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Assessing sustainability in the politics of mining on the Copperbelt Province,

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DECLARATION

I, Sarah Haloba declare that this thesis is a production of my research investigations and findings. Additional information from other sources in this thesis have been have been acknowledged by provision of references.

Signature.....

Data.....

DEDICATION

This dedicated to God Almighty for giving me strength and courage to complete this assignment. To my friends and family for the support. I also dedicate the thesis to people of Nchanga Mine townships who opened their homes to express their perception of the topic.

ABSTRACT

After decades of economic stagnation, Zambia witnessed rapid economic growth fueled by investments in the country's mining industry. However, the government and mine investors have been inconsistent in enforcing an ethical framework that ensures sustainable mining. Sustainable mining refers to the betterment of all Zambians presently and the future generation. Particularly the betterment of communities in Chingola District on the Copperbelt province. The paper focuses on Nchanga Copper Mine's impacts on townships namely Shimulala and Kakosa which are in close proximity to the mine. Nchanga Copper Mine is one of the branches owned by Konkola Copper Mines Limited (KCM). Sustainable mining was assessed by evaluating the impacts of mining on the socio-economy and environmental contamination. The study argues that Zambia has enabled multinational companies such as KCM to degrade environment due to lack of strict environmental regulation. Data collection was conducted in Chingola District. To collect data, semi-structured interviews were used. Respondents were from Chingola Nchanga mine townships, workers from KCM, Nurses from Nchanga mine general hospital, environmentalists from the department of Zambia Environmental Management Agency (ZEMA), and Laboratory technicians from Mulonga Water and Sewerage Company in Nchanga. The findings indicate that mining practices in Zambia are not sustainable. The economy is worse due to government's failure to enforce strict tax and environmental regulations. Investors have failed to adhere to corporate social responsibility thus causing environmental contamination and other social problems such as poor sanitation and diseases. Water contamination, siltation, air and noise pollution are negative externalities affecting the local communities. Local people are not taught on how to handle pollution and are prone to easily getting ill. There is lack of compensation to the affected communities. Land degradation has hindered agricultural activities. Employment levels in Chingola District reduced due to the adoption of casualization and unemployment resulted to increased crimes in the townships. Nchanga Mine's primary aim is to acquire substantial long-term profits will depriving the surrounding communities of a safe and clean environment.

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ABREVIATIONS AND ACRONYMES

AAC.....	Anglo American Corporation
CSR.....	Corporation Social Responsibility
ECZ.....	Environmental Council of Zambia
EIA.....	Environmental Impact Assessments
EPPA.....	Environmental Protection and Pollution Act
EPPCB.....	Environmental Protection and Pollution Control Bill
GDP.....	Gross Development Product
GNP.....	Gross National Product
IMF.....	International Monetary Fund
GNP.....	Gross National Product
MEWD.....	Ministry of Energy and Water Development
MMD.....	Movement for Multiparty Democracy
MMMD.....	Ministry of Mines and Mineral Development
MUZ.....	Mineworkers Union of Zambia
NCS.....	National Conservation Strategy
SAPs.....	Structural Adjustment Programmes.
ZCCM.....	Zambia Consolidated Copper Mines

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1.0 CHAPTER ONE

1.1 INTRODUCTION

Although Zambia has one of the world's largest copper reserves. It is still recognized as one of the poorest countries. In fact, it is stipulated that most mineral dependent countries include some of the poorest and having worst economies, questioning if it is an example of a resource curse. Resource curse is a situation when countries with abundant natural resources such as hydrocarbons or minerals do not achieve diversified economic growth and fail to significantly reduce poverty level (Singh and Bourgoignie, 2013). The argument is that governance of the extractive industry for instance in Chingola District is challenge by the private sectors, dominating the economy while polluting the environment and marginalizing the local communities. Mining in Chingola District has the potential to be an important source of income and a backbone of local economic development. But the potential has not been fully realized. Economic development in this study refers to the betterment of the local communities (Kakosa and Shimulala townships) surrounding Nchanga Copper Mine.

Mining in Zambia particularly in Chingola District has experienced significant interests and investments fueled by neoliberal policies, a low tax environment and low political interference, and lack of strict environmental regulations. Neoliberal policies implemented in Zambia during the Structural Adjustment Programmes (SAPs) gave way to globalization and increased capitalists in the extractive industries whose aim was to accumulate capital. Neoliberal policies were supported by the World Bank and the International Monetary Fund (IMF). With increased investments and capitalists such as KCM's Nchanga Copper Mine in Chingola, copper production increased and pollution was inevitable. The statutory body, Zambia Environmental Management Agency (ZEMA) is responsible for implementing environmental regulations, monitors hazardous wastes from Nchanga Copper Mine and prosecutes environmental offenders. However, the agency has failed to enforce strict environmental laws. Therefore, suggesting that mining in Zambia does not always contribute to sustainable development. Until April 2013, ZEMA did not have a laboratory (Chitotela et al 2013). The agency did not collect samples from waste dumps for analysis to verify if the chemical contents discharged in the environment were within the stipulated limits.

ZEMA relied on Nchanga Copper Mine bi-annual chemical results which were prone to manipulation (Chitotela et al, 2013). Till now ZEMA lacks well equipped technologies and trained laboratory technicians in Chingola thus environmental governance is unsustainable (Chitotela et al, 2013).

Not only has Nchanga Copper Mine over looked the environment, it has also overlooked the wellbeing of mineworkers who are the important element in the production and accumulation of wealth. From very early on, mineworkers have been by and large the most radical element of the Zambian working class (Negi, 2008). This was on account of a consciousness of their unwarranted exploitation, the inequitable distribution of the revenue generated by their hazardous labor and the importance of this labor in the strategically important copper mining industry and through it, national development (Negi, 2008). Exploitation of mineworkers for the purpose of accumulation of wealth is typical in a capitalist economy like Zambia. Where the capitalist bourgeoisie exploits the proletarians recognizing that their work generates wealth (Marx and Engels, 1848). In 2013, KCM announced the retrenchment of 2000 workers claiming that the company did not make enough profit. However, in 2012 the Global Data analyst reported that KCM was the highest earning venture in Zambia. Although mine workers have one of the largest trade union called the Mineworkers Union of Zambia (MUZ) that that champions their interest, lately the union is disorganized and not always representing the interests of the working class (Das and Rosa, 2014). Therefore, mineworkers have not only been exploited but denied of the right to express their grievances or been hard ‘the voice of the voiceless’. However, the Zambian government has failed to protect mine workers from been exploited. The government did not relinquish their international human right law obligation when they privatized the mining sector (United Nation report, 2011). The government of Zambia has the right to order private companies such as NChanga Copper Mine to protect the right of its employee from exploitation and from risks that might negatively impact their livelihood. The development agreement signed between the government and KCM stipulates that the mine right holder should comply to the Cooperate Social Responsibility which include protection of workers right (United Nation report, 2011). The point to be driven is that KCM must put into consideration both socio-economic development and environment to achieve sustainable mining.

1.2 RESEARCH QUESTIONS

- ❖ How has Zambia governed Nchanga Copper Mine to ensure sustainability?
- ❖ How has Nchanga Copper Mine's operation impacted the local townships' socio-economic development and environment?

To answer the first research question, the paper evaluated institutional roles in the management of pollution from Nchanga Copper Mine. The aim of institutional roles is to achieve of sustainable mining. In this case, sustainability refers to how the Zambian government sustains it minerals to benefits the present and future generation through the betterment of local people's socio-economic wellbeing and minimized environmental degradation. Governance of resources is a complex term which encompasses a large variety of institutional processes related to governing (Werner, 2016). Institutional processes assess the linkages both positive and negative in a network of policies and regulations that are representatives of the state (Werner, 2016). Governing the extractive industry identifies the gaps and inconsistencies within Zambian natural resource policy framework (Werner, 2016). The first research question also argues that mining potential, combined with increased demand on the global market and favorable environmental regimes provides an excellent opportunity for local development. Zambia is recognized internationally as having good mineral potential. Zambia is 26 out of the 76 jurisdictions worldwide for mineral potential and demand for copper is expected to remain strong mounting up to 25 percent million tones by the year 2020 (Fraser and Larmer, 2010). Below is the table illustrating the potential of mining industries if governed sustainably.

	Business as Usual	Zambia's Potential
Output	800-850,000 tonnes a year	1.3-1.5 million tonnes a year (2020)
Export earnings	US\$4.5-6.8 billion a year	US\$8-12 billion a year (based on output of 1.5 million tonnes and a price of US\$6,000 to US\$8,000 a tonne)
Government revenue	Approaching US\$1 billion (or less) a year	US\$2.2-4.0 billion a year (based on output of 1.5 million tonnes)
Employment	Modest increases and periodic layoffs	Better quality jobs
Linkages	Limited	Greater linkages involving more local suppliers

Table 1: illustrates the scale of opportunities if mining industries are governed well.

Source: Retrieved from (The World Bank report, 2010)

[http://siteresources.worldbank.org/INTZAMBIA/Resources/copper-mining-summary-note\(online-copy\).pdf](http://siteresources.worldbank.org/INTZAMBIA/Resources/copper-mining-summary-note(online-copy).pdf)

The second research question is the outcome of mine governance. The question addressed mine impacts on the local communities by evaluating Nchanga Copper Mine mining effects local communities' socio-economic development and the environment. However, the term socio-economic development is broad, thus indicators such as house hold poverty (how often people in households afford three square meals, training their children, and access to health services) and unemployment levels, and type of crimes were used to evaluate human wellbeing.

1.3 PROBLEM STATEMENT

Konkola Copper Mine is Zambia's largest and richest mining company On the Copperbelt province (Dsa and Rose, 2014). As investments and production increase the environment is overlooked leaving the local communities to bear the externalities depicting a sense of environmental injustice. It is well established that disempowered communities or urban poor, are disproportionately located in and around

technologically hazards, like smelters or other potentially deadly sources of exposure and thus prone to be affected by environmental injustice (Robbins, 2012). The Copperbelt province has a long history of environmental problems due mine pollution. Nchanga Copper Mine discharges effluents and emissions in the environment that result to water, air, and soil contamination. Water pollution has compromised the water quality supplied to local communities while air pollution of the is reported to cause respiratory diseases. Soil contamination has an effects soil fertility depriving from practicing agricultural activities.

Nchnaga Copper Mine has also caused social problems such as increased unemployment due to entrenchment and adoption of casual workers popularly termed as casualization. KCM has retrenched almost 2,000 and has not employed the working class since 2013, affecting people's house hold poverty level, increased unemployment, and worker twice as hard for the same amount of money (Das and Rosa, 2014). KCM regularly cite production rate of 8 tons per employee, but in 2013 production levels stated in their annual report, the real figure was 12 tons per employee (Das and Rosa, 2014). The same year KCM recorded that it employed 11, 000 casual workers, who are not protected by the Mineworkers Union of Zambia (Das and Rosa, 2014). Causal workers in Nchanga Copper Mine have no right to complain about been worked because they are not protected by any legally binding contract.

1.4 STRUCTURE OF THE THESIS

This thesis has six (6) chapters. The first chapter one (1), the introduction presents the topic background, research questions, problem statement, and the thesis outline. Chapter two (2) presents the background of the mining industry, post-privatization events on the Copperbelt province including the buying of KCM, the development agreement signed between the Zambian government and KCM, and Nchanga Mine Corporate Social Responsibility. Chapter three (3) presents the theoretical framework which consists of The Environmental Governance Framework, environmental justice, and sustainable development. Chapter four (4) presents the instrumentation and methods used to collect data. Chapter five (5) discusses and analyses the findings with regards to the research questions. Chapter six (6) provides the conclusions of the study.

2.0 CHAPTER TWO

2.1 BACKGROUND

2.1.1 HISTORY OF MINING IN ZAMBIA

The Zambian mining industry has its genesis from the early 1920s since the discovery of copper on the Copperbelt Province. Initially, the local natives practiced traditional and subsistence mining confined to surface outcrop deposits. The natives melted and molded copper into ingots and used it for exchanges for other products. Mining on the Copperbelt Province expanded and was explored by the British. It was the presence of copper that led to Zambia being put under the British indirect rule in 1889 after the partition or scramble of Africa (Sikam, Mwanza, and Mweemba, 2014). 1908 saw the extensive mining and first commercial copper being produced on the Copperbelt province (Sikam, Mwanza, and Mweemba, 2014). During that period, the British South African companies (BSA) was formed and had full rights over the Copperbelt province and its copper deposits. Below is a map of Zambia showing the location of the provinces.



Figure 1. Map of Zambia's provinces.

Figure 1: Showing Zambia's provinces

Source: Lindahl, 2016. Retrieved from

<http://resource.sgu.se/produkter/sgurapp/s1422-rapport.pdf>

In 1924 Zambia was under British direct rule as a protectorate under the colonial office, considered as the new era of imperialism, marginalizing, and exploiting of local resources. Post-1924 saw the beginning of intensive investments in the development of mines on the Copperbelt Province (Lindahl, 2016). The country's economy was fast growing, a major player on the global copper market. By 1957 the mining industries on the Copperbelt Province were fully established contributing 51 percent of the country's economic growth and monopolized by Roan Selection Corporation and Anglo-American Corporation (Lindahl, 2016).

From the establishment of copper mines to Zambia's independence in 1964, production increased to over 640,000 tones annually supported by strong international copper prices on the global markets (The Southern African Institute of Mining and Metallurgy report, 2011). After independence Zambia nationalized its mining industries and were controlled by state under the Zambia Consolidated Copper Mines (ZCCM). In 1968 the president of Zambia at the time Kenneth Kaunda announced that mines would be nationalized, following a disagreement over lack of new investments and royalty system (5 percent) (Werner, 2016). President Kaunda argued that the companies were not investing into the mines sufficiently, while the foreign investors argued that that the royalties were prohibiting and hampering further investments (Werner, 2016). After nationalization, Zambia controlled 51 percent shares, while Roan Selection Trust Corporation and Anglo-American Corporation controlled the rest. Roan Selection Trust Corporation was in charge of Mufurila, Luanshya, Chibuluma, Chambeshi, Kalengwa, and Ndola copper refinery. On the other hand, Anglo-American Corporation was in charge of Rhokana, Nchanga, and Konkola mines.

However, 1964 to 1967 saw a decrease of investment in the mining industries due to issues of royalties between the government and investors (Sikam, Mwanza, and Mweemba, 2014). From inception of mines, mineral royalties were controlled by the British South African Company and were handed over to the government after

independence without changing the taxation systems (Sikam, Mwanza, and Mweemba, 2014). Since investors were shareholders of the British South African Company under the colonial office, they never saw royalties as a real cost (Sikam, Mwanza, and Mweemba, 2014). The Zambian government denied a reduction of mineral royalty taxes and investor argued that a rise of mineral royalty taxes would affect their investments and profits. The enforcement of tax regimes has always been a challenge in Zambia. The country's economic growth also declined and the per capita income collapsed from 1974 to 1994 due to collapse of copper prices on the world market. During the times of the decline, Zambia experienced hard times. About 68 percent of Zambians were living on expenditures below a level sufficient to provide basic needs and 55 percent did not have sufficient income even to meet basic national needs (Ferguson, 1999). Zambia shifted from an emerging country to one of the poorest countries of the world. To resolve the fast decline and increased poverty, Zambia incurred external debts. In 1997 Zambia's total debts amounted to US\$6.7 billion (Ferguson, 1999). In 1995 Zambia's external debts amounted to a staggering US\$650 per capita (Ferguson, 1999). Ironically, this is in a country whose 1995 Gross National Product (GNP) per capita was only US\$370 (Ferguson, 1999). The staggering debts pushed Zambia into the pressure set by the International Monetary Fund (IMF) and the World Bank to privatize its mining industries through the Structural Adjustment Programs (SAPs). Zambia got monetary aid from the World Bank and International Monetary Fund on the condition its privatize mine and liberalize the economy.

Following the pluralism and liberalized economic policies, the Zambian government opted to privatize its mines. Privatization accelerated during the rule of the Movement for Multiparty Democracy (MMD) under president Fredrick T. J. Chiluba. Owing to external pressure to privatize, various tax incentives were proposed in order to attract foreign investors (Ng' ambi, 2015). Zambia signed a number of development agreements with investors granting them generous terms by fixing royalty rates for copper at 0.6 percent which was far below the royalty rate of 3 percent stipulated in the now repealed Mines and Mineral Act of 1995 (Ng' ambi, 2015). The corporate tax was to be 25 percent and the development agreements contained stabilization clauses that prohibited the government of Zambia from altering the fiscal regime prescribed in the agreement (Ng' ambi, 2015). Not so long after privatization, prices on world

market drastically increased. It was as if Zambia had fallen victim to a grand global scheme (Fraser and Lamer, 2010). The same year copper prices increased, Zambia only received royalties of US\$20 million from combined gross proceeds of US\$ 3.4 billion (Fraser and Lamer, 2010).

The mining industry has gone through three main phases of ownership: First, the private ownership under a colonial administration prior to political independence in 1964, then national ownership post-independence in 1971 under the Kaunda government, until the re-privatization of the 1990s under the Chiluba government (Makando, et al, 2014). It is still contended that the Zambian government was pushed to privatize its mines by key donors such as the World Bank and IMF (Werner, 2016). After qualifying for the World Bank and IMF's heavily indebted poor country category (After the failure of the state-owned mines and the structural adjustment programs (SAPs) imposed by the donors), the government was forced to choose between debt relief or control over its mining industries (Werner, 2016). Privatization of mining industries had both negative and positive impacts on socio-economic development, and environment. Privatization also led to mass retrenchment, cavalier disregard of safety and national labor laws, a reduction in the living standard of those living in the mining townships and country at large (Werner, 2016). The empirical evidence of privatization's benefits includes increased Foreign Direct Investments (FDI), increased production and direct employment, improved infrastructure and technological processes, economic upturn and mining industries were the main pivotal contributor. At the end of privatization in 2013, copper production increased to 763,000 tons, direct employment increased to 90,000, and national revenue increased pushing Zambia to be one of the fast developing economies in Africa (Sikam, Mwanza, and Mweemba, 2014). Figure 2 and 3 shows mining contributions to Zambia's revenue and fluctuated copper production since colonial period till the end of privatization. Post-privatization, 28 percent of total revenues came from mining taxes and constituted almost 78 percent of export of which 96.5 percent is from copper and 61.7 percent from 61.7 percent of Foreign Direct Investments (FDI) (Werner, 2016). A clear perception that mining industries are one of Zambia's important engine that drives and enforce development. However, maybe much more benefits can be extracted from mining industries that not only benefits the significant few (Sikam, Mwanza, and Mweemba, 2014).

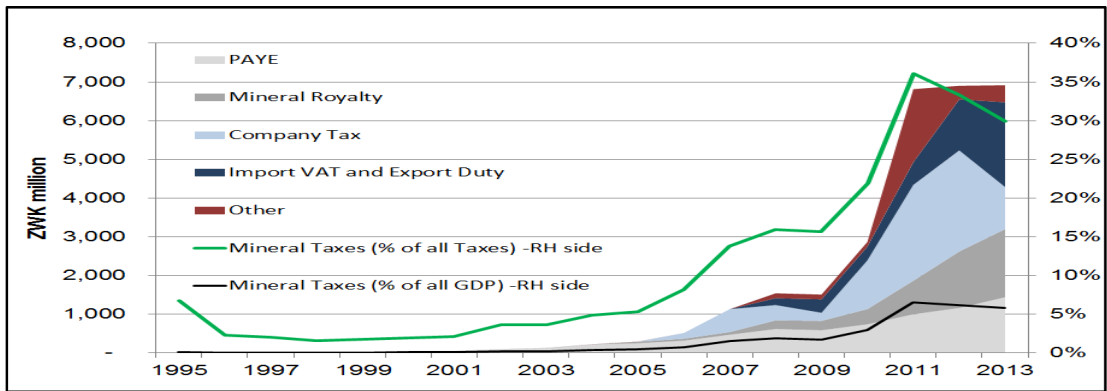


Figure 2: Mining contributions to Zambia's revenue (Sikam, Mwanza, and Mweemba, 2014).

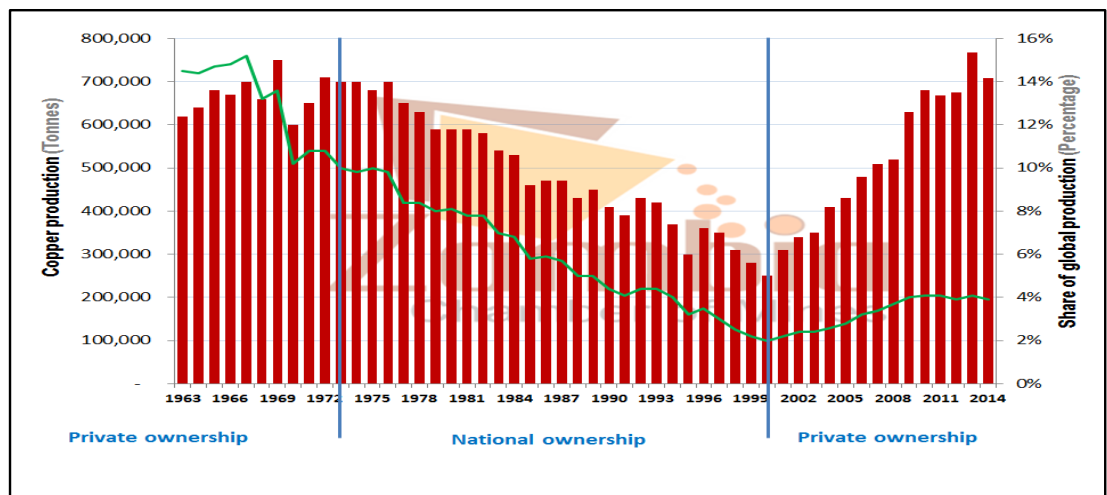


Figure 3: Copper production fluctuation from colonial office to privatization (Sikam, Mwanza, and Mweemba, 2014).

2.1.2 KONKOLA COPPER MINE ON THE COPPERBELT PROVINCE POST- PRIVATIZATION

The process of privatization resulted in some large mining companies acquiring majority shares in large-scale mining operations on the *Zambian Copperbelt Province* (Geological society of London report, 2005). One of the foreign companies that took advantage of neoliberal policies and invested in *Zambian* was Anglo American Cooperation (AAC). Anglo American Cooperation was the largest investor on the *Copperbelt Province* and controlled Konkola Copper Mines in Chingola-based Nchanga underground and open pit mines, Konkola mine in Chililabombwe, and Nampundwe pyrite mines (Geological society of London report, 2005). The Cooperation also obtained managerial control of Nkana smelter and the acid plant refinery in Kitwe (Geological society of London, 2005). The multinational Cooperation was by far the largest post-privatization investor and invested US\$300 million before withdrawing from *Zambia* in March 2002 (Geological society of London report, 2005). It was reported that AAC extracted high-grade easy-to-access ore without paying tax and causing a barrage of chemical toxic. The development agreement signed with the *Zambian* government stipulated generous tax concessions that remained in place for twenty years and granted investors the ability to dodge paying tax. The development agreement stated that investors should pay taxes when they started making profits from mining productions. After the withdrawal of AAC, KCM returned as an entity of the government.

In 2004, the *Zambian* government and the British-Indian based company Vedanta Resources limited concluded negotiations on selling 51 percent of KCM shares. A majority of stakes in KCM were subsequently acquired by Vedanta following an international bidding process led by standard Bank and supported by the World Bank (Oxfam, 2001). Vedanta is a registered company in London with a head office in Mumbai, India Upon acquiring KCM, Vedanta Resources Limited committed on upholding Corporate Social Responsibility by increasing employment, improving work conditions, providing social services for local communities, and reduce a barrage of chemical toxic. Corporate Social Responsibility (CSR) is an approach that contributes to sustainable development by delivering economic growth, social, and environmental benefits. However, the government has also not implemented specific

policies on Corporate Social Responsibility (CSR) it remains voluntary and uncoordinated (Werner, 2016). The mission statement for KCM states that “we will uphold the values of good corporate citizenship and seek to contribute to the wider economic, social, and environmental wellbeing of Zambia” (Oxfam, 2001). However, the Rhetoric has not matched the company practices (Oxfam, 2001). According to the Mine and Mineral Development Act, companies have to sign a development agreement which includes items of local context, skills, maintenance of hospitals and roads, training of nationals, and promotion of local business development (Werner, 2016). Since Vedanta Resources Limited acquired KCM in Chingola, the company has caused massive chemical, air, water, and dust pollution that have affected the local community. Vedanta Resource Limited pledged to implement CSR projects. It is argued that CSR programs are primarily about greenwash or a caring image without significant changes to socially or environmentally harmful practices (Werner, 2016). However, it is important to state that in an environment of heavy mining, pollution and environmental degradation is inevitable but can be minimized by treatment of chemical waste products and discharging minimal amounts of chemicals.

Two years after Vedanta took over KCM in 2006, the multinational company caused a major spill over in the Kafue River in Chingola and caused hospitalization of hundreds of residents (Oxfam, 2001). It failed to prevent pollution of the Kafue River which houses the major water pump for Mulonga Water and Sewerage Company thus contaminating domestic water and causing health risks. In 2007, the local community in Chingola filed a law suit against KCM to compensate them (Oxfam, 2001). In 2011 KCM was awarded US\$2 million in the Zambian high court, but appealed and in 2015 the Supreme Court upheld the guilty verdict but removed all compensations (Oxfam, 2001). Protests of local communities against KCM and government can be seen what is termed as “governance from below”. Social movements or civil society protests against transnational corporations aims at fighting environmental injustice (Lemos and Agrawal, 2006). To some communal residents, KCM inability to uphold sustainable mining and government’s lack of strict environmental laws alludes to hegemonic tendencies. Therefore, environmental governance in Zambia is seen as being embedded in a neoliberal political economy which is hegemonic in the neo-Gramscian sense and dominant power relations are more maintained by consent as well as by coercion (Lemos and Agrawal, 2006).

KCM has been extracting minerals by degrading the environment and dominating the country's economy. Although Zambia is no longer colonized, its economy is still colonized. In post-colonial times, economic domination replaced political hegemony, for example, 75 percent of copper production in developing countries of the Southern hemisphere is in the hands of Western countries or economic powers (Gunter and Konrad, 1998). Neoliberalism can be interpreted as a utopian project to realize a theoretical design for the reorganization of international capitalism or as a political project to re-establish the condition for capital accumulation and to restore the power of economic elites (Harvey, 2007). Capital accumulation is the revolution of the rich (Polanyi, 1994). In addition, the colonial political-economic structure still persists both in the realm of economics as well as in that of ideas. However, KCM's Nchanaga Copper mining operations have left the local community to bear a disproportionate share of negative environmental consequences. Pollution from Nchanaga Mine KCM is mainly due to spoliation of land by mining activity caused by mining methods and dumping of solid and liquid waste from the ore crushers and concentrators; while air pollution is from Sulphur dioxide and dust from the smelters. Zambia should embrace environmental justice by providing fair treatment and involvement of the local community participation with respect to development, implementation and enforcement of environmental laws. This will enhance sustainability as it encompasses improved socio-economic wellbeing and environmental consciousness.

Although it is easy to apportion blame on KCM or neoliberal policies such as SAPs, or foreign aid donors, Zambia has sovereignty over its minerals and has the responsibility to protect the environment and local communities or harvest financial gains. Sovereignty in localized terms suggests that communities, people and nationalities have the rights to make decisions over their natural resources especially if they fall within community boundaries (Bebbington, 2016). Therefore, the Zambian government has signed away its sovereignty over minerals and its governance by not being strict to enforce environmental regulations.

Although the Zambian government placed environmental policies, KCM has at times managed to discharge effluents over the stipulated amounts of chemicals thus infringing a safe and healthy livelihood. The environmental institution, Zambian Environment Management Agency has not been efficient in monitoring pollution.

KCM have their own laboratory technicians that presents chemical contents in effluents thus prone to manipulate the results. Mining industries in developing countries exposes local communities to risks such as environmental degradation associated with weak governance and legal regimes and thus compromising sustainability (Kirsch, 2014). The focus of the study is to present KCM mining operations impact on the environment and local socio-economic development.

3.0 CHAPTER THREE

3.1 CONCEPTUAL FRAMEWORK

My thesis is theoretically situated along the lines of political ecology and political economy. The two disciplines in my view overlap, as they all show historical processes in ecology, social and power relations that the project seeks to explore. Political economy is a discipline that has recently been interlinked with the economy, society, power structures, and the environment. In relation to the project, my intention is to show how different institutional roles are in managing externalities such as chemical pollutions from mining industries. Political economy will show government activities and responsibilities in the realm of environmental problems on the Copperbelt province, Chingola district. Political economy will also show how the conflicts between mine owners and the local communities concerning environmental degradation have been resolved.

On the other hand, political ecology a broad term, many theorists suggest that political ecology represents an explicit alternative to apolitical ecology (Robbins, 2012). Political ecology is used to explaining land degradation, local resource conflicts, or natural conservation failures (Robbins, 2012). The term presents power relations in the management of natural resources. Political ecology combined with political economy encompasses the constantly shifting dialectic between society and land-based resources, and also within society itself (Blaikie and Brookfield, 1987). Political ecology and political economy are similar because they both aim at environmental conservation. Political ecology explain phenomenon such as externalities or environmental bad will political economy finds instruments or measures to deal with the externalities such as degradation.

3.2 ENVIRONMENTAL GOVERNANCE FRAMEWORK

Within political economy the Environmental Governance Framework will be used to illustrate how institutions interact within an environment and how negative externalities are to be dealt with to enhance sustainability. The Environmental Governance Framework shows how dynamics between resource characteristics, technology, and resource regimes influence resources use and its outcome. Environmental governance in this case is a set of regulatory processes, mechanisms, and organizations through which political actors influence environmental actions and outcomes (Lemos and Agrawal, 2006). Environmental governance evaluate relationship that shape identities, actions, and outcomes (lemons and Agrawal, 2006). Resource regime consists of property regimes that govern the use and rules that govern the transactions concerning the results from the use of the resources (Vatn, 2015). On the Copperbelt province in Chingola District KCM have the property rights over Nchanga Mine and has a state license to produce copper. As a rational institution, KCMs' main goal is to maximize utility and profits. However, copper productions cause externalities that are neither minor nor accidental issues. It is a fact that copper productions and processes are interlinked with the environment therefore affecting the commons surrounding area. Externalities from KCM are a pervasive phenomena which requires immediate state and private institution response. It is KCM's responsibility to bear the cost of cleaning up the environment, paying environmental taxes, and compensate the affected people. However, in Zambia clean ups, environmental taxes, and compensations might not always be adhered to by mine right holders. Therefore, Conflicts exist between the mine owners and the local community for degrading their environment. Two words define mining in Zambia "contentious" and "ambiguous". It is "contentious" because mining has delivered adverse social, environment, economic effects for many, but only significant gains for the few; "ambiguous" because of the abiding sense among local populations as much as development professionals, that just maybe mining could contribute much more (Bebbington, 2008).

The Environmental Governance Framework is a policy instrument in a wider sense as (re)-reformulation of the resource regimes, which includes (1) establishment of changes in property rights and type of interaction rules and (2) various specific environmental regulations given these structures (Vatn, 2015). Zambian mining industries are common/state property and the government grants rights to investors to explore and extract minerals on behalf of the population for the purpose of development. In Zambia the Mine and Mineral Act of 1969, has served as the foundation of governmental control over Zambia's mining industry (Ndulo, 1986). The mining legislation or rules strive to maximize benefits from the mining industries by increasing the rates of employment, foreign exchange, trade balance, and preservation of resources as copper is an exhaustible resource (Ndulo, 1986). The Mine Act consists of mining licenses giving investors the right to explore, check mine prospects, exploit, and carry out mining processes for a specified number of years (Ndulo, 1986)

The Mine and Mineral Act is also designed to obligate mine right holders to minimize environmental degradation (Ndulo, 1986). However, the Mine and Mineral Act is more dominate on stipulating property rights and use right. On the other hand, Environmental legal framework is implemented by the Zambia Environmental Management Agency. Environmental regulation dates back to 1970 when the Natural Resources Act was passed aiming at nature conservation (Makando et al, 2014). Although the National Conservation Strategy (NCS) was put in place, the cost of environmental liabilities and the negative legacy of mining were felt at privatization after due-diligent audits that were conducted in 1990s (Makando et al, 2014). The new mine holders were exempted from the liability of fines or claims made in respect to past chemical contamination made by ZCCM. Consequently, the Kaunda government from the recommendation of the NCS initiated the Environmental Protection and Pollution Control Bill (EPPCB) and enacted by parliament in 1990 as the Protection and Pollution Control Act-EPPCA (CAP 204) (Makando et al, 2014). The EPPCA established the Zambia Environmental Management Agency (ZEMA) initially known as the Environmental Council of Zambia (ECZ) in 1992 and assumed an advisory role to the government on environmental matters (Makando et al, 2014). At that point, the Zambian government conducted Environmental Impact Assessments (EIA) on new and existing mining industries. However, the EIA did not include

public consultation and thus the local people’s concerns were not put into consideration. Pertaining to mining and environmental management, the Zambian government implemented the Hazardous Waste Management Regulations, Protection and Pollution Act, Environmental Management Act of 2008. In 2011, the Environmental Management Act was enforced. The Environmental Management Act of 2011 is reported to be stronger than the Environmental Protection and Pollution Control Act. The Environmental Management Act of 2011 is based on the principles of noting that the environment is a common heritage of both present and future generation, minimization of adverse effects, meaningful local participation, Precautionary Principle, and Polluters Pay Principle (Lindhahl, 2014).

Apart from policies and regulations, institutional roles are important in achieving sustainable mining. In Zambia, there are several institutions involved in environmental governance. The figure below shows different institutions involved in environmental governance in Zambia.

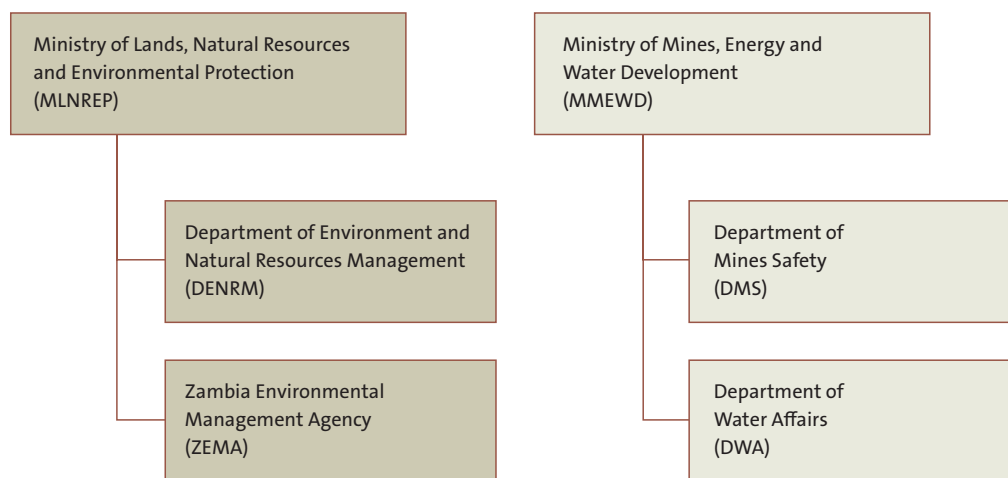


Figure 4: Illustrates the institutions responsible for the management of impacts from mining industries

Source (Lindhahl, 2014). Retrieved from

<http://resource.sgu.se/produkter/sgurapp/s1422-rapport.pdf>

The Ministry of lands, Natural Resource and Protection is responsible for the overall policy formulation on environmental management (Lindhahl, 2014). Under this ministry the Department of Environment and Natural Resource monitors and

evaluates the operations of executive agencies that have been created to implement policies on behalf of the government (Lindahl, 2014). One of agencies monitored by the Department of Environment and Natural Resources is ZEMA whose mandate is to “do all things necessary to ensure sustainable management of natural resources and protection of the environment and the prevention and control of pollution” (Lindahl,2014). The agency advises the government on environmental issues, sets guidelines, emission and effluent standards, controls and monitors pollution among other functions. The Ministry of Mines, Energy, and Water Development was formulated by merging the Ministry of Mines and Mineral Development (MMMD) with the Ministry of Energy and Water Development (MEWD), under the ministry the Department of Mine Safety is a specific sector mandated to safe of worker and conditions under which they work in (Lindahl, 2014). Furthermore, the ministry is also responsible for the overall water management in the country. Finally, the civil society in Zambia play an important institutional role in ensuring sustainable mining. The civil society through the Zambia Institution of Environment Management is committed to the principle of sustainable development through community based environmental actions (Lindahl, 2014). Environmental regulations, the Environmental Management Act, and institutional roles, are meant to ensure sustainable mining that embraces sustainable development.

The Environmental Governance Framework is an important concept because it illustrates how resources are governed and who has the right to use them. The framework is an institutional arrangement that aims at controlling organizations pertaining to the use of natural resources, ecological systems, and discharging of waste products in order to achieve sustainable development and protection of the local communities.

However, the Environmental Governance Framework in this case was more descriptive illustrating institutional role in governing copper mines but it failed to address social problems such corruption among economic and political actors. Corrupt economic and political actor’s decisions and interests are dominate in environmental governance and makes regulations void. Therefore, failing to include civil society’s in meaningful participation in policy making and decisions have failed to effectively achieve sustainable mining. Below is the Environmental Governance

Framework that shows interactions between actors guided by institutions and regimes and how these activities are interlinked and affect operations, resources use, and the outcomes of the resources.

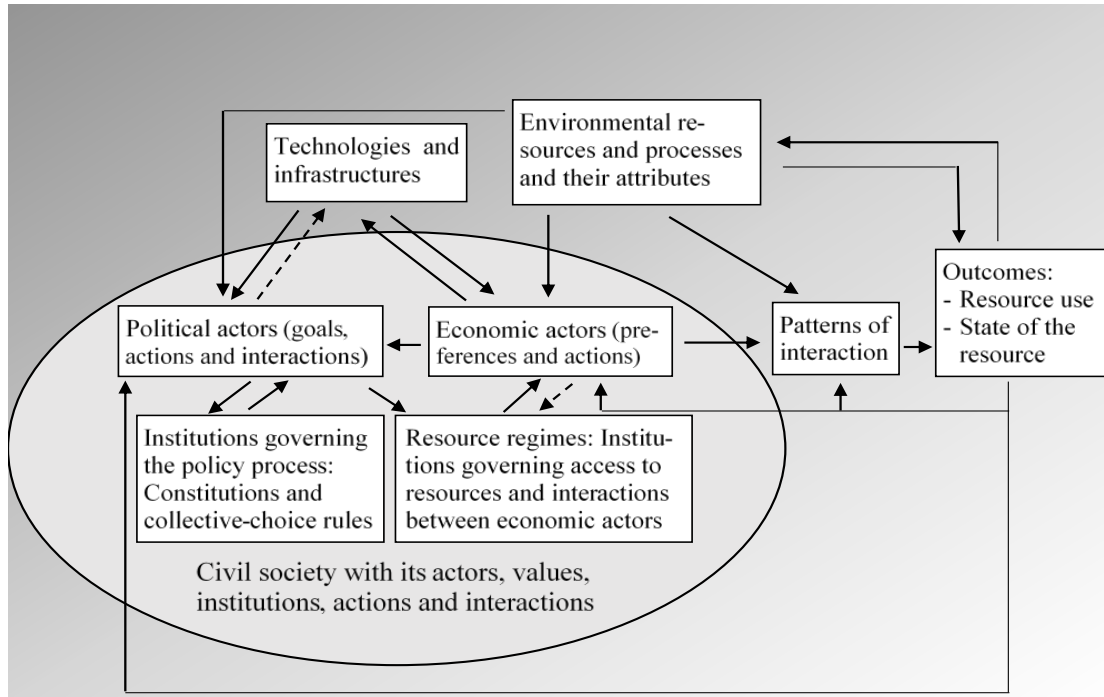


Figure 5: Illustrates the Environmental Governance Framework (Vatn, 2005).

3.3 SUSTAINABLE DEVELOPMENT CONCEPT

Sustainable development is important concept that was used in the study. Sustainable development is defined as development that meets the present without compromising the ability of the future generation to meet their own needs (Emas, 2015). Sustainable development was first proposed at the Brundtland Commission in 1998 and touches on the importance intergenerational equity (Emas, 2015). Sustainable development aims to maintain economic advancement and progress while protecting long-term value of the environment, it provides a framework for the integration of environment policies and development strategies (Emas, 2015). In Zambia, sustainable mining and sustainable development can only be achieved if there is a balance between environmental and economical sustainability. Economic and social sustainability is attained by formulating policies to protect the environment (Emas, 2015). Properly designed sustainable policies can encourage the introduction of new technologies and reduce production waste (Emas, 2015). Economic or anthropogenic activities such as

mining cause negative externalities which are conceived as transaction spillover and Pigou suggested environmental taxes that will be beneficial for the economy and societal sustainability (Emas, 2015). Policy instruments such as polluters pays principle (PPP) states that “governments should require polluting entities to bear the costs of their pollution rather than impose costs on others or the environment” (Emas, 2015). Healthy environment, such as clean air and water are considered public goods in that they are non-rivalrous and non-excludable and is government responsibility to protect and minimize degradation through strict regulations and achieve sustainability (Emas, 2015). Sustainable development requires the integration of socio-economic and environment and not thought of as fragmentation.

Sustainable development is important to attain sustainable mining but while conducting the research is it almost hard to resolve issues of ethnocentric issues and rendered the concept limited. It is almost difficult including Issues of local needs, values, cultural identities in the concept of sustainable development. Therefore, the weaker voice's needs, values, and cultural identities maybe eroded. The local communities in Chingola district are not included in meaningful decision making, thus making sustainable development void for locals.

3.4 ENVIRONMENTAL JUSTICE CONCEPT

Sustainable development is interlinked with Environmental justice as both concepts seek to share the risk of anthropogenic activities. Environmental justice campaigns globally are reformulated to encompass sustainability and vice-verse (Agyeman, 2005). Environmental justice is an important concept in political ecology and of great importance to this research study. Environmental justice is based on the principal that all people have the right to be protected from environmental pollution and live in and enjoy a clean and healthful environment (Agyeman and Evans, 2004). It is argued that environmental justice is a developed environmental ideological framework that explicitly links ecological concerns with labor and social justice (Agyeman, 2005). It embraces equal protection and meaningful involvement of all people with respect to development, implement and enforcement of laws, regulations, and policies and the equitable distribution of environmental benefits (Agyeman and Evans, 2004).

Therefore, the concept also embraces issues of democracy such the right to information and decision-making. The democratic aspect of environmental justice concepts are said to be a new of grassroots environmentalism emerging from civil rights movement. Therefore, some theorists emphasis that environmental justice is understood as a local, grassroots, or bottom-up community reaction to external threats to the health of the community which have been shown to disproportionately affected people low income neighborhood (Agyeman, 2005). Meaningful participation is achieved through public deliberation and consent. However, it is complicated including public voices in policy formulation because of different interests and powerful voices within the community. It can be argued that multinational corporations and the government are preferred in policy formulation. The purveyors of environmental 'bad' such as large multinationals and governments are favored in pluralistic decision-making process because of their disproportionate influence, economic muscles, and knowledge (Agyeman and Evans, 2004). But the fact still remains that multinational, government, and civil society such as the community are all important actors in environmental regulation formulations. From inception, the concept of environmental justice may be viewed as having two distinct but inter-related dimensions, first, it is predominantly at the local and activist level, a vocabulary for political opportunity, mobilization and action (Agyeman and Evans, 2004). Secondly, the concept is at government level, it is a policy principal that no public action will disproportionately disadvantage any particular social group (Agyeman and Evans, 2004).

Environmental justice paradigm emerged in 1499 in the United States during the social movement against toxic wastes in places of low class and people of color (Agyeman and Evans, 2004). The fight against toxic waste in places of marginalized or minority started when the state what to dump more that six thousand truckloads of soil contaminated with Polychlorinated Biphenyls (PCBs) into what was euphemistically described as a "secure landfill" (Agyeman, 2005). Similarly, to the Chingola case in Zambia, most contaminations affect the marginalized or low-income residents thus depriving them of a healthy environment. Disputing what Thomas Malthus pointed out that the poor cause environmental degradation, but caused by the affluent capitalists or modern bourgeoisies whose aim is to accumulate capital with less consideration of externalities. However, Environmental justice is not just

concerned with sharing environmental risk but preventing them from being produced in the first place. It is concerned with correcting the environmental bad.

However, the discourse of environmental justice sees the use of scientific experts as part of a system of oppression and domination (Agyeman and Evans, 2004). This is the reality of mining industries in Chingola, Konkola Copper District mine have their own laboratory technicians that can manipulate results of chemical waste content in effluents. Without access to experts of their own, some local community activities see scientific discussions as a means of keeping their viewpoints and concerns from being addressed by government officials (Agyeman and Evans, 2004). Instead, environmental justice demands for a cultural informed participatory to expert led risk assessment that use an analytic deliberative method capable of bringing together citizens and experts (Agyeman and Evans, 2004). Furthermore, the expert part is based on rigor and protocol but that the deliberative part; inform risk decisions such as deciding which harms to analyze and how to describe scientific uncertainty and disagreements (Agyeman and Evans, 2004). In relation to KCM's Nchanga Mine the concept of environmental justice will be used to illustrate how local communities have been exposed to prolonged anguish to chemical risk. In Zambia, local communities fighting against KCM is like a fight between David and Goliath. Local communities are weak and KCM having the power to manipulate the system and dodge Corporate Social Responsibility.

4.0 CHAPTER FOUR

4.1 METHODOLOGY

This chapter gives an outline of the data collection processes and its techniques. It will discuss the research design and sampling method used. This chapter will also discuss challenges faced during data collection.

4.2 Research Design

The study employed a qualitative approach to assess sustainability in the politics of mining in Zambia. Qualitative approach is a research strategy that usually emphasis words rather than quantification in the collection and analysis of data (Bryman, 2012). The primary strength of qualitative research is its potential to explore a topic in depth (Cleary et al, 2014). Qualitative research is used to understand a phenomenon. As a research strategy it is broadly inductive, constructionist, and interpretivist (Bryman, 2012). It has an inductive view of the relationship between theory and research, whereby the former is generated from the latter (Bryman, 2012). Qualitative research has an epistemological position described as interpretivist, meaning that, in contrast to the adoption of a natural scientific model in quantitative research, the emphasis is based on the understanding of the social world through an examination of the interpretation of that world by its participants (Bryman, 2012). The research method engages in naturalistic, studying real world setting. Qualitative research is at times taken to imply an approach to a social research (Bryman, 2012). The research strategy also has an ontological position described as constructionist that implies that social properties are outcomes of the interaction between individuals, rather than phenomena out there and separate from those involved in its construction (Bryman, 2012). It is used to produce findings that cannot be established through statistical quantifications. Qualitative research is inquiring aiming at describing and clarifying human experience. This research strategy was chosen to get human experience and observation of the impacts of mining in Chingola District in Zambia

Central to good qualitative research is whether the research participants' subjective meanings, actions, and experience dimensions of human lives and social world (Marshall and Rossman, 2014). Therefore, qualitative research study typically takes place in a natural world, draws on multiple methods that respect the humanity of the

participants in the study and focuses on context (Marshall and Rossman, 2014). It is emergent and evolving rather than tightly prefigured and is fundamentally interpretive (Marshall and Rossman, 2014). Qualitative research can traverse a range of information gathering and analysis methods, which have an impact on how participants are selected, and when data collection should stop (Cleary et al, 2014). Finally, qualitative research views the social world as holistic and complex. To conduct this study, reports, articles, and books will also be used.

4.3 Sampling Method

To conduct the project, purposive sampling will be used. Purposive sampling places the investigator's research questions at the heart of the sampling consideration (Bryman, 2012). Qualitative research methods revolve around the notion of purposive sampling. This type of sampling strategy is essentially to do with the selection of units (Bryman, 2012). Purposive sampling also acts like a master concept around which different sampling approaches in qualitative research can be distinguished (Bryman, 2012). It does not allow a research to generalize a population. Examples of purposive sampling in qualitative research are theoretical and snowball sampling. Theoretical sampling is the process of data collection for generating theory whereby the analyst jointly collects, codes, and analyzes his data and decides what data to collect next and where to find them, in order to develop his theory as it emerges (Bryman, 2012).

On the hand, snowball sampling is a sampling technique in which the researcher samples initially a small group of people relevant to the research questions and these sampled participants propose their participants who have had the experience relevant to the research (Bryman, 2012). This study also uses non-probability sampling that is characterized by deliberately selecting a group of people with the needed knowledge and experts. Key informants will be approached to get specific information on the impact of mining to the environment, health risk, and society, or individuals or organizations with direct reference to the research questions being asked. The idea is that the research questions should give an indication of what units need to be sampled (Bryman, 2012). The main key informants the study aimed to approach included workers from the mine, mine management, and environmentalists from the department of ZEMA, medical health practitioners, and laboratory technicians or

analyst from KCM's Nchanga copper mines. Within purposive sampling, sites, like organizations, and people within sites are selected because of the relevance to the research questions (Bryman, 2012).

Convenience sampling was also employed while conducting community interviews. Convenience sampling is a sampling technique conducted by chance to the researcher (Bryman, 2012). It is sampling available by virtue of accessibility. Convenience sampling played an important part to get communal perceptive on the impact of mining on their livelihood. Sampling methods are done on two levels. Sampling of the context or area and then of participants. Sampling of the context and participants is a common strategy in qualitative

4.3.1 Sampling of context/site

The research study was conducted in Chingola District in the Copperbelt province of Zambia. Copperbelt province is home to 10 districts and 6 towns namely Kitwe, Ndola, Mufulira, Luanshya, Chingola, and Chililabombwe. The choice of Chingola District was made because it is one of the most contaminated areas with heavy metals and house of KCM's Nchanga mining industry, a multinational corporation known for notorious environmental contamination (Lindahl, 2014). As already established, copper production dominated the Copperbelt province for eight decades and in 1970s schools, hospitals, housing, and roads were built in close proximity or few meters to Nchanga mines. With the intensification mining, production increased and pollution increase was inevitable. Air, soil, and water pollution has increased. For instance, air pollution is as a result of more than 98 percent of sulfide oxide emissions (Lindahl, 2014). Negative externalities from the mining industries have negative impacts on human health such as respiratory diseases, aggravate asthma, emphysema, and bronchitis, and acid rain. Soil and water pollution is as the result of accumulation of metal and direct discharge in the river from mining industries. Chingola District was also selected because the Nchanga Copper Mine is within the catchment of the Kafue River and therefore, affected large and small-scale fishing, and domestic use of water. It is obvious that there is competition of resource use between the mining industries and the local community thus causing conflicts of resource use. Chingola District was deliberately selected because of the ongoing contamination and conflicts. The area

was also selected to exemplify or address social problems faced by the local communities in Chingola District. It is reported that Nchanga Copper Mine in Chingola District have violated environmental regulations and conducted unsustainable mining making it a priority for investigations.

4.3.2 Sampling of participants

Sampling of participants sought to generate a sample within each area that exemplified the population under consideration (Bryman, 2012). In this research, 25 participants from Nchanga mine townships (Mushima and kakosa township) residents approached and interviewed. Workers from Nchanga mine KCM including underground, technicians, analysts, and casual workers were interviewed. In qualitative research participant selection should have a clear rationale and fulfil a specific purpose related to the research question, which is why qualitative methods are commonly described as purposive (Cleary et al, 2014). In addition, who and how many participants will depend on what you want to know, the purpose of the inquiry, what is at stake, what will be useful, and what will have credibility (Cleary et al, 2014). Nchanga Copper Mine KCM workers were important participants because they provided information on working conditions and how mining impacts their livelihood. The mine workers provided rich and dense information on the happenings of mine operations. Being part of Nchanga mine townships, the mine workers also presented their grievances of how pollution from mine affects their families.

Key informants in this research studies included laboratory technicians from Mulonga Water and Sewerage company, environmentalists from the department of ZEMA, and medical officers from Nchanga Mine general hospital in Chingola district. Broadly, key informants are selected because of their personal experience or knowledge of the topic. Key informants are usually selected in small numbers and intensively studied and participants are purposefully chosen (Cleary et al, 2014). Selection of key informants is commonly sequential rather than pre-determined and participants should be likely to generate rich, dense, focused information on the research question to allow the research to provide a convincing amount of phenomenon (Curtis et al, cited in Cleary et al, 2014).

4.4.3 Data collection

In qualitative research method, different instruments are used to collect data. Instrumentation strategy of gathering information applied in this study includes direct and indirect observation and in-depth interviews. Observation refers to systematic noting of people's behaviors and experience in a social setting. Participation observation was designed from cultural anthropology. Participation observations are used to keep an open mind to understand peoples' motives and beliefs. There are three types of interviews in qualitative research to understand a phenomenon: structured, semi-structured, and unstructured interviews (Gill et al, 2008). Interviews are essentially and verbally administrated questionnaires in which a list of predetermined questions are asked (Gill et al, 2008). In structured interviews, questionnaires are used to obtain responses and information. Structured interviews are used in survey investigations and includes a host of questions designed for a particular purpose (Bryman, 2012). A structured interview is sometimes known as standardized interview that entails the administration of an interview scheduled by an interviewer (Bryman,2012). On the other hand, Semi-structured are used so that the researcher can more of an open mind about the contours of what the researcher needs to know about, so that concepts and theories can emerge out of the data (Bryman, 2012). This is the inductive approach to theorizing and conceptualization in qualitative research (Bryman, 2012). Semi-structured interview consists of several key questions that help to define the areas to be explored and allow interviewee to diverge in order to pursue an idea or response in more details (Gill et al, 2012). A research interview is a prominent data-collection strategy in qualitative research. Semi-structured interviews will also be used to get an in depth knowledge. In this study both structured and semi-structured interviews method were administered. While conversing with Nchanga mine residents and mine worker both semi and structured interviews were used. When interviewing key informants, semi-structured interviews were used in order to obtain detailed information.

Another instrument that was used to obtain data was through the use of focus groups. During the field one focus group consisting of mine workers (underground workers currently working and retired). It was an interesting approach as it allowed the

researcher to obtain information of work conditions and also how mine management changed and affected works. Issues such as lack of Nchanga mine KCM lack of commitment to up holding social corporate responsibility were debated on or how poor housing and sanitation due to pollutions have become a heavy burden and almost a norm. During focus groups issues of casualization instead of permanent jobs deprives the youths from obtaining jobs thus results in high crime in the townships. Political issues such as government's lack to help the locals were also brought up. Therefore, focus group is a group discussion on a particular topic organized for research purpose (Gill et al, 2012). It is used on collective views and meaning that lie behind those views (Gill et 2012).

4.3.4 Ethical consideration

Ethics are an important aspect in social research projects. Ethics are centered on four main issues firstly making sure there is no harm to participants. Harm to the participants include facets like physical harm, harm to participants' development, loss of self-esteem; stress; and including subjects to perform reprehensible acts (Bryman, 2012). Secondly, ethical matters arise in when there is lack of informed consent. Thirdly, matter of privacy invasion will be considered. Lastly, it is very important to be honest during the project and gain trust of the key informants. Considering the nature of qualitative research method, the interaction between the researcher and participants can be ethically challenging (Sanjari et al, 2014). Qualitative researcher face challenges such as respect of privacy, establishment of honest and open interactions and misrepresentations (Sanjari et al, 2014). To avoid challenges of ethics, participants were well informed about the purpose of the research and what the information was going to be used for and confidentiality was an important aspect to ensure and up hold. However, ethically challenging situations may emerge if the researcher have to deal with contradiction issues and participants feel it difficult disclosing. As a researcher informed consent were offered to the participants and provided them informed details about the study and its purpose. Informed consent naturally requires ongoing negotiations of the terms of agreement (Sanjari et al, 2014).

4.3.5 Limitations

Mining issues in Zambia can be sensitive and highly dangerous, the most challenging aspect that was faced was getting in touch with management from Nchanga Copper mine KCM. Nchanga Copper Mine KCM is reported to be a culprit of causing environmental degradation, working conditions are said to be poor, and is known for dodging taxes. Having an interview with management would have been an important aspect in this study, it would have given management a platform to defend or deny the allegations. During the research, entering the KCM plant was not a problem because of inside help, approaching site of chemical waste dumps was prohibited. Interests and motivations among the regulators and the investors may have limited the flow of information. As a Zambian citizens affected by negative externalities it was easy been biased or carried away by emotions or feeling empathetic of people's grievances. Furthermore, lack of resources and facilities to conduct chemical test or access to mine reports made it difficult to support claims of chemical pollution. Although, Nchanga mine general hospital gave access to their premises it was against their work ethics to give details of people reported to have fallen ill due to chemical pollution.

5.0 CHAPTER FIVE

5.1 FINDINGS, ANALYSIS, AND DISCUSSIONS

This chapter will present and discuss the findings. This chapter is organized as follows: Section 5.2 will present major ZEMA's involvement in the governance of mines. Section 5.2 will make use of the information obtained from informants working at the department of ZEMA whose offices are housed at Nchanga Mine general hospital. Section 5.3 will give a view of KCM Cooperate Social Responsibility since acquiring the mine. Section 5.4 presents the impacts of mining operations on economic growth, social wellbeing, and the environment.

5.2 PART 1: ZEMA INSTITUTIONAL ROLE IN MINING GOVERNANCE AND ENVIRONMENTAL REGULATIONS

Institutions are important governing structures and influential in policy and regulation formulations. These institutions of governance, helps assess the linkages both positive and negative in a network of policies and regulations that are representatives of the state's government (Werner, 2016). By looking at the institutional role, the study aimed to identifying the gaps and inconsistencies within Zambia's natural resource policy framework, in an effort to broaden the understanding of how the governance of the sector may be streamlined and optimized (Werner, 2016). Although there are a number of institutions involved in mine governance, the paper will focus on the role of the Zambia Environmental Management Agency to understand its role in sustainable mining. Zambia has several ministries and institutions bodies which are part of policy framework around the extractive industry and these include the ministry of mines, energy, and water development, the Zambia Revenue Agency (ZRA), the ministry of finance, and the Zambia Environmental management Agency (ZEMA) (Werner, 2016). ZRA and the ministry of finance carries out financial regulations such as taxation schemes and promotes industrial and economic development (Werner, 2016). ZRA is also responsible for offering financial incentive to mine investors such as a zero percent tax for five years to mining companies upon making investments. However, the function of ZRA were not emphasized in the study. On the other hand, ministry of mines, energy, and water development work in collaboration

with ZEMA by making consultations and acquiring scientific knowledge needed for the formulation environmental regulations.

As established the governmental framework that regulates the mining sectors compliance is centered on ZEMA, the agency authorizes mining projects through an Environmental Impact Assessments and grants environmental permits, management of natural resources to enhance sustainable development (Lindahl, 2014). The existing environmental policies and regulations are up to date in Zambia. The main problem in Chingola is that the implementation is not satisfactory due to lack of coordination between institutions, but to the larger extent the lack of manpower and technical capacity, and inadequate supervision towards the active mining industries and generally low quality of EIA reports complied used in the license process (Lindahl, 2016). To analyze the institutional role of ZEMA, the study will present how the agency has monitored and controlled environmental impacts such as water, air, and noise pollution.

5.2.1 MONITORING OF WATER POLLUTION

The first environmental impact to be addressed is water pollution. Nchanga Mine discharges liquid water into Mushishima stream which is directly flows into the Kafue River. In Chingola District, Kafue River is a main source of domestic water and houses the largest pump for Mulonga Water and Sewerage Company. The contamination from the mines affects ground water and water quality. A respondent named Anawana (names given in this thesis are not real names) living in Shimulala area a township in Nchanga mine township decribed that;

“I have lived in Shimulala for many years, our drinking water from water wells and taps is very bad. At times, we can vividly see the brown color from our taps. We have complained to the water utility Mulonga Water and Sewerage Company but we are always told it is not their fault and blames it on Nchanga Mine KCM. As a

community, we organized ourselves and marched to Nchanga Copper Mine plant but we were turned away. We are fighting an economic giant, and it has not been easy”.

Below is the picture showing the high turbidity or color and poor quality of the water running from bore holes, water wells, and taps due to contamination from Nchanga Mines.



Figure 6: Showing dirty water coming out taps and water pumps (Das and Rose, 2014). Retrieved from:

<http://www.savingiceland.org/wp-content/uploads/FV-Zambia-report.pdf>

A respondent from Shimulala Phiri in his 60s said “at time we have no choice but to use the dirty water because personally I cannot afford to buy mineral water for my family. My family tend to suffer from stomach problem.. I and most of the local community members have accepted the condition because we have talked about the problem for so many times and nothing has changed. ZEMA responds when we protest and forgets about our grievances when we stop talking. KCM do not compensate us. We have meetings with the local councils so that they can take our pleas to the higher authorities but still nothing has changed”.

The location of townships in Nchanga Copper mine where not properly planned because there are in close proximity to the mining company KCM. In addition, the water utility and major streams and River are also in close proximity Nchanga Copper thus been prone health risks and contamination. Below is the aerial view showing the location of Nchanga Copper Mine, Nchanga Mine townships, and the water utility, the stream in which KCM discharges its effluent (Mushishima stream) and the Kafue River.



Figure 7: Showing a map of KCM Nchanga Mines and the surrounding area.

Source: (Das and Rose, 2014). Retrieved from

<http://www.foilvedanta.org/articles/how-kcm-is-killing-the-zambian-copperbelt-part-1-water-pollution/>

The key informant working from ZEMA Mr. Zulu emphasized that environmental governing of mines has not being an easy task. The respondent's description reflected frustration and pointing out that more has to be done because produced results are not always satisfactory. Below is the response from Zulu an environmentalist working for ZEMA.

“Am passionate about working for the agency and being part of environmental governance. However, we have challenges because as you can see, we are understaffed and we do not have the capacity to conduct daily monitoring such as going to waste dumps to check chemical contents. We depend on results from mine laboratories to make conclusions on chemical content but that does not mean we do not carry out own experiments just not often as required. We have received complaints from the community due to poor water quality and in fact we are aware of the problem, we try to do our best to control the situation”.

The respondent added saying *“we conduct our own chemical experiments at KCM Nchanga Mine discharge points to make sure that the mining company discharges the stipulated amounts of effluents in the stream and minimize water contamination”.*

The environment is a common heritage of both the present and the future and ZEMA within their capacity in Chingola have put up protective measures to secure the environment. The agency monitors KCM's Nchanga Copper Mine waste dumps both solid and liquid waste dumps. KCM waste dumps are situated within the company licensed area. The company must comply to the discharges standards stipulated by ZEMA. ZEMA carries out tests and treatment of waste. ZEMA has the possibility to send an investigator to audit and make sure that Nchanaga Mine discharge effluents within the international standard. The table below shows the amount of chemicals allowed to be discharged.

Air emission (mg/Nm ³)		Water effluent discharge (mg/l)	
Sulphur dioxide	1 000	Suspended solids	100
Arsenic	0,5	Arsenic, total	0,5
Cadmium	0,05	Cadmium, total	0,5
Copper	1	Copper, total	1,5
Lead	0,2	Lead, total	0,5
Mercury	0,05	Mercury, total	0,002
PM10 Smelters	50	Iron, total	2
PM10 Other	50	pH	6–9 units

Figure 8: Shows Zambia's statutory effluent limits.

Source: Lindahl, 2014. Retrieved from

<http://resource.sgu.se/produkter/sgurapp/s1422-rapport.pdf>

Nchanga Copper Mine has the right and license to pollute the environment at a minimal and sustainable level. However, it is now public knowledge in Zambia that Nchanga Copper Mine in Chingola is notoriously known for discharging more than the stipulated limits thus breaching the regulations. In 2015 KCM in Chingola was taken to court for discharged Sulphur dioxide and Cadmium 10.3 and 13.41 times above the stipulated limits. KCM was also reported to have discharged acidic material spill over from the tailing dumps polluting the Kafue River and causing shut down of water supply by Mulonga Water and Sewerage Company. In such instances, ZEMA has penalized KCM by charging them with financial fees and orders the company to repair and maintain their tailing dumps, and use green technological production. The Polluters Pay Principle is also enforced. The Polluters Pay Principle (PPP) is an important governance instrument enforced by ZEMA to manage pollution. The PPP was first defined in 1972 by the Organization for Economic Cooperation and Development (OECD) as the principle used for allocating cost measures to encourage rational use of scarce environmental resources (Chang and Pires, 2015). This governance instrument specifies that the polluters shall support cost of preventing and controlling pollution (Chang and Pires, 2015).

As the government agency ZEMA economic incentives are used as a governing instrument. For instance, when KCM spilled over acidic materials in 2015 the

company was ordered to compensate the community for the damage caused (Oxfam report, 2011). However, the government asked Vedanta owners of KCM not to pay the compensation but put up mitigation projects to clean up pollution and improve the technical operations. This make it difficult to govern because the government at times favor investors and deprives the local community of a healthy lifestyle. The key respondents Zulu from ZEMA seemed disheartened and pointed out saying:

“As ZEMA and personally an environmentalist, our aim is to punish the polluters and put up efforts to prevent, mitigate, and manage pollution caused by multinationals such as KCM. But lack of cooperation between institutions is frustrating our effort to effectively govern the mining industries. The government should have faith in our decisions and not interfere in our way of punishing the culprits. Communities complain about dirty water and we cannot do much to help them”.

On the other hand, Nchanga Copper Mine argues that the company discharges the stipulated amount of chemical content in the stream and that Mulonga Water and Sewerage Company is responsible for the bad quality of water. It is difficult to disprove their claims because ZEMA has no capacity to conduct effective samples and experiments of chemical waste. A laboratory technologist and a key informant from Mulonga Water and Sewerage Company pointed out saying;

“We blame KCM Nchanga Copper Mine for the bad quality our water utility distributes to local communities. The company’s water pump in the Kafue River is down stream and affected by the upstream mine activities. We encounter a lot of organic and inorganic pollutants from the mining activities and treatment of water is expensive making it difficult to supply good quality of water. During rainy seasons coupled with pollutants turbidity is high and thus the brown color of the water supplied. In our own capacity will can reduce turbidity levels by the addition of Aluminium Sulphate a chemical compound used to clear water”.

Another respondent from Mulonga Water and sewerage Ms. Purity added that *“not only is the Kafue River polluted with chemicals, it is also affected by the increasing slit dispositions and thus reducing the River volume and water quantity. Our company has faced challenges due to ZEMA and government’s failure to control waste*

products from Nchanga. We have received funding from the government to improve our facility and improve water quality but all these efforts are useless if pollution from Nchanga Copper Mine keeps affecting our water pump and quality of water”.

To improve water quality and avoid water pollution, ZEMA periodically send its investigators to monitor waste dumps and carry out experiment. By doing so, ZEMA avoids formulation of regulations and actions based on uncertain scientific knowledge provided by Nchanga Copper Mine. The Precautionary Principle within the Zambian environmental governance helps the agency to avoid scientific uncertainty. The Precautionary Principle is a policy tool that states that lack of scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation. However, until April 2013, ZEMA had no laboratories to conduct its own chemical tests and depended on other organizations to conduct their chemical test making unsustainable (Chitotela et al, 2014). Some instruments such as field portable gas monitory and PH meters are not in good conditions (Chitotela et al, 2014). The respondents from ZEMA Mrs. Monde also mentioned that *“apart from lack of proper instrument, we do not have the capacity and procedures to conduct our test and we lack manpower to effectively govern the mines, for example until 2013 we did not have trained laboratory technologists to conduct examinations at the waste dumps”.*

Water pollution is an going challenge in Chingola District and KCM pollute water bodies with impunity because they are backed by government. A respondent working at Nchanga General hospital mentioned saying;

“We have had cases of patients complaining of stomach pains but so far have not received serious cases of illness due contaminated water. In 2010 when KCM accidentally spilled chemicals in the Kafue hundreds of people suffering from stomach were recorded”.

5.2.2 MONITORING OF AIR POLLUTION

Air pollution means a condition of ambient air arising to form the presence of pollutants. In Zambia, the mining industry contributes to over 98 percent of the

country's Sulphur dioxide emission (Lindahl, 2014). In 2008 KCM produced a total of 346,700 ton/year of Sulphur dioxide (Lindahl, 2014). The residents from Nchanga Mine Peter working underground pointed out that;

“We have always inhaled polluted air while working and Living close to a mine has its disadvantages, the air is also dusty and the fumes irritate our respiratory passage”.

“The respondent from the Nchanga Mine General Hospital Mr. Mwewa said “fumes from the mines cause respiratory diseases which affects the respiratory systems and causes diseases such as asthma, emphysema, and bronchitis”.

ZEMA monitors pollution from KCM by making sure that it discharges the stipulated amount of Sulphur dioxide in the air. Under the Environmental Protection and Pollution Act, Nchanga Copper Mine has the rights to pollute, but the company's rights are limited. The respondent working at KCM mentioned that *“exposure to Sulphur dioxide has affected my health, I always have coughs. The company provides workers with medical checkups every year. I get paid 4000 Zambian Kwacha take home (approximately 3900 Norwegian Krone) which includes medical and housing allowance. The medical allowance only applies to workers not our families. This is not fair because my family members are also affected by air pollution”.*

However, ZEMA in its own capacity has taken matters into their own hands by conduct public awareness of how to handle pollution and have communal discussions. These discussions are mostly about community grievances and priorities of clean-up. The environmental governance of Zambia under the EPPA stipulates that the local community where pollution is produced have the right to informed knowledge but the pollutant and how to handle it. The respondent from ZEMA Zulu mentioned that;

“we cannot govern the environment without the community. They are part of the governing structure as the civil society and the agency upholds free prior informed consent in decision making and policy formulation. The EPPA also states that local communities where pollution is produced have the right to report and seek solution. The governing institutions on the other have the duty to protect and respect rights of

its citizen right to clean water, air, and life style. But it is a pity am saying this, in Zambia free prior informed consent or duty to protect and respect is a rhetoric. Written on paper but never practiced.”

The respondent from ZEMA added pointing out that mines in Zambia mining are at times is susceptible to political risks because of conflicts that may rise in governing the natural resources. For example, the government may want to create an investment friendly environment even if the multinational company KCM evidently degrades the environment. The Zambian government has allowed itself to be colonized by KCM by not enforcing the regulation set to protect and preserve its resources. This has hindered sustainable mining as production of copper increases while polluting the air. Not only that, the urban poor community in Nchange mine townships have been disregarded by and left to bear with the environmental justice caused by government and Nchanga Copper Mine.

Sustainable mining is a holistic approach with a complex, interlinked set of factors that determine the societal worth of a project (Hendrix, 2006). An approach that improves economic results and minimization of environmental externalities. Furthermore, sustainable mining integrates socio-economic and environmental consideration in order to improve the lives of the current generation and ensure that the future generation will have adequate resources and opportunities (Hendrix, 2006). Integration of the economic, environment, and the society is important for the effectiveness of governance. In Zambia, the possibility of achieving sustainable mining depends on government, institutional, local government, and economical actors collaboration, and meaningful participation of civil society in policy and environmental regulations. However, sustainable mining and environmental governance are neither narrowly restricted to institutional functions, it also encompasses a set of behaviors, interactions, technological innovation, and effective monitoring capacity. The respondent Zulu from ZEMA described sustainable mining below.

“Off course sustainable mining is proper management of our mineral resources and fair and equal benefits from the mineral wealth presently and for our future generation and the core aim of governance is sustainable mining. Sustainable mining

also means that externalities are fairly and equally apportioned, the local communities especially in Nchanga mine township which is in close proximity to KCM must be protected from mining side effects and benefits from the production through job creation, improved livelihood, and by doing so the agency prevents environmental injustice”

Zulu from ZAME added *“we might have the regulations written on paper and stack on our wall but if our work ethics and negative practices such not taking environmental issues serious, then whatever regulations we formulate are useless”*.

As part of managing the environment and mining pollution caused by Nchanga, ZEMA and the government orders Nchanga and other mining companies are ordered to employ sustainable development which in some ways is similar to sustainable mining as both terms aim at resource use and its benefit for present and future generations. In addition, as part of the development agreements signed during privatization of mines, investors are obligated to employ sustainable mining which ensure implementation of economic development, improved livelihood, and minimized externalities. In Zambia, inclusion of sustainable mining programs is a prerequisite for companies to get access of mining license. Economic development in this context of the study implied to betterment of local population. It is reported that over 67 percent of the population living on the Copperbelt province in 2010 were living below a US\$ 1 a day. The respondent Zulu described that *“the agency is encouraging sustainability as part of governance by ordering Nchanga Copper Mine to employ green technological processes, maintenance of waste dumps, and working in collaboration with local governments and inclusion of residents in decision making”*. Therefore, governance is not just about institutions working to enforce policies and regulations but it also includes democratic participations both at national local levels, a bottom-up governing is paramount. In Zambia, there is democratic deficit and the respondent added that there is lack of democracy to conduct local participation and consultations thus hindering sustainable mining.

In Zambia, local communities are part of environmental governance and thus important actors. The Environment Management Act of 2011 state that local communities are important actor in environment management and have the right to a

clean, safe, and healthy environment. The community have the right to inform ZEMA of any activity that hinder a safe and clean environment. The environment is common heritage and as the commons it should be protected and externalities should not be burdened on the local communities. Tembo a worker from ZEMA mentioned that *“in practice externalities should not be burdened on communities but it is a shame that the local communities suffer a huge proportion of mining side effects, this is partially because we have not been effective at implementing regulations. I know am part of the governing structure but truth be told, the agency is lacking behind and we have to work even harder to ensure sustainability”*.

However, ZEMA in its capacity have ensured that local communities have access to environmental information. For instance, information on how to handle chemical pollutions. The Environmental Management Act of 2011 stipulates that the agency must seek free prior informed consent of development actions and encourage programs that promote sustainability. The local resident of Nchanga township described that: *“ZEMA conducts communal awareness, we are asked how the side effects impact our livelihood and how to handle and pollutions. We are also asked on what changes we want to be implemented. But after the awareness we never see the changes made and we forgotten”*. Phiri added *“I live few meters from Nchanga Mine and have the experienced air, noise, and water contamination, have complained but nothing has been done so far”*.

ZEMA works in collaboration with the local council and communities by conducting communal clean up. The local council in their jurisdiction within communities collect and disposal waste. A resident in Nchanga township Mr. Mwambo described local council's works towards pollution cleanup below as:

“pathetic, I have lived in this community and worked for Nchanga for five years now and local government have only dug drainages during the rainy seasons to stop spillover from Nchanga from entering our homes. The drainages are just temporal holes that are not properly structured and maintained and the chemical waste still gets to our homes. A lot has to be done to ensure sustainability and improved livelihood and not just rhetoric regulations”.

ZEMA as an environmental statutory body has the right to administer the Environmental Protection Fund which is money set aside by government for pollutions and environmental damages. The fund was established to handle post-mining environmental liabilities (Symujaye, 1998). The Environmental Protection fund stipulated under the Mine and Mineral Act is a set annual contributions from the mining industries in Zambia. The fund provides protection to the government against the risk of having the obligation to undertake the rehabilitation of the mining areas where the holder of a license falls (Symujaye, 1998). Part of the rehabilitation include construction of drainages, roads, maintenance of mine workers houses, and chemical cleanups. Therefore, lack of proper construction of communal services such as drainages is due to institutional negligence. It is argued that the environmental protection fund has not been effective because mining industries have not been able to contribute to the fund. However, the Mine and Mineral Act points out that mining companies that do not comply to the Environmental Protection Fund and contribute the stipulated fund will be fined. Therefore, government and other environmental institutions should be strict at enforcing regulations and achieve sustainability. In addition, KCM must take charge and employ sustainable mining.

5.3 NCHANGA COPPER MINES ROLE IN EMPLOYING SUSTAINABLE MINING

When Vedanta acquired Nchanga Copper mine, it signed a development agreement which included enforcement of the Corporate Social Responsibility or detailed local content regulation (Werner, 2016). The development agreement mine right holders should have a list of items on the local context such as skill and national training, and encouragement of business activities. In Zambia, there are no specific rules obligating mine right holders to commit to Corporate Social Responsibility as it is voluntary. The Corporate Social Responsibility is not legally binding. Therefore, it is always argued that nchanga and other mine companies can extract minerals without caring about the community around them because they have a choice to so. However, embarked on employing Corporate Social Responsibility. The mine in 2008 invested in eye screening programs. In addition, the year Vedanta acquired KCM in 2004, the

company embarked on the roll back malaria programs. However, to most of the local community pointed out that;

“Corporate Social Responsibility is Nchanga Copper Mine’s effort to cover up their unethical perverse contamination of the environment. The other respondents in a focus group Kayombo emphasized by saying look around you, our roads, houses, and sanitation are poor, we do not see the need of Corporate Social Responsibility when educated few are benefiting from their programs. For instance, our houses were last renovated during the times of ZCCM. Our houses have cracks during rainy seasons we use buckets to collect rainy water”.

Although the mine management refused to be interviewed and denied access to enter their offices, some of the workers living in the townships described saying;

“Off course the company has CSR programs but they are politics within management. The people benefiting from these programs are family of top management. It is public knowledge that KCM sponsors deserving students from public school to universities but a lot of our children are lazing around in the township and involving themselves into petty criminals and prostitutions in order to get fast money. Corporation Social Responsibility is about projecting sustainable mining by embracing the welfare of the local communities where the mine right holders operate. CSR programs aims at reducing poverty. However, to many CSR is viewed as a form of greenwash. Nchanga Mine proposing sustainable development while causing environmental injustice to local communities. CSR programs should be fairly distributed by addressing the root cause such as minimization of pollution of land, water, air. Local communities can be self-sufficient if the environment is not degraded.

5.4 PART 2: IMPACTS OF MINING ON SOCIO-ECONOMIC AND ENVIRONMENTAL

This section addresses the second part of the research question by addressing the impacts of mining on the socio-economic and environment. The section will first address the socio-economic impacts. Socio-economic growth in this study will human betterment within Nchanga mine townships. However, socio-economic impact is a

broad term, the paper will use indicators such as household poverty and employment levels, and type of crimes to view how NChanga mine has helped better people's lives in those areas. Therefore, the study looks at socio-economic impacts of mining as a social phenomenon.

5.4.1 HOUSEHOLD POVERTY LEVELS

Although Zambia has a well sized deposition of minerals, it is reported to be one of the poorest countries in the World. The graph below emphasizes that Zambia has the largest copper reserves in the world but ironically, the country's poverty levels on the Copperbelt Province is 65 percent and living a dollar per day. The government have not fully utilized its state sovereignty by taking over their resources to generate rational maximization of profits. Zambia can gain more from its mining industries if regulations are strict in terms of revenue regimes and environmental regulations.

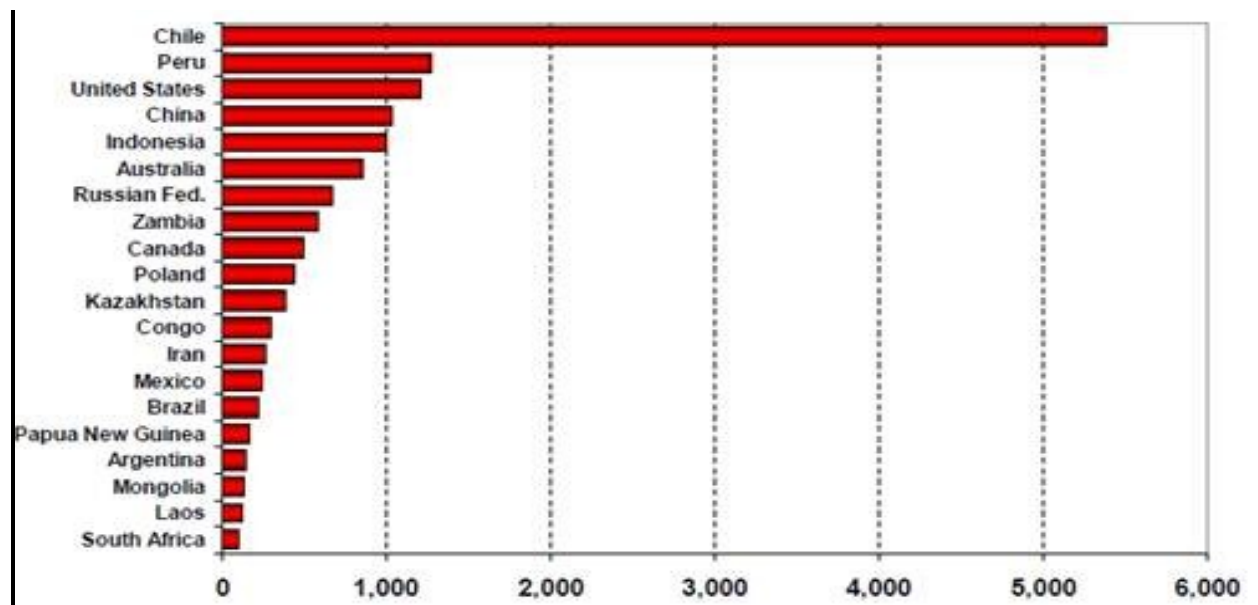


Figure 8: Shows the largest producers of copper in the world

Sources: (Das and Rose, 2014). Retrieved from

<http://www.savingiceland.org/wp-content/uploads/FV-Zambia-report.pdf>

In this study, socio-economic impact will refer to the betterment of human welfare. When the respondents were asked about their livelihood and how mining industry affected them, most of the traders interviewed said;

“Living close to the mine has its benefits, my husband whose is a mine worker for Nchanga Copper Mine raised money for me and opened a small store for me. I am not complaining because business is good workers especially from the mine patronize my business by buying from me. From this business, my husband and I combine our monies and we are able to support our families. I say our lives changed for the better because our capital was from the money that my husband earns from Nchanga”.

However, some respondents stated that *“I have a lot of dependents and I am unable to support. I am a casual worker at Nchanga Mine, for 4 years and I do not have a fixed pay, it is hard feeding at times I have lost count of how many times my family went to bed on an empty stomach”.*

Other respondents mentioned that impact from KCM such as constant pollution of the Kafue River and land have worsen their income flow. A male respondent in his 50s mentioned that *“I am mine worker and beside that I was a fisher man but I had to stop fishing because it is not safe to sell fish from the nearby stream or Kafue River due to contamination. I have now been forced to depend of the salary which I am not ashamed to mention that it is not enough to feed my family”.*

A number of male respondents gave similar responses and expressing great disappointment for government to get more from the mines.

5.4.2 UNEMPLOYMENT LEVELS

Employment levels on the Copperbelt province specially at Nchanga mine has decreased in the past five years. KCM has been criticized for not creating enough jobs and resorting to casualization. In 2013 Vedanta declared that the company was making little profits justifying the move to retrench 2000 workers (Das and Rose, 2014). The mine management added that retrenching of workers was due to unstainable cost of production, high payment rate, and electricity prices (Das and

Rose, 2014). Lungu working for Nchanga mentioned that *“since 2013, the company has not been able to employ more workers, we work over time and get the same fixed amount of money. I am lucky I have a working contract, many of my colleagues are casual worker experiencing the horror of the possibilities of losing their job at any time even if it is not enough, the work conditions are poor”*. In fact, 11,000 workers at KCM are casual are casual and maybe working part time and getting lower payments (Das and Rose, 2014). When asked how the trade union reacted to the 2013 mass retrenchment of workers at KCM the respondents stated that; We tried to protest and had a meeting with management but that did not change their decisions stating that the company has no capacity to keep or employ any more workers (Mine workers respondents, focus group interview). Other respondents participating in the focus group stated that;

“Currently, the mine trade union is not as strong and organized as it was during the era of ZCCM. During ZCCM we had meeting with management and government made sure it championed our cause. Not only that, the trade union has divided attention, our leaders do not always represent our interest. As it is now, the mine trade union is toothless because it has failed to protect us from exploitation and violation of our rights such as working over time without payment. To make matters worse, the President of Zambia Mr. Lungu made a public announcement that anyone who goes on strike will lose their jobs, such political interferences have made it difficult for us to fight the multinational KCM”.

When asked how some of the retrenched workers present at the focus group interview manage to fend for their families Kalaluka answered saying; *‘we were given money (did not reveal the exact amount) after the layoff some colleagues started small business and other moved to other parts of the provinces in search of jobs and greener pastures. Some of the respondents described with a bit of frustration state that we should not be in this predicament, if only government did not sell the mine to Vedanta. Things were better during the era of Vedanta’s predecessor Angol America because there were enough jobs, and better pay’*. The respondents added saying; *“I hate the SAPs and privatization because it disrupted our income flow and livelihood. To make matters worse, the current government is packed with selfish political leaders that only want to bring investors that deprives us of better livelihood. I am not*

saying that it has always been bad, my children are educated because of the job I had at Nchanga. All am trying to say is that we would have gained more from our mine. Look around you, our houses were last rehabilitated during the era of ZCCM and the numbers of unemployed graduates keep increasing”.

The respondents concluded the focus group interview by stating that this is our country, our resources, our copper and no one has the right to come from another country and control us as if we do not have leaders. We blame the government for allowing themselves to be controlled by multinationals like Vedanta. If the way mining processes continue to be run the way Vedanta is operating, our future generation will have nothing to look forward to, workers are reduced to nothing while private investors accumulate and lavish our national wealth.

The accumulation of wealth by capitalist multinationals was criticized by Karl Marx. Karl Marx emphasized that the essences of capitalism generally is characterized in terms of private ownership (Wood, 2014). The capitalist mode of ownership and distribute give rise to a new mode of industrial production which creates a degree of wealth although the distribution is in a highly inequitable fashion (Wood, 2014). The capitalists or bourgeois KCM dominate the economy controlling the production will the working class such as the mine workers the proletarians are reduced to nothing and marginalized.

5.4.3 TYPES OF CRIME

The residents interviewed from Nchanga mine townships stated that crime rate has increased. When asked what type of crimes are common in their communities, Muzumara said; *“of late theft has become common, almost every week we hear of a young man caught of stealing in someone’s house. Our youths have nothing to do, for example I have three boys in my house that have been to collage but have no jobs. In my opinion, crime rate has increased among our youths because they have nothing going on. However, I am not saying all theft in the communities is because the high unemployment rates but it is one of the contributing factor”.* The notion here is that because human beings have the need to maintain a life style or provide basic needs during the period of unemployment, one is more prone to stealing or committing other

types of crimes to get fast money. The other crimes that is now rampant is prostitution among the young girls. One of the respondent Kalinda said; *“young ladies I know have what we call ‘investors’ or ‘sponsors’ these are older men who have money and are willing to pay young ladies. This happens because we do not have work and the ongoing retrenchments and economic crisis have made it difficult finding jobs and youths have no option but to involve themselves. We have responsibilities I help support my younger one so I understand the pressure to make money”*.

5.5 IMPACT ON THE ENVIRONMENT

Environmental impacts of mine activity in Chingola cannot be over emphasized. Mining industry is said to produce more than 98% of the country's Sulphur dioxide (Lindhal, 2014). Not only that these emissions are mostly in urban poor community affecting the poor who have no capacity to help themselves or handle pollution (Lindhal, 2014). Therefore, causing marginalizing the poor and exposing them environmental injustice. The excess metal from mine have accumulated the result wind-dust particles (Lindhal, 2014). Water bodies close to Nchanga have been polluted with heavy metals.

6.0 CHAPTER SIX

6.1 CONCLUSION

Environmental regulations are up to date in Zambia and function well. However, negative practices among government institutions and mining companies have resulted to poor environmental management. In addition, environmental governance in Zambia has loopholes and inconsistencies that have resulted into poor governing of resources. The EPPA and the Mine and Mineral Act together with other governing instruments can be effective only if the government's governance institutions take charge and formulate strict regulations that does not enable Nchanga Copper Mine to take advantage of the government weak policies.

Answering the first research question, environmental governance is guided by set rules and regulations set by environmental ministries and enforced by ZEMA. ZEMA is statutory body that ensure that mining industries in this case Nchanga Mine release minimal amounts of chemicals in the environment. However, ZEMA is lacking technology and manpower to effectively govern resources.

The Second question could not over emphasize the impact of pollution. Impact of pollution have been perverse affecting the local people and depriving them to enjoy health lifestyle.

The theories used in the paper are mostly descriptive. For example, the Environmental Governance Framework describes the interests, interaction, action, regimes and regulation and hoe these affects the resources out. Sustainable development shows the ongoing processes and how there effects the resources outcome presently and future comes. Therefore, sustainable development is core in governance. Environmental justices showed the unfair distribution externalities and wealth. The urban poor are left to handle externalities even there are the core element in production who produce the wealth lavished by the elites

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INTERVIEW GUIDE

1. Describe governmental governance.
2. How has ZEMA approached environmental governance and sustainability?
3. Why is there so much uncontrolled mine waste?
4. What has ZEMA done to ensure waste discharges minimization of pollution?
5. How have ZEMA worked with the community and Nchanga Mine to enhance sustainable mining?
6. Has there been records of death or illness due to pollution?
7. How has Mulonga Water and Sewerage Company resolved contamination of the Kafue River?
8. How has working in Nchanga Copper Mine improved your family's livelihood?
9. Does the company provide medical and housing allowances?
10. How is the work condition at the mine?
11. Does ZEMA or Council work your community? If so how have they helped?
12. What is sustainable mining in your own view?
13. What are impacts of mining on livelihood and environment?
14. Do you know anything about CSR?
15. Is CSR important?
16. How has MUZ helping you as work?
17. What are the standards of effluent and emissions?



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