the mechanisms that SDFIs have put in place to ensure environmental compliance by small-scale and junior miners.

iv. Officials involved in the process of financing small-scale and junior mining projects are repositories of invaluable information on the role of their institutions in fostering environmental compliance by small-scale miners and are willing to share it with the researcher.

# CHAPTER 2. LITERATURE REVIEW

## 2.1 Introduction

This literature review is structured into four sections. The first section of this chapter gives a background to this study. The second section covers literature pertaining to research question one which focuses on the type of assistance which SDFIs provide to small-scale and junior mining enterprises and the effects thereof on environmental compliance. The third section focuses on literature pertaining to the second research question which deals with the instruments or mechanisms used by SDFIs in promoting environmental compliance by small-scale and junior miners and the factors that informs the choice of such mechanisms. The last section covers literature related to the third research question that deals with the resources drawn upon by SDFIs in fostering environmental compliance by small-scale and junior miners.

## 2.2 Background discussion.

The importance of developing a vibrant small-scale and junior mining sector is increasingly receiving widespread attention in South Africa and other developing countries. Historically, the South African mining sector has been dominated by major mining companies. According to Landu (2014), large corporations constitute about 90% of the mining enterprises in South Africa. However, with the depletion of large mineral reserves rendering mining operations by large corporations unprofitable, there is an increasing belief that the future of mining in South Africa lies in the promotion of small-scale and junior mining enterprises (DWAF, 2006). Besides, the development of a vibrant small-scale and junior mining sector in South Africa is seen as a vehicle for empowering the previously disadvantaged groups who have been alienated from the mining sector which, historically, has been dominated by a few large mining corporations (Mkubukeli & Tengeh, 2015).

Despite strides made in promoting sustainable growth in the small-scale and junior mining sector, environmental issues still present a big challenge to all stakeholders involved in this sector (Hentschel, Hruschka & Priester, 2003). The devastating effects of small-scale mining on the environment tend to be ignored (Hilson, 2002a). According to DWAF (2006),

there is often an assumption that small-scale mining enterprises have little environmental impact. However, the opening up of the mining sector to previously disadvantaged South Africans as a result of the adoption of the mining charter, coupled with improved access to mechanised methods and haphazard management, has increased the potential of small-scale and junior mining enterprises to adversely affect the environment (DWAF, 2006). Hentschel et al. (2003) note that, despite small-scale mining having a higher environmental cost per unit output than other types of mining, environmental monitoring and regulation enforcement in this sector remains a challenge. They cite lack of resources on the part of regulators and inaccessibility of small-scale mining enterprises as reasons for poor environmental monitoring and regulation enforcement. Without proper support, effective mechanisms and institutions to foster environmental compliance, the small-scale mining sector could prove to be a big environmental challenge for South Africa.

In recent years, the mining sector has been hit by a wave of environmental accidents, conflict and intense debate which have not only put the mining industry under the spotlight but also affected the financial institutions funding the projects due to the astronomical costs involved in redressing the negative environmental and social impacts (Davis & Franks, 2014). This has rekindled the discourse on the role of finance institutions in addressing the environmental impacts of their clients. While some quarters have contended that it is not the duty of financial institutions to regulate the environmental performance of their clients (Juecken & Bouma, 1999), there is increasing pressure on financial institutions not only to consider the environmental impacts of their clients but also to influence their environmental performance (Sarro, 2012). Thompson (1998) argues that though financial institutions are reluctant to act as environmental policemen, they can act as environmental partners and advisors by providing products and services that promote environmental care.

In some jurisdictions, for instance, the United States of America, under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), financial institutions can be directly held responsible for the environmental pollution of their clients and can be held liable for rehabilitation costs (Jeucken & Bouma, 1999). Recently, the Chinese Banking Regulatory Commission put in place statutes which obligate state-owned banks to strictly carry out green-credit policies and promote their borrowers' environmental protection awareness (Du, Weng, Zeng, Chang and Pei, 2017) . Though the South African legislation is not as explicit, Alberts (undated) argue that financial

institutions involved in the financing of mining operations may face liability under three pieces of legislation, namely the National Environmental Management Act 107 of 1998 (NEMA), National Environmental Management Waste Act 59 of 2008 ( NEMWA) and te National Water Act 36 of 1998 (NWA) . According to Alberts (undated), under section 19 of NWA and section 28 of NEMA, persons who directly or indirectly contribute to environmental or water pollution may be held responsible.

As a result of the high social, environmental and financial risks associated with small-scale and junior mining enterprises, most commercial banks and private finance institutions are reluctant to provide finance to the entrepreneurs in this sector (Mutemeri & Petersen, 2002). In addition to this dilemma, research by Pimenova and Van Der Vorst (2004) reveals that governments in developing countries generally give very little support to small businesses in terms of environmental policy-making, support programs, and incentives (including financial incentives) to ensure that these businesses are economically stable and environmentally sustainable. It will be argued in this study that SDFIs have the potential to bridge this gap created by lack of finance from private commercial finance institutions and inadequate environmental support from government departments directly responsible for mineral resources and environmental affairs.

In South Africa, SDFIs seem to be the most active financial institutions in the small-scale and junior mining sector (Dreschler, 2001; Mkubukeli & Tengeh, 2015; Mutemeri & Petersen, 2002). SDFIs are created and financed by governments and their responsibilities go beyond mere provision of equity or debt for profit (Zemek, 2002). They are expected to contribute to social and economic development of their countries as well as promoting environmentally and socially responsible investment (Griffith & Evans, 2012). According to Kingombe, Massa and te Velde (2011), SDFIs are mandated to finance high risk sectors which are of importance to socio-economic development but underserviced by private financial institutions. Gumede, Govender and Motshidi (2011) argue that besides providing finance for developmental projects and addressing capacity failure in the public sector, SDFIs should also play a crucial role in building the capacity of their clients from the stage of project preparation to implementation. One would suppose that this includes providing their clients with the necessary technical assistance to enable them to contribute to economic growth while conducting their operations in an environmentally responsible

manner. For Vives (2004), the issue of corporate social responsibility should be a priority for DFIs.

However, despite their presence in the small-scale and junior mining sector (Mkubukeli & Tengeh, 2015), being seen as leaders in technology transfer and environmental issues (Gumede et al., 2011) , the potential risks they face as a result of poor environmental performance in this sector, their experience across different sectors of the economy and networks they have in government and private sector, there is limited research on the (potential) role of SDFIs in fostering environmental compliance by small-scale and junior mining enterprises in South Africa.

## 2.3 Characteristics of small-scale and junior mining companies in South Africa

The definition and classification of small-scale and junior mining companies in South Africa is quite confusing with overlaps in some characteristics such as the number of employees. For instance, Seeger (2007) has defined a junior mining enterprise as a small, entrepreneurial company that is involved in exploration, feasibility studies and at times development of mines. It is not uncommon to find some small-scale miners just below the junior mining level carrying out these functions. Notwithstanding the confusion in the classification, understanding the nature of these miners is crucial in developing an insight into their environmental performance. For the purposes of this study, small-scale and junior miners were defined as those business entities within the category of small and medium enterprises which are involved in the extraction and beneficiation of mineral resources.

While literature is awash with information on small-scale mining, there are a few scholarly articles that extensively cover junior mining companies in South Africa. Landu (2014) nevertheless gives an overview of junior mining companies in South Africa. According to him, junior mining companies are small to medium mining companies with a capitalisation of between $20 million to $1 billion. He further notes that most of these companies are a product of the Broad Based Black Economic Empowerment programme implemented by the government to address the economic injustices of apartheid South Africa. Landu (2014) also notes that these companies have a weak corporate and management profile. In addition, they find attracting investment challenging as most banks regard them as a high risk investment. Therefore, they rely on owners' equity and some contribution from

family and friends (Seeger, 2007). As with most small businesses, financial constraints means that environmental issues are not a primary concern for most junior miners. With heavy equipment and operating on fairly large areas, junior mining operations can be environmentally destructive.

Mutemeri and Petersen (2002), Hilson (2002) and Hentschel *et al*. (2003) have extensively covered the nature of small-scale miners in South Africa. They paint a picture of a sector that is underresourced, mostly ignorant of environmental regulations and in instances where awareness is present, compliance is still problematic because of lack of resources and the onerous nature of South African environmental regulations. These characteristics are important in understanding environmental challenges in the small-scale and junior mining sector, a subject which will be discussed in the ensuing section.

## 2.4 Environmental challenges in small-scale and junior mining sector

This section puts into perspective the role SDFIs could play in assisting small-scale and junior mining enterprises in complying with environmental regulations. It starts with a review of environmental impacts of small-scale and junior mining operations and the environmental compliance challenges faced by these enterprises and then delves into the role of financial institutions in influencing the environmental performance of their clients.

### 2.4.1 *Environmental impacts of mining*

The discourse on environmental issues in small-scale and junior mining has mainly focused on the role of government departments directly responsible for environmental regulation such as the departments of environment and mineral resources without necessarily looking at the important role financial institutions can play in this regard. Allet (2015) cites various issues that are critical to environmental compliance by small and medium enterprises. These are knowledge or access to information, resources and motivation. Financial institutions are capable of facilitating knowledge and technology transfer as well as providing incentives to promote a culture of environmental compliance. Scholars like Allet (2015) and Bridge (2004) have argued that financial institutions can play an expanded role in promoting environmental compliance within the small and medium enterprises sector. In order to understand the potential role of financial institutions in

assisting small-scale and junior miners to comply with environmental regulations, this section will provide an insight into the environmental impacts of small-scale and junior mining and the barriers to environmental compliance within the sector.

Small-scale mining has long been perceived to be environmentally destructive (Hilson & Van Der Vorst, 2004). While small-scale mining has often been associated with the use of rudimentary tools and hence the underestimation of its environmental impact, Kambani (2003) notes that highly mechanised small-scale mining can be more environmentally destructive. The same applies to junior miners who are even more mechanised. Generally, small-scale and junior mining, just like any other form of mining, involves the digging and stripping of the earth's surface to extract minerals (Kambani, 2003) and chemical processing of the ore (Hilson & Van Der Vorst, 2002). The clearance of vegetation to kick start mining operations and the subsequent digging and stripping of soil to extract minerals result in the physical alteration of the landscape (Bridge, 2004). The destructive nature of small-scale mining on the environment is best exemplified by deforestation, large quantities of waste piles and holes which, with the accumulation of water, provide breeding ground for mosquitoes (Kambani, 2003).

In addition to that, the use of toxic chemicals in mineral processing and leachate from dam tailings contribute to contamination of land and water resources while the dust from tailings and earth stripping result in air pollution. According to Bridge (2004), the rapid increase in small-scale gold mining operations in the developing world has exposed workers in this sector and communities downstream to heavy metals such as mercury used in the refining of gold. Similarly, a study by Babut et al. (2003) attributes the high mercury concentration in fish, rivers and water sediments in Dumasi, a village in Ghana, to the inefficient use of mercury in small-scale gold mining operations in the region. There are various factors which lead to poor environmental management practices in the small-scale mining sector and these will be discussed in the ensuing sections.

### 2.4.2 *Environmental compliance in small-scale and junior mining sector*

Various studies on environmental issues in the small-scale and junior mining sector concur on the challenges faced by entrepreneurs in this sector in complying with environmental regulations. Studies by Mutemeri and Petersen (2002); Hilson (2002) and Hentschel et al

(2003) show that the challenges faced by small-scale mining enterprises, bar some sector-specific regulations, are generic to small businesses across different sectors. These challenges include lack of knowledge, lack of capital, improper training of workers, inappropriate and outdated technology as well as lack of proper support and guidance from authorities and stakeholders (Hentschel, 2002; Hilson & Van Der Vorst, 2004).

In their study of drivers and barriers to environmental compliance in the small and medium enterprises sector, Walker, Redmond, Sheridan, Wang and Goeft (2008) argue that factors influencing environmental performance of small businesses across different sectors can be viewed from two different perspectives. From the perspective of small businesses, there are three main factors that prevent them from adopting and engaging in good environmental practices. These factors are resource availability (including financial, human and time), owner- manager's environmental knowledge, commitment and motivation relating to environmental compliance (Walker et al., 2008). From the perspective of the government or other regulators, the main barriers are how best to engage small businesses and communicate with them effectively.

### *2.4.3 Resource availability and environmental compliance*

Availability of resources plays a crucial role in the environmental compliance of businesses in general. Most studies show that lack of resources is the main reason for non-compliance with environmental regulations in the small-scale and junior mining sector (Hentschel, Hruschka, & Priester, 2003; Hilson, 2002; Mutemeri & Petersen, 2002). Hillary (2004) explains that these resources are in the form of finance, time and human (skills) resources.

#### *a. Lack of finance as a barrier to compliance*

Small-scale and junior mining enterprises, just like any other small businesses, operate under financial constraints because of limited funding (Cranstoun, 2010; De la Torre, Peria, & Schmukler, 2010; Dreschler, 2001). In fact, South African bankers generally perceive small businesses as a high risk area with weak returns (Smit & Watkins, 2012). The undercapitalisation of small-scale and junior mining enterprises is manifested by lack of finance to acquire new and clean technologies (Allet, 2015; Buratti & Penco, 2001). Lack of finance inhibits environmental technology transfer, restricting small-scale miners to the

use of antiquated technology (Babut et al, 2003) with the potential consequence being non-compliance with environmental regulations.

Most studies on the relationship between mining and the environment have attributed emissions and wastes from mining to production inefficiency emanating from lack of investment in technology and insufficient technical and management skills (Babut et al., 2003; Bridge, 2004; Dreschler, 2001; Kambani, 2003). Hilson and Van Der Vorst (2002) posit that, of the three main problems in small-scale gold mining namely mercury pollution, acid mine drainage and land degradation, the first two can be mitigated by the use of better technology. However, despite the importance of technology transfer in cleaner production within the small-scale mining sector in South Africa, Mutemeri and Petersen (2002) found that the use inappropriate and antiquated technology which is no longer protected by patents is still widespread in the sector. This tends to be the problem also faced by junior miners in South Africa. This can be traced back to lack of finance and knowledge.

The other ripple effect of lack of finance on environmental compliance is noted by Walker et al (2008) who argue that due to lack of finance, small businesses often employ few people. Hiring employees with environmental management expertise is often seen as a futile expenditure. Rather, environmental responsibilities are often delegated to owners or managers as secondary duties (Hillary, 2004).

### *b. Lack of knowledge and skills as barriers to compliance*

Besides a lack of funding and its ripple effects on environmental compliance, a lack of knowledge and skills has also been cited as a barrier to environmental compliance in the small-scale and junior mining sector (Hentschel et al., 2003). Hillary (2004) argues that it is rather the lack of human resources and not lack of finance that has proven to be a major obstacle to sound environmental management in small businesses. Hillary (2004) further notes that setting up and maintaining sound environmental systems requires specialist staff, which most small businesses do not have and are reluctant to hire due to inadequate funds.

Environmental knowledge and skills play a critical role in environmental compliance (Allet, 2015; Parker et al., 2009). Studies have shown that small-scale miners world over have a poor understanding of the knowledge and skills necessary for environmental management

(Crispin, 2003; Ghose, 2003; Hentschel et al., 2003; Hilson & Van Der Vorst, 2002; Kambani, 2003). Most of these studies show that lack of knowledge is the main cause of widespread mercury pollution in regions where small-scale gold mining operations are conducted (Babut et al., 2003; Kitula, 2006).

A study by Dreschler (2001) further illustrates the importance of knowledge, noting that one of the reasons for non-compliance with environmental regulations in South Africa's small-scale mining sector is that the regulations are unintelligible to most small-scale miners. He further notes that the environmental regulatory requirements are burdensome for small-scale miners who often neither have that capacity nor the resources to meet these requirements. According to Parker et al. (2009), small businesses find keeping up to date with environmental regulations quite onerous. Parker et al (2009) further note that small businesses often have difficulties in identifying the regulations that apply in their individual context and worse still, finding guidance and advice on what they ought to do to be compliant is often difficult. This view is supported by Hilson (2002a) who cites extensive and incomprehensive legislation, a lack of clear government policy, support and encouragement among some of obstacles to the improvement of environmental performance in small-scale mining sector.

Sinding (2005, p. 247) argues that the most important hurdle in overcoming the problems faced by small-scale miners is "breaking the vicious circle that prevents investment in knowledge." However, in the face of undercapitalisation, small-scale miners would find it difficult to invest in knowledge. Kehbila, Ertel and Brent (2009) have recommended the provision of technical assistance through outreach efforts as therapy to lack of knowledge on environmental issues within the small businesses sector. This viewpoint is supported by the Banking Association of South Africa (BASA) (2016) who emphasise the need for the development of research and knowledge management initiatives by financial institutions to overcome the hurdle of non-compliance with regulatory requirements by small businesses. Improving the technical capacity of small-scale and junior miners in mining skills and environmental management is critical in promoting environmentally responsible practices within the sector (Kambani, 2003). According to International Network for Environmental Compliance and Enforcement (INECE) (2009), enhancing the technical capacity of businesses also equips them with the knowledge of their legal duties and responsibilities.

Provision of compliance related information is crucial in promoting environmental compliance by small businesses (Pimenova & Van Der Vorst, 2004). However, Mazur (2015) cautions that it is not just the dissemination of environmental compliance-related information that is important but how it is done. According to him, small businesses seek clear and consistent information on the minimum requirements for compliance to avoid excessive costs for businesses, as such, environmental guidance should clearly distinguish between minimum regulations requirements and good practice. Parker, Redmond and Simpson (2009) state that environmental information can be acquired in two different ways. It can be acquired through self-directed learning in the form of checklists, do-it-yourself (DIY) guides, fact sheets, case studies, newsletters and self-help toolkits or through facilitated learning in the form of workshops, seminars and conferences. Parker, Redmond and Simpson (2009) caution that provision of environmental information through education should be tailor-made to meet the diversity and complexity of small businesses.

### 2.4.3 *Role of financial institutions in environmental compliance*

Financial institutions have increasingly come under pressure to incorporate environmental issues when providing finance for developmental projects (Wright, 2012; Coulson & Monks, 1999). According to Zemek (2002) financial institutions financing mining operations are increasingly under public scrutiny because of the increased awareness of the social and environmental risks associated with this industry. In some instances, they have been held liable for rehabilitation (Twum, 2013). Wright (2012) emphasizes the increasing pressure on financial institutions to consider environmental factors by citing how many banks stood to lose after a mining company they were financing in the Phillipines had its licence suspended for poor environmental performance. Thus financial institutions face financial and reputational risks as a result of poor environmental performance of their clients. However, they can leverage their position to mitigate these risks. A study by Lefebvre, Lefebvre and Talbot (2003) found financial institutions' concern on the environmental performance of their clients to be influential in the environmental behaviour of small businesses.

According to Twum (2013), banks (financial institutions) possess attributes which make them important role players in influencing the environmental performance of their clients.

Firstly, they can use their finance as a powerful tool for enforcing environmental compliance through setting environmental standards and requirements that have to be met by their clients when financing projects (Twum, 2013). This viewpoint is shared by Sarro (2012) who argues that financial institutions could act as environmental regulators of their clients by setting environmental standards, monitoring and enforcing them. Secondly, financial institutions are imbued with knowledge regarding sector-specific legislation, information and market developments through constant interaction with clients and stakeholders across various sectors. This knowledge could be used by SDFIs to promote environmental compliance by small-scale mining enterprises. Financial institutions could also play a leading role in cleaner production by financing clean technology transfer (Karani & Gantsho, 2007) thus promoting good environmental practices.

Besides acting as environmental policeman as proposed by Thompson (1998), Allet (2015) notes that, financial institutions dealing with small businesses can also act as environmental advisors to these micro-enterprises because of their close relationship.Allet (2015) adds that the other advantage of such finance institutions in fostering environmental compliance by small businesses is their ability to provide finance to these businesses that would otherwise be excluded from the mainstream financing system. Thompson (1998) argues that, the provision of environmental information and advice could be looked at as a value-added service provided at no or little cost by a bank to its customers. According to Kingombe *et al*.(2011), DFIs provide financial resources, project-specific and general technical assistance and promote standards in the funds or companies in which they invest. Such services would be welcomed by small businesses which operate on very tight budgets and are usually unwilling to commit some of their resources to environmental issues (Mazur, 2015).

In Clause 3.2 of the UNEP Statement of commitment by financial institutions on sustainable development, all signatory financial institutions declared their commitment to sharing "relevant information with customers, as appropriate, so that they may strengthen their own capacity to reduce environmental and social risk and promote sustainable development" UNEP FI (2011, p. 28). Some banks, for instance Piraeus Bank in Greece, provide consulting services and advice on environmental related issues such as climate change (UNEP FI, 2011).

An investigation conducted in New Zealand on the relationship between small businesses and their banks reveals that small businesses frequently turn to bank representatives as sources of support and advice (Perry & Coetzer, 2009). However, the study does not specify the type of support sought by these entities. The role of financial institutions as providers of information and knowledge to small businesses was further explored by Anzboeck and Couzinet (2014), who, in their study of how commercial banks can offer financial products to small businesses for investing in energy efficiency in projects, argue that banks can play a key role in providing knowledge and information about the potential benefits of energy saving. In addition to that, ecological economists believe financial institutions can play an important role in funding green initiatives as well as preventing "problematic forms of commodification of environmental goods and bads"(Røpke, 2017). Though literature has covered much on the initiatives taken by commercial banks (Coulson, 2009; Erina & Lace, 2012; Thompson & Cowton, 2004) and multi-lateral development institutions (Boisson de Chazournes, 2000; Bowles, Rosenfeld, Kormos & Reining, 1999; Gutner, 2005) in influencing environmental compliance by their clients, little is known of what SDFIs in South Africa are doing in response to the growing call for financial institutions to incorporate environmental issues when financing developmental projects.

According to Kingombe et al (2011), most SDFIs do not have any clear transparency and disclosure policies. Te Velde and Warner (2007) cited in Kingombe et al (2011) argue that there are areas where SDFIs have not been transparent enough and these include the technical assistance they provide to their clients. This leads to the first research question.

### 2.4.4 *Research Question 1*

What kind of assistance do SDFIs in South Africa currently provide to small-scale and junior mining enterprises and what effects does this assistance have on environmental compliance by small-scale and junior mining enterprises?

## 2.5 Mechanisms for fostering environmental compliance

Fostering environmental compliance in the small-scale mining and junior mining sector is a challenge that requires concerted efforts from various stakeholders and use of a blend

of mechanisms. According to Zemek (2002), the majority of cases of environmental accidents in mining are neither due to poor design nor inadequate standards of construction but rather a consequence of inadequate monitoring, poor maintenance and repair or failure to adhere to standards. Thus there is need to put in place compliance mechanisms to guard against avoidable disasters. Environmental compliance mechanisms are generally classified into two categories, namely command and control mechanisms and market-based mechanisms (Keene, 1999). Figure 1 shows the environmental management cycle which includes various compliance mechanisms that can be adopted by regulators to foster environmental compliance by regulated entities.

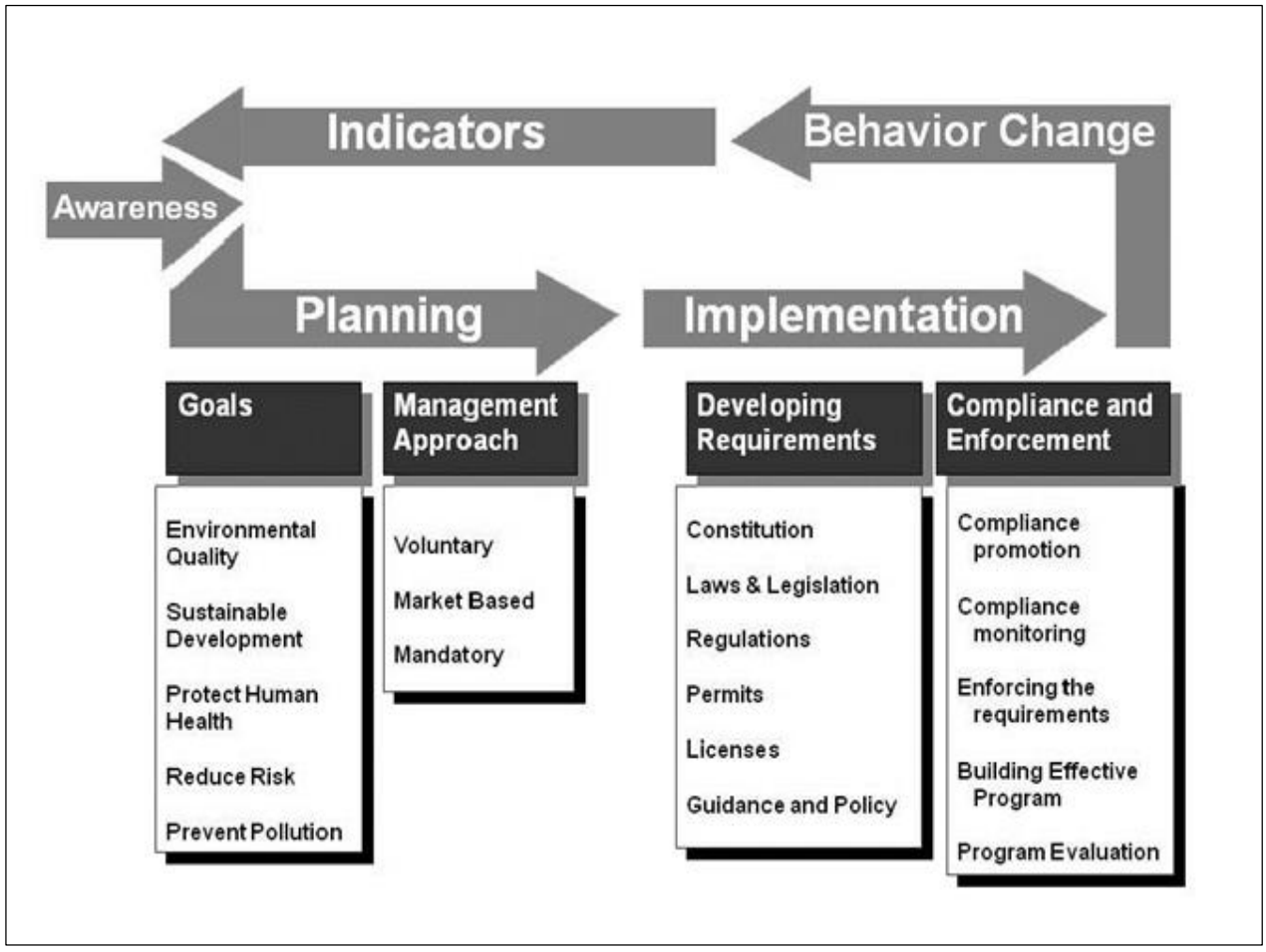



Figure 1: The environmental management cycle (INECE, 2009 p.4).

In order to understand this, the ensuing section will touch on the theory of compliance behaviour in an attempt to explain why some authorities for instance INECE (2009) have advocated for the adoption of both mechanisms.

### 2.5.1 *The theory of compliance behaviour*

Various studies have sought to understand and explain why certain organisations comply or fail to comply with environmental regulations. Two theories namely, the rationalist theory and normative theory, have been put forward to explain environmental compliance behaviour of regulated entities (INECE, 2009). According to the rationalist theory, regulated entities "follow the logic of consequence", that is they look at the costs and benefit of complying with environmental regulations and if they find violating the regulation "cheaper" they will do so (INECE, 2009 p.8). Rationalists are proponents of deterrence-based enforcement, they believe that raising cost of non-compliance forces individuals and entities into compliance (Becker, 1968). According to INECE (2009), rationalists contend that policy can only act as a deterrent factor if regulated entities believe that there is a high likelihood of being caught, that immediate, definite and fair reaction to non-compliance and the severity of punishment is more than the cost of non-compliance.

On the other hand, the normative theory postulates that regulated entities "follow the logic of appropriateness and often act in good faith" (INECE, 2009 p.9). According to this theory, compliance by regulated entities or lack thereof is a function of capacity and commitment (INECE, 2009). Capacity in this instance refers to the regulated entity's knowledge of regulations, as well as the availability of finance and technology to comply with regulations, while commitment focuses on the regulated entity's perception of whether the regulations are fair or not (Burby & Paterson, 1993). It is against this background that INECE (2009) advocates the "stick and carrot approach" which simultaneously adopts threats of action against non-compliance and promotion of compliance in the form of incentives and assistance.

### 2.5.2 *Command and Control Mechanisms*

Command and control mechanisms obligate regulated entities to achieve the set outcomes regardless of their individual cost structures (Whitten, Van Bueren & Collins, 2003). This form of compliance mechanism seem to be the most common in the mining sector in South Africa. Small-scale and junior mining enterprises are expected to comply with the same unintelligible and onerous regulations applicable to large mining corporations (Debrah, Watson & Quansah, 2014). Because of the complexity of environmental laws, most small-

scale miners decide to operate outside the ambit of the law while junior miners are in constant breach of the law. This situation is further exacerbated by failure of governments in the developing world to provide enough incentives to encourage small-scale miners to operate within the confines of the law (Hentschel et al, 2003).

A study by Sarro (2012) shows that some financial institutions make use standards, monitoring and auditing as mechanisms to promote environmental compliance by their clients. In another study, Thompson (1998) notes that some financial institutions include environmental compliance covenants in their loan contracts. These covenants are terms and conditions of the loan which may include, for example, a demand by a financial institution that a client or borrower train his/her personnel on environmental risks (University of Leeds Sustainability Research Institute, undated). Calderon and Chong (2014) prescribe monitoring as an important tool that could be used by financial institutions to ensure that borrowers continue to comply with environmental standards as set out in the loan contracts. However, they argue that financial institutions have not always dutifully managed to monitor the environmental performance of their SMEs clients. Despite the importance of the use of command and control mechanisms, such mechanisms may not always yield results when dealing with regulated entities such as small-scale miners.

A study by Mutemeri and Petersen (2002) shows that most small-scale miners in South Africa do not have the resources and technical capacity to meet regulatory requirements such as EIAs. Further, Reid (2013) argues that one of the weaknesses of relying on regulatory tools such as EIAs is that the incentive for environmental performance diminishes once environmental approval and funds are secured. Besides, Iraldo, Melis and Sabbatino (2011) argue that small businesses are not capable of setting up advanced environmental management systems. These are seen as costly and small businesses need to see some tangible financial returns coming out of better environmental performance for them to be persuaded on the importance of being environmentally compliant. Further, small businesses are preoccupied with daily challenges and are not prepared to take environmental initiatives unless there is a monetary incentive to do so (Calderon, 2014). Thus the use of a stick and carrot approach would be more effective when dealing with small businesses.

### 2.5.3 *Market-based mechanisms*

Market-based instruments have been defined as the mechanisms that encourage compliance behaviour through market signals as opposed to explicit directives (Stavins, 2000). Mazur (2015) argues that small businesses look for cost effective ways in their endeavour to comply with environmental regulations. The use of market-based mechanisms would achieve that by helping small businesses to make adjustments commensurate with their unique business structures and opportunities (Whitten et al., 2003).

Different scholars have looked at various incentives that could be used as a way of fostering environmental compliance by small businesses (Farmer, 2012; Mazur, 2015; Parker, Redmond, & Simpson, 2009). According to INECE (2009), these incentives comprise of a set of policies and programs that eliminate, lessen or waive penalties under certain conditions for institutions that voluntarily identify, promptly disclose and correct non-compliance and prevent future non-compliance. Such incentives include recognition of good environmental performance and provide tangible benefits for institutions that actively monitor their environmental performance and report problems to relevant authorities. Reid (2013) argues that these incentives should be a mix of positive and negative incentives that can be used throughout the life of a loan to encourage environmental compliance.

A study by Iraldo et al. (2011) shows that some Italian banks have come up with different financial products and incentives to encourage small businesses to be "environmentally conscious", for instance provision of soft loans and lower interest rates to small businesses as a way of encouraging investments in cleaner production. Reid (2013) argues that even after the life span of a loan, banks can still encourage environmental compliance by firms through conditioning future access to, or the pricing of, credit on environmental performance history. Elsakit and Worthington (2013) suggest that financial institutions can collect their clients' environmental information for future use in the evaluation of environmental credit risks associated with financing such clients. They argue that this would encourage small businesses to adopt good environmental practices, knowing that their environmental performance has a bearing on their future ability to attract financing from finance institutions.

However, Parker *et al.* (2009) caution that when deciding on the type of instruments to use in encouraging environmental compliance by small businesses, even those within the same sector (for instance mining), it is important to consider their motives for environmental compliance. Redmond and Walker (2009) concur with the preceding caution and further argue that, while small businesses are often accused of failing to embrace good environmental practices, such failure may be attributed to failure by governments to actively engage small businesses. How stakeholders engage small businesses and the mechanisms they choose when dealing with these businesses determines the level of success in promoting good environmental practices in small businesses (Parker et al, 2009).

Literature shows that financial institutions use different tools at their disposal when dealing with environmental risks (Calderon, 2014; Sarro, 2012; Thompson, 1998). However, the decision on what kind of tools to use depends on how individual financial institutions perceive environmental risks and their assessment of the type of project to be financed (Jeucken, 2001). There are marked differences between approaches that private financial institutions and DFIs use on one hand and between approaches which multilateral DFIs use and those some SDFIs use on the other hand (Kingombe et al., 2011).There is limited research on the mechanisms used by SDFIs to influence their clients to implement environmentally friendly practices. This leads to the second research question

### 2.5.4 *Research Question 2*

What mechanisms do SDFIs in South Africa use to promote environmental compliance by small-scale and junior mining enterprises and what factors inform the choice of such mechanisms?

## 2.6 Resources for fostering environmental compliance

The adoption of sustainable banking practices has seen new environmental regulators, advisors and partners in the form of financial institutions (Sarro, 2012; Thompson, 1998). The extant literature often cite lack of internal expertise in environmental issues one of the main challenges faced by financial institutions in effectively fostering or promoting environmental compliance by their clients (Calderon & Chong, 2014; Aizawa & Yang,

2010; Mendelsohn & Seo, 2007). However, because sustainable banking is a relatively new phenomenon (Calderon, 2014), little research has been conducted on the resources drawn upon by financial institutions in providing assistance on environmental compliance to their clients.

A study by Spence, Agyemang and Rinaldi (2012) looked into the resources drawn upon by accountants in providing environmental advice to small businesses. In their study, they found that most accountants drew upon their past experiences with their clients, past experience as small business owners as well as the trust of their clients particularly when introducing new topics on environmental issues. However, the study also revealed that, though relied upon as sources of environmental advice by small businesses, accountants lacked proper training in this regard. While studies on sustainable banking have not directly looked into the resources drawn upon by financial institutions in fostering environmental compliance, literature reveals that some financial institutions, for instance, the World Bank, some regional development banks and commercial banks have begun training their personnel on environmental issues as well as employing environmental staff (Delibasic, 2008; Gutner, 2005; Rich, 1984).

Further, Thompson (1998) argues that financial institutions can draw upon the experience gathered through working with stakeholders across different sectors in providing assistance on environmental issues to their clients. Perry and Coetzer (2009) contend that bankers and accountants rank as small businesses' most trusted sources of advice and support. Walker et al. (2008) note that one of the reasons why government support in promoting environmental compliance by small businesses has failed is because these businesses do not trust the support they get from government departments. In trying to address this issue, Parker et al. (2009) argue that governments could roll out these support services through third parties such as financial institutions.

There seems to be lack of co-ordination among institutions promoting environmental compliance by small-scale miners in South Africa. According to Gumede et al., (2011) SDFIs occupy the space between the government and the private sector. Thus, in the process of fostering growth in the small-scale mining sector, SDFIs could also act as leaders and a link between government and private regulators in promoting environmental compliance in the sector. However, fulfilling this task can only be accomplished if SDFIs

are well-resourced to drive the environmental sustainability agenda within the small-scale mining sector. The extant literature rarely touches on the structures and resources existent within the SDFIs to champion environmental compliance. This leads to the third research question.

### 2.6.1 *Research Question 3*

What resources do SDFIs draw upon in fostering environmental compliance by small-scale and junior mining enterprises in South Africa?

## 2.7 Conclusion of Literature Review

While literature shows that financial institutions have a role to play in addressing environmental impacts of their clients, this role has been mainly restricted to large projects overseen by large institutions which have structures to deal with the environmental impacts of their activities. Studies show that with the right support and mechanisms, small-scale and junior mining enterprises can improve their environmental performance. In addition, studies also show that small businesses trust private partners such as financial institutions and accountants when it comes to support and management of their businesses, thus highlighting the important role that SDFIs could play in fostering environmental compliance by small-scale and junior miners. While it has been argued that it is not the duty of financial institutions to regulate environmental performance, SDFIs can influence the environmental performance of their clients in the small-scale and junior mining sector by using financial instruments as well as the sector-specific information they gather through their experiences with clients and stakeholders across different sectors. However, thus far, limited research has been conducted on the potential role of SDFIs in fostering environmental compliance by small-scale and junior mining enterprises in South Africa. This study evaluates the role of SDFIs in fostering environmental compliance by small-scale and junior mining enterprises. In an endeavour to do so, the study sought to answer the following research questions.

### 2.7.1 *Research Question 1:*

What kind of assistance do SDFIs in South Africa currently provide to small-scale and junior miners and what effects does this assistance have on environmental compliance?

### 2.7.2 *Research Question 2*

What mechanisms do SDFIs in South Africa use to encourage environmental compliance by small-scale and junior miners and what factors inform the choice of such mechanisms?

### 2.7.3 *Research Question 3:*

What resources do SDFIs draw upon in fostering environmental compliance by small-scale and junior mining enterprises in South Africa?

# CHAPTER 3. RESEARCH METHODOLOGY

This chapter gives a detailed description of the methodology that was employed in this study. The chapter is divided into sections which in totality give a picture of the framework within which this research was conducted. Firstly, the qualitative research paradigm and the rationale for the use thereof in this study is discussed. This is followed by the discussion of the multimethod research design that was adopted in this study. Thereafter, the data collection and analysis methods used in this study are discussed. The chapter ends with the discussion on how the issues of transferability, credibility and dependability were handled to ensure the trustworthiness of this study.

## 3.1 Research methodology / paradigm

This purpose of this study was to evaluate the role of SDFIs in fostering environmental regulation compliance by small-scale and junior mining enterprises in South Africa. The research questions which underpin this study sought to investigate the type of assistance provided to small-scale and junior mining enterprises by SDFIs and how this type of assistance affected environmental compliance. Further, the study sought to investigate the mechanisms used by SDFIs in ensuring environmental compliance by small-scale and junior miners and the factors that influence the choice thereof as well as the resources drawn upon by SDFIs in dealing with environmental issues of small-scale and junior miners. This called for a detailed understanding of the day to day interaction between SDFIs and small-scale and junior miners, which could only be accomplished by getting an insight into the experiences of the employees of the SDFIs under study and the owners and/or managers of the beneficiary small-scale mining enterprises. As a result, the qualitative research paradigm was deemed to be suitable for this study.

Corbin and Strauss (2014) define qualitative research as any study in which findings are not a product of statistical methods or any form of quantification. Snape and Spencer (2003) note that the main feature of qualitative research methods is their ability to facilitate the description and display of phenomena as experienced by the study population in detail and in the study participant’s own terms. Qualitative methods thus present researchers with “an opportunity to 'unpack' phenomena, to see what they are about or what lies inside,

and to explore how they are understood by those connected with them" (Snape & Spencer 2003, p. 27)

The suitability of the adoption of the qualitative research paradigm in this study was also underpinned by the scarcity of literature on sustainable banking and the role of SDFIs as third party environmental regulators in South Africa. According to Babbie and Mouton (2001), the qualitative paradigm provides a flexible way of conducting studies where literature is scarce. A qualitative research approach thus provided a suitable way of getting an in-depth understanding of this relatively new phenomenon of sustainable financing and environmental compliance in the small-scale and junior mining sector in a manner that could not be accomplished using quantitative methods. The flexibility of qualitative data collection methods such as semi-structured interviews and document analysis enabled me to collect invaluable and detailed data from participants on the role of SDFIs in fostering environmental compliance by small-scale mining enterprises.

## 3.2 Research Design

This study sought to evaluate the role of SDFIs in fostering environmental compliance by small-scale and junior mining enterprises through the experiences of individuals working for SDFIs who are involved in the financing of these enterprises and the owners and/or managers of recipient small-scale and junior mining enterprises. These experiences could only be expressed in language either written or spoken (Tracy, 2013) and as such a multimethod research design of interviews and document analysis was deemed to be useful in this qualitative inquiry.

## 3.3 Population and sample

### 3.3.1 *Population*

The population of this study consisted of individuals who are working for SDFIs providing financial and non-financial support to small-scale and junior miners. In this study, SDFIs were identified using the information obtained from the Department of Trade and Industry website. Of these numerous SDFIs, initially three were identified in literature as the most

active in funding small-scale and junior mining companies in South Africa. However, after consultation with the regional manager of one of the three SDFIs identified in literature, it emerged that the SDFI no longer funds small-scale and junior miners but rather small and medium enterprises that offer mining services. For small-scale and junior mining enterprises, the population consisted of all owner/managers of all SDFIs funded small-scale and junior mining enterprises receiving any form of finance from SDFIs.

### 3.3.2 *Sample and sampling method*

The twin sampling methods of purposive and snowball sampling were used in this study. Welman and Kruger cited in Groenewald (2004) consider purposive sampling as the most important non-probability sampling method used for identifying primary participants in a research. The objective of using purposive sampling was to select a sample that is relevant to a research (Petty, Thomson & Stew, 2012). The purpose of this study was to evaluate the role of SDFIs in fostering environmental compliance by small-scale and junior miners and as such participants had to be selected from SDFIs that finance small-scale and junior miners. Further, these participants were supposed to be individuals who are involved in the financing of small scale and junior mining companies. This was done in line with Goulding (2005) who argues that in a phenomenological study, the interviews should be limited to the participants who have experienced or lived the phenomenon under study.

Unfamiliarity with the organogram of the SDFIs made identification of participants a little difficult and as such, the point of contact at SDFIs were receptionists who in turn directed the researcher to relevant people. Once participants were identified, they were contacted telephonically and through emails requesting interviews and to also refer the researcher to other potential participants, hence snowball sampling.

It was also felt that the funding of small-scale and junior miners is a process that involves two parties, that is, the SDFIs as the financiers and the small-scale and junior miners as beneficiaries, and in as much as SDFIs are important role players in ensuring that their funding does not harm the environment, recipients of the funds bear the major responsibility of ensuring that their projects are not detrimental to the environment. These participants would have information relevant to the study and as such owners or managers of small-scale and junior mining enterprises which are beneficiaries of the SDFIs were also

selected as participants. Initially it was thought that these miners would be identified using snowball sampling. However, because of the need to protect the confidentiality of their clients, SDFIs were not at liberty to divulge the identities of small-scale and junior miners in their portfolios. As a result, the database of all mining entities provided by the Department of Minerals resources was used to identify miners who could participate in the study. Not many miners were willing to divulge their source of funding and only one project manager of an SDFI-funded junior mining company was willing to offer an interview.

Nevertheless, snowball sampling was still useful in this study as some of the participants were recommended by other participants as important sources of information on the phenomenon under investigation.

Besides the profile of participants selected in the sample, the other important factor that was considered was the size of the sample. Morse (1994) cited in Guest, Bunce and Johnson (2006) recommend at least six interviews while Creswell (1998) suggested between five to twenty five interviews for a phenomenological study. However, Englander (2012) argues that it is not the number of interviews that is important but rather the depth of the content of experience.

Table 2 shows the profile of the respondents.

**Table 2: Profile of respondents**

| **State-Owned Development Finance Institutions** | | |
|---|---|---|
| **Name** | **Number of Participants** | **Participants** |
| SDFI 1 | 2 | Regional Officers |
| SDFI 2 | 1 | Senior Investment Manager Partnership Funds |
| **Small-scale and junior mining enterprises** | | |
| **Name** | **Number of Participants** | **Proposed Participants** |
| Mine 1 | 1 | Project Manager |

## 3.4 Procedure for data collection

Two methods of data collection were used in this study. The first method of data collection was in- depth interviews. Goulding (2005) notes that when using a phenomenological approach to a qualitative inquiry, interviews are almost a default method of data collection. The second method of data collection used in this study was document analysis. Since study sought to evaluate the role of SDFIs in fostering environmental compliance by small-scale and junior mining enterprises, documents of the SDFIs under investigation was seen as important in providing the context within which the participants work.

### 3.4.1 *Interviews*

With scarce literature available on sustainable banking practices of SDFIs in South Africa, employees who are working for the SDFIs identified in this study and the owners and/or managers of the beneficiary small-scale and junior mining enterprises were identified as invaluable sources of information. Thus interviews were deemed to be one of the suitable methods in this research. Three people from different SDFIs were interviewed and in addition to that, one project manager of a junior mining company was also interviewed. The interviews focused on the views and understanding of interviewees of the phenomenon being investigated. Therefore, this method relied, to a great extent, on the views of the participants (Groenewald, 2004). The data obtained from interviewing the participants working for the SDFIs and the owners and/or managers of beneficiary small-scale and junior mining enterprises, coupled with further interpretation and analysis, helped the researcher to give an explicit description of the essence of the phenomenon being studied (Petty, Thomson & Stew, 2012).

According to Groenewald (2004), data are contained in the perspectives of people involved in a situation being investigated. The participants identified in this study were deemed to be repositories of data that could be used in constructing a detailed understanding of the role of SDFIs in fostering environmental compliance by small-scale and junior mining enterprises. Interviewing the individuals involved in the phenomenon under study was seen as almost a default way of getting relevant information (Goulding, 2005).In this study, data were collected through 30 to 60 minute in-depth interviews with fund managers and

loan officers working for SDFIs under study as well as the owners and/or managers of the beneficiary small-scale and junior mining enterprises .

The research instrument that was used in this study was a semi-interview schedule provided in Annexure A. According to Petty et al. (2012, p.380), a semi-structured interview includes “a few predetermined areas with possible prompts” designed to get data relevant to the study. In semi-structured interviews, the schedule guides rather than dictates the interview (Smith, Flowers & Osborn, 1997). There are a number of advantages of using semi-structured interviews in a qualitative inquiry. There is an attempt to establish a rapport with the participants which encourages trust and a more frank and honest dialogue between the researcher and the participant. This may result in the collection of reliable data. In addition to that, Noor (2006) notes that semi-structured, in contrast to structured interview, allows enough flexibility to approach each interviewee from a different angle and still cover the same areas of data collection.

Pre-arranged interviews were conducted with employees who are directly involved in the funding of small-scale and juniors mining enterprises at the SDFIs under study at their workplace, that is, in a naturalistic environment as recommended by Bowen (2005). Similarly, interviews were also conducted with the owners or managers of beneficiary small-scale and junior mining enterprises. Due to time and distance constraints, some of the interviews were conducted telephonically. The interviews lasted between 6 to 45 minutes for each participant. With the consent of the participants, the interviews were audio recorded using a blackberry smartphone and notes were taken as well. However, one participant, the Senior Investment Manager: Partnership Funds, refused to be audio-recorded. Interviews started with the reading and signing of the consent form which had been emailed to them days prior to the interviews. In order to establish a rapport with the participants, the first few interview questions pertained to the demography of the participants.

### 3.4.2 *Document analysis*

Bowen (2009) defines document analysis as methodical review or evaluation of documents in print or electronic format. According to Bowen (2009), document analysis

has been traditionally used in conjunction with other methods in qualitative research as a way of triangulating data with the aim of reinforcing the credibility of data.

One of the advantages of using document analysis in this study was that websites and annual reports of the SDFIs under scrutiny were easily accessible and provided the researcher insight of the context within which the interviews were later conducted. Besides easy accessibility and utility in data triangulation, Bowen (2009) adds that, document analysis can also be used to formulate new interview questions. Merriam cited in Bowen (2009) notes that documents help a researcher in uncovering meaning, developing an understanding and having in insight into a research problem. In this study, reviewing of annual reports, websites, other non-technical documents provided data on the context within which participants operate (Mills, Bonner & Francis, 2006).

Document analysis was deemed to be particularly a suitable method in addressing sub-problems one and two. Sub-problem one sought to investigate the types of assistance on environmental compliance that SDFIs provide to small-scale mining enterprises and sub-problem two dealt with the mechanisms or instruments that SDFIs use to encourage small-scale mining enterprises to comply with environmental regulations. Usually, organisations post the products and services they provide to their clientele on their websites and SDFIs under study were not an exception.

Annual reports/integrated reports, policies and guidelines as well as websites of the SDFIs under investigation were downloaded from the internet and reviewed to get an insight into how these SDFIs manage environmental issues arising from their financing of small-scale and junior miners as well the products and services they offer to these miners. For SDFI 1, seven annual reports from 2010 to 2016, funding policies and guidelines for mining as well as information on the website were reviewed. With regards to SDFI 2,information on the SDFI's website, two annual reports from 2015 and 2016 and criteria for funding and support documents were reviewed. In addition, information pertaining to the partnership fund between SDFI 2 and one multinational mining company found on the website of the latter was also reviewed. Relevant excerpts were copied and pasted on to a grid in Microsoft Word under three main topics directly related to the three research questions. These topics were assistance, mechanisms and resources. These excerpts were later

arranged into codes which were then developed into themes related to sustainable banking practices by SDFIs identified in this study.

## 3.5 Limitations of the study

This study has some limitations. Comprehensive information on environmental policies, standards, practices and procedures of financial institutions is considered a secret which gives these institutions a competitive advantage and thus there is a possibility that they might not have divulged such information. Kingombe et al (2011) further note that there is lack of transparency and disclosure on the nature of technical assistance used by most SDFIs and the terms of their deals with their clients. There is thus a possibility that respondents withheld some information that might have been of importance to this study. Since this study adopts a phenomenological approach, its success depended on accessibility of participants and relevant documents. However, there were some documents such as the covenants signed by small-scale and junior miners that could not be availed by concerned SDFIs for confidentiality reasons. The details in these documents could have been important in understanding the extent to which environmental compliance are considered in the funding of small-scale and junior miners.

Using the snowball sampling method to identify beneficiary small-scale and junior mining enterprises proved to be difficult as the officials from the SDFIs under study insisted on maintaining the confidentiality of their clients. As a result, this had an effect on the number of small-scale and junior miners interviewed. Of the small-scale and junior miners that were identified as beneficiaries of funding from SDFIs under study, only one project manager from a junior mining company not yet fully operational agreed to participate in the study. A larger number of small-scale and junior miners getting funds from SDFIs could have enriched this study further, particularly in data triangulation.

In addition, while annual reports are an important source of information on the environmental performance of an organisation, most of the information contained in the annual reports of one SDFI dealt at length with the its internal environmental performance while external environmental issues were mentioned in passing. In the annual reports of the other SDFI 1 there was little or no information on environmental issues, making data

triangulation difficult. Besides, annual reports may be used as a public relations instrument that might not be a true reflection of the environmental practices of an institution.

## 3.6 Trustworthiness

Bowen (2005) has argued that qualitative researchers who adopt an interpretive paradigm are concerned with the trustworthiness of their research in apposition to the positivist criteria of validity, reliability and objectivity. Denzin and Lincoln (1994) cited in Bowen (2005) consider credibility, transferability, dependability and confirmability as four important aspects in establishing the trustworthiness of a qualitative research. These aspects were also considered to be important in ensuring the trustworthiness of the findings of this study and ensuing sections describe how each one of these aspect was dealt with.

### 3.6.1 *Transferability*

Many scholars have argued that the aim of qualitative research is not to produce results that can be replicated but to give an in-depth description of phenomena under study (Creswell & Miller, 2000; Elo et al., 2014; Guba, 1981; Rolfe, 2006). Guba (1981) recommends the use of purposive sampling as a way of ensuring transferability in a qualitative inquiry. He argues that purposive sampling facilitates the collection of thick descriptive data relevant to the phenomenon under scrutiny, resulting in the construction of a thick description that is relevant to other similar contexts. The use of purposive sampling in this study resulted in the collection of thick descriptive data that enabled an evaluation on the role of SDFIs in fostering environmental compliance by small-scale and junior mining enterprises. Such a thick descriptive data permits comparison with phenomena in similar contexts, for instance sustainable lending practices in the commercial banking sector.

### 3.6.2 *Credibility*

According to Shenton (2004), the extent to which research findings are consistent with reality determines the credibility of qualitative research. Ensuring credibility in a qualitative

inquiry that uses a phenomenological approach entails establishing results that are credible and believable to the participants who are immersed in the situation under scrutiny (Petty et al, 2012). This phenomenological study sought to evaluate the role of SDFIs in fostering environmental regulation compliance by small-scale and junior mining enterprises from the perspective employees of the SDFIs who are directly involved in the process of financing small-scale and junior miners as well as the owners and/or managers of beneficiary small-scale and junior mining enterprises and as such they are best suited to judge the credibility of the research. To ensure validity of the data gathered, member checks were done on spot to ensure that the participant's experiences had been accurately captured.

Another strategy that was used to ensure credibility was triangulation. This strategy involved collection of data from different independent sources (Mays & Pope, 1995). The use of different data sources and informants from the SDFIs and small-scale and junior mining enterprises compensated for the limitations of individual data sources (Shenton, 2004) and gave completeness to this qualitative inquiry (Tobin & Begley, 2004). In order to avoid taking the perspective of one group as the sole truth on the role of SDFIs in fostering environmental compliance by small-scale and junior mining enterprises, interviews were conducted with participants from different perspectives, that is from the perspective of both the SDFIs as well as small-scale and junior miners. Three interviews were conducted with participants working for SDFIs identified in this study while a further interview was conducted with a project manager of a junior mining company funded by one of the SDFIs, Mays and Pope (2000) recommend this technique which they call "fair dealing". Fair dealing was deemed to be necessary in a obtaining balanced view from both the SDFIs and the small-scale and junior miners immersed in the phenomenon under study. In addition, documents of the SDFIs were also analysed.

Because of the reluctance of SDFIs to divulge a lot of details on their dealings with their clients, the study also relied on document analysis to complement the data collected from the few interviews conducted. Bowen (2009) recommends this type of triangulation, noting that document analysis can be used to corroborate other data collection methods and contradictions may help the researcher identify aspects that need further investigation. The use of methodological triangulation, in the form of interviews and document analysis was done to enhance the credibility of this study.

### 3.6.3 *Dependability*

In addition to the aspects discussed in the preceding sections, another aspect of importance in a qualitative inquiry is dependability. According to Elo et al. (2014), dependability refers to consistency in data over time and under different conditions. To ensure dependability, the overlap method was used. This entailed the use of document analysis and interviews in tandem to evaluate the role of SDFIs in fostering environmental compliance by small-scale and junior mining enterprises. Guba (1981) argues that the use of two or more methods in tandem is to ensure that the weaknesses of one method are compensated by the strength of the other. Petty et al. (2012) contend that variations in contexts, people and time and the dynamic nature of data analysis makes it difficult to replicate a qualitative research elsewhere. However, they note that leaving an audit trail constituting the research procedures and processes carried out in a study enables a judgement to be made by a different researcher (Petty et al., 2012).

# CHAPTER 4. DATA ANALYSIS AND INTERPRETATION

## 4.1 Introduction

This chapter gives a brief description of respondents.This is followed by the presentation and analysis of data obtained from interviews and document analysis.

### 4.1.1 *Profile of respondents*

SDFI 1 A is a regional officer at SDFI 1 and has been working in that capacity for six years. He is mainly responsible for the mining portfolio in his region. Part of his responsibilities is deal sourcing as well as linking clients to relevant units within the institution and to relevant consultants. In addition to that, he is responsible for conducting basic assessments as part of determining the viability of providing loans and equity to potential clients.

SDFI 1 B is a regional officer working for SDFI 1 and has been working in that capacity for three years. He, like SDFI 1 A is also responsible for sourcing deals for his employer. He works with clients in different portfolios of SDFI 1 but is mainly involved with the mining portfolio because mining is the main industry funded by the SDFIs in the province he works.

Project Manager 1 is a project manager at a platinum junior mining company situated in Limpopo Province's Bushveld Complex. SDFI 1 has 23% stake in the mining company. Project Manager 1 has been working the junior mining company since it was established. SDFI 1 has been involved in this project from the prefeasibility study that commenced in 2011. The mine is still not fully functional and is expected to be fully functional in 2021.

SDFI 2 Mining Partnership Fund Manager is a partnership funds investment manager at a multinational mining house. He has been working with mining partnership funds overseen by his company and SDFI 2 since 2013. He is responsible for managing the partnership fund exclusively meant for small-scale and junior mining projects.

## 4.2 Thematic Analysis

Thematic analysis was used in the analysis of data collected through interviews and document analysis. This type of analysis involved identifying and analysing patterns of meaning in the dataset (Braun & Clarke, 2013). Transcribed interviews and relevant excerpts from documents reviewed during document analysis were pasted to Word to start the process of thematic analysis. The researcher read the data several times to familiarise himself with the data as suggested by Tracy (2013). Once data immersion was achieved, codes, which Tracy (2013) defines as words or phrases that capture important and nuanced aspects of data, were generated to condense, organise and sort data into themes. During coding, the unit of analysis was taken to be any sentence that referred to the assistance, mechanisms and resources drawn upon by SDFIs under investigation in addressing environmental issues directly or indirectly.

Codes were generated and pieced together into themes which gave a comprehensive picture on the role of SDFIs in fostering environmental compliance of small-scale and junior mining enterprises and ultimately used to answer research question as suggested by Ritchie, Spencer and O'Connor (2003). The themes were generated using the deductive and inductive methods driven by the research questions as well as the data obtained from interviews and document analysis. Table 3 shows the codes that were generated in the thematic analysis of interview scripts and documents of the SDFIs under study. A total of 18 codes were generated and these were condensed into 3 over-arching themes.

**Table 3: Codes and Themes from thematic analysis of data**

| Codes | Theme |
|---|---|
| • Grants for training and consulting in mining related issues<br>• Grant for business plans<br>• Green energy efficiency funds<br>• Provision of environmental compliance information | Environmental Compliance Support |

| | |
|---|---|
| • Procurement of environmental compliance related documents. | |
| • Pre-investment and post-investment conditions<br>• Basic assessments and due diligence<br>• Setting of environmental standards and requirements<br>• Environmental performance covenants<br>• Post-investment monitoring and site visits<br>• Differential pricing<br>• Exclusion and withdrawal of funding<br>• Board representation<br>• Quarterly reports | Environmental Compliance Mechanisms |
| • Internal human resources<br>• International organisations and standards<br>• Governments departments and small business agencies<br>• Consultants | Compliance Resources |

The three over-arching themes that emerged from the coding process were environmental compliance support, environmental compliance mechanisms and compliance resources. The findings of this research were presented under these three over-arching themes which correspond to research question one, two and three respectively.

### 4.2.1 *Theme 1: Environmental compliance support*

This theme focuses on data related to research question one, which sought to investigate the type of assistance provided by SDFIs to small-scale and junior miners and its effects on environmental compliance. A common theme that came out of the narratives of the participants and document review was reference to provision of environmental support to small-scale and junior miners by SDFIs. The narratives of participants and document review revealed that SDFIs under investigation provide environmental compliance support to their clients in one way or the other. While the overarching theme "environmental compliance support" describes the environmental compliance related assistance given to clients by SDFIs under investigation, respondents and documents reviewed always referred to two types of assistance, that is, financial support and non-financial support which the SDFIs also referred to as technical support. Thus this theme was divided into those sub-themes.

#### *a. Financial Support*

This category refers any form of monetary assistance that is provided to small-scale and junior miners to be channelled towards environmental management issues and excludes incentives which were dealt with under the second theme. SDFIs under investigation recognise the importance of compliance with environmental regulations among its clients and set it as one of the criteria by which financing could be approved.

The participants' narratives and document review showed that SDFIs under investigation have an understanding of the linkage between environmental compliance and reduced financial and reputational risks. SDFI 1 B had this to say:

> *Anybody who qualifies for our funding has to comply (with regulations) because the assumption is that if you don't comply, say for example, the Department of Environment and Water Affairs shut the operations down, it becomes a risk to us.*

The SDFI 2 mining partnership fund manager echoed the same sentiments. He stressed the importance of environmental compliance by the small-scale and junior miners in their mining portfolio. He pointed out that environmental compliance was an important factor in deciding whether or not to approve funding for small-scale or junior mining project.

There is a realisation among the SDFIs in this study that one of the reasons for non-compliance with regulations by small-scale and junior miners is lack of finance. SDFI 1 has a unit dealing with the mining portfolio of the institution. While the unit deals with mining in general, their financial support and technical support seems to be increasingly focusing on junior miners. In its 2016 annual report, SDFI 1 states the following:

> *The mining business unit will continue to play a meaningful role in supporting growth of the minerals and beneficiation sector, particularly in the steel and steel-related industries; providing financial and technical support to junior mining companies, particularly in early-stage development*.

It emerged from the data that this financial support took various forms. It entailed, among others, the provision of grants for business plans, consulting fees both pre-investment and post-investment to clients where certain gaps had been identified to be a source of risk to the SDFIs' investments. For SDFI 1, these grants covered 50% of the cost of any form of training or consulting. This included training or consulting on environmental issues where non-compliance with environmental legislation or standards had been identified to be a source of risk. SDFI 1 B had the following to say:

> *We look at all aspects of the business, if there is need for training in environmental management or regulation compliance obviously we will look at that because we want to ensure that the business is holistically sound and that they are able to continue into the future. Obviously if environmental issues are not dealt with, basically the mining licence can be revoked, so if we see that as a gap, obviously we will come in, like I sad IDC offer equity and loans, we don't provide grant but in that instance if we see there is need for training, say in environmental aspects, then we can pay 50% of the cost of training as grant and the other 50% comes from the client.*

For SDFI 2 and its funding partner, financial support included procurement of consulting and project management services for small-scale and junior mining operations in their portfolio depending on the needs assessment of their clients.

The participants also emphasised the importance of provision of assistance in the early stages of small-scale and junior mining operations to ensure environmental compliance.

Both SDFI 1 and SDFI 2 and its funding partner got involved at an early stage when funding small-scale and junior mining projects to ensure that all the regulatory requirements were complied with. SDFI 2's funding partners assessed the capacity of prospective clients in dealing with environmental aspects of mining and among other things provided consultancy services to small-scale and junior miners to help them in getting environmental authorisation for their projects.

However, SDFI 1 only got fully involved in the early stages where the mining project was sizeable and strategic enough for it to get some shares. In such instances, the SDFI could be involved from the prefeasibility and feasibility studies. The SDFI also helps small-scale and junior miners in getting a SAMREC competent person's report and all the necessary environmental compliance reports in order. The SAMREC report comprehensively deals with aspects of the project. Among other things, it includes the provision of a statement that all the necessary permits have been approved, the description of future yearly environmental liabilities, compliance methods and costs, including reclamation and closure and their planned funding as well as an environmental impact assessment (EIA). Thus by helping small-scale and junior miners with this report, SDFIs contributed towards environmental compliance by these miners. SDFI 1 A said:

> *So one of the requirements that we have is a complete SAMREC compliance competent person's report and by implication it is not a cheap document to have…. so with that in mind, when you talk about small-scale and junior miners, it tends to be people who don't have that report. Sometimes we get involved in part of that process in the development of that (document) but there are some exceptions to it, the transaction has to be sizeable, if it's not sizeable it has to be strategic, we do the prefeasibility study with the promoter. So effectively we are taking some risk.*

In addition to that, SDFI 1 provide energy efficiency funds to its clients. Though this fund is not exclusively meant for small-scale and junior miners, this initiative may be helpful to these miners in reducing their carbon footprint as mining is an energy intensive industry. This, coupled with the attractive idea of carbon trading may influence small-scale and junior miners to buy into such initiatives thus improving on their environmental performance and compliance. According to SDFI 1 website, the institution:

*assists other businesses to also reduce their impact on the environment thereby making a real difference in lowering the local economy's carbon footprint. Reducing industries/ clients' impact on environment – The focus of this initiative is to assist companies to reduce their environmental impact. The initial focus will be to provide funding to companies that are implementing plans to improve energy efficiency.*

### *b. Non-financial support*

The non-financial support category refers to any assistance other than monetary assistance that SDFIs provide to small-scale and junior miners.

The SDFIs under study all concurred that in addition to finance, one of the challenges that small-scale and junior miners face in complying with regulations is lack of knowledge and technical expertise. To this end, in addition to funding, they provide a wide range of non-financial support services which they commonly referred to as technical assistance. SDFIs under study categorised environmental compliance-related support under technical assistance. SDFI 2, an SDFIs specifically created for small businesses, provided this kind of assistance to small and medium enterprises across all sectors. While its funding partner was responsible for administering their joint mining fund, SDFI 2 made its support available both to its clients and the beneficiaries of its funding partners. On the other hand, though SDFI 1 provides technical support to mining companies of different sizes, its mining business unit prioritises the provision of financial and non-financial assistance to small-scale and junior miners. SDFI 1's mining business unit states one of its main objective in one of the annual reports as:

*providing financial and technical support to junior mining companies, particularly in early-stage development. The pre-investment business centre will facilitate access to the specialist and advisory skills available within SDFI 1, providing business support as needed and streamlining the application process for our clients. It will further increase awareness of SDFI 1's business support programme, which is available both to new applicants and existing clients*.

In addition to this, the participants' accounts and document review show that SDFIs under investigation have function-specific and sector-specific expert consultants who are available to their clients in all provinces of South Africa. According to SDFI 1, some of

these initiatives were aimed at facilitating capacity-building for clients to assist them with developing their environmental management programmes to improve their environmental performance. SDFI 2 also enlisted the services of government agencies in providing post-investment support to its clients and those that get funding from its funding partners. While this support did not make specific reference to environmental issues, environmental compliance issues are incorporated under the umbrella term “compliance mentorship and strengthening on management skills”. According to its website, the SDFI 2 has a post loan programme meant to help small businesses throughout their life cycle.

> *The post loan business support programme is designed to provide business support services to enterprises during the life cycle of the business from early stage (growth/development/compliance mentorship) as well as the decline phase (turnaround specialists). This service is only provided to small businesses that have benefitted from loan facilities provided by SDFI 2 and its financing partners. Institutional strengthening support include management and leadership training and up-skilling, focusing specifically on core competency gaps and weaknesses such as (but not limited to) management and leadership skills, investment appraisal and risk analysis, project finance and computer literacy.*

This means that small-scale and junior miners in SDFI 2 and its funding partner portfolio can readily access compliance information and assistance whenever the need arises.

SDFI 2 mainly fund small-scale and junior miners through a joint partnership fund with one of the world’s biggest multinational mining companies. The mining giant, as the fund manager, took lead in the administration of the fund. So, in addition to the business support given by SDFI 2, the mining house provided technical support to beneficiary small-scale and junior miners in managing their environmental impacts. The multinational mining house, in addition to using its internal resources in helping small-scale and junior miners comply with environmental regulations, also enlisted the services of independent environmental consultants and project managers.

The other form of assistance that emerged from data was the provision of compliance information and advice by the SDFIs under investigation. From the basic assessment, miners were presented with a set of legal requirements that had to be met before they could get funding from the two SDFIs. This helped small-scale and junior miners in creating

their own checklist to tick areas they were compliant and the areas which they needed to work on to become compliant. In the process of applying for funds, small-scale and junior miners would thus get to know the set of regulations they had to comply with. The SDFIs under investigation also provided advisory services to their clients through their officers and consultants across all fields. For SDFI 1, these consultants are found all over South Africa and can be accessed through regional offices. Advice could also be provided on-site by the post-investment monitoring unit. In stressing the importance of provision of information to small-scale and junior miners, SDFI 1 A had this to say:

> *We do provide some information to clients, we know from our experience that there are certain issues in mining that need to be taken care of. So that in itself will give the client a clue of what issues need to be addressed*.

SDFI 2 mining partnership fund manager indicated that they also provided small-scale and junior miners with information related to environmental issues such as measures to mitigate environmental impacts during the operational stages of mining and environmental rehabilitation post mining operations. Such assistance helps equip small-scale and junior miners with knowledge and understanding of environmental regulations and their responsibilities as well.

While this assistance may not be a panacea to all environmental compliance challenges faced by small-scale and junior miners, the provision of environmental compliance assistance by SDFIs to small-scale and junior miners will complement efforts by other role players in improving environmental performance in this sector which is important to the future of South Africa's mining industry.

### 4.2.2 *Theme 2: Environmental Compliance Mechanisms*

This theme was deductively and inductively derived from research question two and data obtained through interviews and document review. Research question two sought to investigate the mechanisms used by SDFIs under investigation to foster environmental compliance by small-scale and junior miners and the factors that inform the choice thereof.

Both document review and interviews consistently showed explicit and implicit reference to the use of different mechanisms by SDFIs under investigation to ensure that clients

complied with environmental regulations and standards. These mechanisms included exclusion, basic assessments, due diligence, condition setting, and covenants, monitoring compliance, penalties and incentives.

SDFIs under investigation used exclusion as a form of fostering environmental compliance among their clients. Exclusion refers to non-consideration for funding of a certain activity. According to an SDFI 1 annual report, the institution states that:

> *SDFI 1 understands its environmental and community responsibilities and is committed to ethical business practises that avoid activities with a significant environmental impact and/or mitigate the impact of such activities to acceptable levels. SDFI 1's investment decisions are guided by a Responsible Investment Policy. No socially or environmentally damaging activities, or any that involve human rights abuse are financed*.

The SDFIs under investigation also used pre-investment and post-investments conditions as a way of ensuring that clients comply with environmental regulations. Pre-investment conditions refer to conditions that clients are required to meet before funds are approved while post-investment conditions are conditions that clients have to meet for the duration of investment from the time funds are secured. Among others, compliance with environmental laws was one the pre-investment conditions set by the two SDFIs for securing funding by mining enterprises irrespective of size. SDFI 1 A said the following:

> *We do have a basic assessment that we do at a regional office level, when that gets approved then we do due diligence. When we do our due diligence a group of experts physically go the mine and part of the team of experts will be environmentalists and they obviously look into environmental issues and do their own assessments. If we see upfront that the client doesn't comply with environmental regulations pre-investment, obviously we won't approve the fund. We set conditions before we disburse any money so we can only do so after we are satisfied that environmental and other regulation requirement have been complied with.*

The SDFIs under investigation required that prospective clients to obtain mining licences in order to secure funds. Part of the requirements of that licence is a comprehensive

environmental impact assessment (EIA) and environmental management plan (EMP). SDFI 1 even set higher standards by requiring clients to conform to "international environmental regulations" irrespective of their size. According to a project manager of one of the junior mining companies funded by SDFI 1, compliance with environmental regulations pre-investment and post-investment was set as a precondition for provision of equity. In addition to this, prospective clients were required to conform to certain environmental standards. Small-scale and junior miners who applied for the joint partnership mining fund between SDFI 2 and a multinational mining house were required to conform to the environmental standards of the multinational mining house while SDFI 1 demanded compliance with international environmental standards. After securing funding, clients were obliged to meet certain environmental standards for the duration of the loan. These proactive approaches by SDFIs show the important role that these institutions can play in ensuring environmental compliance by small-scale and junior miners from the inception of a project.

The study also revealed that SDFIs use due diligence as a mechanism for screening projects for funding. For SDFI 2 and its funding partner, due diligence in the determination of small-scale and junior mining funding was conducted by a panel of independent consultants. For SDFI 1, its Environment, Health and Safety (EHS) department was responsible for conducting a thorough environmental and social due diligence process in addition to the basic assessment that is conducted by its regional officers before approving funding for any project. This due diligence process is carried out with the help of a multidisciplinary team and covers issues ranging from financial, technical, legal, marketing and management to environmental risks "where necessary." This due diligence process informs the decisions on which projects are funded or excluded. In its 2014 and 2015 annual reports, SDFI 1 states the following:

> *At the due diligence stage… we use a checklist to screen investments. SDFI 1 understands its environmental and societal responsibilities and is committed to ethical business practices that avoid activities with significant environmental and social impact and/or mitigate the impacts of such activities to acceptable levels. SDFI 1 investment decisions are guided by a Responsible Investment Policy. No socially or environmentally damaging activities, or any that involve human rights abuse are financed.*

After due diligence, small-scale and junior miners, just like other clients, were asked to sign a covenant undertaking to comply with all the post-investment conditions set out by the SDFIs and funding partners. The covenants entailed among other things, undertaking by small-scale and junior miners to comply with relevant laws that included environmental regulations. Failure to abide by the conditions set out in the covenant would result in some penalties which included an increase in the interest rate. SDFI 1 B said:

> *We have a fairly detailed contract and there are assurances that the client makes in the contract. The idea is that you have to make sure as entrepreneur that you stick to what you have agreed to do. And if you don't comply, the implications are there, we impose some penalties.*

SDFIs under study also use post-investment monitoring as a mechanism to ensure that small-scale and junior miners in their portfolio are compliant with environmental regulations and conditions set out in their contracts. This monitoring entailed regular site visits. According to SDFI 2's funding partner, there were project managers and independent consultants who were responsible for monitoring regulation compliance by small-scale and junior miners that had benefited from the mining partnership fund. SDFI 1 made use of its Environmental, Health and safety unit to conduct this post-investment monitoring. SDFI 1 A said the following:

> *Look, for us to be involved a mining project there has to be a mining licence in place, obviously part of the process of having that licence is to do EIA and have in place an EMP, so directly, probably we won't do it separately, but we ensure that they comply with mining licences from DMR. So that's what we specifically check when we do our site visits post investment. Obviously we may be don't look at it on its own but we look to see if all the legal requirements are met, if that are not met then obviously they won't get a licence and we won't fund them.*

For SDFI 1, this monitoring has been a success in ensuring environmental regulation compliance by its clients as environmental compliance auditing has persistently shown a high levels of compliance. According to its 2015 annual report, out of the 60 clients that were monitored for environmental compliance, 54 clients exhibited compliance and the institution was now busy working with non-compliant clients to assist them to be compliant. While these statistics included businesses of different sizes and sectors, the SDFI monitors

clients based on their risk category and since small-scale and junior mining companies pose high environmental risks, it is safe to assume they fall into the category of the clients that are regularly monitored for environmental compliance.

SDFI 1 also relied on quarterly reports submitted by clients as source of information on the general performance of their clients. According to SDFI 1B, these reports also include information on the client's environmental performance. However, these reports do not only cover environmental issues but also include a wide range of business aspects, raising a possibility that there might not be enough reporting on environmental issues or that in the absence of site visits, clients might favourably report on their environmental performance. SDFI 1 B said:

> *How it works is that, we have a quarterly report that we receive from clients and once a year we have a post investment team that visits the client on site and part of that communication process challenges should be disclosed*

While interviews and documents pointed out to the use of regular monitoring by SDFIs as a mechanism for ensuring environmental compliance, the project manager of a junior mining company pointed out that since they got equity from SDFI 1 almost three years ago, no environmental monitoring had been done. However, since the investment in the junior mining company was in the form of equity and SDFI 1 has some representatives on the board of directors, one cannot discount that the SDFI felt that if there were issues of non-compliance, their representatives could easily pick it up and relay it to the relevant department within the SDFI. Moreover, the project is still in the early stages. Nevertheless, it should be expected that the SDFIs should be actively involved in the early stages to ensure that they set the tone for environmental compliance as per their standards.

One of the issues that came up from the narratives of participants is the co-option of employees of SDFIs on the board of directors in instances where SDFIs provide equity to junior miners. This can be viewed as another form of environmental compliance mechanism that emerged from the data. By sitting on the board of directors, SDFIs can influence decisions in all aspects of management including environmental management issues. However, equity investment by SDFIs under investigation was only in sizeable junior mining companies and therefore this mechanism did not apply to small-scale mining enterprises. A project manager of a junior mining company confirmed that SDFI 1 had

representatives on the board of the company and had an influence on the direction that company took. He had this to say:

> *They do have board representation so they sit on the board where they have a say on the decisions of the company*.

SDFI 2 mining partnership fund manager also made reference to the signing of a memorandum of incorporation where investors would agree on how the small-scale and junior mining companies would be run. They used this opportunity to ensure that environmental compliance issues were incorporated in the running of these entities.

### 4.2.3 *Theme 3: Compliance Resources*

This theme focuses on the resources that SDFIs under investigation drew upon in fostering environmental compliance. This study revealed that SDFIs drew upon a wide array of resources in fostering environmental regulation compliance by their clients. These resources included employees within their institutions, government departments, and consultants in the private sector, multinational mining houses, international standards and guidelines for environmental management.

The study revealed that the SDFIs under investigation first used the resources within their organisation to foster environmental compliance and would only seek consultancy services where they fell short. SDFI 1 made use of its Environmental Health and Safety Department to deal with the environmental issues of its clients. However, if the institution felt there was need, then they would enlist the services of consultants outside the institution. SDFI 2 and its funding partner also adopted a similar approach.

In addition to the use of consultants, SDFIs also worked with various stakeholders such as government agencies, communities and non-governmental organisations in ensuring that all mining companies in their portfolio did not have adverse impacts on the environment. Some of the stakeholders such as government agencies also helped in providing technical support to small-scale and junior miners. A 2014 SDFI 1 annual report states the following:

*As an extractive industry, unmonitored mining can have adverse effects on the environment and surrounding communities. SDFI 1 will adopt an integrated approach in which local government, mining companies, communities, NGOs and development finance institutions will be encouraged to find ways together in which local communities can benefit sustainably from the mining supply chain network.*

The SDFIs under study also drew upon international standards and guidelines for finance institutions in fostering environmental compliance. These included the UNEP FI initiative to which SDFI 1 is a signatory. The initiative is an undertaking by finance institutions to consider the impacts of their transactions on the environment. In fact, the process followed by SDFI 1 in approving its finances follows the procedures laid out in the UNEP FI initiative. Further, the involvement of multinational mining companies as funding partners also helped in the seamless adoption of international environmental standards as these mining houses also provided environmental compliance assistance to small-scale and junior miners.

Because of their proximity to governments and international donors, SDFIs also benefited by receiving funds and information from international donors aimed at improving environmental performance of their clients. SDFI 2 worked in partnership with government agencies, thus complementing each other in providing assistance to small-scale and junior miners while SDFI 1 administers a fund from an international donor that is meant for improving the energy efficiency of its clients. Small-scale and junior miners could benefit from these kind of initiatives and cut on their carbon footprint.

# CHAPTER 5. DISCUSSION

This research sought to investigate the role played by SDFIs in fostering environmental regulation compliance by small-scale and junior miners. In an endeavour to accomplish the purpose of the research, interviews were conducted with the officials of SDFIs financing small-scale and junior miners. To ensure the credibility of the findings, triangulation was done using the two methods document analysis and fair dealing. Because of the reluctance of small-scale and junior miners to participate in this study, fair dealing was only done with one project manager of a junior mining company getting assistance from the SDFI 1 to find if there were corroboration or contradictions between SDFIs and beneficiary small-scale and junior miners. This study sought to answer the following research questions:

1. What kind of assistance do SDFIs in South Africa currently provide to small-scale and junior mining enterprises and what effects does this assistance have on environmental compliance by small-scale and junior mining enterprises?

2. What mechanisms do SDFIs in South Africa use to encourage environmental compliance by small-scale and junior miners and what factors inform the choice of such mechanisms?

3 What resources do SDFIs draw upon in fostering environmental compliance by small-scale and junior mining enterprises in South Africa?

These questions are dealt with in turn in the ensuing sections.

### 5.1.1 *Research Question 1: What kind of assistance do SDFIs in South Africa currently provide to small-scale and junior mining enterprises and what effects does this assistance have on environmental compliance by small-scale and junior mining enterprises?*

The SDFIs under investigation appreciated that non-compliance with environmental regulations by clients posed serious credit and reputational risks to their institutions. In addition, they also acknowledged that with some assistance, small-scale miners and junior

miners can be good business, with less financial and reputational risks that come with non-compliance with environmental regulations. SDFIs, as banks of last resort and mandated to foster sustainable socio-economic development in sectors underserviced by commercial and private finance institutions, provide a wide range of products and services to their clients. This study revealed that the two SDFIs under investigation provided financial and technical assistance to small-scale and junior miners in their portfolio which help them comply with environmental regulations in one way or another. However, in some instances, these products and services were not explicitly directed on environmental compliance.

Literature consistently pointed out to the lack of finance as a reason why most small-scale and junior miners failed to comply with environmental regulations (Cranstoun (2010; Dreschler, 2001). To small-scale and junior miners, environmental issues are a secondary concern and little or no money is thus channelled towards addressing these issues. This fact is acknowledged by SDFIs under investigation and to counter this, SDFIs provide grants for training and consulting. While these grants are not exclusive to environmental training and consulting, where SDFIs felt that environmental issues needed to be addressed, they provided grants for such.

The provision of products such as grants by SDFIs sets them apart from profit-driven private commercial financial institutions in their ability to act as leaders in fostering environmental regulation compliance. Provision of grants for consulting and training on environmental issues helps in capacity building within the small-scale and junior mining sector, thus equipping these miners with environmental management knowledge and impressing upon them the benefits of environmental compliance. In addition, it helps small-scale and junior miners to address environmental compliance issues at minimal costs. This is very important considering that most small-scale and junior miners operate on a tight budget. However, SDFIs should increase the capacity of their Environmental Health and Safety unit in case of SDFI 1 or create such units, in the case of SDFI 2, so that they are able to provide most of the environmental training and consulting services to their clients to avoid a situation where they refer their clients to unscrupulous external consultants.

This study also revealed that SDFIs under investigation provide technical assistance to their clients on an ad hoc basis. There is an understanding among these institutions that the needs of small-scale and junior miners differ from one enterprise to the other. Parker

et al (2009) pointed out that one of the reasons for failure of some of the interventions in fostering environmental compliance by small businesses is that regulators tend to apply the same interventions indiscriminately. By identifying the gaps in the needs of individual clients and providing environmental compliance assistance to small-scale and junior miners on an ad hoc basis, SDFIs are moving away from the ineffective one size fits all approach that has characterised environmental management within the small businesses sector to an approach that caters for the heterogeneity among these miners based on their needs and level of understanding of environmental issues.

In fact, instead of coming up with a range of products and services on their own, SDFIs should tailor make their products and services according to the needs of their clients. Since the success of SDFIs is not only measured by the amount of profit they make but by their ability to transform underserved sectors critical to the economy and leading sustainable development, they have the flexibility to offer a wide range of services and products to small-scale and junior miners that are not offered by commercial banks and other private financial institutions that are profit driven, particularly considering that they can easily secure financial backing from both the governments and international donors.

However, despite the concerted efforts by SDFIs to play a role in fostering environmental compliance by their clients, one of the most striking observations in the data was the little attention given to technology transfer by SDFIs under study. Although there was some evidence that SDFIs offer assistance in the procurement of environmentally friendly technology, the cases were rather isolated. SDFIs under study are still lagging behind in playing the key role of leaders in technology transfer, particularly in the small-scale and junior mining sector. Kingombe, Massa and te Velde (2011) argued that good SDFIs are leaders in technology transfer. Literature consistently points to the use of antiquated technology as one of the cardinal reasons why small-scale and junior miners fall foul of environmental laws. In fact, the observation by Bridge (2004) that the environmental performance of a mining company is determined more by its innovative capacity than the regulations under which it operates seems to be more applicable to small-scale and junior miners. Burrati and Penco (2001) also stressed the importance of assisted technology transfer when dealing with environmental compliance issues of small businesses in general.

Despite the foregoing, evidence from this study shows lack of an aggressive strategy among SDFIs in assisted technology transfer within the small-scale and junior mining sector. SDFIs should look to leverage their proximity to different stakeholders to drive this initiative and turn around the environmental performance of this sector which is vital to the future of South Africa's mining industry. SDFIs should consider leasing technology or providing funds to secure modern technology at favourable rates as ways of encouraging rapid transfer of environmentally friendly technology by small-scale and junior miners. In addition to that, as part of basic assessment and due diligence, SDFIs should also consider factoring in the state of technology used by small-scale and junior miners in risk assessment and pricing of loans as a way of encouraging investment in technology. Despite the shortcomings of the SDFIs in assisted technology transfer in the small-scale and junior mining sector, there are some encouraging signs. According to one of the annual reports, SDFI 1 has started rolling out subsidised green energy efficiency funds in cooperation with an international donor and the SDFI is also in the process of introducing new smelting technology that would save energy and reduce pollution.

Also crucial in the fostering of regulation compliance is clear communication of the assistance SDFIs provide to their clients and how their clients can have access to this assistance. The project manager of a junior mining company interviewed in this study professed ignorance to some of the environmental services and products available provided by SDFI 1. While SDFI 2 had products and services meant for small businesses, there is a need for both SDFIs to effectively communicate with their clients vis-à-vis the products and service available. Various scholars have argued that environmental engagement with small businesses is hampered by ineffective communication and highly technical language used by agencies (Parker et al.,2009; Redmond & Walker, 2009; Pimenova & Van der Vorst, 2004).

The SDFIs under investigation used brochures and websites to advertise their products and services. However, the websites and all the brochures seen by the researcher were written in English, which in itself can prove to be a challenge given that the majority of prospective small-scale and junior miners are from previously disadvantaged groups who might be illiterate or whose home language is not English. Thus SDFIs should communicate in a language that is easily understood by clients. In addition they can embark on outreach programmes to sell their products and also use the opportunity

engage communities within which their clients in the small-scale and junior mining sector operate as part of their drive to work with all stakeholders in improving their internal and external environmental performance.

### 5.1.2 *Research Question 2: What mechanisms do SDFIs in South Africa use to encourage environmental compliance by small-scale and junior miners and what factors inform the choice of such mechanisms?*

The study revealed that SDFIs make use of a wide range of mechanisms in encouraging environmental compliance by their clients in general. These ranged from command and control mechanisms such as pre-investment and post-investment conditions, basic assessments, due diligence, covenants, monitoring and reporting to marked-based mechanisms such as differential pricing and green energy efficiency mechanisms.

The setting of pre-investment conditions, conducting of basic assessments and due diligence point to the proactive approach being adopted by SDFIs in dealing with environmental risks associated with their financing of projects. One of the criticisms levelled against environmental regulators is that they have been reactive rather than proactive in dealing with environmental compliance. Among the pre-investment conditions set by the SDFIs under investigation for funding mining operations is compliance with environmental regulations. Prospective clients have to satisfy certain conditions such as having a mining licence which entailed a detailed EIA and EMP in which clients state how they are going to deal with environmental risks arising from their mining operations. In addition to that, they also have to comply with international environmental standards.

The setting of high environmental standards to be met by clients can be viewed from two different perspectives. The first is that, in striving to meet international environmental standards, small-scale and junior miners achieve compliance. The second perspective is that asking small-scale and junior miners to comply with international environmental standards is asking them to do something beyond their capabilities. Nevertheless, literature is replete with arguments that South Africa's environmental regulations are as strict as there can be at a global scale. Notwithstanding the preceding argument, SDFIs need to ensure that in fostering environmental compliance, the standards they set for small-scale and junior miners are commensurate with their resources and capabilities.

Iraldo et al (2011) found that small businesses often do not have the capacity to implement international environmental standards and as such, should not be expected to satisfy the same environmental requirements as big businesses. Data show that SDFI 1 set the same preconditions for all mining enterprises irrespective of their size. Though the burden of satisfying these onerous requirements may be made lighter by the fact that SDFI 1 provides technical assistance to its clients, environmental requirements should be commensurate with the ability and resources to avoid driving potential clients to investors who disregard environmental issues.

Another interesting finding from the study is the partnerships that SDFIs are establishing with multinational companies in funding small-scale and junior miners. SDFI 2, in particular has a mining partnership fund for small-scale and junior miners with a multinational mining house which acts as the fund manager. While the use of third parties in the management of funds may indicate the inadequate capacity within SDFIs to deal with their small-scale and junior mining portfolio, it can also be viewed as a deliberate ploy by SDFIs to expose small-scale and junior miners to third parties who, arguably, follow the best environmental practices.

In addition, the administration of small-scale and junior mining partnership funds by third parties with sectoral knowledge and expertise improves the knowledge within SDFIs on how to deal with environmental credit risks that come with financing small-scale and junior mining projects. One of the challenges consistently coming out of literature is that financial institutions do not have enough expertise to deal with environmental credit risk management (Sarro, 2012; Iraldo et al., 2011). This study shows that regional or loan officers who conduct the first form of assessment, which was referred to as basic assessment by the two SDFIs under study, lacked training in environmental credit risk management. As a result, they are prone to overlooking or underestimating the effects of environmental non-compliance by small-scale and junior miners, which in turn could result in the financing of environmentally fatal mining operations.

While the mechanisms discussed in the preceding sections may help in improving environmental regulation compliance by small-scale and junior miners, there is need for SDFIs and their financing partners to strengthen the current mechanisms. The study revealed that SDFIs did not insist on the use of independent consultants in conducting

EIAs used in the approval of funding for small-scale and junior mining projects unless the project was strategic or big enough for the SDFIs to have some shares. In fact, for them to approve funding, the prospective miners had to submit all relevant authorisations from the Department of Mineral Resources which included EIAs and EMPs. Thus there was a chance that EIAs with fatal flaws could be used in procuring funding. While the SDFIs could compensate for that by conducting due diligence, this process would not give a detailed insight into the environmental risks of the project as would come out of the involvement of their experts in the EIA process.

The study also points to sporadic and inadequate compliance monitoring as evidenced by the interview with the project manager of one junior mining company who revealed that in the three years that SDFI 1 had invested in their project, he was not aware of any site visit by the SDFI. This is problematic particularly bearing in mind that site visits arguably present SDFIs with ample opportunity to get reliable and first-hand information on the environmental performance of their clients.

Evidence from the study suggests that SDFIs under investigation are overly reliant on command and control measures. While these may be helpful, there is need to balance command and control mechanisms with market-based mechanisms to encourage compliance among small-scale and junior miners. Revisiting the theory of compliance behaviour, it was argued that non-compliant institutions flouted regulations because either the cost of compliance outweighed the cost of non-compliance or there was lack of knowledge and resources to conform to regulations. Literature also showed that one of the reasons why small businesses were not concerned about environmental issues is that they did not see any tangible benefits.

In view of the foregoing, there is need for SDFIs to adopt the stick and carrot approach when dealing with small-scale and junior miners. SDFIs could provide incentives to compliant small-scale and junior miners, for example, SDFIs could promote carbon trading among the small businesses in their portfolio, with those continuously improving on their environmental performance also getting favourable pricing on their loans. The use of such mechanisms from which small-scale and junior miners can derive tangible financial benefits can persuade them to improve their environmental performance and in the process comply with environmental regulations.

### 5.1.3 *Research Question 3: What resources to SDFIs draw upon in fostering environmental regulation compliance by small-scale and junior miners?*

Literature pointed to dearth of environmental knowledge and training in financial institutions as one of the reasons why there was lack of or inadequate consideration of environmental issues in project financing (Jeucken, 2001). This is consistent with the findings of this study. The study shows that regional or loan officers who conduct the first form of assessment, which was referred to as basic assessment by the two SDFIs under study, did not have any form of training in environmental credit risk management. As a result, they were prone to overlook or underestimate the effects of environmental non-compliance by small-scale and junior miners, which in turn could result in the financing of environmentally fatal mining operations.

Nevertheless, SDFIs under study drew upon a wide range of resources to ensure that their clients complied with environmental regulations. In addition to having a few environmental management experts in their ranks, they also enlisted the services of private consultants to provide environmental advice and training to small-scale and junior miners if they identified environmental issues as a source of credit or reputational risk to their funding. In addition to that, the SDFIs also closely worked with different stakeholders to ensure environmental compliance in the mining sector.This integrated approach is important in enriching and strengthening mechanisms used by SDFIs in fostering regulation compliance. It also helps SDFIs come with products and services that are environmentally compatible with the needs of their clients and socially acceptable in communities in which their clients operate.

While there can be benefits in working with different stakeholders in fostering environmental compliance by small-scale and junior miners, SDFIs need to capacitate their employees in dealing with environmental issues of small businesses in their portfolio.

# CHAPTER 6. CONCLUSION

## 6.1 Introduction

The aim of this study was to investigate the role of SDFIs in fostering environmental regulation compliance by small-scale and junior mining enterprises. The urge to conduct this study was driven by the recent developments in sustainable banking, a concept that deals with how finance institutions deal with the external environmental aspects of their transactions as part of corporate citizenship and as a way of reducing their exposure to financial and reputational risks emanating from financing environmentally destructive projects.

Three research questions underpinned this study. These research questions focused on types of environmental related assistance provided by SDFIs to small-scale and junior miners, compliance mechanisms and resources drawn upon by SDFIs in fostering environmental compliance by small-scale and junior miners. In an attempt to answer these research questions, a qualitative multimethod approach comprising of interviews and document review was adopted. Interviews were conducted with two regional officers working for SDFI 1, a senior investment manager responsible for a small-scale and junior mining partnership fund between SDFI 2 and a multinational mining house as well as a project manager of a junior mining company funded by one of the SDFIs. In addition, various documents from the two SDFIs were also reviewed. The data were analysed using thematic analysis and the results were presented and discussed in the preceding chapters. In this chapter, the conclusions drawn from the research are presented. The researcher concludes this chapter by suggesting areas related to this study that warrant future research.

## 6.2 Conclusion of the study

Based on the evidence from this research, it can be safely concluded that SDFIs have taken a keen interest in influencing the environmental performance of their clients in the small-scale and junior mining sector by offering a wide range of products and services and adopting mechanisms to ensure that they cushion themselves from financial and

reputational risks emanating from environmental liability of their clients. Though most of the products and services provided by these SDFIs are not exclusive to small-scale and junior mining enterprises, it would seem that, when funding mining companies which include small-scale and junior miners, SDFIs set strict when it comes to compliance with environmental standards.

The SDFIs under investigation both provided similar types of assistance to small-scale and junior mining enterprises which were divided into two categories namely financial and technical assistance. These two types of assistance are particularly important considering that most studies have consistently pointed to both lack of resources and technical expertise as the cardinal reasons why most small-businesses fail to comply with environmental regulations. However, the observation made by the researcher is that most of the environmental services and products are “hidden” within other products and are not explicit. For instance, environmental advice or training in some instance is hidden in the “management and leadership skills’’ training. Thus SDFIs should relook at rebranding their products and services so that they are explicit and clients are clear as to which type of environmental products and services they can get from the SDFIs.

It was also evident from the study that SDFIs have come up with an array of mechanisms to ensure that small-scale and junior miners comply with environmental regulations. One can conclude that though SDFIs used a variety of instruments to foster environmental compliance, the choice of these mechanisms is not influenced by the size and capability of mining enterprises. SDFI 1 applied the same mechanisms universally to ensure environmental compliance by both large-scale and small scale mining companies. The study revealed that SDFIs are heavily reliant on command and control mechanism with little in the form of incentives for good environmental performance record being offered. While this may work, there is need to balance command and control mechanisms with market-based instruments to ensure that poor environmental performance is penalised on one hand and good environmental performance is rewarded on the other hand.

Pertaining to research question three, one can conclude that SDFIs still do not have adequate resources within their establishments to foster environmental regulation compliance. This was evidenced by their reliance on external players to provide consultancy services and lack of environmental training of loan officers and fund managers

who are supposed to conduct the initial basic assessment. While there is nothing wrong in using the services of other stakeholders, SDFIs should do more to improve their capacity in handling environmental issues arising from their financing of projects.

With the pressure mounting on financial institution to play an important role in ensuring that they finance projects that are not detrimental to the environment, SDFIs are faced with serious challenges. SDFIs do not have much freedom that private financial institutions have, that is, simply deciding that they cannot fund certain high risk sectors. They are expected to drive social and economic development by filling in the financing gap left by private finance institutions in high risk areas and their success is measured by their ability to transform these so-called high risk sectors. Moving forward, their long term success hinges on how they handle the triple bottom lines issues in driving sustainable growth in these sectors.

Thus, SDFIs have their work cut out for them, particularly in the extractive industry which can provide hefty benefits to South African communities yet, if not well-managed can be a poisoned chalice. Equipped with the understanding that small-scale and junior miners hold the future of South Africa's mining industry and the awareness of increasing environmental activism, SDFIs have to expertly come up with products and services that encourage growth in the mining industry at minimal environmental cost, cognisant of the fact that poor environmental performance by their clients can also have an impact on their finances and reputation. SDFIs also need to revisit their funding criteria and assistance they provide to small-scale and junior miners to ensure that they do not exclude a lot of prospective small-scale and junior miners who might end up securing funds from unscrupulous investors who do not care about the environment.

Despite the observation of little involvement in technology transfer in the small-scale and junior mining sector, there is evidence that SDFIs are already playing an important role in fostering environmental regulation compliance by small scale and junior miners. As SDFIs continue to diversify their environmental products and services and enhance their capacity in dealing with the environmental impacts of their clients, their influence in fostering environmental regulation compliance by businesses across different sectors will continue to grow.

## 6.3 Suggestions for future research

The limitations of this study provide avenues for further studies. There was reluctance to participate in this study by small-scale and junior mining companies which are beneficiaries of SDFI funding resulting in only one participant from a junior mining company being interviewed. The sample of small-scale and junior miners can be increased to give a more balanced analysis of the role of SDFIs in fostering environmental regulation compliance. A longitudinal approach in this regard would allow a researcher to track issues such as compliance monitoring over the life-span of a loan or project in cases where SDFIs provide equity. A longitudinal study would also help determine the effect of SDFIs on the environmental performance of small-scale and junior miners by comparing the miners' environmental performance before and after securing funding from an SDFI.

This study mainly focused on the role of SDFIs in fostering environmental compliance by small-scale and junior mining companies from the perspective of SDFIs because of time constraints and the desire by SDFIs to keep the identity of their clients confidential. With more access to these miners, an in-depth multiple case study on the environmental performance of a few small-scale or junior mining companies funded by SDFIs could be conducted as a way of understanding the role of SDFIs in fostering environmental compliance from the perspective of these miners. Further research could also be conducted on the role of SDFIs in fostering environmental regulation compliance by small and medium enterprises. Alternatively, a comparative study on the role of SDFIs and commercial banks in fostering environmental regulation can be an interesting proposition in finding areas of overlaps and areas where these institutions can complement one other in driving towards sustainable development in areas with weak governance structures.

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# APPENDIX A: LETTER TO RESPONDENTS

Dear Respondent,

I am completing an MSc at the University of Witwatersrand, Johannesburg (Wits). My MSc thesis is on the role of state-owned development finance institutions in fostering environmental regulation compliance by small-scale mining enterprises in South Africa. Towards gathering data on this subject, I would be grateful if I could arrange a 60 minutes interview with you to understand the role that your institution play in fostering environmental compliance by small-scale mining enterprises. I understand you are extremely busy and your agreement to contribute to my research will be greatly appreciated. The interview will be focusing on establishing the types of assistance on environmental compliance that you provide to small-scale mining enterprises, the instruments or mechanisms that your institution make use of in encouraging or ensuring environmental compliance by small-scale mining enterprises as well as the sources that you draw upon in fostering environmental regulation compliance by small-scale mining enterprises.

Confidentiality will be observed throughout the thesis process and the final report will be for academic purposes only.

I will be available to meet with you at a location and time of your convenience.

Yours truly

Brighton Manzi (Student Number 762984)

# APPENDIX B: INTERVIEW GUIDE

## PART A: Interview Guide to SDFIs

1. What kind of financial and/ or non-financial assistance do you provide to small-scale mining enterprises?
2. What environmental issues, if any, does this kind of assistance address?
3. Why and how do you provide this kind of assistance?
4. How does this assistance, if at all, improve environmental compliance by small-scale miners?
5. What mechanisms or instruments, if any, do you make use of in addressing the risks that may emanate from environmental issues arising from your financing of small-scale miners?
6. How do you determine the choice of such mechanisms or instruments?
7. How do small-scale miners respond?
8. Who (if any), in your institution, is responsible for providing assistance and ensuring that small-scale miners comply with environmental regulations?
9. What kind of expertise do they have?
10. What other resources, if any, do they make use of in dealing with environmental issues small-scale miners in your portfolio?

## PART B: Interview guide to small-scale mining enterprises

1. Do you receive any kind of assistance on environmental compliance issues? If so, from whom and in what form is this assistance provided?

2. In what ways does the assistance provided to you help in complying with environmental regulations?

3. What kind of instruments do your stakeholders, whether government, investors or any other use to encourage environmental compliance by your small-scale mining enterprise?

4. In what ways do you think these mechanisms are helpful or not helpful to you in complying with environmental regulations?

# APPENDIX C: RESEARCH CONSENT FORM

**Research Consent Form for PARTICIPANTS**

"The role of state-owned development finance institutions in fostering environmental compliance by small-scale mining enterprises in South Africa"

I,……..agree to participate in the research study conducted by Brighton Manzi, Student Number 762984 from University of Witwatersrand.

The purpose and the nature of the study has been explained to me [in writing and] verbally.

My participation is voluntary and I understand that I can withdraw at any time during the study without any repercussions.

I understand and give permission that extracts from the interview may be quoted and published in the research report.

I also understand that confidentiality will be ensured in the research report and that no identifying features will be attached.

Signed:……. Date:……..

I give permission for the interview to be audio-recorded: YES/NO

Signed:…….. Date:……..