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**LUND UNIVERSITY INTERNATIONAL MASTER'S PROGRAMME IN
ENVIRONMENTAL STUDIES AND SUSTAINABILITY SCIENCE**

**An Assessment of the Economic, Social and Environmental Impacts of the Mining Industry
A Case Study of Copper Mining in Zambia**

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May, 2008

ACKNOWLEDGEMENTS

First and foremost I would like to pay special gratitude to my employer, Copperbelt Museum for the financial and moral support they have given me during my studies in Sweden. Special mention goes to the Director, Mr. Siachoono and all the employees at the Museum.

I would be out of line if I did not acknowledge the invaluable support and guidance provided by my supervisor, Ransom Lekunze during the conceptualization of the thesis and finally the write up. I would also like to thank LUMES professors who in one way or the other contributed to my successfully finishing the programme.

I would also like to pay special appreciation to Fadina for his constructive criticism which helped shape the paper.

Lastly I would like to pay my special gratitude to all my LUMES friends who made my stay in Sweden memorable.

DEDICATION

My special acknowledgement go to my sister Matilda Kangwa who has been a driving force behind who am today and this thesis is dedicated to her for making me.

ABSTRACT

The mining and mineral industry as sources of primary export income plays an important role in the economic and socio-political development of many developing countries, as these countries largely depend on the mining for their economic development. An example of which is Zambia.

This study assesses the impacts of copper mining in Zambia, a country which is highly dependent on copper for foreign exchange earnings; the assessment was carried out through the use of a case study methodology which employed interviews and documents as instruments for data collection. It establishes that copper mining in Zambia has been a major contributor to the country's foreign exchange earnings however; the revenues from copper mining is externalized and consequently makes very minimal contribution to the local economy and people. It further establishes that though copper production has been on an increase and seen increased inflows in DFI, environmental management has not received the same attention and this has negatively impacted on the environment and the livelihood of the people of the Copperbelt Province. In addition to this, the social impacts on the local people arising from copper mining were examined and it was found that the mining industry has negatively impacted on the social support systems of the local people and that productive land which could ideally be used for other developmental projects has been allocated for copper mining. The study therefore, recommends reinforcement of institutional capabilities and competencies for proficient long-lasting planning for sustainable development.

Key Words: Copper mining; Mineral industry; Economic development; Environment; Social impacts; Livelihood; Foreign exchange earning

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CHAPTER ONE

1.1. Introduction

Mining activities as sources of primary export income play an important role in the economic and social-political development of many developing countries, and many of these countries largely depend on mining for their economic development. Not only does mining offer a source of foreign exchange earnings, the industry is an important source of income for people through direct and indirect employment. Indirect employment created by the mines includes mine contractors and suppliers who feed the mining industries thus the total effects of the operations on local and regional employment is significant¹. While it goes without saying that mining has the potential to proffer economic development, on the other hand, most of the poorest countries in the world are countries which are rich in mineral resources as the World Bank reports in their Mining and Development Report that about “3.9 billion people live in today’s 56 mining countries, of which 90 percent of them are in the 51 developing and transition countries on this list. And among the 3.5 billion people in these countries, about 1.5 billion live on less than \$2 a day, making up nearly two thirds of the world’s poorest population.”² Consequently mineral mining for many developing countries like Zambia is perceived to be a ‘curse’ as the mineral wealth has not translated into economic and social gains for these countries, a phenomenon termed “resource curse” hypothesis.³

Zambia is endowed with abundant copper resources yet the country has experienced slow and sometimes negative economic growth⁴. Common sense and economic theory argue that large revenues from natural resources should engender wealth. On the contrary, many empirical research findings have shown that, in practice, these economic gains have been elusive but instead resource abundance lead to negative development and economic outcomes. For instance Murshed (2004) in his report, “*When does natural resource abundant lead to a resource curse?*” found that developing countries with a rich endowment of mineral resources have performed shoddier in their economic growths than countries poor in natural resources.

Economic development theories have advanced different arguments as to why many natural resources rich nations are not economically sound of which notable examples include Nigeria, Angola, Democratic Republic of Congo (DRC) and Zambia. Market-oriented theories on the other hand argue that local governments of these developing countries are to blame for failing to transform their natural resource revenues into human development for their peoples. On the other hand, Auty and Mikesell (1998) noted that for mineral industry to be able to translate into economic gains for the people, effective institutions and sound economic policies are a prerequisite. The view of Auty and Mikesell has been re-echoed by Sarraf and Jiwanji (2001) in the World

¹ McMahon, G. and Remy, F. *Large Mines and the Community: Socioeconomic and Environmental Effects in Latin America*, 2001.

² World Bank and International Corporation, *Mining and Development: Treasure or Trouble? Mining in Developing Countries*, 2002, Page 9

³ Auty, R. M. and Mikesell, F.R, *Sustainable Development in Mineral Economies*, 1998, Page 6

⁴ Ndulo, M and Mudenda, D, *Trade Policy Reform and Adjustment in Zambia*, 2004

Bank Report, “*Beating the Resource Curse, The Case of Botswana*”. On the other hand, dependency theories blame wealthy countries and their multinational corporations (MNC) whose sole aim is to generate profit via the exploitation of natural resources in these developing countries⁵. Bosson and Varon (1977) argue that multinationals operating in developing countries are driven by the desire to maximize profits and due to the power they possess, can influence, directly or indirectly, the policies and action of governments of developing countries. Consequently very little attention is paid on the impacts their actions have on the local people and the environment.

Despite the potential of the mineral mining industry to generate wealth and employment for these mining countries and their peoples, mining faces mammoth challenges in harmonizing economic gains with environmental integrity and social concerns. The United Nations (UN) “*Environmental Guidelines for Mining Operations*” identified mining related activities as a major source of degradation to the physical and social environment more so when not properly managed⁶. It is noteworthy that mineral extraction by its very nature does have the potential to impact negatively on the environment if not carefully managed. Thus, the most widespread environmental impact of mining is land quality degradation, air and water pollution and biodiversity loss⁷

From the foregoing, the study seeks to address an important contemporary issue; that of sustainability of copper mining industry taking the empirical case of copper mining in Zambia. Furthermore, the study seeks to contribute to the growing debate and provide further knowledge and understanding on the impacts of natural resources on economic development and give analytical explanations as to why Zambia, a country with abundant natural resources is economically, socially and environmentally poor, and how the identified problems can be addressed.

1.2. Background and Problem Formulation

Zambia is principally a mining country with abundant deposits of copper and other minerals such as cobalt, coal, emeralds, amethyst, lead and zinc⁸. However, the country is primarily dependent on copper mining for its export earnings. Large scale copper mining in Zambia started in the 1920s, thus the country has a long history of copper mining activities. Prior to independence, Zambia’s economy was solely reliant on copper mining and this accounted for 90% of its total export earnings⁹, thus copper mining was the engine of development for the country. At Independence, “Zambia inherited a dual economy with a developed export enclave sector based on

⁵ Giddens, A. *Sociology*, 2006 Pages 408,409

⁶ United Nations, *Environmental Guidelines for Mining Operations*, United Nations Department of Economic and Social Affairs (UNDESA) and United Nations Environment Programme Industry and Environment (UNEP, 1998)

⁷ *Environmental Impact from Mining*,

<http://www.ott.wrcc.osmre.gov/library/hbmanual/epa530c/chapter3.pdf> Accessed: 19/12/07

⁸ *Sustainable Development in Zambia: Experiences and Ways Forward*,

http://www.ias.unu.edu/sub_page.aspx?catID=107&ddlID=207 Accessed. 18/12/07

⁹ Osei-Hwedie, Z, B. *Development Policy and Economic Change in Zambia: A Re-Assessment*, 2003

copper production and a backward rural or agricultural sector”¹⁰. This made Zambia a mono-economy sorely reliant on copper for export earnings and revenue for government public expenditure. Currently copper mining still dominates Zambia’s foreign exchange earnings as it accounts for 68.1% of Zambia’s total export earnings¹¹.

On the other hand, the mining sector in Zambia is a key employer more so on the Copperbelt Province which is the home of the mining industries. Of the 1.6 million people on the Copperbelt Province¹², the mining sector alone employs about 75% of the total workforce in the Province¹³ therefore providing a much needed source of income in a country with high unemployment levels which currently stands at over 70%¹⁴

Suffice to say that despite the identified economic benefits of income and employment copper mining activities offer in Zambia, it has impacted negatively on the environment and the people. To start with, mining by its nature requires large tracts of land thus many people have been forced to relocate in order to accommodate the mining operations. The Environmental Council of Zambia (ECZ) in its report, “*State of the Environment in Zambia*” (2000) noted that wastewater discharged over the years from the mines has been reported to have resulted in the accumulation of copper in the water and sediments. Furthermore, research conducted by Von der Heyden and New (2003) revealed that the concentrations of copper in the Kafue River sediments exceeded that found in other polluted river sediments worldwide with concentrations ranging between 11 028 - 12 855 µg/g dry mass in the mining area. One of the ecological consequences of this is reduced fish stocks in the river¹⁵ which is a major fishery and supports thousands of households whose livelihoods depend on fishing. Government main focus has been to attract investors into the country thus creating an investor friendly environment however social and environmental issues have not received the same attention.

1.3. Study rationale and relevance

It is in the line of this mirage of understanding that countries rich in natural resources like Zambia are still wallowing in poverty and environmental problems that this study seeks to address. Thus the study seeks to address an important contemporary issue, that of sustainability of the mining industry taking the empirical case of copper mining in Zambia. It is further envisaged that the study will make a contribution through a holistic and systematic analysis of copper mining in Zambia. Notwithstanding this, it is envisioned that the study will contribute to sustainable copper mining through policy recommendations which will ensure that copper mining is being carried out in a manner that ensures that the economic gains are shared equally among

¹⁰ Osei-Hwedie, Z. B. *Development Policy and Economic Change in Zambia: A Re-Assessment*, 2003

¹¹ Central Statistics Office, Vol 54, September, 2007

¹² Central Statistics Office, *Main Zambia Census Report*, Vol. 10. 2003

¹³ Action for Southern Africa (ACTSA) et al. (2007) *Undermining development? Copper mining in Zambia*

¹⁴ New Zambia: *Economic reflections for a new and better Zambia*. <http://zambian-economist.blogspot.com/2007/04/addressing-challenges-of-our.html> Accessed : 29/01/08

¹⁵ ECZ, 2001, *State of the Environment in Zambia 2000*, Page 94

all the stakeholders and that mitigation measures are put in place to take care of the negative environmental impacts on the local people.

1.4. Research objectives

The study assesses the economic, social and environmental impacts of copper mining in Zambia, a country that is highly dependent on copper for foreign exchange earnings and in order to do this the study will look into the following specific objectives.

- ❖ To assess the economic benefits from copper mining and how the revenue from copper mining is distributed among the identified stakeholders.
- ❖ To assess the social impacts of the mines on the people on the Copperbelt Province
- ❖ To assess the environmental impacts of copper mining.
- ❖ To understand and critically analyze policy related barriers to the development of sustainable mining in Zambia and proffer recommendations that will ensure sustainable copper mining.

1.4.1 Research questions

- ❖ In order to address these specific objectives the study will have to answer the following research questions;
- ❖ Who are the stakeholders and what are their roles and stakes in copper mining industry?
- ❖ What are the benefits from copper mining to the stakeholders?
- ❖ What are the environmental impacts of copper mining?
- ❖ What is the contribution of copper mining to the employment sector and national GDP?
- ❖ What are the social impacts of copper mining?
- ❖ What are the policies that will ensure sustainable copper mining?

1.4.2. Statement of the Hypothesis

Together with the objectives of the study and the specific objectives alluded to earlier it can be hypothesised that copper mining in Zambia has not transformed into wealth for its people. On the contrary it has impacted negatively on the environment while the quest for economic sustainability from copper mining may conflict with social and environmental sustainability.

1.5. Thesis outline

The study is organised into six chapters. The first chapter provides a background on the mining industry and its associated economic benefits, environmental and social impacts. This chapter also provides the objectives on which the study is founded.

The second chapter provides the methodology employed in data collection and analysis while the third chapter presents theoretical-based arguments surrounding natural resources and the “resource curse”, under which the political economy of copper has been discussed. Under the same section the impacts of copper mining have been presented.

The fourth chapter of the paper introduces the case study of copper mining in Zambia and deals with issues such as the mining policy and environmental regulations governing copper exploration and extraction in Zambia. The section also gives a historical account of copper mining in Zambia as seen through the reforms that the country has undergone since independence and this section also provides an in-depth analysis of the stakeholders, their roles and stakes in copper mining in Zambia. This is followed by chapter five which presents the results from the economic, social and environmental standpoints. The section then provides an analysis of copper mining in Zambia so as to get a snapshot of the sustainability profile of copper mining. The sixth chapter discusses the results and finally teases out recommendations.

CHAPTER TWO

2.0. Research Framework

2.1. *Research design and methodology*

The study employs a case study methodology based on the research questions posed which are mostly the “what” questions thus calling for an exploratory study.¹⁶ The use of a case study methodology offers the opportunity of collecting as much information across a wide range of dimensions.¹⁷ Furthermore, case study methodology offers the opportunity of using multiple sources of evidence which increases the validity and reliability of the findings¹⁸. Suffice to say, the complexity nature of copper mining industry called for the use of case study inquiry which Yin (2003) argues has the advantage over other research methodologies of explaining and describing complex issues. Meanwhile, Yin (2003) argues that the case study methodology not only facilitates in arriving at an in-depth analysis and logical explanations of contemporary events, nevertheless also helps in yielding qualitative data.

The collected unstructured data was analyzed using both qualitative and quantitative methods which seek to assess the impacts of copper mining through economic, social and environmental dimensions.

2.2. *Instruments for Data Collection*

The study used multiple sources of evidence and the underlying principle behind this was that multiple sources of evidence proffer the opportunity to address a broader range of issues. Notwithstanding this the most significant advantage presented through the use of multiple sources of evidence was the “development of converging lines of inquiry”¹⁹ and this increased the validity, quality and reliability of the findings²⁰. The study employed interview instruments for primary data

¹⁶ Yin, R. K. *Case Study Research: Design and Methods*, 2003. page 6

¹⁷ Gomm, R, et al. (eds) *Case Study Method: Key Issues, Key Texts*, 2000, London. Page 3

¹⁸ Yin, R. K. *Case Study Research : Design and Methods*, 2003 page,97

¹⁹ *Ibid.*, page 98

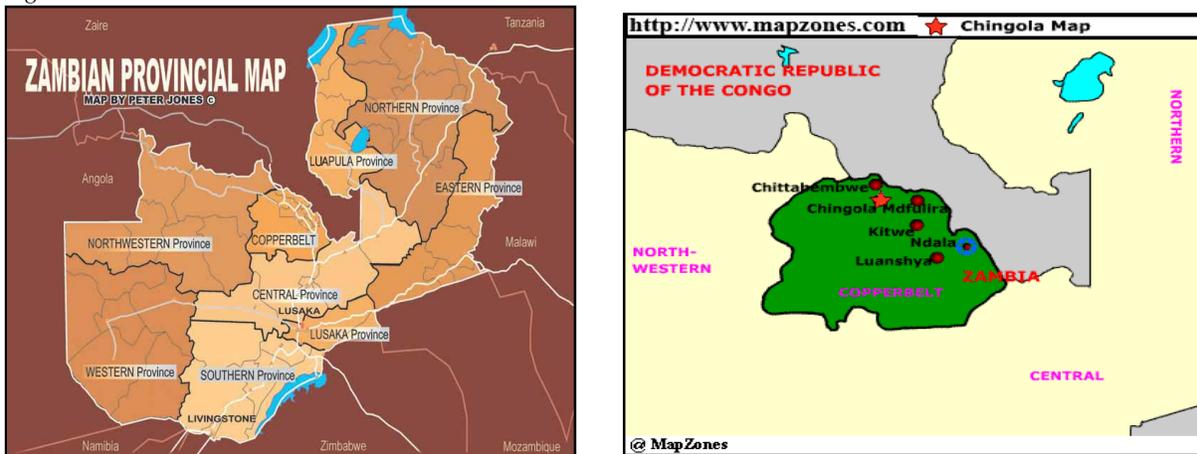
²⁰ *Ibid.*, page 97

collection, while documentaries, books and other archival material provided the secondary data. The use of interviews in this study hinges on Kvale (1996), views that interviews serve to gain deep insight, as well as interpret meanings and obtain descriptions of the phenomena. While the use of secondary sources of data was premised on its strength to serve as source of support for information gathered during the interviews and also guide in the generation of theoretical information for the study,

2.3. Study area

The study was limited to the Copperbelt Province (figure 1) which is home to Konkola Copper Mines Plc (KCM), Mopani Copper Mines (MCM), Luanshya Copper Mines (LCM), First Quantum Mineral Plc (Bwana Mkubwa), Chibuluma and Chambishi Mines. The primary data collected was then scaled up with secondary information from the provincial and national levels in order to address the micro-and macro-aspects of the assessment. The significance of this was to gain insightful knowledge on the dynamics of the problems faced from local mining communities, provincial and national levels in the country.

Figure 1: Map showing the location of the Copperbelt province and the mining towns that make up the region.



Sources: <http://www.mapzones.com/citymap/zambia/copperbelt/chingola.jpg>
http://www.zambiatourism.com/travel/maps/images/political1_72dpi_low%20res.jpg²¹

2.4. Study population and Data collection process

The study commenced with a literature review of books and papers with relevant topics to the study so as to gain a broader insight and perspective on copper mining, natural resources and sustainability issues. The study further made use of publications and information available on the Internet in different formal organizations in Zambia which included ECZ, CSO, Ministry of Natural Resources and Environment, Ministry of Mines, United Nations Development Programme (UNDP). The idea was to collect information from as many different sources as possible and then be able to counter check the information so as to further validate the findings.

²¹ Both sources accessed on 12/01/08

The following comprised the study population who provided the primary data through interviews for the study:

The copper mining companies: The mining companies that were sampled were purposely selected based on the size of the mine thus these mining companies represent the largest copper mining companies in Zambia. The design was to sample mining companies that have been operating in Zambia for more than five years and the significance of this was that these companies were better positioned to give insight into their operations than recently launched companies. The Manager Corporate Affairs at MCM and the Manager Environment at Mbwana Mkubwa were interviewed as it was felt they were strategically positioned to answer the questions posed. KCM categorically declined to be interviewed thus relied on published company reports and interviews with employees. It was also not possible to interview management at Luanshya and Chambishi mines consequently published reports on the companies and interviews with employees acted as sources of data.

Employees of the mines and local residents: Three (3) employees were interviewed from each of the mining companies and some of these chose to remain anonymous for fear of victimization. These mine workers are people are currently working for the mines and live in the mining towns. The rationale behind the choice of interviewees was that these would be in a position to give valid contribution based on their experiences and perceptions. Furthermore three (3) people were interviewed from each of the five mining towns to get their views on the impacts of the mines on their livelihood.

ECZ: ECZ being the institution mandated with the management of environmental issues in Zambia was purposely selected to provide a snapshot of the environmental issues emanating from the mines. The manager at ECZ was interviewed on the premise that he was better positioned to give a concise overview of the mines and related environmental issues.

CSO, Ministry of Natural Resources and Environment and Ministry of Mines: Representatives from the above mentioned government institutions were interviewed. One officer from each of the government departments was interviewed. However, data supplied was limited due to bureaucratic nature of government departments concerning concealment of facts on perceived government failures.

2.5. Scope and limitations

The scope of this study will be limited to the analysis of copper mining. The focus will be on large scale copper mining, thus small scale and other mineral mining like cobalt and gemstones will not be considered. Copper mining will be considered because of the importance of the industry to the country and also due to the fact the country has had a long history of copper mining. The fragmented nature of small scale mining and the undocumented nature of industry made it possible for the study to leave that out of the analysis as it would have been difficult to get the data required for the analysis. Emphasis will be placed on understanding the economic, social and environmental dimensions and dynamics of large scale copper mining on the local people and how to make copper mining more sustainable through ensuring that the benefits from copper

mining are shared equally and measures are put in place to mitigate the environmental impacts that arise as a result of copper mining.

Due to financial constraints the researcher was not able to travel to Zambia to collect the data required for the study in person thus the researcher had to rely on the employer Copperbelt Museum based in Ndola for the collection of the data in which case the museum's researcher was used to collect the data. Suffice to say the museum researcher was provided with the necessary interview guides and the interviewees were selected before hand by the researcher.

CHAPTER THREE

3.0. Theoretical Framework and Literature Review

3.1. *The political economy of copper*

Classical economic theory envisages that abundant natural resources ought to be good for the economy and therefore, would anticipate that if a country is rich in mineral resources like Zambia, the country would enjoy higher economic output which would translate into higher growth rates and wealth for its peoples. Empirical evidence, however, has divulged an apparent paradox, whereby resource-rich countries suffer from the "resource curse"²². Several of the richest countries today are, in general, rather poorly endowed with natural resources and this sentiment has been echoed by Ross (1999) who argues that there is significant evidence that abundant natural resource-rich countries perform not as well as natural resource-poor counterparts. However, not all rich countries follow this pattern; notably Norway, where abundant natural resources account for the wealth of the country²³.

Natural resources have both been a blessing and a curse for some African countries like Zambia and this has been argued for by many researchers, for instance in a study of thirty Sub-Saharan African countries it was established that there was a negative correlation between economic performance and the share of minerals in total exports²⁴. In Zambia for instance, though the country is rich in mineral (copper) resources the country is faced with high poverty levels, high population living below poverty lines, unemployment, environmental degradation, lack of access to health care²⁵.

The persistence of poverty and lack of development of developing countries according to Marxist theorists is a consequence of capitalist exploitation²⁶. Thus, underdevelopment in mineral resource-rich countries like

²² Kronenberg, T., *The Curse of Natural Resources in the Transition Economies*, 2004

²³ Pedro, A., *Mainstreaming Mineral Wealth in Growth and Poverty Reduction Strategies*, Economic Commission for Africa, Ethiopia

²⁴ Wheeler, D., *Sources of Stagnation in Sub-Saharan Africa*, 1984

²⁵ UNDP, *Human development Reports- Zambia: The Human Development Index - going beyond income*. http://hdrstats.undp.org/countries/country_fact_sheets/cty_fs_ZMB.html Accessed: 23/12/07

²⁶ Dependency theory, (2004), <http://folk.uio.no/johannwi/homework/SGO/SGO2500/SGO2500.pdf> Accessed: 22/02/08

Zambia is perceived to be an upshot of the unequal power relationships which exist between the rich developed capitalist countries and poor developing countries. In this power struggle, the powerful developed countries dominate dependent powerless third world countries such as Zambia through the international capitalist system. Under this capitalist system, dependent countries supply cheap minerals like copper which international multinational corporations (MNC) exploit for their economic gains. This model is founded considerably upon the supposition that economic and political power are heavily centralized and concentrated in the developed countries through the international multinational corporation²⁷.

For the sake of this study the radical and structural models have been used to explain the mineral resource curse hypothesis and this has been highlighted in the proceeding sections. The use of these models is on the premise of what is prevailing in Zambia with many indicators pointing to the prevalence of the resource curse in the country. And the models provide better insights into what is happening in Zambia and how to avoid the curse.

3.1.2. Structuralist Dependency (Singer-Prebisch) Theory.

Singer-Prebisch theorizes that the disparity which exists between developed and developing countries lies in the nature of products the different countries produce and that the terms of trade for primary products deteriorates over time relative to manufactured goods owing to a “combination of low income and price elasticities of demand”²⁸. The deterioration in the terms of trade for primary products “results in a long-term transfer of income from poor to rich countries”²⁹. Many of the developing countries produce primary goods with Zambia producing copper, while countries from the north produce manufactured goods. Thus, according to the theory, the exchange rate between the two will depreciate to the benefit of the countries producing the manufactured goods over time.³⁰ Therefore, the developing country like Zambia acquires most of its needed manufactured supplies for relatively higher prices than what it gets for the sale of its copper. Thus the developed countries will continue to grow economically to the disadvantage of the developing countries that will experience slow and sometimes negative economic growth over time.

3.1.3. Radical Dependency (Neocolonial dependency) theory

Neocolonial dependency model is a direct outgrowth of Marxist economics and in Marxist view economics are defined by exploitation through capitalism³¹. In this light investments made in Zambia by capitalists international mining firms from the North are meant to create a profit for the capitalists and top governmental officials who act to serve the interest of the MNC. Under this capitalist system someone has to be exploited, while a net transfer of wealth towards the North is taking place. The local people who live in these areas where the resource is located are made to suffer from the environment degradation as a result of

²⁷Ferraro, V., *Dependency Theory: An Introduction*, 1996

²⁸*Ibid.*,

²⁹Todaro, M., P and Smith, C., S., *Economic Development*, 8th edition, 2003, Page 522-523

³⁰Todaro, M., P and Smith, C., S., *Economic Development* 9th edition, 2006, Page 586-587

³¹Ferraro, V., *Dependency Theory: An Introduction*, 1996

the resource exploitation while the profits are enjoyed elsewhere. Meanwhile the capitalist investors rely on the continued underdevelopment of the South, to insure the continued capitalist relationship. Thus in neo-Marxist view perpetuation of poverty coupled with environmental degradation is attributed to the existence of policies of the international capitalist system.

3.1.4. The Central Propositions of Dependency Theory

Dependency theory has a number of propositions, which form the heart of the theory however; the following propositions are relevant for this particular study as they proffer possible explanations for the mineral resource curse in Zambia;

a) That underdeveloped countries such as Zambia are not lagging behind in development and are not poor for the reason that they lagged behind the enlightenment principles as predicted by the neoclassic theory.³² They wallow in poverty and environmental degradation for the reason that they were coercively incorporated into the international capitalist system only as producers of primary goods (copper) and serve as repositories of cheap labor for the benefits of investors and their partners in government³³.

b) The diversion of wealth over time is sustained not merely by the power of the dominant states and MNC, but also through the power of top government officials in the developing countries. These perpetuate this dependent relationship since their own private interests correspond with the interests of the dominant states and MNC thus make policies that do not ensure equitable distribution of the resources from mineral production³⁴.

The political economy of mineral resource management gives adequate explanations of the disappointing economic performance of mineral resource-abundant economies like Zambia and this follow in the proceeding section of this chapter which discusses the economic and political explanations for the mineral (copper) resource curse.

3.2. Economic explanations for mineral resource curse

Zambia is endowed with abundant mineral resources yet the country has experienced slow and sometimes negative economic growth. The explanations which accounts for this slow and sometimes negative economic growth include crowding off other economically enhancing sectors like agriculture and the manufacturing in favor of the mineral resources, a phenomenon referred to as the 'Dutch disease'³⁵ which has been defined as the "coexistence within the traded goods sector of progressing and declining, or booming and lagging, sub-sectors"³⁶.

³²Ferraro, V., *Dependency Theory: An Introduction*, 1996

³³ *Ibid.*,

³⁴ *Ibid.*,

³⁵Kronenberg.,T., *The Curse of Natural Resources in the Transition Economies*, 2004

³⁶ Corden., M, W., and Neary., P, J., *Booming Sector and De-Industrialization in a Small Open Economy*, 1982

The Dutch disease has the capacity to weaken the competitiveness of other non- mineral sectors such as agriculture and manufacturing and this comes about as a result of mineral export booms which set off both short-term and long-term shifts in prices and mineral resources³⁷. What this implies is that non-mineral sectors will shrink when there is boom in mineral export. Currently copper mining dominates Zambia's foreign exchange earnings and accounts for 68.1% of Zambia's total export earnings³⁸ while other sectors account for the remaining 31.9% and this is indicative of the Dutch disease in the country's economy.

On the other hand, mineral resource export booms make the exchange rate to appreciate and this result in the rise of domestic income which consequently leads to a rise in the real exchange-rate. Furthermore, labor and capital are withdrawn from other sectors in favor of the mineral sector³⁹. The mining sector in Zambia is the key employer, more so on the Copperbelt Province which is the home of the mining industries. Mining alone employs about 75% of the total workforce in the Province⁴⁰. Thus other sectors like manufacturing and agriculture employs the remaining 25% of the people on the Copperbelt which depicts one of the dimensions of the Dutch disease. Therefore, when mineral resources are abundant, production is concentrated in the mineral resources rather than manufacturing and agriculture, and so does capital and labor that could otherwise be utilized by these sectors⁴¹.

Therefore, the Dutch disease phenomenon shows that the existence of large mineral resource sectors like copper, will affect the allotment of employment and capital throughout the economy which consequently affects the long term growth of the economy⁴².

3.3. Political explanations for mineral resource curse

Mineral resource abundance has been linked to governance issues which suggest that minerals resources weakens institutions and also brings about rent seeking and corruption.⁴³ Furthermore, mineral wealth has also been linked to conflicts leading to civil wars due to the inequity in the distribution of the mineral revenues.⁴⁴

3.3.1. Rent seeking and corruption

Researchers have theorized that availability of mineral resources tends to lead to enormous rent seeking in the government. In this instance rent seeking may take the form of tax protection of investors or outright corruption. This in turn leads to massive distortions of the economy and slows down economic growth. Corruption, it is noted always goes hand in hand with rents for the reason that mining firms (investors) may

³⁷ Corden., M. W., and Neary., P. J., *Booming Sector and De-Industrialization in a Small Open Economy*, 1982

³⁸ Central Statistics Office, Vol 54, September, 2007

³⁹ Mikesell., R. F., *Explaining the resource curse, with special reference to mineral exporting countries*, 1997

⁴⁰ *New Zambia: Economic reflections for a new and better Zambia*. <http://zambian-economist.blogspot.com/2007/04/addressing-challenges-of-our.html> Accessed : 29/01/08

⁴¹ Sachs ., D. J., and Warner., A. M., *Natural Resource Abundant and Economic Growth*, 1997

⁴² Matsuyama, K., *Agricultural Productivity, Comparative Advantage, and Economic Growth*, 1992

⁴³ Kronenberg.,T., *The Curse of Natural Resources in the Transition Economies*, 2004

⁴⁴ *Mining, Minerals, and Sustainable Development, Breaking New Grounds*, 2002, Page 192

block political reforms in order to protect their rents⁴⁵. Therefore, mineral resource abundance is associated with high corruption and high corruption is in turn associated with low economic growth. These assertions support the view that corruption in mineral resource-rich countries hinders economic growth and the countries that are mineral rich are ranked lowly on the Transparency Corruption Perception Index (CPI) with Zambia and DRC ranked 123 and 168 respectively⁴⁶. In the same light, the Mining, Mineral and Sustainable Development (MMSD, 2002) notes that corruption is a major impediment to equitable distribution of mineral revenues. Thus, there are good reasons to believe that mineral resource abundance, by concentrating wealth and power in the hands of small elite who include government officials, fosters corruption and rent-seeking behavior⁴⁷.

3.3.2. Mineral resources and governance

“We are in part to blame, but this is the curse of being born with copper spoon in our mouth”.

Kenneth Kaunda, Former President of Zambia⁴⁸

Going by Kaunda’s assertions above, it can be said that natural resources have the potential to weaken governance of resource-rich countries. Ross (1999) further argues that dependence on mineral and oil resources have the propensity to generate weak states and institutions through weakened governance and lack of accountability. Thus, mineral wealth erodes the integrity of national institutions leading to lack of accountability and wasteful spending of the resources. Consequently, mineral and oil resources impinges on the democratic governance of these resource-rich countries. In short, the evidence is that governments receiving substantial revenues from oil and minerals tend to become corrupt, in part because the huge sums involved can overwhelm the limited capacity of small bureaucracies to manage them effectively, and in part because of the instability of these revenues⁴⁹. The potential of mineral development to weaken institutions which play a central role in ensuring equitable sharing of mineral revenues and environmental management, the collapse of these institutions means that sustainable mining is hindered. Consequently passing and enforcing of laws which are core governance issues are automatically affected⁵⁰.

⁴⁵ Mining, Minerals, and Sustainable Development, *Breaking New Grounds*, 2002, Page 192

⁴⁶ Corruption Perception Index Regional Highlights for 2007: Africa.

<http://www.transparencia.org.es/INDICE%20DE%20PERCEPCI%C3%93N%202007/Africa.pdf> Accessed: 27/03/08

⁴⁷ Kronenberg.,T., *The Curse of Natural Resources in the Transition Economies*, 2004

⁴⁸ Former President of Zambia between 1964-1991

⁴⁹ Banks, G, *Resources and Conflict in the Asian Pacific Region: Linking Resources and Conflict the Melanesians way*, 2005

⁵⁰ Mining, Minerals, and Sustainable Development, *Breaking New Grounds*, 2002, Page 66

3.3.3. Mineral resources and conflict

“Diamonds are UNITAS life blood. Without them UNITA wouldn’t be able to maintain its options. We need to have choices, and as you see what the government is doing now, UNITA needs to maintain military reserves so that the government doesn’t destroy us. This is the reality” General Arlindo Pean⁵¹

These observations confirm the volatile nature of mineral resources to spur off conflicts. Most of these cases where resources have ignited wars have been in Africa with Angola being the typical example of how mineral wealth can fuel conflicts. In Angola for instance, mineral wealth have fueled conflict with the mines providing revenues for warring factions to purchase weapons⁵². On the other hand, the Angolan government itself allegedly used profits from oil resources to procure weapons⁵³.

There is a strongly link between conflict and dependence on mineral and oil exports. Low average incomes of the country and slow growth have fueled civil wars in resource rich countries like Angola and DRC. By reducing economic growth, mineral resource rich countries become more likely to suffer from civil conflicts and the evidence also points to an association between natural resource dependence and increased rates of poverty in a population, which again is a potential factor for fueling civil conflicts.⁵⁴ In some countries, mineral wealth have fueled civil wars as a result of tension between multinational mining owners and local communities as observed in the civil war which erupted in Papua New Guinea⁵⁵. Furthermore mineral or oil rich dependent has been linked to higher child mortality rates, which also fuels civil conflicts in these countries⁵⁶. In most of these instances the overriding cause is the inequitable sharing of mineral revenues which has provoked conflict with people fighting to have “a piece of the cake”⁵⁷.

3.4. Mineral mining

The United Nations (UN) defines mining as an “economic activity that consists of the extraction of potentially usable and non-renewable mineral resources from land or sea”.⁵⁸ Mineral mining generally takes the form of surface and underground mining; however, *in-situ* and placer methods are also practiced⁵⁹. Metals like copper are produced through a long series of processes, each of which involves pollution as well as the generation of waste⁶⁰.

While it has been generally agreed upon that mineral mining has the potential to transform into economic growth though on the other hand empirical evidence has shown that some countries have been losers. Many mineral rich countries like Zambia are still searching for harmonized economic, social and environmental

⁵¹ Former UNITA Chief of Staff, Angola

⁵² Sherman., J. H., *Profits vs. Peace: The Clandestine Diamond Economy of Angola.*, 2000

⁵³ Global Witness., *A Crude Awakening: The Role of the Oil and Banking Industries in Angola’s Civil*, 1999

⁵⁴ Ross, M., *Natural Resources and Civil War: An Overview*, 2003

⁵⁵ Banks, G., *Resources and Conflict in the Asian Pacific Region: Linking Resources and Conflict the Melanesians way*, 2005

⁵⁶ Ross, M., *Natural Resources and Civil War: An Overview*, 2003

⁵⁷ *Mining, Minerals, and Sustainable Development, Breaking New Grounds*, 2002, Page 192

⁵⁸ UNEP, *Mining*, <http://www.uneptie.org/pc/mining/index.htm> Accessed: 23/12/07

⁵⁹ U.S. Environmental Protection Agency, *Background for NEPA Reviewers: Non-Coal Mining Operations*, 1994

⁶⁰ Young, J., E., *Mining the Earth*, 1992, Page 18

sustainability which will ensure improved lives of their people as well as environmental security. The UN at the Johannesburg Summit reaffirmed that “Sustainable Development (SD) means ensuring that actions today to promote development and reduce poverty do not result in environmental degradation or social exclusion tomorrow”⁶¹. In essence this means any development (copper mining) which is aimed at bringing economic growth must take into consideration social and environmental security of present and future generations.

3.5. Mining and the environment: An Overview

The World Bank in their report, *Mining and Development: Treasure or Trouble? Mining in Developing Countries* noted that the mining sector by its nature leaves behind a “footprint” which is the environmental, social, and economic impacts⁶². Furthermore, MMSD, (2002) observes that mineral mining industries have significant impacts on the environment. These impacts on air, land and water are high lightened in the proceeding section.

3.5.1. Impacts of Mining on Air Quality

Air pollution as a result of mineral mining is essentially due to the fugitive emissions of particulate material and gases which include, carbon monoxide, methane, oxides of nitrogen, sulphur dioxide and dust⁶³. These gases endanger the lives of the people who get exposed either through occupation or living around the mining sites. Human health problems and environmental degradation may arise through direct inhalation from the air, soil deposition, or accumulation within a water body. High levels of dust in the air increases respiratory diseases such as chronic bronchitis and asthma in the exposed population. Additionally, uncontrolled dust from the mines pollutes nearby surface waters and affects crop growth by shading and blocking the pores of the plants⁶⁴.

3.5.2. Impacts of Mining on Water regime

Mining impacts greatly on water and deteriorates the quality of the water and this is done through the waste water discharged into the surface drainage system⁶⁵. Furthermore U.S. Environmental Protection Agency (1994) noted that waste water which is released from the mineral mining operations can have major impacts on the quantity and quality of groundwater. Erosion on the other hand may cause significant loadings of sediments to nearby rivers and streams especially during severe rainstorm events. This means that in countries like Zambia where only 58% of the population have access to improved water source while the rest consume water directly from water bodies such as rivers and streams which maybe be polluted, they are constantly increasing their health risk due to consuming polluted water.⁶⁶ Additionally pollutants from the

⁶¹ United Nations, *Report of the World Summit on Sustainable Development. Johannesburg, South Africa*

⁶² World Bank and International Corporation, *Mining and Development: Treasure or Trouble? Mining in Developing Countries, 2002*

⁶³ Boocock, C., N, *Environmental Impacts of Foreign Direct Investment in the Mining Sector In Sub-Saharan Africa, 2002*

⁶⁴ Singh, G., *Environmental Issues with best Management Practice of Coal Mining in India*

⁶⁵ *Ibid.*,

⁶⁶ UNDP, *Human development Reports- Zambia: The Human Development Index - going beyond income.*

http://hdrstats.undp.org/countries/country_fact_sheets/cty_fs_ZMB.html Accessed: 23/12/07

mines which end up in rivers and streams impact negatively on aquatic biodiversity. In Zambia for instance young *Tilapia* fish species can not survive in the water in the Kafue River around the mining area⁶⁷.

3.5.3. Impacts of Mining on Land

Irrespective of the kind of mining employed for extracting copper, mining always results in mammoth land disturbance which encompass large scale excavation, “removal of top soil, dumping of solid wastes, cutting of roads and creation of derelict land”⁶⁸. As noted by MMSD (2002) the waste generated as a result of mining has the long-term effect of reducing the overall land productivity. Thus productive land which ideally could have been used for other economic enhancing sectors like agriculture is rendered unproductive.

3.5.5. Biodiversity and habitat loss

Mining operations impacts negatively on the biological diversity of the area as the operations involve clearing of vegetation and topsoil which can lead to accelerated desertification⁶⁹. Vegetation removal on the other hand, alters the availability of food and shelter for wildlife. Consequently, mining operations bring about habitat loss and fragmentation for animals. On a broader scale however, mining has the capacity to impact negatively on biodiversity by altering species composition and structure. For instance acid drainage and high metal concentrations in rivers generally result in an impoverished aquatic environment⁷⁰.

3.6. Mining and health

Stephens and Ahern (2001:13) noted that mineral mining is one of the most difficult, “dirty and hazardous occupations which cause more fatalities than any other occupations” for mining operations impact on the health of the local communities living around the mining areas at various levels. Local communities get exposed through air, water, soil and noise pollution and these directly or indirectly impacts on their health. In some studies conducted, Blot and Fraumeni (1975) showed that average mortality-rates from lung cancer for both males and females in the United States of America (USA) were significantly increased in the region with copper, lead, or zinc smelting and refining industries. Furthermore, exposure to copper has been associated with nonmalignant respiratory disease mortality rates in men on the other hand, lung and thoracic mortality in people living in copper mining regions has been noted.⁷¹

3.7. Mining and local people

Even when mineral development results in national economic growth, the benefits are not always equitably shared, and local communities closest to the source of mineral development suffer the most⁷². In some cases, mining has provided jobs in otherwise economically marginal areas. However, typically these jobs are

⁶⁷ ECZ, *State of Environment in Zambia 2000, 2001*, Page 94

⁶⁸ Singh, G., *Environmental Issues with best Management Practice of Coal Mining in India*

⁶⁹ *Mining, Minerals, and Sustainable Development, Breaking New Ground, 2002, Page 260*

⁷⁰ Appendix 2: *Environmental and Social Impacts of Mining*,

http://pdf.wri.org/mining_background_literature_review.pdf Accessed: 01/02/08

⁷¹ U.S. Department of Health and Human Services, *Health Consultation: Copper Basin Mining District Copperhill, Polk County, Tennessee*, 2005

⁷² *Mining, Minerals, and Sustainable Development, Breaking New Ground, 2002*

limited in number and duration⁷³. Mining development tends to hoist wage levels for their employees, leading to displacement of some community residents and existing businesses which fail to meet up with the mines⁷⁴. Additionally, mining may also trigger indirect negative social impacts, such as alcoholism, prostitution, and sexually transmitted diseases⁷⁵.

Mining brings about in-migration which is the major cause of disruption to social relationships and cultural identity around mining regions. Migration is possibly the most devastating of all the effects of large-scale mining on social relationships as this make local community to go from being relatively coherent and stable to a situation where local people feel they are in a minority⁷⁶.

CHAPTER FOUR

4.0. Copper Mining -The Case Study of Zambia

4.1. Background on the Copper mining industry in Zambia

The Copperbelt Province lies on the DRC border which is on the North-Western side of Zambia. The Province is 144 km long and 48 km wide in size and is the hub of the country's economy⁷⁷. The Province has a population of 1.6million based on the last population census conducted in 2000; standing as the province with the highest population in terms of population by province in the country⁷⁸.

Copper mining on the Copperbelt Province was initiated by private mining companies following the discovery of copper ore deposits in the late 1920's and ever since then copper mining has been a significant economic activity in Zambia. By the time the country gained its independence in 1964, copper mining was the heart of the country's economy and a dominant force in shaping the Copperbelt Province. Copper mining brought about the establishment of the mining towns which drew workers from rural areas in search of jobs and access to housing, infrastructure and a variety of social amenities⁷⁹. Consequently, the mining sector was the second largest employer after the government, and generated about 85% of foreign exchange earnings⁸⁰.

In 1973 the Zambian government embarked on the nationalization of the mining sector, which saw the birth of the state-owned Zambia Consolidated Copper Mines (ZCCM) in 1982. However, upon change of government in 1991, the new government yet again embarked on the privatization of ZCCM assets as separate entities under the structural adjustment programme (SAP)⁸¹. It was envisaged that privatization of ZCCM would boost the competence of the mining industry and draw foreign investment to Zambia. It was

⁷³ Redwood, J, *World Bank Approaches to the Brazilian Amazon, The Bumpy Road Towards Sustainable Development*, 2002

⁷⁴ Kuyek, J and Coumans, C, *No Rock Unturned: Revitalizing the Economies of Mining Dependent Communities*, 2003

⁷⁵ Appendix 2: *Environmental and Social Impacts of Mining*,

http://pdf.wri.org/mining_background_literature_review.pdf Accessed: 01/02/08

⁷⁶ Banks, G, *Resources and Conflict in the Asian Pacific Region: Linking Resources and Conflict the Melanesians way*, 2005

⁷⁷ Siachoono, S.,M, *Guide to the Copperbelt*, 2003, page 2

⁷⁸ Central Statistics Office, *Main Zambia Census Report, Vol. 10. 2003*

⁷⁹ The World Bank, *Copperbelt Environmental Project, Lusaka, Zambia, 2003*

⁸⁰ *Ibid.*,

⁸¹ Siachoono, S.,M, *Guide to the Copperbelt*, 2003, page 2

further envisioned that the privatization of ZCCM would mark the turning point in Zambia's economic reform, providing the foundation for improved environmental organization and economic growth⁸². Thus ZCCM was transformed into an investment holding company, ZCCM-IH, which became a minority shareholder with a 10-20% share in the privatized mining firms⁸³.

4.2. Review of the Mining policy

A new Mining Act was put in place in 1995 which repealed the 1971 Act. The key elements of the Act are the provision for the privatization of the mines which brought about the privatization of ZCCM, the liberalization of the fiscal policy and the provision of several tax concessions to mining companies. The main aims of the Mining Policy as enshrined in the Mines and Minerals Act chapter 213 of the Laws of Zambia are as follows;

- ❖ To increase private sector participation in copper production and export and to encourage private sector initiative in the development of new mines in order to boost and diversify mineral and mineral-based products and exports. The idea is to maximize the long term economic benefits for Zambia.
- ❖ To reduce the threat of environmental damage arising from mining activities in addition to damage to the health of workers and local people living in the vicinity of the mines through air, land and water.
- ❖ To encourage the local processing of primary mineral materials into finished products for added value.

The enactment of the act was mainly aimed at attracting private sector investment in exploration and development of new mines. In addition, the Act is also aimed at encouraging cost-effective management and greater exploitation of the enormous copper resources⁸⁴.

4.3. Tax regime and incentives for copper mining companies

The investors operating the mining companies in Zambia entered into Concession Agreement with the government. The agreements enable the investors to exploit natural resources (copper) in exchange of payment of royalties⁸⁵. Currently, mining companies exporting copper are taxed between 20-35% and 0.6-2% in corporate tax and mineral royalties respectively based on how much the owners of the mining companies negotiated for with government in their agreements⁸⁶. However, government has increased both the income tax and mineral royalty to 47% and 3% respectively in order for the Zambia people to benefit from their mineral resources, it is envisioned⁸⁷, a move which was rejected by the mining companies⁸⁸ and

⁸²The World Bank, *Copperbelt Environmental Project, Lusaka, Zambia, 2003*

⁸³*Ibid.*,

⁸⁴Ministry of Mines and Mineral Development., *Zambia: Investment Opportunities in the Mining industry*

⁸⁵Cotula, L. *Strengthening Citizens' Oversight of Foreign Investment: Investment Law and Sustainable Development, 2007*

⁸⁶*Ibid.*,

⁸⁷Mulenga, N. (2008) *Mineral tax revision more than timely, Times of Zambia, Thursday, January 24, 2008, p.1.*

⁸⁸Mulowa, A, (2008) *Mines reject tax regime, Times of Zambia, Tuesday, February 12, 2008, p.1.*

even threatened to sue government⁸⁹. The mining companies on the other hand enjoy tax relief for any investment made in mining and prospecting thus are exempted from customs duties on machinery and equipment for lengthy periods of up to 20 years.

4.4. Regulatory Framework for Environmental Management in the Mining Sector

Not much concern was directed towards environmental impacts of copper mining activities in Zambia prior to 1980 thus environmental degradation and pollution, and their associated impacts on public health and ecosystem functions, were deemed to be an acceptable trade off given the economic benefits afforded by the mines⁹⁰. However, this trend changed as civil society and government became progressively more conscious of the necessity of extenuating the long term environmental impacts as a result of the mining activities so as to ensure that the quality of life of the people is maintained. Meanwhile, the poor economic performance of the mining sector in the 1980's and 1990's did not help matters and this led to an increasingly derisory management of environmental issues arising from copper mining activities. Suffice to say the institutions mandated with this responsibility did not receive much support in terms of financial and human resources. Consequently, an enormous “environmental mortgage” ensued that required to be dealt with once the mines were privatized⁹¹ which led to the enactment of the Environmental Protection and Pollution Control Act of 1990 (CAP 204) which is the primary environmental legislation in Zambia⁹². Some of the other environmental regulations which pertain to copper mining are in place and these include the Environmental Impact Assessment Regulations (EIAR) of 1997. However, these have not been successful thus; certain projects have been allowed to operate based primarily on the financial benefits the project will make as opposed to the environmental and social impacts because the focus is still on creating wealth for the country.

4.5. Stakeholder identification and analysis

The copper mining industry has many stakeholders. A stakeholder is defined as “any individual or group who affects or is affected by the organization and its processes, activities and functioning”⁹³. Meanwhile, based on their involvement in the copper mining industry, stakeholders can be categorized as primary and secondary stakeholders with primary stakeholders being, those people and institutions that affect and are affected directly while secondary stakeholders represent those indirectly impacted upon⁹⁴.

Many stakeholders have been identified due to the complexity of the industry in that so many people as well as institutions rely on the copper mining industry in one way or the other. A diversity of stakeholders raises the challenge of incorporating their diverse interests as all may have a vital role to play in the governance of

⁸⁹ Chileshe, R., *Mine owners threatens to sue Government*, Zambia Daily Mail, Monday, February 11, 2008, p. 2.

⁹⁰ The World Bank, *Copperbelt Environmental Project*, Lusaka, Zambia, 2003

⁹¹ *Ibid.*,

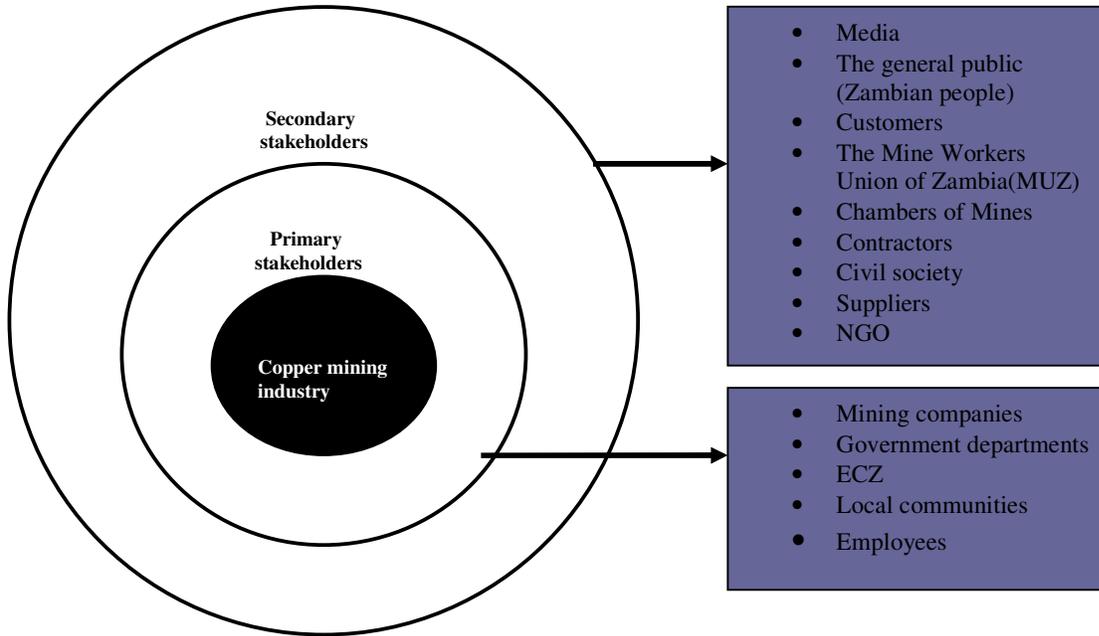
⁹² Scott Wilson Piésold Zambia Ltd, ZCCM Investments Holdings PLC Copperbelt Environmental Project Counterpart Environmental Management Plan, Volume 1, 2003

⁹³ Carroll, A. B. and Näsi, J. (1997) *Understanding Stakeholder Thinking: Themes from a Finnish Conference*

⁹⁴ *Social Issues in Fisheries : Stakeholder Analysis*, <http://www.fao.org/docrep/003/W8623E/w8623e05.htm#b1-4.1%20Stakeholder%20analysis> Accessed: 12/03/08

the mining industry to ensure sustainable outcomes⁹⁵. Figure 2 depicts the identified primary and secondary stakeholders in the copper mining industry in Zambia.

Figure 2: Depicting the identified primary and secondary stakeholders in the copper mining industry in Zambia



4.5.1. Primary Stakeholders

Primary stakeholders, identified include those stakeholders that have a stake and role in the copper mining through policy, by being directly concerned with its different facets. These stakeholders comprise implementers of the policies, key environmental institutions, and policy formulators. On the other hand there are those stakeholders who are impacted upon by the mining operations either economically and socially. Table 1 presents a detailed description of some of the identified primary stakeholders and their effects and stakes in the copper mining industry in Zambia.

⁹⁵ Sharma, S. and Starik, M. (eds) Stakeholders, the Environment and Society. 2004. Page 1

Table 1: Primary stakeholder associated with the copper mining industry and their stakes

Stakeholder	Concerns/Roles	Effects
Mining companies/investors	<ul style="list-style-type: none"> • Receive satisfactory returns on their investments • Increase copper production for maximum returns 	<ul style="list-style-type: none"> • Their operations pollute water, land, air • Contribute to economic growth of the country and areas of operations through taxes, royalties and permits
Government Institutions (Ministry of Mines and Development, Ministry of Finance, Ministry Tourism, Environment and Natural Resources)	<ul style="list-style-type: none"> • Make contractual arrangements with investors • Sets the mining policy directives of Zambia in compliance with international regulations • Manage the copper mining industry in the country • Raise revenues through taxes • Promote national economic development • Allocate resources realized from copper • Ensure that environment integrity is maintained by the mining companies • Issuing of regulations, licenses, and permits to the mining companies. 	<ul style="list-style-type: none"> • Failure to enforce and ensure compliance has contributed to environmental degradation • The mining policy in place and how resources from copper mining is used contribute to the economic growth of the country
ECZ	<ul style="list-style-type: none"> • Issuing environmental standards • Mandated to regulate and coordinate environmental management • Promote public awareness and ensure environmental protection • Ensure compliance with laid down environmental standards by the mining companies • Enforce the environmental standards set 	<ul style="list-style-type: none"> • Their failure to enforce and ensure compliance by the mining companies has exuberated the situation
Employees	<ul style="list-style-type: none"> • Rely on the copper mining industry for their livelihood 	<ul style="list-style-type: none"> • Form an integral part of copper production through selling their labor to the mines
Local authority and Community	<ul style="list-style-type: none"> • Rely on the copper mining industry for employment and other social support services • Rely on the mining companies to develop their communities 	<ul style="list-style-type: none"> • Mining operations through air, water and land pollution impacts on their health • Get dislocated to accommodate the mines

Despite the identified stakeholders in the copper mining industry, their identified economic, social and environmental concerns/roles and effects there is the problem of who hold the deciding power, what this implies is that local people do not have much of a say in the way the resources from copper mining is used and how environmental issues arising from copper mining are dealt with. Notwithstanding this, local people are not part of the contract making process thus rely on government to address their concerns.

4.5.2. Secondary stakeholders.

Secondary stakeholders identified essentially include those representing group interests thus their participation is to ensure that the interests of the groups they represent are properly taken into account and these stakeholders include the Chamber of Mines, Mine Workers Union, suppliers, NGOs and civil society as shown in figure 2. On the other hand, some of these stakeholders like civil society and NGOs serve as advocates by pressing government and the mining companies to act thereby protecting the social values of the people and the environment typical example is the role NGO played in ensuring government rejected genetically modified corn donated to Zambia by The United States of America⁹⁶. These essentially lobby government and the mining companies on behalf of the environment and the general public. Equally important stakeholders are the media which keep the public informed on all issues relevant to their health, well-being, economic and environmental status; these principally act to monitor the operations of the mines⁹⁷. However, the media turns to be biased with government institutions reporting on what is palatable from government's perspective while the independent media seems to play a much more balanced role in informing the public. The Mine Workers Union of Zambia's role is to advocate for fair wages for their members and to ensure that the mine workers work in a safe and comfortable environment, nevertheless their power is limited on how much they can influence the mines and sometimes their own interest take precedence over the workers.

CHAPTER FIVE

5.0. Results from the Case Study and Analysis

5.1. Sustainability Assessment from the case study

Worldwide, mining faces sustainability challenges in trying to strike a balance between economic benefits, social wellbeing of the people and environmental integrity as they seek to increase their foreign exchange earnings and meet the ever increasing demand for the raw materials. "Global refined copper consumption has been on an increase for instance the demand augmented from 16.9 million tonnes in 2005 to 17.5 million tonnes in 2006, representing an increase of 3.5%. The increase has been driven principally by the demand from the construction and power sectors in Asia, and Western Europe and these together accounts for nearly 72% of global refined copper consumption"⁹⁸.

Paradoxically, research has shown that many countries rich in mineral and oil wealth are economic losers⁹⁹, Zambia inclusive as exploration of the natural resources does not benefit either the national economy or the local people living in these mining areas. On the other hand local people are faced with social and environmental sustainability issues as well as economic deprivation.

⁹⁶ Porcher L. Taylor, P. L. et al *Helping Africa Achieve Millennium Development Goal 1: A Hyperbole-Free US Genetically Modified Food Aid Policy*, 2007

⁹⁷ McCombs, M. *The Agenda-Setting Role of the Mass Media in the Shaping of Public Opinion*, <http://sticerd.lse.ac.uk/dps/extra/McCombs.pdf> Accessed: 07/04/08

⁹⁸ Vedanta Resources Plc, *Preliminary Results for the Year Ended 31 March 2007*, 2007

⁹⁹ Murshed, M, S, *When does natural resources abundant lead to a curse?*, 2004

As rightly put by the Commission on Sustainable Development “indicators can provide a crucial guidance for decision making, as they help to gauge and assess progress towards sustainable development goals”¹⁰⁰ and these indicators discussed henceforth will form the basis for the policy recommendations to be put forward.

This part of the study takes a critical analysis of the contribution of copper mining in Zambia to the Copperbelt Province and the country as a whole and seeks to assess to what extent the mines have been a blessing/curse to the people on the Copperbelt and Zambia in general. In order to do this, the economic contribution of the mines is analyzed based on the copper production and its contribution to national GDP, and the contribution of the mining companies to the employment sector of the country.

Environmental impacts of the mines are also analyzed with regard to the impact on land in which waste generation will be used to establish the extent of the damage of the mines to land which could otherwise be used for other developmental projects like agriculture. This section of the study also looks at the impacts of copper mining on aquatic life and air and these are analyzed in order to get a full picture of the effects of the mines on the environment. The social dimension of the mines is assessed through the impacts of the mines on the social support system of the local people. A look at the human development profile of Zambia is thus imperative in order to get a clear picture of the situation on the ground.

5.2. Human development profile of Zambia

Though the country is rich in copper mineral resources which account for more than 60% of the country’s foreign exchange earnings the country is faced with high poverty levels and declining life expectancy. On the other hand unemployment, environmental degradation, lack of access to health care are among other negative human development indications (table 2). In fact, despite the rich endowment of natural resources, according to the United Nations rankings, Zambia is ranked as one of the worlds 20th Least Developed Countries (LDCs) and 165th out of 177 countries with a Human Development Index (HDI) of 0.434¹⁰¹. The Republic of Zambia, under the Ministry of finance and Economic Development, Interim Poverty Reduction Strategy Paper report of 2000 stated that 53.2% and 57.9% of Zambians were living in extreme poverty in 1996 and 1998 respectively.

¹⁰⁰ CSD Theme Indicator Framework from 2001. http://www.un.org/esa/sustdev/natlinfo/indicators/isdms2001/table_4.htm
Accessed: 04/03/08

¹⁰¹ UNDP Development Report 2007/2008, <http://hdr.undp.org/en/>

Table 2: Key selected human development

Indicators for Zambia

The general pattern of poverty trends has shown an increase in overall poverty and a very marginal decline in extreme poverty. On the other hand the country's life expectancy is on the decline which has been worsened by the HIV/AIDS pandemic with life expectancy for both men and women being 38 years while unemployment levels have gone up as currently Zambia's unemployment rate stands at 70%¹⁰².

Indicators and period	
Life expectancy at birth, annual estimates. 2005	40.5
Adult literacy rate % aged 15 and older) 2005	68
GDP per capita PPP US\$) 2005	1,023
Employment, total (thousands) 2005	3,530
Population not using improved water Source (%) 2004	42
Population living below \$1 a day (%) 2005	63.8
Population living below \$2 a day (%) 2005	87.2
Population living below the national Poverty line (%)_2004	68.0

Source: Created from UNDP Human Development Report 2007/2008

5.3. Economic contribution of the mining industry

Economic indicators used to assess the contribution of copper mining companies include: the contribution of the mineral industry to national GDP, its contribution to the employment sector in Zambia, the generation of government revenue, and infrastructure development. To begin with, a critical look at the contribution of the copper mining industry to Direct Foreign Investment (DFI) in Zambia is vital in order to get a picture on how much investment the industry attracts to Zambia.

5.3.1. Direct Foreign Investment Inflows

The liberalization of the Zambian economy in the 1990s brought about an increase in DFI particularly through the mining sector. DFI inflows increased considerably reaching \$334 million in 2004 representing 11.7% increase¹⁰³. The boom in the mining sector after the privatization of ZCCM has been a particularly strong force in the country's recent growth and increased DFI inflows. All in all, DFI has been concentrated in the copper mining sector and the sector attracted more than half the DFI inflows into the country¹⁰⁴. FDI inflow has brought into the country the much needed technology and know-how thus mining companies are looking at options of increasing their copper production and also exploring other avenues.

¹⁰² New Zambia: Economic reflections for a new and better Zambia. <http://zambian-economist.blogspot.com/2007/04/addressing-challenges-of-our.html> Accessed : 29/01/08

¹⁰³ United Nations Conference on Trade and Development, Investment Policy Review Zambia, 2006

¹⁰⁴ Ibid.,

5.3.2. The mining companies and copper production

In order to understand and get acquainted with the industry under review it is imperative to look at the ownership structures, location and duration of operation of the mining companies in Zambia (table 3).

Table 3: Showing the copper mining companies operating on the Copperbelt Province

Mining company	Ownership	Location on the Copperbelt	How long they have been operating in Zambia
KCM	British/Indian company, Vedanta and ZCCM-IH	Chingola and Chililabombwe	2000-2004
MCM	Glencore, First Quantum Minerals(Canadian) and ZCCM-IH	Kitwe and Mufulira	2000
Mbwana Mkubwa	First Quantum(Canadian)	Ndola	1998
Luanshya Mine	J&W/Enya (Switzerland)	Luanshya	1997
Chambishi	China Non-Ferrous Metal Industries (China).	Chambishi	1998
Chibuluma	Miranda Mine Limited, Junior mining companies (South Africa); Crew Development Corporation, (Canadian), Genbel Limited (Australia).		1997

Source: Zambia Privatization Agency, 2006

These companies represent the six major mining companies of which KCM is the largest followed by MCM operating on the Copperbelt.

As depicted in Table 4 below, copper production in Zambia has generally been on an increase with all the mines experiencing an increase in production. However, setbacks experienced during the years under review affecting some of the mining companies were adduced to these mines' experiencing flooding and workers unrest which pulled back their production targets¹⁰⁵.

Table 4: Copper production between 2002 and 2007 in tonnes for four major mining companies

Mining Company	2002	2003	2004	2005	2006	2007	% increase
KCM	222 010	187 500	191 700	163,604	231000	196000	-11.71
MCM	94 339	134 800	160 600	132,719	135000	250000	165
Bwana Mkubwa ¹⁰⁶	11878	29513	41546	49538	51068	54750	361
Chibuluma	7,373	5,300	4,450	4 400	7 700	15400 ¹⁰⁷	109

Sources: First Quantum Minerals, 2006, Martin Broome, M, Mbwana Mkubwa Mining Limited in Brief, Ministry of Mines and Mineral development, and Vedanta Resources Plc, 2007

All the mining companies reviewed had experienced tremendous increase in copper production except for KCM that experienced a decline of 11% and this is partly attributed to the flooding and workers unrest which

¹⁰⁵Shacinda, S. UPDATE 1-Zambia y/y copper output down 6 pct to August 2007
<http://www.reuters.com/article/companyNewsAndPR/idUSL075742120071107?pageNumber=2&virtualBrandChannel=0&sp=true>
 Accessed: 01/05/08

¹⁰⁶ First Quantum Minerals, 2006

¹⁰⁷ Based on company projection

impacted on the company's production¹⁰⁸. Nevertheless, MCM, Mbwana Mkubwa and Chibuluma experienced an increase in production in 2007 from 2002 of 165%, 361% and 109% respectively.

Table 5 presents the total copper production in Zambia in order to get a clear perspective on the increase in copper production.

Table 5: Copper production in Zambia for the period 2002-2007

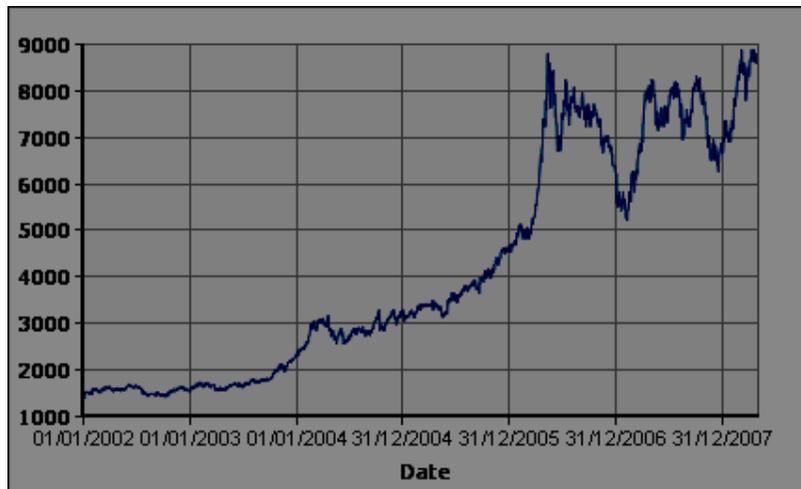
Copper production in Zambia from 2002 to 2007 represents a 55% increase and this coupled with the increase in copper prices on the London Metal Exchange (LME) which increased from about \$1800 in 2002 to \$6500/ton in 2007¹⁰⁹ of grade A copper which is mined in Zambia means that there is a corresponding increase in the revenue made from the sales

Year	Production(tonnes)
2002	337 400
2003	349 800
2004	409 500
2005	445 600
2006	515 618
2007	523 435

Source: CSO and National Budget, 2008

Copper prices have experienced the highest increase of more than 200% from 2002¹¹⁰ (figure 3) due to the increased demand for the raw material. Recording the highest market price for copper in almost a decade of more than US\$8000/ton¹¹¹ and this record price has been due to the demand on copper coming from mainly Asia and Western Europe¹¹².

Figure 3: Copper prices per ton in dollars



Source: Created from LME, 2008¹¹³

¹⁰⁸ Shacinda, S. UPDATE 1-Zambia y/y copper output down 6 pct to August 2007
<http://www.reuters.com/article/companyNewsAndPR/idUSL075742120071107?pageNumber=2&virtualBrandChannel=0&sp=true>
 Accessed: 01/05/08

¹⁰⁹ LME, http://www.lme.co.uk/copper_graphs.asp, Accessed: 24/02/08

¹¹⁰ Ibid.,

¹¹¹ Ibid.,

¹¹² Ndulo, M and Mudenda, D, Trade Policy Reform and Adjustment in Zambia, 2004

¹¹³ Ibid.,

The increase (55%) in copper production coupled with the increase in copper prices means that the mining companies are making profits and that the money accruing to the Zambian government from the mines should inline with this increase be on the rise. With this increase in the revenues collected it can therefore be expected that economically the country should be experiencing an improvement in the lives of the people. However this is not so in Zambia as the country's profile presented earlier shows that poverty levels are high, with more than 50% living below poverty lines and lacking access to safe drinking water not to mention safe sanitation¹¹⁴. The question that arise is where does this resources go and who are the beneficiaries? One thing is clear that the mines have been making profits from copper. To further analyze the contribution of copper mining to government revenues a look at the contribution of copper mining to national GDP necessary.

5.3.3. Contribution of the mining sector to national GDP and generation of Government Revenue

It is paramount to look at the contribution of the mining companies to the national GDP so as to get a clearer picture of the economic contribution of copper mining. Table 6 presents the percentage contribution of the mining sector to national GDP for the last six years.

Table 6: Percentage contribution of mining sector to national GDP between 2002 and 2007

Activity	2002	2003	2004	2005	2006	2007
% Contribution to GDP	7.9	7.7	8.4	8.6	8.7	8.0
% Contribution to foreign exchange earnings	61.9	58.0	52.1	63.6	70.4	70.0

Source: CSO, 2006&2007, Chamber of Mines and Government of Zambia, 2006

The contribution of the mining sector to GDP has generally been increasing marginally. It increased from 7.9 % in 2002 to 8.0% in 2007 representing a 1.3% increase. When this contribution to GDP is compared with the increase in copper production which has come about after the privatization of ZCCM in line with government vision of increased production and the copper prices prevailing on the LME at the moment these do not seem to correlate. In 2007 the contribution of the mining industry to GDP went down by 0.7% on the other hand the foreign exchange earnings for 2007 went up to \$3.404billion from \$2.323billion in 2006. The reasons for the decline could be adduced to mismanagement of foreign exchange earnings from copper, through diversion of funds, as well as corruption with Zambia scoring 2.7 on the CPI, a score which indicates that corruption is rampant¹¹⁵. On the other hand the percentage contribution of copper mining to foreign exchange earnings stood at 70.4% in 2006 to which revenue of \$2.323billion was made; however, only 8.7% about \$202million went to government coffers¹¹⁶. If the industry is doing so well and contributing more than 60% to foreign exchange earnings yet only 8% actually goes into government coffers, the question that arises is, where does the money go? For instance, in the 2007 financial year, the copper mining companies earned

¹¹⁴ UNDP, Human development Reports- Zambia: The Human Development Index - going beyond income. http://hdrstats.undp.org/countries/country_fact_sheets/cty_fs_ZMB.html Accessed: 23/12/07

¹¹⁵ Corruption Perception Index Regional Highlights for 2007: Africa. <http://www.transparencia.org.es/INDICE%20DE%20PERCEPCI%C3%93N%202007/Africa.pdf> Accessed: 27/03/08

¹¹⁶ CSO Zambia, Bulletin, 2006

close to US\$4 billion representing 70% contribution to foreign exchange earnings but paid just over US\$150 million in taxes¹¹⁷. Where has the country gone wrong? At this point it might help to explain the paradox.

Government collects revenue from the mining companies as corporate income tax and royalties which are meant to increase government revenues. The Zambia government has been charging the mining companies very low mineral royalties of 0.6% -2%and 25% -35%corporate tax which are said to be the lowest in the world¹¹⁸. This has resulted in low earnings from copper mining by the country, with most profits being sent outside the country. And this, it could be speculated could be attributed partly to poor bargaining power and corruption on the part of government, contractual arrangement, and corporate manipulation. On the other hand the mining companies are still carrying over losses even when they are making profits thus pay nothing on corporate tax¹¹⁹. The benefits which the mine owners negotiated for during the negotiation process with government. On the other hand, the mines enjoy a 100% tax relief (table 7) on equipment thus do not contribute to custom duty charges for bringing into the country their mining equipment and this gain was negotiated for by the mine owners.

Table 7: Tax rate negotiated in their development agreements

Mine	Corporate tax rate	Mineral royalty tax rate	Provision of carry-over losses	Provision for capital investment deductions (%)
KCM	25	0.6	Can carry forward losses	100
MCM	25	0.6	Can carry forward losses	100
Chambishi	35	0.6	Can carry forward losses	100

Source: Ministry of Finance

During the privatization process, many mining companies were able to negotiate for very minimal tax incentives. The consequence of this has been the mining companies pocketing huge profits (close to US\$4 billion)¹²⁰ while returning very little in the country as the government do not impose restrictions on how much money is externalized. On the other hand it is worth noting that despite the boom in copper production, the benefits of this have not been felt by the local people and the nation as evidenced by the country's human development indicators with 87.2% of the population living on less than US\$2 a day while more than 50% live below the nation poverty line¹²¹and the marginal contribution to national GDP.

The weak bargaining power exhibited by the Zambian government seen in the above figures reveals the fact that Zambia as a developing country is very much enmeshed in the international capitalist exploitation through

¹¹⁷ Mulenga, K, 2008, UK backs new mining tax. *Zambia Daily Mail*. Tuesday February12, 2008

¹¹⁸ *Action for Southern Africa (ACT SA)* , *Christian Aid and, Scotland's agency(SCIAF)*, *Undermining development: copper mining in Zambia, 2007*

¹¹⁹ *Interview with MCM employee(chose to remain anonymous)*

¹²⁰ Mulenga, K, 2008, UK backs new mining tax. *Zambia Daily Mail*, Tuesday February12, 2008

¹²¹ UNDP, *Human development Reports- Zambia: The Human Development Index - going beyond income*
http://hdrstats.undp.org/countries/country_fact_sheets/cty_fs_ZMB.html Accessed: 12/04/08

the agents of MNCs operating in Zambia and this by every extenuating submission goes a long way to determine the levels of poverty in the country. This submission strengthens the supposition of the theoretical framework of this study as shown in the radical dependency theory above.

5.3.4. Contribution of the mining industry to the employment sector in Zambia

Copper mining in Zambia is a source of both direct and indirect employment on the Copperbelt Province and Zambia in general (table 8).

Table 8: Number of employees in employment in the mining companies

Mining Company	Permanent employees	Employees on contract	Suppliers and contractors
KCM	10000	4000	NA
MCM	9276	643	1631
Mbwana Mkubwa	763	17	683
Chambishi	52	2148	NA
Luanshya	3000	NA	NA
Chibuluma	550	NA	NA

Sources: Field survey, 2008 and annual reports for the mining companies

Since the privatization of the mining sector in 2000 copper mining activities has been on an increase and this has seen new mining companies coming in and the number of employees increasing. However, the casualization of the labor force in some mines notably Chambishi Mine which has only 52 employees on permanent basis while 2148 are employed on contracts¹²². This kind of set up deprives the employees of the mine benefits while the company is not liable to paying them any benefits and saves money this way. On the other hand, KCM employs about 14,000 employees of which 4000(26%) are on contracts without a pensionable income.¹²³

Further evidence on the casualization of workers by the mines was given by an interviewee,

*...i work long hours yet they (mining companies) pay us peanuts and we can not afford to send our children to school. Even when am sick I have to force myself to come for work because they will not pay me if I don't work since am a casual...*¹²⁴

Table 9 presents the total number of employees employed by all the mining companies for the stated period and their corresponding percentage contribution to national employment. Generally the number of people employed in the mines has been increasing at a very minimal rate, representing a 0.9% increase from 2000 to 2007. However the country has experienced an increase in the number of employees in other sectors like manufacturing and tourism. It is worth noting that some mining companies are embarking on expansion projects notably KCM has embarked on the Konkola Deep Mining Project (KDMP) which is expected to increase the company's copper production and employ 6000 more people by the year 2010¹²⁵. Though the mines are contributing to the employed labor force through direct and indirect employment of mine workers,

¹²² Interview with Chambishi Mine employee (chose to remain anonymous)

¹²³ Vadanta, Konkola Copper Mines Plc, 2007

¹²⁴ Interview with Chambishi Mine employee (chose to remain anonymous)

¹²⁵ The Business Post, Corporate social responsibility: is KCM living up to the challenge?, 2006

contractors and suppliers; however, these jobs are limited to the life span of the copper resources. This situation accounts for the cyclical unemployment common on the Copperbelt. The words of an interviewee are quite revealing:

...this is the third mine and third company I have been working in the past 19 years...they (mining companies) stop us immediately they feel they do not need our services, and we have to wait to see a company that is ready to employ us again...¹²⁶

Considering the high unemployment levels estimated at over 70% in the country¹²⁷, the contribution made by the mines can not go unnoticed. On the other hand with the high DFI flowing into the mining sector, mining companies are looking at options of extending the life span of the mines. A move which is set to ensure the local people sustained employment.

Table 9: Percentage contribution of the mines to the employment sector in Zambia

Year	No. of Employees	Total employed people in formal employment	% contribution of the mines to national employment
2000	35, 355	476,347	7.422
2001	34, 275	475,316	7.211
2002	32, 040	429,406	7.461
2003	30, 961	416,804	7.428
2004	31, 151	416,099	7.486
2007	35, 108	462,000	7.599

Source: CSO, IMF, 2006 and Youth Development Network¹²⁸

With the coming of privatization, the mines laid off a number of workers as they felt that the mines were over staffed thus there was a decrease in the total contribution of the mines to the employment sector in the country. The increase in employment figures between 2004 and 2007 is mainly on account of increased mining activities. Thus it can not go unmentioned that the mines in Zambia are one of the major employers and their contribution to employment sector is invaluable considering the high unemployment levels in the country.

On the other hand as earlier alluded to in chapter 3 mineral resources abundance has the potential to draw capital and labor that could otherwise be utilized by other economic enhancing sectors¹²⁹. As observed on the Copperbelt, copper mining employees 75% of the total employed population thus only 25% are employed in other sectors¹³⁰. This implies that the boom being experienced has the potential to collapse these sectors as all resources are drawn into the mining sector.

¹²⁶ Interview with KCM employee (chose to remain anonymous)

¹²⁷ *New Zambia: Economic reflections for a new and better Zambia.* <http://zambian-economist.blogspot.com/2007/04/addressing-challenges-of-our.html> Accessed : 29/01/08

¹²⁸ *Zambia - Final Country Report, Youth Development Network,*

¹²⁹ Sachs., D, J., and Warner., A, M., *Natural Resource Abundant and Economic Growth, 1997*

¹³⁰ *Action for Southern Africa (ACTSA) et al. (2007) Undermining development? Copper mining in Zambia*

5.3.5. Community development projects and infrastructure development

The copper mining companies are at the center of local community development; in all the towns where these mining companies are located. It came to light that the mines are involved in various community projects which included school rehabilitation and management, management of hospitals and road rehabilitation programmes in which the mines claimed to have invested millions of dollars.

Furthermore, some mining companies are involved in providing safe drinking water to the residents and with the current situation where only 70% of the urban population has access to safe drinking water; the residents are indebted to the mining companies as was highlighted in the interviews with Copperbelt residents¹³¹. According to Mbwana Mkubwa mine report, the mine is involved in road maintenance and street lighting of Ndola residential areas where the mine is located. Notwithstanding this, the company is also involved in upgrading of school facilities as well as sinking community boreholes to avail the residents with drinking water¹³². It was interesting to note that the company is involved in many community developmental projects of which some include the revamping of the Dag Hammarskjöld Memorial Site as well as renovating of the local police station¹³³.

On the other hand, MCM owns and operate two schools and two hospitals which are mainly intended to serve their employees and the local community. In Luanshya it was noted that the mining company operates a school which they took over from ZCCM after privatization, however, the mine did not take over the running of the hospital which was eventually handed over to government, a move which the residents complained has deteriorated the services provided by the hospital¹³⁴.

KCM has been actively involved in community development projects which include construction of houses, churches, market, clinic, classroom block at an existing school at Kasumbalesa all at an estimated cost of US\$2million¹³⁵.

From investigations from the local residence however, the figures quoted by the companies seems to have been over bloated or perhaps misplaced in terms of priority as infrastructures provided by the companies to the local communities are far too little compared to what they gain from here.

5.3.6. Mining and the local community

Most of all the mining companies on the Copperbelt have projects that are aimed at improving the lives of the people in this mining region.

MCM is actively involved in malaria and HIV/AIDS prevention and treatment programmes in Mufulira and Kitwe. Suffice to say the programmes are mostly targeted at their employees as the majority can not afford to pay for these services.

¹³¹ Walktheirwalk, 2007 Project Goal. http://walktheirwalk.com/2007_details.html Accessed: 26/04/08

¹³² Bwana Mkubwa Mining Limited In Brief, Ndola

¹³³ BwanaMkubwa Mining Limited: Partnership with the Community, Ndola

¹³⁴ Musonda, J, Luanshya resident

¹³⁵ The Business Post, (2006) Corporate social responsibility: is KCM living up to the challenge?, 2006

Mbwana Mkubwa, in Ndola, like MCM, is involved in Malaria control prevention programme in which they are allegedly working in collaboration with the Ndola District Health Management Board¹³⁶. In Zambia, like many other sub-Saharan African countries, malaria and HIV/AIDS are among the diseases that are killing millions of people. Additionally, the company is involved in many community projects through the support of local government departments such as the Zambia Wildlife Authority (ZAWA), the Forestry department and is also involved in sponsorship of sporting clubs for basketball and football¹³⁷.

Thus it goes without saying that copper mining companies are making tremendous strides at improving the lives of the local people in these mining towns and the contribution can not be ignored

5.3.7. Corporate Social Responsibility (CSR) and mining in Zambia

The community projects being developed and implemented by the mining companies on the Copperbelt can be seen as CSR at work, which has been defined by the World Bank as, “the commitment of businesses to contribute to sustainable economic development by working with employees, their families, the local community and society at large to improve their lives in ways that are good for business and for development”¹³⁸. Though CSR programmes may be seen as the promotion of sustainability by the mines through the World Bank definition, on the other hand it can be argued that the overall goal of CSR is to contribute to maximizing the profits for the mining companies. Therefore, projects such as the ones being alleged to be developed and implemented by the mining companies on the Copperbelt are aimed at portraying a good image to their customers and shareholders in a bid to increase the sales and ultimately profits for the mining companies. Pellet (2008) echoes this sentiments when she argues that “companies will invest in ventures that boost their reputation as this is instrumental in boosting sales and attracting investors and strategic partners and that the investment will be high if the company is faced with competition”. In this set up, the copper mining companies are making huge profits which they externalize and the society supposedly benefits through the social programmes therefore, it is a win-win situation. Nonetheless, who really wins? If there are benefits to the local communities through CSR programmes, do these benefits outweigh the environmental degradation and the loss of livelihood as well as the social upheavals inflicted on the people? Corporate watch raises a very interesting argument on CSR, that when companies make investment in community projects such as the investment of US\$2million by KCM into community projects¹³⁹, the money they are giving away is shareholders’ money, and they can only do if they see potential profit in it. Furthermore the community programmes developed and implemented by the mining companies can be argued that these are just strategies employed to divert attention from real issues thus

¹³⁶ *Bwana Mkubwa Mining Limited In Brief, Ndola*

¹³⁷ *Bwana Mkubwa Mining Limited: Partnership with the Community, Ndola*

¹³⁸ *The World Bank, Corporate Social Responsibility, <http://www.ifc.org/ifcext/economics.nsf/Content/CSR-IntroPage> Accessed: 10/05/08*

¹³⁹ *The Business Post, (2006) Corporate social responsibility: is KCM living up to the challenge? 2006*

helping them to avoid regulations¹⁴⁰. Whether CSR in the mines is profit driven or is aimed at the promotion of sustainability is difficult to ascertain.

5.4. Environmental impacts of copper mining on the Copperbelt Province

The three most common and serious problems which came to light during the interviews and literature review conducted are sulphur dioxide emissions from the smelters and heavy-metal effluents being released into water systems. On the other hand waste generation which is part and parcel of the territory can not go unmentioned as it takes up productive pieces of land which could be used for other developmental projects and run the risk of chemical seepage into ground water.

5.4.1. Impacts of the Mines on air quality

Sulphur dioxide (SO₂) emissions from smelters cause human respiratory diseases in addition to acid rain which damages rivers, streams and trees¹⁴¹. Though this may seem purely as an environmental problem, on the other hand SO₂ causes enormous problems for local communities who rely on these resources for their livelihood. This it was observed is a problem for local communities living downwind of the Mufulira and Nkana smelters¹⁴², the smelters which are operated by MCM. Table 10 shows the amounts of SO₂ released into the air from MCM and Mbwana Mkubwa.

Table 10: Amounts of pollutants released into the air by MCM and Mbwana Mkubwa

Mine	Pollutant	Amount released(ton/yr)
Nkana Mine(MCM)	SO ₂	8000
	Dust	Negligible
Mufulira Mine	SO ₂	181000
	Dust	730
Mbwana Mkubwa	SO ₂	274-412
	Dust	Negligible

Source: Field survey, 2008¹⁴³

It came to light during the interviews with Chingola residents that KCM has a problem with SO₂ however, the company has recognized that they have a problem in this area, and are taking measures to reduce emission by up to 80% through installing technology which captures SO₂ and converts it into sulphuric acid which the company then uses in mineral processing¹⁴⁴.

It is apparent as shown in table 10 that the Mufulira Mine has a problem with SO₂ emissions. According to the manager corporate affairs at MCM, 181000t/yr of SO₂ is emitted by the smelter of which 51, 000t/yr is

¹⁴⁰ Corporate Watch. (2006) *What is wrong with Corporate social Responsibility, Corporate Watch Report*

¹⁴¹ Cunningham., M, A and Cunningham, W., P, (3rd Ed)(2006) *Principles of Environmental Science Inquiry and Applications*, Pages220-222

¹⁴² Chibuye, B. Kitwe resident

¹⁴³ *During interviews with MCM Corporate Affairs Manager and Bwana Mkubwa, Environmental Manager*

¹⁴⁴ *Interview with KCM employee (chose to remain anonymous)*

converted into sulphuric acid, a project which was only commissioned in the second half of 2007. Meanwhile, there is still more than 100, 000tonnes of SO₂ which is released into the atmosphere annually and this could prove to be detrimental to the environment and the residents living near the mine. Thus far, only 28% of the total SO₂ is captured and converted into sulphuric acid. Nevertheless MCM claim they have plans of increasing SO₂ conversion this year and highlighted their commitment to developing acid plants at both of their smelters as there is still need to capture the emitted SO₂ and reuse to make sulphuric acid¹⁴⁵. On the other hand, there was no indication by Mbwana Mkubwa of plans of a total capture of SO₂. Also interesting to note is the fact that the company emits zero particulate matter into the atmosphere at their site. On the issue of the SO₂ emissions (274-412t/yr), the company was however quick to highlight their commitment to cleaner copper production as noted by their negligible dust emissions.¹⁴⁶ SO₂ emissions on the Copperbelt was noted as a major environmental issue. The copper smelters emit as much as 300,000 to 700,000t/yr in total of SO₂ which is said to be way too high¹⁴⁷.

5.4.2. Impacts of copper mining on water quality in Zambia

Heavy metal effluents being discharged into rivers that supply drinking water are a serious risk to human health on the Copperbelt, a sentiment expressed by many residents interviewed in the mining towns. The reference point by many Chingola residents which is the home to KCM is the leakage in the pipeline at the tailings leach plant which occurred in 2006 and left the residents of Chingola with no access to safe drinking water as the major river (Kafue river) was highly polluted. During this leakage, it has been reported that the effluents released into the Kafue River raised the chemical concentrations of copper to 1,000% off the acceptable levels of 1.5mg/l, notably also was manganese, whose normal maximum limit is 1.0mg/l, and resulted into 77,000% of this limit., On the other hand cobalt concentrations in the water rose to 10,760% off compliance limit of 1.0mg/l. The result was that the residents of Chingola were cut off from freshwater supplies for six days¹⁴⁸. Some residents of some informal settlements in the area, such as Hippo Pool Township, who do not have access to piped water, and have always drawn their drinking water from the Kafue River were left with no choice but to consume polluted water.

A resident from one of the affected communities lamented,

....we had no choice but to continue drinking water from the river since we can not afford tap water....¹⁴⁹

In some cases where piped water had been cut off, some residents were forced to go directly to the river. In line with environmental regulations, the tailings leach plant was shut down by ECZ and is yet to be reopened, a move which has affected copper production at KCM¹⁵⁰. The poor in Zambia who constitute more

¹⁴⁵ Interview with MCM Corporate Affair Manager

¹⁴⁶ Interview with Mbwana Mkubwa Mine Environmental Manager

¹⁴⁷ The World Bank, Copperbelt Environmental Project, Lusaka, Zambia, 2003

¹⁴⁸ Chansa., M. 2008, KCM pollutes Kafue River. Wednesday, November 8, 2006

¹⁴⁹ Bwalya, P. Hippo Pool resident

¹⁵⁰ Vedanta Resources Plc, Vedanta Resources plc Interim Results for the Six Months Ended 30 September 2006, 2006

than 50% of the Zambian population do not have access to safe drinking water (piped) thus rely on river waters for this most precious essential commodity¹⁵¹. The problem of the leakage also created increased costs for the water supply and sanitation companies that provide water to more formal settlements who also in a bid to cut losses increased the cost of delivering safe piped water to the residents and ultimately the impacts were felt more by the residents who had to bear the costs. The problem of heavy metal discharge into water bodies was brought to light in the interviews in which MCM metal discharged was highlighted (see table 11). This is a problem for most of the companies, particularly MCM and KCM. MCM's spills have created significant problems at both Nkana and Mufulira mines. For the poor majority who can not afford piped water they are forced to consume polluted water¹⁵².

Copper though is a trace element is required by aquatic organisms such as fish for normal growth and metabolism. When biological requirements are exceeded, this metal can become harmful to aquatic life such as fish¹⁵³ and the amounts discharged (5.0-2mg/l) by MCM is above the limits set by ECZ to discharge into aquatic environments which is set at 1.5mg/l¹⁵⁴.

Table 11: Copper concentrations discharged into water Systems by KCM and Mbwana Mkubwa

Mine	Site	Amount/yr (Mg/l)
Mufulira	Main plant site outlet in to Mufulira stream wetland	5.0
	Tailing dam discharge into Mufulira stream	0.2
	Water exiting Mine boundary	0.1
Nkana	Main plant site outlet, North Uchi	2.0
	Mindolo Shaft dewatering water	2.0
	Tailing dam discharge	0.2
Mbwana Mkubwa	Mbwana Mkubwa	Zero discharge

According to the environmental standards set by ECZ, the limit of copper concentrations to be discharged into aquatic environments is 1.5mg/l of which the mining companies are not complying with, for instance MCM discharge amounts as high as 5mg/l which they were quick to state that this goes straight into the wetlands for purification. However the other discharges of 2mg/l which is still higher than the limits goes straight into water systems¹⁵⁵.

Source: Field survey, 2008¹⁵⁶

5.4.3. Impacts of the mines on aquatic life

The ultimate discharge of this heavy metal (copper) is the Kafue River which is one of the major fisheries in Zambia and supports thousands of households whose livelihoods depend on fishing and river bank cultivation of food crops. In addition, it offers a life support to industrial, mining and agriculture sectors¹⁵⁷. The Kafue River is also a source of portable water for approximately 40% of the Zambian population¹⁵⁸.

¹⁵¹ UNDP, Human development Reports- Zambia: The Human Development Index - going beyond income http://hdrstats.undp.org/countries/country_fact_sheets/cty_fs_ZMB.html Accessed: 12/04/08

¹⁵² Mwanza, R. Mufulira resident

¹⁵³ Hellawell, J. M., (1988). Toxic substances in rivers and streams. *Environmental Pollution* 50: 61.85

¹⁵⁴ Government of Zambia, Water Pollution Control (Effluent and Waste Water) Regulations, 1993.

¹⁵⁵ During interview with MCM Corporate Affairs Manager

¹⁵⁶ During interviews with MCM Corporate Affairs Manager and Bwana Mkubwa, Environmental Manager

¹⁵⁷ Kambole, S. M. (2003) *Managing the Water Quality of the Kafue River. Physics and Chemistry of the Earth* 28, p1105-1109

¹⁵⁸ *Ibid.*,

The bioavailability and bioaccumulation of copper in water and sediments facilitates their absorption by fish. It is worth to note that the Kafue Fishery alone accounts for 10% of the total fish produced in Zambia and over 6000 self employed fishermen rely on the river.¹⁵⁹ Research conducted revealed that the concentrations of copper in the Kafue River sediments exceeded that found in other polluted river sediments worldwide with concentrations ranging between 11 028 - 12 855 µg/g dry mass in the mining area¹⁶⁰. One of the ecological consequences of this has been reduced fish stocks in the river(see table 12). It is evidenced from the results presented in table 12 that fish production in the Kafue River has declined by 2.5% between 1996 and 2003 and this could be adduced to reduced fish populations.

Table 12: Annual fish production in metric tones

Year	1996	1997	2002	2003	%change
Production	6293	6479	6316	6137	2.5

Source: Sub-Regional Trade Expansion in Southern Africa: Supply Survey on Zambia's fish and Fish products and Field survey, 2008¹⁶¹

It has been researched that the mortality rate of young juvenile fish is high in highly polluted water with copper and it is reported that young *Tilapia* fish can not live in Kafue River water located in the mining area¹⁶² due to high copper concentrations. It is also worth mentioning that the Kafue River is home to 122 fish species¹⁶³. Zebra fish (*Danio sp*) is one of the fish species found in the Kafue River which is seriously endangered and this has been attributed to changes in the environment by ECZ¹⁶⁴. The hatching rate and mean survival time for Zebra fish in the Kafue River are highly reduced and consequently this has reduced the number of fish species in the river¹⁶⁵ as well as fish landings. In a research conducted it was found that exposure of juvenile rainbow trout fish species to copper concentrations ranging between 0.008 - 8.0 mg/l resulted in 100% mortality rate after 65 days¹⁶⁶ and this concentration falls within the 5mg/l of copper discharged into the water systems by mining companies such as MCM and KCM. Thus the aquatic life run the risk of extinction if this is not checked. It should be noted however that copper concentrations in the water is subject to other physical factors such as rainfall.

¹⁵⁹ Munene, F, *The Kafue Examined: Catching Up* <http://idrinfor.idrc.ca/Archive/ReportsINTRA/pdfs/v12n3e/110755.pdf>
Accessed: 02/04/08

¹⁶⁰ Von der Heyden, J. C., and New, G.M. (2003). *Sediment Chemistry: A History to Mine Contaminant Remediation and Assessment of Processes and Pollution Potential*. *Journal of Geochemical Exploration* 82 (2004); 35- 57

¹⁶¹ Interview with Fisheries Research Officer

¹⁶² ECZ. (2001) *State of the Environment in Zambia 2000*. Lusaka, Zambia page 94

¹⁶³ *Ibid.*,

¹⁶⁴ *Ibid.*, Page 32

¹⁶⁵ *Ibid*

¹⁶⁶ Stasiunaite, P., (2005). *Toxicity of Copper to embryonic development of Rainbow trout (Oncorhynchus mykiss)*

5.4.4. Impacts of the mines in Zambia on land through waste disposal

Mining by its very nature generates a lot of waste,¹⁶⁷ Table 13 below shows the rate of tailings disposal from the mining companies. In order to produce one ton of copper, it is interesting to note that 350 tonnes of unwanted earth material are generated, together with 147 tonnes of tailings and 3 tonnes of slag, therefore illustrating the destructive nature of copper mining¹⁶⁸. This implies that in 2007 alone Zambia produced 523 435 tonnes of copper and this came with 260.15million tonnes of waste. The environmental problem which arises because of the waste is the seepage into groundwater and runoff into water systems and this was brought to light in the interview with Mbwana Mkubwa. All the mining companies operate dumps (table 13) for which they have licenses. However, there is no regular monitoring of these dumps to ensure that seepage into ground water and runoff into water systems is taken care of. Such sentiments were raised by residents in these mining towns. On the other hand, the huge amount of waste from the mines defecate the cities.

Table 13: Some of the tailing dams operated by the mining companies with the amounts of tailings deposited

Mine	Tailings Dam	Monthly tailings Deposition Dry Tonnes(millions)	Annual tailings depositions(Millions tonnes)
Nchanga(KCM)	Muntimpa	1.300	15.6
Konkola(KCM)	Lubengele	0.180	2.16
Mufulira(MCM)	TD11	0.260	3.12
Nkana(MCM)	Musi	0.245	2.94
Luanshya	Mindola 15A	0.230	2.76
Chambishi	Musakashi	0.017	0.204
Mbwana Mkubwa	Bwana Mkubwa	0.585	7.02

Source: Environmental Council of Zambia, 2004

Open-pit mining is carried out at KCM and the mine is the second largest open-pit in the world¹⁶⁹. Open-pit mining has defaced the land in Chingola. On the other hand copper mining has damaged agricultural land and taken up land which could ideally be used for other developmental projects like agriculture. The nature of copper mining is that large tracts of land have to be cleared to accommodate the mines and also waste disposal equally require big pieces of land to accommodate the huge amounts of waste as by-products of the mines. For instance there has been an increase in the land covered by mine waste deposits from 4,289 ha in 1972 to 8,350 ha 2000 and this suffice to say excludes the area covered by the water bodies associated with the deposits¹⁷⁰ and this it can be assumed is increasing considering the expansion projects going on in the different mining companies such as Konkola Deep Mining Project (KDMP) by KCM. It is thus apparent that

¹⁶⁷ World Bank and International Finance Corporation, *Mining and Development: Treasure or Trouble? Mining in Developing Countries*, 2002

¹⁶⁸ Menzie, D., W, *Hearing on Energy and Mineral Requirements for Development of Renewable and Alternative Fuels Used for Transportation and Other Purposes*, 2006

(<http://www.doi.gov/oc/2006/RenewableAndAlternativeFuels.htm>) Accessed: 20/03/08

¹⁶⁹ S.M., Siachoono, *Guide to the Copperbelt*, Page 36

¹⁷⁰ Limpitlaw, D, *Mapping Waste and Environmental Impacts in Zambia with Landsat*, 2003

copper mining does affect other developmental projects like agriculture as land is taken away from local peasants and converted into mine waste disposal sites.

5.5. Social impacts of the mines on the Copperbelt Province

One of the major social impacts of copper mining in Zambia is the disruption of social and traditional fabric especially among indigenous communities around mining areas as well the health impacts. However, due to the non availability of data, it was not possible for the study to assess the health impacts of copper mining on the residents of the Copperbelt Province. That notwithstanding, inquiries during interviews revealed that there was an outbreak of health problems in the communities within the catchments of the Kafue River, due to consumption of the river water and the fish. Reasons for this can not be totally substantiated because it was not possible to access secondary data given the limited time.

5.5.1. Mining and disruption of the social and traditional fabric of local people

Mining operations require a lot of land, and the consequence of this is that local people and communities have had to be displaced and resettled elsewhere, a move which has caused a break down in the family social system as families are separated from their relatives and friends. It was observed during the interviews that Mbwana Mkubwa in Ndola had to relocate 70 families to accommodate the mining operations. And these families according to the Environmental Manager at Mbwana Mkubwa were compensated. However; these families had to move away from their families and friends as well as their social support systems to new areas which required adjusting to and for this no amount of compensation would suffice and this I doubt if it was factored in when calculating the amount of compensation to give the families.

It is in line with this sort of problem that one resident lamented,

*...due to the establishments of the mines our land was taken over,
and many of the family members were forced to move to the city because
they couldn't get jobs from the mines (due to old age) ...¹⁷¹*

KCM are currently implementing a major project, KDMP at Konkola Mine in Chililabombwe which upon completion in 2010 is envisioned to employ about 6000 people. However, the implementation of the KDMP means expansion of the Lubengele tailings dam a move aimed at accommodating the increased volume of tailings discharged from Konkola Mine. Consequently the volume of discharge could potentially inundate certain parts of Kawama compound, the entire Ming'omba Village and a section of Momba Farms. In order to take care of the resettlements a Resettlement Action Plan (RAP) was developed to deal with relocation and compensation for an estimated 750 affected persons¹⁷².

¹⁷¹ Mulenga, F, Ndola resident

¹⁷² The Business Post. Corporate social responsibility: is KCM living up to the challenge? 2006

increased water and air pollution as well as land degradation. Water pollution affect the aquatic biodiversity in the water leading to reduced fish stocks in the river which supports many local people. Consequently this impacts on the livelihood of the people and exuberate poverty levels.

CHAPTER SIX

6.1. Discussion on Case Study Results

Being endowed with copper may be a curse to the Copperbelt Province and Zambia in general. However, countries like Botswana and South Africa have been able to transform their mineral wealth into wealth for their people¹⁷⁴. In this case it has been argued that “sound management of the sector, good governance, and respect for the rule of the law and an overall favourable environment for business development”¹⁷⁵ have been the driving force behind the success of the mineral mining. Based on the results of this study, it is apparent that copper mining in Zambia is a missed blessing to the people of the Copperbelt and Zambia as a whole in terms of the socio-economic benefits generated by the sector. On the other hand the people have to contend with the negative impacts of mining the resource. Though it is no doubt that the industry is making profits from copper mining, however, the revenues generated is externalised and does not benefit the local economy and people.

It is apparent that the mining companies operating in Zambia are exploiting copper resources for the benefit of the investors in the developed countries and perhaps their partners in government. As observed, a huge part of the profit is externalized by the investors to their developed countries while the contribution to national GDP is relatively small. Conversely, the Copperbelt supplies the mining companies with cheap labor as observed through the casualization of workers and copper. It is also evident that Zambia relies heavily on exporting primary goods (copper) which enrich the multinational companies while the people on the Copperbelt are left to deal with the social and environmental impacts and also faced with other negative human development indicators. It was evident in the study that economic and political power are heavily centralized and concentrated in the developed countries through the MNCs running the mines in Zambia.

Institutions play a central role in ensuring equitable sharing of mineral revenues and environmental management, the collapse of these institutions (as mineral development has the potential to) means that sustainable mining is hindered¹⁷⁶. Consequently passing and enforcing of laws which are core governance issues are automatically impinged upon. In line with these arguments, the government instead of passing policies that contribute to equitable sharing of resources and ensuring that environmental management is made top priority by the mines, however, make policies to the contrary. The consequence of which is evidenced in the relatively small contribution to GDP and the lack of commitment to ensuring proper

¹⁷⁴ Pedro, A., *Mainstreaming Mineral Wealth in Growth and Poverty Reduction Strategies, Economic Commission for Africa, Ethiopia*

¹⁷⁵ *Ibid.*,

¹⁷⁶ Ross, M. *The Political Economy of the Resource Curse, 1999*

environmental management thus they knowingly or unknowingly betray the interests of the poor who are the ones that pay the social costs of the mineral extraction as well as get affected by the environmental impacts arising from copper extraction. This supports the argument that being dependent on mineral resources (copper) for government revenues has the propensity to generate weak states with weak institutions which result in poor governance and lack of accountability¹⁷⁷.

It is also noteworthy that the paltry mining taxes through which government collects revenue from copper mining, as negotiated for by the mine owners was increased with effect from the first of April, 2008. Tax has been increased amid protests and threats from the mines which was meant to block the political reform in order to protect their rents¹⁷⁸. Therefore, what many people awaits including this researcher is to see if the increased taxes will mean more wealth for government and the local people in this mining region

Environmental issues in Zambia are not top priority on government's priority list consequently institutions mandated with the task of environmental management are incapacitated to carry out the mandate as they are under-funded by the government and lack qualified human resources to do the work. Furthermore there is lack of monitoring equipment to carry out routine measurements so it is only when disaster strikes that these institutions seem to respond, what happened at KCM in 2006 is a typical example which saw the closure of the tailings leach plant at KCM. According to the Manager at ECZ, interviewed, he noted that the institution lacks the required human resources and funding to ensure compliance and enforcement of environmental quality standards. The consequence as evidenced by the results has been massive air and water pollution and land degradation since the mines are not bound by stringent environmental regulations.

It can be ascertained that the paltry taxes which were being paid by the mining companies and the tax concessions they enjoy reflect the weak bargaining power on the part of the Zambian government. It is further evident that Zambia as a developing country is enmeshed in the international capitalist exploitation through the MNCs operating in Zambia (investors) and this by every extenuating assertion goes a long way in determining the levels of poverty as well as environmental degradation as a result of copper exploitation in the country. This assertion strengthens the supposition of the theoretical framework of this study as shown in the radical dependency theory above (chapter 3). Moreover, degrading environmental conditions experienced in Zambia, poor health, rising levels of unemployment and the increasing levels of poverty in the country could be conveniently argued to be an outgrowth of the international capitalist system and the political economy of copper mining and sale. This submission is arrived premised on the fact that copper mining dilates the traditional political economy of the Copperbelt region specifically and that of Zambia as a whole. Equipped with these results from this study it makes the theoretical framework for the study adequate

¹⁷⁷ Ross, M. *The Political Economy of the Resource Curse*, 1999

¹⁷⁸ Chileshe, R., *Mine owners threatens to sue Government*, *Zambia Daily Mail*, Monday, February 11, 2008, p. 2.

to explain copper mining in Zambia as well as not only justifying why the country remains in poverty despite its abundant resources(copper), but also accounts for her development of underdevelopment.

6.2. Conclusion and Recommendations

There is need for government to synchronize mining and environmental laws and policies in Zambia so as to improve the conditions for the local communities and ensure economic, social and environmental sustainability. In order to do this the study therefore recommends the following:

There is need for the policy and legal frameworks pertaining to mining to be overhauled in order to impress upon the mining companies stringent environmental and social accountability and liability. In line with this it is imperative that the mining environmental guidelines in place are reviewed to ensure environmental compliance. Suffice to say the current mining environmental guidelines are riddled with flaws that make it possible for the mining companies to obliterate the environment and the livelihood of local communities in these mining towns. Furthermore, there is a necessity to put in place policies, legal and regulatory frameworks that will make possible equitable participation by the mining companies, communities and other stakeholders in the mining sector, as well as tools to improve revenue distribution at local level. In addition, there is need to promote equity and fair allotment of the benefits from copper mining, through enhancing transparency, accountability and monitoring in the management of copper revenue flows. For this to be done efficiently and effectively there is need to reinforce institutional capabilities and competencies for proficient long lasting planning for sustainable copper mining. It is also imperative for the country to come up with policies that are aimed at economic diversification in sectors such as agriculture, manufacturing and tourism in an attempt to reduce the dependence on copper. It is imperative for Zambia to reduce dependence on exporting primary copper as a raw material but instead process the copper which will fetch more than primary copper.

The study was based on two main hypotheses: i) that copper mining in Zambia has not transformed into wealth for its people, rather has impacted negatively on the environment, ii) that the quest for economic sustainability from copper mining may conflict with environmental and social sustainability. Both of these hypotheses have been confirmed according to the results obtained through the economic, social and environmental indicators used in the analysis. The study, therefore, acknowledges that copper mining in Zambia has contributed to the increase in mining investment through increased DFI inflows and has resulted in a significant increase in copper production and the generation of external earnings. However, the wealth generated does not benefit either the national economy or the local communities located in the mining region who are instead subjected to the negative social and environmental impacts.

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