The Pennsylvania State University

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STRATEGIC CONSIDERATIONS FOR RESOURCE ENDOWED COUNTRIES TO AVERT THE RESOURCE CURSE PHENOMENON:

WITH A CASE STUDY OF

THE DEMOCRATIC REPUBLIC OF CONGO

A Thesis in

Energy and Mineral Engineering

by

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ABSTRACT

The discovery of a new valuable mineral deposit in a country does not always lead to economic growth or development in a nation. There are many examples of countries with abundant resources whose economic and social situations have not improved, and in many cases have worsened, because of their bountiful mineral resources. The “resource curse” describes the paradoxical fact that countries with an abundance of natural resources, specifically non-renewable resources like minerals and fuels, tend to have less economic growth and worse development outcomes than countries with fewer natural resources. The degree of the phenomenon’s effects varies from country to country. There are many causes and symptoms of the resource curse evident in the economics literature, but there is no clear guidance on how a country can avert its resource curse.

This study aims to identify the factors that hinder resource-rich countries’ attempts to achieve sustainable development and economic growth. The relative importance of the factors is assessed, and a seven-point strategy is formulated to help resource-rich countries reduce the adverse effects of the resource curse. The study uses a qualitative-phenomenological methodology. Fifteen resource-rich countries, which either faced the phenomenon in the past, are still facing it, or never experienced it, were selected for the study population. Subsequently, the study focuses primarily on the Democratic Republic of Congo (DRC), one of the wealthiest in terms of resource endowment, but also the most affected by the resource curse within the study population. A comprehensive set of variables were selected to compare the DRC’s mining sector to that of Australia, Botswana, Brazil, Canada, Chile, Ghana, India, Ivory Coast, Namibia, Peru, South Africa, United States of America, Zambia, and Zimbabwe.

This study finds that there are seven specific factors that enable a country to reduce adverse economic and social outcomes as a result of its vast mineral resources. The seven factors are the following: political will, competitive legislation and the enforcement thereof, strong institutions with targeted goals, economic discipline to achieve visions and goals, the diversification of the economy, the application of good governance practices, and motivation to learn from other countries’ experiences. By focusing on these determinants, mineral-rich countries can mitigate the effects of the resource curse, and as a result, they can experience the economic growth and sustainable development that should follow from their mineral assets.
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Chapter 1

Introduction

1.1 Problem Statement

The resource curse phenomenon was first studied by Richard Auty in the 1980s, and there are numerous theories on the effects it has on resource-rich countries. Slow economic growth and development are the two most salient outcomes in countries suffering from this phenomenon. Most mineral-rich countries struggle with economic growth and tend to have worse development outcomes than countries with fewer natural resources (NRGI).

After the discovery of a new valuable deposit, and its exploitation and sale in international markets, the local currency will appreciate significantly as a result of the large amount of foreign currency that is being converted. This appreciation of the local currency, with respect to world markets, causes increases in wages and local raw material prices; these increases result in higher costs for local producers (Posner). The aforementioned phenomenon is known as Dutch Disease, and is important because it affects the country’s economy, and particularly its export sector. A rapid influx of wealth appears to foster other problems including a high incidence of corruption. Often, these problems emerge in parallel with other systemic weaknesses, including weak political institutions lacking transparency, a lack of diversification in the country’s economy, and the practice of rent-seeking.

The resource-curse phenomenon is directly tied to the presource curse, which happens even before any exploitation begins (Cust). “Citizens, governments, and countries respond to the new valuable discoveries by changing their usual habits in anticipation of future wealth.” For example, governments will respond to their citizens’ expectations by increasing borrowing and spending, leading to macroeconomic crises (Cust and Mihalyi).

The obstacles, that many resource-rich nations face, are still not a closed case in 2018. Although there is much published research on the subject of the resource curse, there is no clear guidance on what should be done to lessen, if not avoid totally, its adverse effects on national economies.

1.2 Objective and Scope of the Study

The hypothesis of this study is that there are specific factors that are characteristic of countries that avoid and those that succumb to the resource curse. An understanding of these determinants could be used to inform the policy and actions of mineral-rich nations, such that they
may avert the degree of adverse effects on the country. In so doing, these nations could utilize their mineral wealth to enhance the country’s economic development and to encourage sustainable growth. The objective of this study is to identify the key factors and provide strategic guidance for sustainable development in mineral-rich countries.

The resource curse has varying types and degrees of impact, depending on country-specific details. The scope of this study is limited to those resource-rich countries experiencing the lowest degrees of the resource curse and those experiencing extreme degrees of the phenomenon.

1.3 Methodology

The initial methodology planned for this study was based heavily on quantitative analysis of a large set of parameters that could be used to describe each country, its mineral resources, government practices, and other quantifiable factors. In early stages of the research, as the data sets were being built, it became apparent that various analyses would be difficult to complete because of the sparsity of the data across the countries of interest. An alternative method was employed in which the various available data could be utilized qualitatively.

There are a number of theories on the resource curse available in the literature, and this study applies them in specific countries. Analyses of symptoms pertaining to the curse are conducted on the resource-rich countries that faced the phenomenon in the past, those that are still facing the curse to a high degree, and those that are experiencing it at lower degrees. These analyses have the goal of finding similarities and differences in the set of parameters used to define the country and its minerals sector. These parameters included the Gross Domestic Product per capita, the type of government regime, the year of independence, the type of colonization, the human development index, the employment rate, the business climate, the mining contribution to the GDP, and the mining contribution to exports. Moreover, a number of indices and rankings related to the mining industry is evaluated. These include the Investment Attractiveness Index (IAI), the Resource Governance Index (RGI), the Global Competitiveness Index (GCI), the Corruption Perception Index (CPI), and the Corporate Income Tax (CIT).

Methodologically, the study population was chosen to include developed and developing nations with both significant mineral resources and a dependence on those resources to drive their economy.

The case of the Democratic Republic of Congo (DRC) is central to this study, which compares the DRC to Australia, Botswana, Brazil, Canada, Chile, Ghana, India, Ivory Coast, Namibia, Peru, South Africa, United States of America, Zambia, and Zimbabwe.
Finally, the results from the qualitative analysis and the case study of the DRC are used to develop strategic recommendations for averting the negative effects of a developing country exploiting its mineral resources.

1.4 Thesis Organization
This study is introduced in the present chapter. The second chapter describes a comparative analysis of the countries in the study population. This chapter addresses the particularities of the countries, the selection and analysis of the comparative elements, and the competitiveness of each country; the chapter ends with lessons from successful countries that could be applied to less successful ones. The third chapter presents the case study of the DRC. The fourth chapter offers further discussion and findings from the case study. The fifth chapter formulates recommendations for the DRC on the basis of the comparative analyses and case study. Finally, overarching conclusions from this study are presented in the sixth chapter.
Chapter 2

Comparative Study

A comparative study was conducted to identify the factors that tended to differentiate countries’ relative success or failure in managing the resource curse. The study population, i.e. the countries selected for inclusion in this comparative study, is described in this chapter. Subsequently, the parameters used to compare the countries are described, and the results of the comparison are presented. The results of this comparative study are then used in subsequent chapters to identify underlying causes for differences among countries, and to suggest actions that could lead to improved management of a country’s mineral resources.

2.1 Study Population

The countries included in this study were selected according to the following criteria. The operative dichotomy is between mineral-rich developed countries, and mineral-rich developing countries. These two categories allow for geographic variety within the sample. Within the category of mineral-rich and developing countries, selections include countries that have been more successful as well as less successful in managing the resource curse. In total, 15 countries were chosen for inclusion in the study. This number is somewhat arbitrary, but the countries selected meet the criteria within a manageable collection of cases. Table 1 lists these countries according to these criteria.

<table>
<thead>
<tr>
<th>Country</th>
<th>Class</th>
<th>Location</th>
<th>Resource Curse</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Australia</td>
<td>Developed</td>
<td>Oceania</td>
<td>Not Present</td>
</tr>
<tr>
<td>2. Botswana</td>
<td>Developing</td>
<td>Africa</td>
<td>Managed</td>
</tr>
<tr>
<td>3. Brazil</td>
<td>Developing</td>
<td>South America</td>
<td>Managed</td>
</tr>
<tr>
<td>4. Canada</td>
<td>Developed</td>
<td>North America</td>
<td>Not Present</td>
</tr>
<tr>
<td>5. Chile</td>
<td>Developed</td>
<td>South America</td>
<td>Managed</td>
</tr>
<tr>
<td>6. Congo DR</td>
<td>Developing</td>
<td>Africa</td>
<td>Present</td>
</tr>
<tr>
<td>7. Ghana</td>
<td>Developing</td>
<td>Africa</td>
<td>Present</td>
</tr>
<tr>
<td>8. India</td>
<td>Developing</td>
<td>Asia</td>
<td>Managed</td>
</tr>
<tr>
<td>9. Ivory Coast</td>
<td>Developing</td>
<td>Africa</td>
<td>Present</td>
</tr>
<tr>
<td>10. Namibia</td>
<td>Developing</td>
<td>Africa</td>
<td>Managed</td>
</tr>
<tr>
<td>11. Peru</td>
<td>Developing</td>
<td>South America</td>
<td>Managed</td>
</tr>
<tr>
<td>12. South Africa</td>
<td>Developing</td>
<td>Africa</td>
<td>Present</td>
</tr>
<tr>
<td>13. United States of America</td>
<td>Developed</td>
<td>North America</td>
<td>Not present</td>
</tr>
<tr>
<td>14. Zambia</td>
<td>Developing</td>
<td>Africa</td>
<td>Present</td>
</tr>
<tr>
<td>15. Zimbabwe</td>
<td>Developing</td>
<td>Africa</td>
<td>Present</td>
</tr>
</tbody>
</table>
2.1.2 General characteristics of the countries included in the study

This section describes the factors of the four developed nations of the list, which are Australia, Canada, Chile, and the United States of America, following by the developing nations. Subsequently, the section analyzes those values with the goal of identifying the essential determinants of the resource curse.

Australia, with its federal parliamentary system under the constitutional monarchy regime, has a gross domestic product (GDP) per capita by purchasing power parity (PPP) of $48,900. “Minerals are an important part of the Australian economy, accounting for 10% of GDP in 2012-13. The country is the world's leading producer of bauxite, ilmenite, iron ore, rutile and zircon; the second largest producer of gold, lead, lithium, manganese ore and zinc; the third largest producer of uranium; the fourth largest producer of black coal, nickel and silver; and the fifth largest producer of cobalt, copper and diamond. Minerals are Australia's largest export. The industry's exports (excluding oil and gas) were worth approximately $107 billion in 2012-13, accounting for around 59% of goods and services exports and 71% of merchandise exports” (Geoscience Australia). The 2016 unemployment rate in Australia was 5.80% (Central Intelligence Agency).

Canada, with its federal parliamentary system under the constitutional monarchy regime, has a GDP per capita (PPP) of $46,400. “The country is the world’s leading producer of potash; the second largest producer of uranium, nickel and niobium; the third largest producer of cobalt, aluminum and platinum group metals; and the fourth largest producer in salt, sulfur and tungsten and fifth in diamonds, graphite and gold. The mining contribution to the 2015 GDP was $56 billion.” The industry directly employs more than 373,000 workers across the country in mineral extraction, smelting, fabrication and manufacturing, and indirectly employs an additional 190,000 (Marshall). The 2016 unemployment rate in Canada was 7.1% (Central Intelligence Agency).

Chile, with a democratic republic regime, has GDP per capita (PPP) of $24,100. The country is the leading producer of copper with 210 million metric tons of copper reserves (USGS). “In 2016, Chile produced 5.55 million tons of copper, which represents 30% of current global production. Chile is also the second largest lithium producer, with 7,500,000 metric tons of reserves.” The mining sector plays an enormous role within Chile’s economy, accounting for about 10% of GDP and about 50% of Chilean exports (International Trade Administration). The country experienced periods of challenges associated with the resource curse but was able to overcome them. The 2016 unemployment rate was 7.0%, and 14.4% of its population was below the poverty line in 2013 (Central Intelligence Agency).

The United States of America, with a federal government regime, has a GDP per capita (PPP) of $57,400. The mining contribution to the 2016 GDP was $327 billion (NIOSH). “The USA
is the second leading producer of coal and the fourth largest producer of copper in the world. The mining industry plays an important role in the US economy, with 12,637 active surface mining operations and 657 active underground operations in 2015.” The sector employed 1,688,364 employees in 2015 (NIOSH).

Botswana, with a democratic republic regime, has a GDP per capita (PPP) of $16,900. The country is the largest producer of diamonds in the world, with a 130,000 carats reserve of industrial diamond according to the US Geological Survey (USGS). Since its independence in 1966, the country has had stable governance. The mining contribution to exports was 85% in 2008, and its mining contribution to the economy in 2016 was 90.7% (International Council on Mining and Metals). The unemployment rate in the country was 17.3% in 2016, and the population below the poverty line was 29.3% (Central Intelligence Agency).

Brazil, with a federal representative democratic republic under a presidential system, has a GDP per capita (PPP) of $15,200. “The country is the world’s largest producer of niobium, the second largest producer of iron ore and manganese, and the third largest producer of bauxite. Brazilian mineral exports were 19.2% of all Brazilian exports. Iron ore represented 36% of all mineral exports and 7% of all Brazilian exports (in terms of value) during 2016. The Brazilian mining industry depends heavily on exports, so global mineral commodity prices have a greater impact on Brazilian mining companies than on Brazil’s overall macroeconomic outlook” (International Trade Administration). The 2016 unemployment rate was 12.6%, and 3.7% of the population was under the poverty line (Central Intelligence Agency).

The Congo (DRC), with a democratic republic regime, has a GDP per capita (PPP) of $800. Its mining percentage on total GDP is 22%, and mining accounted for 95% of exports in 2016 (Extractive Industries Transparency Initiative). The overall contribution of mining to the economy in 2016 was 96.2%, according to the International Council on Mining and Metals (ICMM). The DRC is the largest producer of cobalt globally, accounting for 51% of global production in 2015 according to the USGS. George-Cosh published that as the demand for socially responsible sources of cobalt is rising, the price of the metal has more than doubled from the start of 2017. On the London Metal Exchange, it has soared to $75,000 per metric ton (George-Cosh). He added that because of the metal’s ability to conduct electricity when stacked with other metals, cobalt is a crucial component of the lithium-ion batteries used to power electric vehicles and portable devices. Aside from cobalt, the DRC is also the 5th largest copper producer. “The country boasts some of the highest-quality copper reserves globally, with some of the mines estimated to contain grades above 3%, significantly higher than the global average of 0.6-0.8%. The DRC is also the third largest producer of industrial diamonds, contributing about 24% of global
production behind only Russia and Australia” (International Trade Administration). According to the US Central Intelligence Agency, the population under the poverty line was 63% in 2012.

Ghana, with a democratic republic regime, has a GDP per capita (PPP) of $4,400. The mining sector contributes 10% to the total GDP, and the contribution of mining to exports is 64% (Extractive Industries Transparency Initiative). Additionally, the mining’s overall contribution to the economy in 2016 was 83.4% (ICMM). Ghana is the second largest producer of gold in Africa (ICMM), with a reserve of 990 metric tons, and the country produced 90 metric tons of gold in 2016 (USGS). Ghana is also endowed with a reserve of manganese totaling 12 million metric tons, according to the United States Geological Survey 2017. Although the country’s total reserves of diamonds are still unknown, according to USGS, Ghana’s gem diamond production in 2016 was 170,000 carats. The unemployment rate was 5.20% in 2013, and 24.2% of the population was below the poverty line in the same year (Central Intelligence Agency).

India, with a democratic republic regime, has a GDP per capita (PPP) of $6,600. “The contribution of the mining industry to the GDP varies from 2.2% to 2.5%, and the whole industrial sector’s contribution to the GDP equals around 10% to 11%. The country is the third largest producer of coal and chromite, and a leading producer of iron ore, bauxite, and manganese ore. The industry employs around 700,000 individuals” (Gupta). The country’s 2016 unemployment rate was 8.4% (Central Intelligence Agency).

Ivory Coast, with a democratic republic regime, has a GDP per capita (PPP) of $3,600. The country has with untapped resources of gold, copper, iron ore, manganese, bauxite and diamonds (International Trade Administration). In 2015, the mining contribution to the total GDP was 5.5% (ICMM). The same year, 46.3% of the population was below poverty line (Central Intelligence Agency).

Namibia, with a democratic republic regime, has a GDP per capita (PPP) of $11,300. The mining sector contributed 11.1% to GDP in 2016 and contributed 25% of the country’s income (Namibia Chamber of Mines). “The sector is the largest contributor to the Namibian economy. Namibia has various natural resources including diamonds, uranium, copper, gold, lead, tin, lithium, cadmium, zinc, salt and vanadium. In 2015, the mining industry accounted for approximately 19,000 jobs in Namibia, a large increase from 14,000 in 2011. Indirectly, the mining industry contributes to the livelihood of 100,000 people” (Binder Dijker Otte). The unemployment rate in 2014 was of 28.10% (Central Intelligence Agency).

Peru, with a democratic republic regime, has a GDP per capita (PPP) of $12,900. The nation is the third largest producer of copper worldwide, with 81 million metric tons of reserves (USGS). “Peru is also the world’s third largest producer of silver, zinc and tin, and the seventh
largest producer of gold. Mining is the country’s primary economic driver, and copper alone accounts for 60% of the country’s exports” (Peru Reports). The 2016 unemployment rate in Peru was 5.90%, and 22.7% of the population was below the poverty line in 2014 (Central Intelligence Agency).

South Africa, with a democratic republic regime, has a GDP per capita (PPP) of $13,200. “The country is one of the leading producers of gold, platinum, coal and diamond. The mining industry contributes 7.6% to the total GDP” (Chamber of Mines of South Africa). The sector also accounts for 34.7% of exports (Extractive Industries Transparency Initiative). In 2016, the country’s unemployment rate was 26.8%, and 35.9% of the population was below the poverty line in 2012, according to the US Central Intelligence Agency.

Zambia, with a democratic republic regime, has a GDP per capita (PPP) of $3,900. “The country is the world's 8th largest producer of copper and the 6th largest producer of cobalt. The four largest mining companies account for over 80% of copper production in the country. Mining accounts for 12% of Zambia’s GDP and 47% of its exports” (Extractive Industries Transparency Initiative).

Zimbabwe, with a parliamentary democracy, has a GDP per capita (PPP) of $2,000. “The country is one of the leading producer of platinum. The direct contribution of the platinum sector to the economy is as follow; 3.5% to total GDP and 17% to total exports. Alone, the platinum sector employs 10,200 individuals. Additionally, gold, chrome, coal and nickel are also major commodities in the country’s economy” (Zimbabwe Chamber of Mines). According to the Central Intelligence Agency, 72.3% of the population was below the poverty line in 2012.

2.2. Selection and analysis of the resource curse factors

The literature provides some guidance on context-specific factors that have the potential to worsen the resource curse. “Among those factors is the rebound after colonization and post-colonial legacy, which affects many African nations. The political and economic relationship between postcolonial countries and their colonizer nations may contribute to the resource curse, in that the relationship may be similar to the colonial period, with a similar exploitative and asymmetric character” (Appiah and Zhang). The authors also point to climate as another fundamental context-specific factor, which limits agriculture, creates public health challenges, e.g. malaria. “Moreover, geography sometimes poses barriers to transportation, with important economic consequences. Religion and/or culture are also determining factors. For example, some nations have strong belief systems that can go against the paths that others have used to escape misery. Certain cultures prefer relying on their gods for their destiny instead of taking actions to
change their destiny. An awareness of these context-specific factors is important for an accurate
diagnosis of any given case of the resource curse. These factors are not frozen in time, so
dynamic metrics are necessary for the analysis undertaken by the present study”.

In an effort to understand why some countries are more successful than others in
managing their resources for the benefit of their country and its people, this study attempted to
identify any factor that might affect these outcomes. The study then endeavors to ascertain values
for these factors for all of the countries in the study population. Unfortunately, data across all of
the countries were only available for a few factors. This sparseness and paucity of the data
precluded a rigorous quantitative approach.

Initially, the study identified 30 factors that were candidates for analysis. These are listed
on the left side of Table 2. Because of the aforementioned limitations in data availability, the list
of factors was reduced to the list shown on the right side of Table 2. These factors will be defined
and discussed in more detail in the remainder of this section. Notwithstanding, it should be noted
here that an effort was made to include all factors used by researchers working in this general
area, without regard to their actual merit. Later in the study, this total number was reduced by
excluding factors for which data were unavailable.

Table 2: Initial comparative factors

<table>
<thead>
<tr>
<th>Population</th>
<th>Unemployment rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Area</td>
<td>Population below Poverty Line</td>
</tr>
<tr>
<td>Type of gov’t regime</td>
<td>Corruption perception index</td>
</tr>
<tr>
<td>2017 GDP</td>
<td>Human Development Index</td>
</tr>
<tr>
<td>2017 GDP per capita PPP</td>
<td>Global Competitiveness Index</td>
</tr>
<tr>
<td>Independence year</td>
<td>Resource Governance Index</td>
</tr>
<tr>
<td>GDP per capita income @ independence</td>
<td>Investment Attractiveness Index</td>
</tr>
<tr>
<td>2016 GDP growth % estimated</td>
<td>Best Practices Mineral Potential Index</td>
</tr>
<tr>
<td>2017 GDP growth % forecast</td>
<td>Policy Perception Index</td>
</tr>
<tr>
<td>Top Rate of Corporate Income Tax (CIT)</td>
<td>Mining Withholding taxes (Dividends, Interest, Royalties, Service Fees)</td>
</tr>
<tr>
<td>Mining % to exports</td>
<td>Quality of Geological database</td>
</tr>
<tr>
<td>Mining contribution to government</td>
<td>Security</td>
</tr>
<tr>
<td>Mining contribution to employment</td>
<td>Quality of Infrastructure</td>
</tr>
<tr>
<td>Mining Contribution Index 2016</td>
<td>Uncertainty Concerning the Administration, Interpretation, and Enforcement of Existing Regulations</td>
</tr>
<tr>
<td>Country risk assessment</td>
<td>Political Stability</td>
</tr>
<tr>
<td>Business Climate</td>
<td>Taxation Regime; personal, corporate, payroll, capital &amp; other taxes &amp; complexity of tax compliance</td>
</tr>
<tr>
<td>Foreign Exchange reserves &amp; gold (Dec 2016)</td>
<td>Worldwide Governance Indicators</td>
</tr>
<tr>
<td>Public debt % GDP</td>
<td>Commodities mined</td>
</tr>
</tbody>
</table>
First, the study classifies the countries by their 2016 GDP per capita (PPP), to order the comparison subjects before turning to the mining sector characteristics. The GDP per capita (PPP), which compares GDP on the basis of purchasing power parity divided by the population as of 1 July for the same year, is the best measurement of a country’s standard of living (Central Intelligence Agency). Consequently, this measurement enables the comparison of countries by the living conditions of their populations and by the goods and services produced by each country (Central Intelligence Agency).

Next, the study analyzes the type of government regime of each country, to comprehend any similarities or differences based on the GDP per capita (PPP). Following the regime categorization, a human development index (HDI) analysis situates each country as developed or developing. “The HDI is the geometric mean of standardized indices for the three key dimensions of human and economic development: a long and healthy life, being knowledgeable and have a decent standard of living. The health dimension is assessed by life expectancy at birth; the education dimension is measured by mean of years of schooling for adults aged 25 years and older and expected years of schooling for children entering school. The standard of living dimension is measured by gross national income per capita. HDI quantifies life expectancy, educational attainment, and income into a standardized number between 0 and 1. No minimum requirement exists for developed status, but most developed countries have HDIs of 0.8 or higher” (United Nation Development Programme). After the HDI analysis, the study examines the unemployment rate of each country and the percentage of its population below the poverty line. Lastly, it analyzes the mining contribution and importance to the economy of the country.

The United States of America, like Australia and Canada, has the highest score in almost all the indices used for comparison. The indices include the Global Competitiveness index, the Policy Perception Index, the Corruption Perception Index, each of which is detailed in the next section. Although the histories of the three nations differ, the countries have the highest GDP per capita (PPP). For example, although the USA has a government regime different from those of
Canada and Australia, it has an outstanding management performance comparable to theirs. The three countries’ HDIs are higher than 0.8, which classify them as developed nations. Their 2016 unemployment rates were below or equal to 7.1%. Together, they are endowed with the largest reserves of industrial diamond, iron, silver, tungsten and coal. Another example of their distinguished positions is that each country is either the largest or second largest producer of a commodity worldwide. The mining sector plays an important role in the economy of these countries and is a major employer. None of these three countries has a history of resource curse challenges. For all of these reasons, these countries were chosen as potential sources of strategic factors for better governance of the mining sector.

Within the study population, Chile has the next highest GDP per capita. The government regime of the country is a democratic republic, and the country has a high HDI score, above 0.8 which also classifies it as a developed nation. The unemployment rate (7%) is as competitive as the three benchmark countries discussed above. The latest available data (from 2013) on the percentage of population below the poverty line is 14.4%. Although the current percentage after a 5-year gap is not available, the country’s recent performance can reasonably be considered exemplary. The country has experienced some resource curse challenges in the past but has since been able to bounce back and become an economic leader in Latin America.

Botswana, a country with only 2 million people and a land area of 231,804 mi², has one of the highest scores in Africa in several indices. The GDP per capita (PPP) of the country is the next highest in the list. The country has maintained a parliamentary democracy, and elections are free and fair. The HDI of the country is 0.698, which classifies the country as developing with a medium score. Because of its high scores on many indices, the country was chosen as an exemplar in the search for determinants for escaping the resource curse.

Brazil also has a democratic republic government. The country’s HDI score is 0.754, which is considered medium. The GDP per capita (PPP) is $15,200. The unemployment rate is 12.6% and only 3.7% of the population live below the poverty line. The country is among the list of leading producers as previously mentioned, and the mining industry is a capital sector for the economy.

South Africa is also a democratic republic regime. With 54.9 million citizens, the country’s GDP per capita (PPP) is $13,200. The HDI of South Africa is 0.666, which is considered a medium score. The country’s high unemployment (26.8% in 2016) and poverty rates (35.9% in 2012) confound the typical correlations, because the country is known for its leading status of producer of many commodities.

The Peruvian government regime is democratic republic, and the country was also inflicted with a high degree of resource curse for decades, which delayed the country’s economic and
political development (Posner). The country suffered from problems associated with the Dutch disease, including a lack of political institutions, corruption, rent-seeking, and conflicts (Cruz). Today, Peru’s HDI is 0.74, which is considered a medium score. The unemployment rate in the country was 5.90%. The country struggled with the resource curse for a long period, but it was able to overcome it and develop its resources for the benefit of the population. Because of the specific challenges the country faced, Peru was selected as one of the exemplary countries.

Namibia, India, Ghana, Zambia, Ivory Coast, and Zimbabwe are listed in the descending order of their GDP per capita (PPP). Their HDIs are also descending in corresponding order. On the low end of the list, Zimbabwe’s HDI is higher than Ivory Coast’s HDI, but both are in the low range. Although the geographies of these countries vary drastically, they all have a democratic republic government, and their economies are fueled by the mining sector. Because of the challenges related to their mining sector and the slow development of the nations, they were specifically chosen to enrich the comparison methods.

The Democratic Republic of Congo (DRC), with a population of 81.6 million, has the lowest GDP per capita (PPP) of the countries included in the study. The government regime is a democratic republic, like most of the previously mentioned African nations. The HDI of the DRC is 0.435, which is within the low range. The unemployment rate is unknown, and the latest data (from 2012) on the percentage of population under the poverty line is 63%. It has two thirds of the world cobalt reserves, and it is the world’s largest producer of the commodity. It is also the world’s third largest diamond producer and the fifth largest copper producer. The country’s economy is dependent on its mining sector, but sector’s overall contribution to the government budget is not as important (28%). Because of challenges in the governance of the sector stemming from the resource curse, the population is not benefiting from the country’s mineral endowment.

Because of the DRC’s low GDP per capita (PPP), its significant dependency on the mineral sector, and the severe nature of its resource curse, the country was selected as the central case study for this thesis.

2.3 Countries’ competitiveness based on indices

The analysis component of the study examines indices that compare the competitiveness of the countries. The following indices are examined in relation to the mining industry: Global Competitiveness Index (GCI), the Investment Attractiveness Index (IAI), the Corporate Income Tax (CIT), the Corruption Perception Index (CPI), the Resource Governance Index (RGI), and the Worldwide Governance Indicators (WGI). The definition and significance of each of these indices is presented here.
The Global Competitiveness Index (GCI), which defines competitiveness as “the set of institutions, policies, and factors that determine the level of productivity of a country,” was developed by the World Economic Forum, an independent international organization committed to improving the state of the world by engaging business, political, academic and other leaders of society to shape global, regional and industry agendas. “The GCI ranks 138 economies and explains that a more competitive economy is one that is likely to grow more quickly over time. The index is calculated by including a weighted average of many different economic components, each measuring a different aspect of competitiveness. The components are grouped into 12 categories, listed below, representing the pillars of competitiveness” (World Economic Forum).

“In line with well-known economic theory of stages of development, the GCI assumes that, in the first stage, the economy is factor-driven and that countries compete based on their factor endowments—primarily unskilled labor and natural resources. Maintaining competitiveness at this stage of development hinges primarily on 1) well-functioning public and private institutions, 2) a well-developed infrastructure, 3) a stable macroeconomic environment, and 4) a healthy workforce that has received at least a basic education. As a country becomes more competitive, productivity will increase, and wages will rise with advancing development. Countries then move into the efficiency-driven stage of development, when they must begin to develop more efficient production processes and increase product quality because wages have risen, and they cannot increase prices. At this point, competitiveness is increasingly driven by 5) higher education and training, 6) efficient goods markets, 7) well-functioning labor markets, 8) developed financial markets, 9) the ability to harness the benefits of existing technologies, and 10) a large domestic or foreign market. Finally, as countries move into the innovation-driven stage, wages will have risen by so much that they are able to sustain those higher wages and the associated standard of living only if their businesses are able to compete 11) using the most sophisticated production processes and by 12) innovating new ones” (World Economic Forum).

A lower GCI represents a higher degree of competitiveness. To better understand the competitiveness score, it is useful to also examine the Human Development Index. If the countries are ranked based on their Human Development Index (HDI), the study finds that the most developed countries also have the best competitiveness scores. For instance, the USA, Canada, Australia and Chile, the four most developed nations of the list, have the best GCI scores seen in Table 3 and have HDI scores higher or equal to 0.7. The remaining countries of the country list, all have HDIs lower than 0.7, and a low GCI score means they are less competitive.
Table 3: The Global Competitiveness Index1

<table>
<thead>
<tr>
<th>Country</th>
<th>GCI (out of 138 countries)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>21</td>
</tr>
<tr>
<td>Botswana</td>
<td>64</td>
</tr>
<tr>
<td>Brazil</td>
<td>81</td>
</tr>
<tr>
<td>Canada</td>
<td>15</td>
</tr>
<tr>
<td>Chile</td>
<td>33</td>
</tr>
<tr>
<td>DRC</td>
<td>129</td>
</tr>
<tr>
<td>Ghana</td>
<td>114</td>
</tr>
<tr>
<td>India</td>
<td>99</td>
</tr>
<tr>
<td>I.C. Coast</td>
<td>84</td>
</tr>
<tr>
<td>Namibia</td>
<td>67</td>
</tr>
<tr>
<td>Peru</td>
<td>47</td>
</tr>
<tr>
<td>S. Africa</td>
<td>3</td>
</tr>
<tr>
<td>US</td>
<td>118</td>
</tr>
<tr>
<td>Zambia</td>
<td>126</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td></td>
</tr>
</tbody>
</table>

The Investment Attractiveness Index (IAI) is another competitiveness index used in this study. The IAI, constructed by the Fraser Institute, an independent non-partisan research and educational organization, is determined from a survey of mining companies designed to identify the provinces, states, and countries that have the most attractive policies for encouraging investment in mining exploration and production. “Jurisdictions that investors assessed as relatively unattractive may therefore be prompted to consider reforms that would improve their ranking. Presumably, mining companies use the information provided by the IAI to corroborate their own assessments, and to identify jurisdictions where the business conditions and regulatory environment are most attractive for investment” (Jackson and Green).

The IAI takes both mineral and policy perception into consideration for 104 jurisdictions in total. The index is constructed by combining the Best Practices Mineral Potential Index (BPMPI) and the Policy Potential Index (PPI). The BPMPI ranks the jurisdictions based on which region’s geology “encourages exploration investment” or is “not a deterrent to investment.” For the calculation of the BPMPI, the Fraser Institute gives a half weight to the “not a deterrent to investment” designation, because it considers the “encourages exploration investment” designation a more positive approach to investment (Jackson and Green).

For example, the BPMPI for the DRC (shown in Table 4) was calculated by adding the percentage of respondents who rated DRC’s mineral potential as “encourages investment” (71%) and the percentage of responses rating the DRC as “not a deterrent to investment” (20%). This 20% of “not a deterrent to investment” response was half weighted at 10 percent. Thus, the DRC has a rounded percent of 81 for 2016.

On the other hand, the Policy Perception Index (PPI) provides a comprehensive assessment of the attractiveness of mining policies in a jurisdiction and can serve as a report card to governments on how attractive their policies are from the perspective of an exploration manager. The PPI is a composite index that captures the opinions of managers and executives.

1 Source: The World Economic Forum
on the effects of policies in jurisdictions with which they are familiar. All survey policy questions (e.g., uncertainty concerning the administration, interpretation, and enforcement of existing regulations; environmental regulations; regulatory duplication and inconsistencies; taxation; uncertainty concerning disputed land claims and protected areas; infrastructure; socioeconomic agreements; political stability; labor issues; geological database; and security) are included in the PPI calculation (Jackson and Green).

Table 4: Investment Attractiveness Index (IAI)\(^2,3\)

<table>
<thead>
<tr>
<th>Country</th>
<th>IAI</th>
<th>BPMPI</th>
<th>PPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>77.6%</td>
<td>N/A</td>
<td>81.5%</td>
</tr>
<tr>
<td>Botswana</td>
<td>77.6%</td>
<td>68%</td>
<td>91.8%</td>
</tr>
<tr>
<td>Brazil</td>
<td>62.5%</td>
<td>61%</td>
<td>64.9%</td>
</tr>
<tr>
<td>Canada</td>
<td>77.2%</td>
<td>64%</td>
<td>86.9%</td>
</tr>
<tr>
<td>Chile</td>
<td>69.6%</td>
<td>81%</td>
<td>78.7%</td>
</tr>
<tr>
<td>DR Congo</td>
<td>72.8%</td>
<td>71%</td>
<td>60.6%</td>
</tr>
<tr>
<td>Ghana</td>
<td>75.5%</td>
<td>38%</td>
<td>81.8%</td>
</tr>
<tr>
<td>India</td>
<td>39.1%</td>
<td>80%</td>
<td>41.5%</td>
</tr>
<tr>
<td>I. Coast</td>
<td>78.9%</td>
<td>58%</td>
<td>77.3%</td>
</tr>
<tr>
<td>Namibia</td>
<td>66.1%</td>
<td>76%</td>
<td>77.8%</td>
</tr>
<tr>
<td>Peru</td>
<td>73.4%</td>
<td>N/A</td>
<td>69.5%</td>
</tr>
<tr>
<td>S. Africa</td>
<td>53.6%</td>
<td>57%</td>
<td>47.5%</td>
</tr>
<tr>
<td>US A</td>
<td>75.0%</td>
<td>72%</td>
<td>85.4%</td>
</tr>
<tr>
<td>Zambia</td>
<td>72.7%</td>
<td>58%</td>
<td>73.6%</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>41.8%</td>
<td>72%</td>
<td>18.0%</td>
</tr>
</tbody>
</table>

In Table 4, Ivory Coast has the highest IAI of all countries in the table. Following Ivory Coast are Botswana, Australia, Canada and the USA. The country with the lowest IAI in this field is India. The DRC has an IAI of 72.8%, which is surprisingly high given its low Global Competitiveness Index ranking of 129th out of 138 economies. To understand the non-correlation regarding some countries’ attractiveness and competitiveness, the BPMPI and the PPI are analyzed. The country with the highest BPMPI is the DRC, followed by Ivory Coast and Peru. The country with the highest PPI is Botswana, followed by Canada, the USA and Ghana. Although it is somewhat difficult to draw correlations between IAI, that was constructed by combining BPMPI and PPI, and the PPI rankings, it was assumed that looking deeper into some of the PPI calculating factors was important for a better understanding of the percentages. The number of countries was then narrowed down to exclude the USA, Canada and Australia, as their BPMPI percentages were not available.

The PPI comprises many factors, including quality of geological database, security, quality of infrastructure, uncertainty concerning the administration, interpretation and enforcement of existing regulations, political stability and taxation regime (Jackson and Green).

\(^2\) Source: Fraser Institute Survey (2016)
\(^3\) This index was developed in 2016 by the Fraser Institute, an independent non-partisan research and educational organization.
Table 5 displays detailed PPI percentages instead of only the final percentage of each country. The first percentage is the “encouraging” response score, and the number in parentheses is the percentage of “not a deterrent” to investments responses. The two numbers are added to give the final percentage. In Botswana, for example, 14% of encouraging to investment responses were recorded along with 64% of “not an obstacle to investments” responses, which gives 78% for the country’s quality of geological database. Among the countries with percent of 70 and higher on the quality of geological database, in decreasing order are Namibia, Botswana, Ghana, Peru, and Chile. Below 50% on the quality of geological database in descending order are the DRC, Ivory Coast, and Zimbabwe.

For the security factor, Botswana has 100%, followed by Namibia with 87% and Chile with 84%. The lowest percentages for the security factor are held by South Africa with 16% and the DRC with 22%. For the quality of infrastructure, the highest percentage is held by Botswana with 74% followed by Namibia 56% and Chile with 54%. The lowest percentages are held by Ivory Coast, the DRC and Zimbabwe. For uncertainty concerning the administration, the interpretation and the enforcement of existing regulations, the country with the highest percentage is Botswana with 92%, followed by the DRC with 86% and Ghana 82%. Finally, for the political stability factor, the highest percentage is held by Botswana with 96%, followed by Ghana with 78% and Namibia with 75%. The lowest percentage is held by Zimbabwe with 0%. 
| Some PPI factors                                      | Bots wana | Brazil | Chile | DRC | Ghana | India | I.Costa | Namibia | Peru | S.Africa | Zambia | Zimbabw
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Encouraging (not a deterrent to inv) = Quality of Geological database</td>
<td>14% (64%)</td>
<td>17% (48%)</td>
<td>26% (45%)</td>
<td>10% (33)</td>
<td>21% (57%)</td>
<td>0% (63%)</td>
<td>33% (46%)</td>
<td>31% (44%)</td>
<td>32% (36%)</td>
<td>6% (56%)</td>
<td>0% (23%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>=78%</td>
<td>=65%</td>
<td>=71%</td>
<td>=43%</td>
<td>=78%</td>
<td>=63%</td>
<td>=40%</td>
<td>=79%</td>
<td>=75%</td>
<td>=68%</td>
<td>=62%</td>
<td>=23%</td>
</tr>
<tr>
<td>Encouraging (not a deterrent to inv) = Security</td>
<td>50% (50%)</td>
<td>22% (30%)</td>
<td>45% (39%)</td>
<td>9% (13%)</td>
<td>13% (40%)</td>
<td>0% (38%)</td>
<td>29% (56%)</td>
<td>4% (43%)</td>
<td>4% (12%)</td>
<td>6% (56%)</td>
<td>0% (25%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>=100%</td>
<td>=52%</td>
<td>=84%</td>
<td>=22%</td>
<td>=53%</td>
<td>=38%</td>
<td>=40%</td>
<td>=87%</td>
<td>=47%</td>
<td>=16%</td>
<td>=62%</td>
<td>=25%</td>
</tr>
<tr>
<td>Encouraging (not a deterrent to inv) = Quality of Infrastructure</td>
<td>22% (52%)</td>
<td>7% (22%)</td>
<td>21% (33%)</td>
<td>5% (9%)</td>
<td>0% (47%)</td>
<td>0% (20%)</td>
<td>28% (26%)</td>
<td>8% (37%)</td>
<td>15% (30%)</td>
<td>0% (44%)</td>
<td>0% (14%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>=74%</td>
<td>=29%</td>
<td>=54%</td>
<td>=14%</td>
<td>=47%</td>
<td>=20%</td>
<td>=0%</td>
<td>=56%</td>
<td>=45%</td>
<td>=44%</td>
<td>=14%</td>
<td></td>
</tr>
<tr>
<td>Encouraging (not a deterrent to inv) = Uncertainty Concerning the Administration, Interpretation, and Enforcement of Existing Regulations</td>
<td>50% (42%)</td>
<td>13% (27%)</td>
<td>23% (50%)</td>
<td>43% (43%)</td>
<td>47% (35%)</td>
<td>10% (0%)</td>
<td>22% (26%)</td>
<td>24% (28%)</td>
<td>14% (53%)</td>
<td>3% (16%)</td>
<td>11% (39%)</td>
<td>0% (17%)</td>
</tr>
<tr>
<td></td>
<td>=92%</td>
<td>=40%</td>
<td>=73%</td>
<td>=86%</td>
<td>=82%</td>
<td>=10%</td>
<td>=48%</td>
<td>=52%</td>
<td>=67%</td>
<td>=19%</td>
<td>=50%</td>
<td>=17%</td>
</tr>
</tbody>
</table>

On the whole, there are many factors that are taken into account to calculate the final Investment Attractiveness Index percentage. The IAI helped the analyses process to better

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4 Source: Fraser Institute Survey (2016)

5 Note: the two numbers in each cell have the following significance: instead of solely writing the final percentage score of each country the detailed scores are displayed. The first percentage is the “encouraging” “encouraging” response score, and the number in parentheses is the percentage of “not a deterrent” to investments responses. The two numbers are added to give the final percentage.
understand the strengths and weaknesses of countries. Not only the knowledge of the mineral potential is important to attract more investments and make the country more competitive in the industry, but also the policies perception from mining companies. As the Policy Perception Index is composed by many factors, it was crucial to analyze them thoroughly. It led to the narrowing of the country list to the most successful and unsuccessful ones.

2.3.1 Taxes related to mining activities

The next section the study will focus on the countries’ taxation regimes, in order to determine how important the regime is to the industry. It will first analyze the taxation regime scores from the PPI, and the same scores from the Corporate Income Tax index and mining withholding taxes.

Based on the taxation regime from the PPI, Botswana is the 3rd on the list of 104 jurisdictions, with a percentage of 91. In the comparison study, the next highest percentage is Ivory Coast with 80%, followed by Ghana. Peru’s and Chile’s scores follow. This comparison suggests how Botswana is successful in many fields while Chile, one of the core examples, has only 61%. Ivory Coast, the most competitive jurisdiction in terms of its Investment Attractiveness Index overall, does not have an outstanding reputation when dealing with natural resources. This may be due to its low position (108th out of 176 countries) in the Corruption Perception index (Table 8).

<table>
<thead>
<tr>
<th></th>
<th>Botswana</th>
<th>Chile</th>
<th>DRC</th>
<th>Ghana</th>
<th>Ivory Coast</th>
<th>Peru</th>
<th>S.Africa</th>
<th>Zambia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxation Regime</td>
<td>91%</td>
<td>61%</td>
<td>57%</td>
<td>73%</td>
<td>80%</td>
<td>68%</td>
<td>45%</td>
<td>59%</td>
</tr>
</tbody>
</table>

Based on Table 6, the most attractive countries in terms of taxes are Botswana, Ivory Coast and Ghana, listed in decreasing order. These scores were calculated using reviews from mining companies in those specific countries. To learn more about why certain tax systems are more attractive than others, this study compares the Corporate Income Tax (CIT) and mining withholding taxes, which include Dividends, Interest, Royalties and Service Fees. Because of the limited availability of data from the PwC report, Table 7 includes only South Africa, Ghana, DRC, Peru and Chile. Table 7 also shows that the countries corporate income taxes range from 24 to 35%. For mining withholding taxes, Chile has the highest percentages in all categories.

6 Source: Fraser Institute Survey (2016)
approximately doubling those of other countries. Overall, the taxes percentages do not vary drastically between countries. To determine why the Fraser Institute Survey showed higher attractiveness score for some countries, the study analyzes the application of regulations factor (PricewaterhouseCoopers).

Table 7: Corporate Income Tax and Mining Withholding taxes

<table>
<thead>
<tr>
<th></th>
<th>Chile</th>
<th>DRC</th>
<th>Ghana</th>
<th>Peru</th>
<th>S.Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate Income Tax (CIT)</td>
<td>24%</td>
<td>30%</td>
<td>35%</td>
<td>28%</td>
<td>28%</td>
</tr>
<tr>
<td>Mining withholding Taxes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dividends</td>
<td>35-44.45%</td>
<td>10%</td>
<td>8%</td>
<td>6.8%</td>
<td>15%</td>
</tr>
<tr>
<td>Interest</td>
<td>4-35%</td>
<td>20%</td>
<td>8%</td>
<td>30%</td>
<td>15%</td>
</tr>
<tr>
<td>Royalties</td>
<td>30%</td>
<td>20%</td>
<td>15%</td>
<td>30%</td>
<td>15%</td>
</tr>
<tr>
<td>Service Fees</td>
<td>15-35%</td>
<td>14%</td>
<td>20%</td>
<td>15%</td>
<td>15%</td>
</tr>
</tbody>
</table>

This section analyzes the Corruption Perception Index (CPI) done by Transparency International, which ranks 176 countries, as the factor of corruption can hinder best practices in the governance of any sector. “CPI aggregates data from a number of different sources that provide perceptions of business people and country experts of the degree of corruption in the public sector. The score ranges from 0 to 100, with 0 being extremely corrupted and 100 being very clean" (Transparency International). Three of the four developed nations in the study, i.e. the USA, Canada and Australia, have scores higher than 70 percent. The CPI of Chile, which was 70% last year, has now dropped to 66%. Among the 11 developing countries of the study, Botswana has the highest CPI (60%), which put the country at the 35th position out of 176 countries. The transparency and low percentage of corruption in Botswana are two of the most salient positive factors in the country. Aside from Botswana, the other developing nations experience a high degree of corruption with percent lower than 50. The following countries are ranked in descending order: Namibia, South Africa, Ghana, Brazil, India, Zambia, Peru, Ivory Coast, Zimbabwe, and the DRC. An interesting fact to keep in mind is the case of Ivory Coast, which is the most attractive country according to the IAI with 78.93% (Table 4) but has a CPI percent of 34, for a ranking of 108th out of 176. The DRC has the 156th position out of 176 countries in the CPI, putting it among the most corrupted nations in the world (See Table 8 for all the scores).

The correlation between resource curse and weak management can be examined with the Resource Governance Index (RGI), which assesses how well resources are managed in a country (NRGI). The RGI was developed by the Natural Resource Governance Institute (NRGI), an independent non-profit organization that provides policy advice and advocacy infused

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7 Source: PwC 2012
with lessons learned in the field and with insights developed through rigorous research. “This index’s composite score is made up of three components: value realization, revenue management, and enabling environment. The first two components capture key characteristics of the extractive sector, while the third captures the broader context of governance in the country. The first component, value realization, covers the allocation of extraction rights, exploration, production, environmental protection, revenue collection and state-owned enterprises. The second, revenue management, covers national budgeting, subnational resource revenue sharing and sovereign wealth funds, as it applies to the extractive sector. The index’s third component assesses a country’s enabling environment. This component draws on pre-existing research to takes into account characteristics such as the rule of law, control of corruption, and political stability, among others” (NRGI). The Natural Resource Governance Institute computed the index for the period 2015-2016, for 81 resource-rich countries.

Table 8 shows that Chile is the country with the highest RGI mining percentage of 81, excluding Australia, Canada, Namibia and the USA. The scores, separated for the mining and oil and gas sectors, are not available for every country in the study. For example, only the oil and gas sector scores are available for India, Ivory Coast, and Brazil. The study nonetheless utilized them to compare with the governance scores of other countries. In descending order, Chile has the highest score, followed by Brazil, India, Peru, Botswana, South Africa, Ghana, Ivory Coast, Zambia, the DRC, and Zimbabwe.

<table>
<thead>
<tr>
<th></th>
<th>Australia</th>
<th>Botswana</th>
<th>Brazil</th>
<th>Canada</th>
<th>Chile</th>
<th>DR Congo</th>
<th>Ghana</th>
<th>India</th>
<th>Ivory Coast</th>
<th>Namibia</th>
<th>Peru</th>
<th>S. Africa</th>
<th>USA</th>
<th>Zambia</th>
<th>Zimbabwe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corruption</td>
<td>79%</td>
<td>60%</td>
<td>40%</td>
<td>82%</td>
<td>66%</td>
<td>21%</td>
<td>43%</td>
<td>40%</td>
<td>34%</td>
<td>52%</td>
<td>35%</td>
<td>45%</td>
<td>74%</td>
<td>38%</td>
<td>22%</td>
</tr>
<tr>
<td>Perceptions Index</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resource</td>
<td>N/A</td>
<td>61%</td>
<td>71%</td>
<td>N/A</td>
<td>81%</td>
<td>33%</td>
<td>56%</td>
<td>70%</td>
<td>55%</td>
<td>N/A</td>
<td>62%</td>
<td>57%</td>
<td>N/A</td>
<td>N/A</td>
<td>50%</td>
</tr>
<tr>
<td>Governance Index</td>
<td></td>
<td>Oil &amp; gas</td>
<td>Oil &amp; gas</td>
<td>Oil &amp; gas</td>
<td>Oil &amp; gas</td>
<td>Oil &amp; gas</td>
<td>Oil &amp; gas</td>
<td>Oil &amp; gas</td>
<td>Oil &amp; gas</td>
<td>Oil &amp; gas</td>
<td>Oil &amp; gas</td>
<td>Oil &amp; gas</td>
<td>Oil &amp; gas</td>
<td>Oil &amp; gas</td>
<td>Oil &amp; gas</td>
</tr>
</tbody>
</table>

Taking a closer look at the 81% of Chile in Figure 1, this high percentage reflects the combination of enabling environment, good revenue management, and favorable value
realization scores, which are 90, 81, and 74 out of 100, respectively (NRGI). Chile has a competitive state-owned enterprise and follows the good governance practices, which position the country 23 points above the regional average.

![Figure 1: Chile’s Resource Governance Index scores](image1)

To break down the 33% of the DRC, the country has a slightly above average score on value realization (52%), and lower than average scores on revenue management (35%) and enabling environment (12%) factors (NRGI). Although the DRC is above average on value realization, its total percentage is very low. Many improvements are needed in the management of the sector and can be seen in Figure 2. The country encounters challenges in the enabling environment factor, which include voice and accountability, government effectiveness, regulatory quality, and rule of law. There is an entire section on the challenges faced by the DRC mining sector in chapter 3.

![Figure 2: The DRC’s Resource Governance Index scores](image2)

The findings of the analyses indicate that countries struggling with the resource curse are having difficulties in the governance of their mineral sectors. A more detail examination of “governance” can be undertaken with consideration of the presence or absence of the following:

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11 Source: Natural Resource Governance Institute
12 Source: Natural Resource Governance Institute
a competitive state-owned enterprise, a competitive taxation and licensing system, and good governance practices.

What are the characteristics of “good governance” in a government? First it should be noted that the concept of “governance” applies not only to how a government organizes its affairs, but also to undertakings in politics, academics, and economics (Kaufmann). “Governance” is the process of decision-making and the process by which decisions are implemented, or not implemented (UNESCAP). “Good governance,” as explained by Kaufmann, is the “rule” of the game, and every player should adhere to the rules; therefore, good governance does not equate to good government. Good governance has eight characteristics, according to UNESCAP. First, good governance is accountable, i.e., it has an obligation to report, explain and be answerable for the consequences of decisions that it has made on behalf of the community it represents. Second, good governance is transparent. Third, it follows the rule of law, i.e., its decisions are consistent with relevant legislation or the common law and are within its delegated authorities. The rule of law requires the impartial enforcement of fair legal frameworks; it also requires full protection of human rights, particularly those of minorities. Fourth, good governance is responsive and always tries to serve the needs of the entire community while balancing competing interests in a timely, appropriate, and responsive manner. Fifth, good governance is equitable and inclusive. Sixth, it is effective and efficient. Seventh, it is participatory. Lastly, it is consensus oriented (UNESCAP).
The Worldwide Governance Indicator (WGI) is also used in this study to compare the governance of the countries under examination because this factor plays a significant role in the countries’ success. In Figure 3, the six indicators analyzed are voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. For some indicators, Chile or Botswana score higher than the other countries, whereas the DRC has the poorest score in every category. Consequently, the cases of Botswana, Chile and Peru can be considered exemplary because they struggled with the resource curse but found ways to reduce its impact in their countries.

2.4 What can be learned from successful nations?

The foregoing sections of this chapter have defined the set of metrics believed to be useful for understanding the underlying reasons for why some countries’ have achieved more success than others in mineral resource management. With these enabling metrics, this section offers examples of the efficacy of the three exemplary countries among the 15 nations. The exemplary countries selected are Botswana, Chile, and Peru. They are considered key countries because
they were once subjected to the resource curse at a high degree and proved to be successful because of the initiatives undertaken.

Botswana’s leadership has fostered conditions that have provided stability, and economic and social development (Lewin). Wilcox states that one solution to Botswana’s challenges was found when the Botswana government recognized the instability of mineral prices. Rather than relying on a high fixed royalty rate to obtain a significant share of mining profits, the government instead sought to acquire equity in mining companies (Wilcox). The author also adds that it is important to note that Botswana’s high degree of political stability since independence was an important factor in mitigating the resource curse, and in mining’s contribution to development. Political stability was crucial for attracting foreign investment to the mining sector, and for the formation of Debswana, a joint venture between the government and De Beers. It also ensured that mining revenues were invested into social spending, such as health and education, to achieve positive development outcomes (Wilcox).

Botswana’s success was due to effective leadership and good governance (Lewin). Lewin adds that most of the credit must be given to the country’s leadership, which since independence, has put in place conditions of governance that have ensured stability and social and economic progress. The government established respect for property rights and the rule of law. It maintained a high standard of transparency, which was reinforced by consulting the Twana tribal tradition of consulting (Lewin). The respect of the rule of law, the high standard of transparency and the inclusiveness helped Botswana develop its country thanks to its mineral resources. Endowed with a strong state-owned mining company and its exceptional joint venture with DeBeers, which controls diamond prices, the country has a HDI score of 0.69 and has the highest Global Competitiveness Index score in Africa. It beats Australia and Canada in the Investment Attractiveness Index.

In the case of Chile, among the measures taken by the country to strengthen the mining sector is the effort to create an attractive environment for investment (Posner). The country adopted an economic structure with four pillars. The first pillar was the adoption of a predictable and responsible fiscal policy, balancing tax revenues and government spending. The second pillar was the adoption of a monetary policy guided by an explicit inflation target. The third pillar was the gradual opening up of financial and trade sectors, and the fourth pillar was the creation of a solid financial system, private banks and appropriate regulatory policies (Cruz).

According to Haslam, Chile’s success is tied to an innovative and productivist approach based on joint ventures with foreign capital. Previous to the nationalization of its copper industry in 1971, the government advanced its import-substituting strategy. The State was preoccupied
with using the mining sector to propel a broader industrial transformation. Thus, there was a dramatic increase in the national integration of the mining industry in terms of employment, research and development, local processing, supplier development and the use of locally produced inputs to large-scale mining. Haslam adds that Chile also created and assisted in the development of a wide range of mining firms in steel, nitrates, coal, oil and lithium, and that the road to a successful development was not simple. 25 years after the nationalization of the copper industry, the government was pushed away from the dictatorship’s rentier approach for two reasons. The first reason was the endangered position of the country usage of rents, which were rents upon which social spending depended. The second reason was the partial privatization the only state-owned mining company at that time, because of inefficiency or management incompetence. This was pushed by the political right and the private mining companies’ business association (Haslam). Chile has a strong state-owned mining companies, and many multinationals exploiting in its land, and it is considered a developed country with a HDI score of 0.847.

In Peru, the economic discipline resulting from policy changes has allowed the Peruvian economy to grow (Posner). Posner states that Peru, as with other many Latin-American countries, has suffered from a lack of political institutions and military governments that try to use their resource abundance as a short-run solution to economic challenges. After many years and a large political crisis caused by the Shining Path terrorism movement in the 1980s and 1990s, a new economic and political order has been the base of current economic development (Posner). He adds that it was in the mid-1990’s that the Peruvian government employed a set of measures that caused a structural reform of the country. The government’s goal was to make Peru more open to trade and investment and have stronger institutions in the field of economic management. This led to a new economic and political order, which has been the basis of the country’s current economic development (Posner).

Cruz writes about the long-awaited development of Peru after decades of political and economic stagnation during which the country sunk to its lowest points in history. He says that these and many other advances have been possible because of the economic policies that the country undertook some 20 years ago. It was in the 1990s the Fujimori government introduced neoliberal and free-market economic policies. Cruz states that these reforms were the key that opened the doors to the economic success that the country enjoys today. Since then, Fujimori’s successors have not only followed the same path he set in the early 90s but have also taken greater steps to liberalize the economy and integrate it with other foreign markets, thus allowing for greater economic activity and growth.
“The Peruvian state has managed to avert much of the resource curse thanks to the macroeconomic policies and legislation designed to grow the economy and attract investment. Despite the mining sector’s overshadowing of other industries with regards to total net exports, the Peruvian state has averted most of the maladies associated with the resource curse. It has grown other sectors of the economy and has achieved other developmental goals” (Cruz). Posner adds that thanks to mining activities revenues, the sectors of education, health and development of infrastructure are now being prioritized. The country has thus been able to develop productive capacities and services in areas other than the extractive sector (Cruz).

Despite this impressive economic progress in Peru, its political institutions have not improved as much (Posner). With a HDI score of 0.74 and a corruption index percent of 36 (0 being highly corrupt), “mismanagement of funds persists in Peru” (Posner). Nevertheless, the success of Peru of reverting the curse lies on the measures taken to redirect the country’s production structure and to stabilize the economy (Posner). The country practiced key components of good governance, including political will, stronger institutions, economic discipline, and the inclusion of all stakeholders for a good governance.

In sum, the following factors helped Botswana, Chile, and Peru mitigate the effects of the resource curse in their domestic economies: political will and stability; strategic measures taken to strengthen, diversify, and liberalize the economy; the cultivation of strong institutions; strong state-owned mining companies; economic discipline; the rule of law and high levels of transparency and accountability; and inclusiveness in governance.
Chapter 3

Case Study – The Democratic Republic of Congo

The Democratic Republic of Congo (DRC) was chosen for the present case study, as it is one of the countries facing tremendous difficulties with not only its minerals resources but with its natural resources in general. The DRC is the second largest country in Africa, with a land area equaling to 905,400 mi². It has 6,467 miles of borders with 9 countries, and it has an abundance of natural resources including minerals, energy, water, rainforest, and biodiversity. Among the DRC’s mineral endowments are cassiterite, copper, cobalt, columbium (a.k.a. niobium), diamond, germanium, gold, iron, lead, lithium, manganese, phosphorous, platinum, salt, silver, tantalum, tin, tungsten (wolfram), uranium, vanadium, zinc, and oil and natural gaz (Democratic Republic of Congo Ministry of Mines). In addition, the DRC has an ample supply of precious and semi-precious stones, coal, and aggregates. The DRC therefore has great potential to become one of the richest in Africa, as the literature has frequently pointed out.

3.1 Mining importance in the DRC

Before going to the importance of mining activities to the DRC’s economy, this section first analyzes the known quantity of resources and reserves of commodities mined in the nation. Table 9 as constructed using two sources, the United States Geological Survey (USGS) and Coordination Cell Technology and Planning Mining (CTCPM), which is a service under the DRC’s Ministry of Mines. The USGS data includes the known reserves, and the CTCPM data is based on inferred resources. The table includes metals and diamonds, but the data for some commodities were not available. A non-correlation was noted between the two sources’ data on almost all commodities, which is why both sources were used. For example, according to the DRC’s Ministry of Mines data, 15,559,447.19 carats of diamond were produced in 2016. However, according to USGS data, the DRC has a reserve of only 150,000 carats of industrial diamond. The USGS also claims that only 2,800,000 carats of gem diamonds and 11,000 carats for industrial diamond were produced in 2016.

This non-correlation is a significant gap that cannot be overlooked, and led to the conclusion that, the data from the Ministry of Mines, is more relevant for the study. This is because the USGS data depends on survey data from specific companies, and the data from the Ministry of Mines contains holistic inferred reserves of the country.
Table 9: Quantification of commodities in DRC\textsuperscript{13,14}

<table>
<thead>
<tr>
<th>Metals</th>
<th>CTCPM (metric tons)</th>
<th>USGS (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cassiterite (SnO\textsubscript{2})</td>
<td>800,000</td>
<td>-</td>
</tr>
<tr>
<td>Cobalt (Co)</td>
<td>6,000,000</td>
<td>3,400,000</td>
</tr>
<tr>
<td>Copper (Cu)</td>
<td>75,000,000</td>
<td>20,000,000</td>
</tr>
<tr>
<td>Columbiun/Niobium (Nb)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Gold</td>
<td>750</td>
<td>-</td>
</tr>
<tr>
<td>Iron (more than 60%)</td>
<td>10,000,000,000</td>
<td>-</td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Lithium</td>
<td>455,000</td>
<td>-</td>
</tr>
<tr>
<td>Manganese</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nickel</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Silver (Ag)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Tin (Sn)</td>
<td>-</td>
<td>110,000</td>
</tr>
<tr>
<td>Tantalum (Ta)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Tungsten / Wolfram</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Platinum</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Uranium</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Zinc</td>
<td>7,000,000</td>
<td>-</td>
</tr>
<tr>
<td><strong>Gemstones</strong></td>
<td><strong>CTCPM</strong></td>
<td><strong>USGS</strong></td>
</tr>
<tr>
<td>Diamond in carats</td>
<td>700,000,000</td>
<td>150,000 (industrial diamond)</td>
</tr>
</tbody>
</table>

The overall importance of mining in the DRC’s economy is important for building an understanding of the country's resource curse. With a GDP per capita (PPP) of $800 in 2016, the contribution of mining to the total GDP is 22\%. The contribution of mining to exports is 95\%, which shows the country’s total dependence on mining sector. The contribution of mining to the government budget is only 28\% (Extractive Industries Transparency Initiative). The DRC mining types range from artisanal mines, small-scale mines and large-scale mines, which are either underground or open-pit mines, depending on the commodity. For LSM in 2016, there were 2426 active mining licenses and 482 active licensees, as a license holder can have many titles (Democratic Republic of Congo Ministry of Mines). Surprisingly, the low percentage of contribution

\textsuperscript{13} Source: USGS (2016)

\textsuperscript{14} DRC Ministry of Mines (2016)
to the government suggests that, despite the importance of the mining sector, it is not a substantial economic contributor as might be expected.

Despite its ample reserves of natural resources, the DRC is one of the poorest countries in the world. This raises the question: how can a country with vast mineral endowments fail to convert those assets into wealth for the benefit of the country? To answer this question, this study seeks to gain insight from the factors of economic and social development discussed in previous sections. The DRC’s HDI score is 0.4. The corruption level is 21%, which puts the country in the 156th position out of 176 countries. From the Worldwide Governance Indicators (WGI), the DRC percentages range from 5 to 15% for all the indicators, including voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. The country’s Global Competitiveness score is 129th out of 138 economies, which is consistent with its low scores on the WGI indicators.

The resource curse hinders the DRC and the ability of its people to benefit from its richness in mineral resources. To address the challenges it faces, the DRC has taken some actions, including setting up organized mining structures and implementing new mining laws. But because the challenges are almost countless, the country is still struggling to escape the curse. In the next section the study looks at the organizational structure of the mining ministry, the mining regulations, and the associated challenges in more detail.

3.2 Organizational structure

The mining sector in the DRC is under the supervision of the Ministry of Mines (Figure 4). The Ministry of Mines is composed of the cabinet of the Minister, the General Secretary (Mining Administration), the Specialized Services and the Non-Specialized Services. Under the Specialized Services is the Mining Registry (CAMI), which is also supervised by the Ministry of Finance (PricewaterhouseCoopers). CAMI is responsible for registering, withdrawing and cancelling mining and quarry rights. It is also in charge of the processing of applications and the extension of mining and quarry rights to other substances. It is also in charge of the co-ordination of the technical and environmental evaluation of applications for mining or quarry rights, as well as recordkeeping the mining and quarry titles (Democratic Republic of Congo Ministry of Mines).

Additionally, under Specialized Services is the Center of Expertise, Evaluation and Mineral Substances Certification of Precious and Semi-precious (CEEC). It is responsible for evaluating, analyzing, and certifying precious, semi-precious, and colored mineral substances. Precious and semi-precious and rare metals associated or not associated with the major ferrous and non-ferrous metals, also fall within the CEEC’s responsibilities. The CEEC certifies the value, the
quantity and appropriate tax of ores before the exportation process. It gives a technical support to comptoirs (also known as buying desks), to authorized trading houses, and to transformation and processing entities, while also carrying out surveillance and the control of mining resources and financial flux. Finally, the CEEC is charged with the prevention of fraud (Democratic Republic of Congo Ministry of Mines).

The Non-Specialized Services comprise two organizations: SAESSCAM and CTCPM. SAESSCAM, which has been recently changed to SAEMAPE, is the Support and Control Service for Small-Scale Mining. It is a technical service with the responsibility of organizing, supervising, and materially and technically assisting artisanal and small-scale mining. CTCPM is the Coordination Cell Technology and Planning Mining and is responsible to conceive and adapt new techniques to improve the mining activities (Democratic Republic of Congo Ministry of Mines).

The presence of the different services within the Ministry shows that the country has given much thought to management of this sector and created a structure to implement its management goals. Although many of the Ministry’s organizational units have intertwined responsibilities, and even though there are numerous flaws in the system, the DRC is served well with this organizational structure.

Figure 4: Structure on the governance of the mining sector in the DRC\textsuperscript{15,16}

\textsuperscript{15} Source: PricewaterhouseCoopers 2016
\textsuperscript{16} Legend: The orange-filled boxes are non-operational administrative units, as opposed to white-filled boxes.
3.3 Challenges

The challenges related to the mining sector in the Democratic Republic of Congo are examined in this section. These challenges are grouped into two categories: the strategic category and the organizational category. Each of these categories comprises five distinct but interrelated challenges.

The strategic category comprises the challenges faced by the government in managing the sector. PricewaterhouseCoopers (PwC)’s audit of the institutional and management sides of the mining sector was undertaken to promote a more effective contribution of the mining to the growth and sustainable development in the DRC. Their report identified the factors affecting the performance of the Ministry of Mines and recommended targeted solutions.

Within the strategic category, PwC lists 1) the absence of a strategic vision clearly defined and shared for the mining sector. Without a vision, the sector is being managed with short-term goals. 2) The absence of updated geological data. This is attributed to a lack of human, financial and logistical resources at the national level. Because of these shortcomings, the Ministry of Mines does not have measured-resources data, which puts the country in a less competitive position. 3) The lack of collaboration. Within the management structure of the ministry of Mines, many organizational units share the same functions, but do not necessarily collaborate or cooperate. For example, there are two distinct units in charge of research and geologic exploration, which do not collaborate despite their similar missions.

The fourth strategic challenge identified in PwC’s analysis is 4) the coexistence of two conflicting executive frameworks. The earlier framework, dated of 2003, was supposed to be replaced by the new one in 2011. However, both organizational frameworks are still being applied. The 2011 framework is burdensome, rigid and inefficient, where the General Secretary has 12 administrative units under his or her purview. Given this observation, it is not surprising that the 2011 framework has not been adopted completely, even though the initial intent was likely to improve upon the 2003 framework. Finally, 5) the lack of formal collaboration between the Administration of Mines and other state-owned entities (PricewaterhouseCoopers).

Within the organizational category, the first challenge identified by PwC is 1) the sector’s weakness in the management of human resources. There is a lack of skilled agents in geology, mining, and metallurgy. These are the key fields of the sector; therefore, insufficient human resources for the national agencies weakens the structure and causes international mining companies to hire foreign employees and subcontractors. 2) There is a lack of planning and anticipation regarding the succession of the staff. All of the mere 16% of skilled agents of the Ministry of Mines are in retirement age, and many new agents are hired but not skilled enough.
With the scarcity of skilled human resources, many of the agents are either not paid regularly or not paid sufficiently to afford to take their pension when reaching retirement age. 3) There are organizational redundancies between the CTCPM and the Directorate of Studies and Planning under the General Secretary of Mines. These two positions share the same responsibilities. 4) The centralization of tasks and decisions are all made in Kinshasa, which creates delays, top-heaviness of responsibilities, high logistical costs, and inefficient decision-making. 5) There is an absence of an internal control system within the mining sector (PricewaterhouseCoopers). This weakness in the organizational dimension is substantial, as it allows fraud and disarrays in the enforcement of laws. Overall, the lack of financial and logistic means do not favor the strengthening of the system. Therefore, the current structure and organization resources are not well adapted to the challenges faced by the Ministry of Mines (PricewaterhouseCoopers).

In literature, it has been stated that the quality of governance can often be linked to the geography of the country such as size, geographic position relative to neighbors, traditional trading routes, and accessibility of production areas relative to trading centers and government offices. This also means that the government’s current strategical approaches are incompatible with the realities of the internal trade (Garrett, Mitchell and Levin).

Aside from the challenges with the management of the sector, a number of other challenges result from the absence of strong national mining companies and the mining regulations. The Générale des Carrières et des Mines (GECAMINES), which had been the country’s most important source of foreign exchange with more than $1 billion in revenues up to 1990, was the largest and most important public enterprise. Since its bankruptcy in 2003, this producer of copper and cobalt has not been able to regain footing and restore its revenue generating role (World Bank). Other national mining companies experienced bankruptcy, including the Minière de Bakangwa (MIBA), the national diamond producer. Because of the country’s dependence of international mining companies with mining royalties, local and national taxes, mining activities do not adequately benefit the state, as the biggest producing companies are under the conventional regime.

Another factor that hinders a successful mining sector is the country’s mining revenues management. According to the Resource Governance Index (RGI), the DRC is the 75th out of 89 countries and its revenue management percentage is 35. This percentage represents a lack of balance, as performance ranges between satisfactory for taxation and failing for revenue sharing (NRGI). Because of a lack transparency in revenue management, there is a high incidence of corruption, tax avoidance, and fraud in the mining sector. The following evidence indicates that the central and local governments do not disclose actual revenues: the lack of fiscal rules guiding
saving and spending decisions, the non-disclosure of revenue projections, and the gap between rules and their enforcement in mining royalties paid and received (NRGI). The difficulty of implementing an effective revenue sharing system results from the absence of good governance practices in the sector.

This analysis also reveals internal challenges faced by mining companies in the DRC. Because of the country’s political instability and postponement of presidential elections, there is an uncertainty when it comes to new investments. Moreover, political instability is not the only problem that frightens mining investors. Because of the revision of the 2002 mining code that still needs to be approved, many investors fear the prospect of high taxes and resultant decreases in profits. The insecurity throughout the nation with rebel groups and war zones also play a significant role in investors’ considerations. Finally, many mining companies present in the DRC are complaining about the illegal mining activities from Artisanal and Small-Scale Mining (ASM) in the area, and the lack of electric-powered systems and infrastructure that slow their production rates (Democratic Republic of Congo Ministry of Mines).

Particular emphasis must be placed on the artisanal mining sector, as it is impossible to examine mining in the DRC without accounting for the artisanal industry. In some countries, including the DRC, “a distinction is made between artisanal mining, which is purely manual and on a very small scale, and small-scale mining, which is more mechanized and on a larger scale or includes the presence of permanent installations. More commonly, ASM is treated in contrast to Large-Scale Mining (LSM), which usually refers to sites run by transnational companies and is both capital intensive and highly technical” (Hentschel, Hruschka and Priester).

In the DRC, ASM activities are as important as LSM activities, particularly because of the numbers of people involved, more than two million according to the DRC ministry of mines. The sector can play a crucial role in poverty alleviation and rural development; most of the miners involved are poor, and mining represents the most promising, if not the only income opportunity available (African Union). Irrespective of one’s perspective on the sector’s net contribution to sustainable development, the fact remains that ASM activities will continue as long as poverty continues to necessitate them (Hentschel, Hruschka and Priester).

Motivated by these conditions of poverty, many individuals decide to exploit a commodity manually in the hopes of selling their extractions for survival (African Union). This informal system of exploitation by millions of people in DRC engenders challenges in the regularization of the sector. Regularization and formalization refer to the processes of bringing ASM activities into the formal economy. In the 1990s, the demand for the formalization of ASM activities reached a peak worldwide, because it was felt that without this specific step, nothing could be achieved to improve
the social, health, safety, or environmental conditions of the sector (World Bank). As of today, nearly 30 years later, the demand is still high in some countries, including the DRC. For instance, artisanal mining cooperatives in Peru, Ecuador, and Northern Chile, where miners have a long tradition of mechanized mining and some technical training, have been more successful than cooperatives in West Africa, where the degree of sophistication with mechanical processes is much lower (World Bank).

Garrett et al. use the term “a-legal” to describe trades in the artisanal sector that occur when it is not possible for the agent to act legally because the state either does not apply and/or does not enforce the law correctly. This is the accurate term for the artisanal sector in DRC. Although the government has recently put in place a system to formalize the sector, most of artisanal activities are done illegally, because of the incompetency of the state in enforcing the law. In practice, a-legal trade occurs where the law makes requirements of the agent, including the use of artisanal miner cards and limited permissions to mine inside delimited artisanal mining zones (AMZs), but the government does not put the necessary structures in place for agents to comply. An illegal ASM sector includes any miner digging without a miner’s card and any owner of a miner’s card that is mining outside of an AMZ (Garrett and Mitchell).

In contrast, a legal ASM sector, following the Mining Code articles, includes all miners having their identification miner cards and that dig only in a government-delimited AMZ. They must record purchase and sales and distribute the records to the CEEC (Democratic Republic of Congo Ministry of Mines). Additionally, any legal export must be done at designated licensed buying desks (Garrett, Mitchell and Levin).

To quantify the presence and importance of artisanal mining activities, the artisanal sector expanded when the industrial sector declined (International Peace Information Service). The Ministry of Mines distinguishes the terms AMZs and artisanal mining sites. The AMZs are delimited zones set by the government, where artisanal miners have the authorization to mine. Artisanal mining sites are the ones that were not delimited by the government, but where illegal artisanal activities are present. In 2016, there were only 200 AMZs compared to 1,364 artisanal mining sites (Democratic Republic of Congo Ministry of Mines).

In 2007, the World Bank estimated that artisans were producing 90% of the minerals exported, despite the poor safety, health, and security conditions (World Bank). According to the International Monetary Fund, approximately one fifth of the Congolese population directly or indirectly depends on manual mineral extraction (Failly, Ntakobajira and Shonja). At the time of that report, the Congolese population was around 60 million, which means that 12 million people depended on the artisanal activities (Failly, Ntakobajira and Shonja).
With this context in mind, a comparison of the country’s diamond production data between ASM and LSM reveals that in 2016 the ASM production was 80% of the country’s total production, and the LSM production was 20% (USGS). Considering the difficulties of accurate data tracking caused by the informality of the sector, the study recognizes that the available data does not include the entirety of artisanal production. Despite these limitations, it is clear that ASM activities include more human resources, impact more lives and produce more than LSM activities (World Bank).

The present section analyzes challenges faced by miners in general are, as the mining industry includes many players. Research reveals gender inequalities within the sector, along with many cases of children and pregnant women working in mines, leading to concerns about health and safety (H&S) in the mines. The Large-Scale Mines are more meticulous and follow international standards when it comes to H&S. But because inability of the government to conduct effective inspections for H&S and to reinforce the rules in registered and unregistered mining sites, there are high levels of risk and fraud (Democratic Republic of Congo Ministry of Mines). For example, artisanal miners, who are commonly unskilled, have a “limited technical capacity and access to appropriate technology” (Legal Resources Centre), but they continue to work as a means of survival. “Artisans’ hesitancy to legalize their activities stems from a reluctance to make tax payments and from their lack of knowledge about legal requirements. Other causes of this hesitancy include the lack of incentives given to miners to join cooperatives, and the paucity of political will from government authorities” (Hentschel, Hruschka and Priester). Moreover, because of their limited technical and legal knowledge, artisanal miners are usually offered unfair trade rates from traders and buyers and are taken advantage of (Democratic Republic of Congo Ministry of Mines). The lack of a local, fully liberalized, and competitive market in the DRC is one of the greatest constraints to achieving real and tangible development of the ASM sector (Communities and Small-Scale Mining). “Miners cannot use their mineral rights as security for funding or to enter joint ventures with other capable partners, which creates difficulties in accessing the market. As a result, banks and other financial agencies are reluctant to provide loans and other financial assistance to ASM cooperatives, because they are considered unregulated” (African Union). Moreover, because of illegal artisanal mining activities in the country, conflict minerals are difficult to trace.

Similar challenges hinder attempts to quantify the environmental degradation resulting from mining activities because of instability in rural areas of the DRC (KPMG Global Mining Institute). Many mining sites are abandoned and not reclaimed as dictated in mining contracts, and ASM contributes to the deterioration of many lands (Democratic Republic of Congo Ministry of Mines).
of Mines). It is also difficult to quantify loss of biodiversity, because animals are mobile and there is a lack of roads and navigable rivers to be used for tracking such losses (KPMG Global Mining Institute). The government, with its responsibility to ensure that regulations are applied by the letter, is thus powerless because of its lack of means and skilled agents. In addition to these environmental concerns, corporate social responsibility in the DRC is not taken as seriously as in other countries, because of the lack of inspections from the government agencies (Democratic Republic of Congo Ministry of Mines). The resulting challenges faced by the neighboring communities to mining sites are alarming. There are many cases where no indemnity is received by the community’s leader, who should have received compensation from the mining company. There are also many cases of unfair indemnity perceived by the population, when asked to relocate for the mining company to start its activities.

3.4 Mining Rules and Regulations

This section focuses on the regulations in the mining code that seem to be ineffective. One may suspect that because of the numerous challenges, fraud, and corruption within the mining sector, that the DRC has weak mining regulations or none at all. This section includes excerpts of some articles from the mining code to demonstrate that the country has competent mining regulations, and the shortcoming lies more with poor interpretation and enforcement of the rules than with their content.

The mining sector in the DRC is subject to the LAW No. 007/2002 of JULY 11, 2002 relating to the Mining Code, its supplement Mining Regulations and different ministerial decrees. According to the Article 3 of the mining code, the deposits of mineral substances, including artificial deposits, underground water and geothermal deposits on surface or in the sub-soil or in water systems of the National Territory, are the exclusive, inalienable and imprescriptible property of the State. The law states, “However, the holders of mining or quarry exploitation rights acquire the ownership of the products for sale by virtue of their rights.”

The LAW No. 007/2002 of JULY 11, 2002 was put in place to replace the previous legislation of 1982 because the latter did not meet the financial expectations of the State regarding the contract agreements with the mining companies present at that time. Moreover, the nation experienced a 10-year absence of investors prior to the implementation of the 2002 mining code.

The 2002 mining code gave mining companies the option to conform to the new legislation, or to continue operating under the conventional regime. Almost all mining companies in the DRC chose not to conform to the new legislation because the conventional regime is more beneficial to them in its tax and customs exemptions (Democratic Republic of Congo Ministry of
Mines). To better understand the issues with the previous legislation, contracts of mining companies were studied. These contracts are considered as exemptions because they are still under the conventional regime. Below are some excerpts of articles from conventional regime contracts.

The “Mines d'Or de Kisenge” (MDDK/SCARL), which is a partnership of Cluff Mining Ltd and EMK-Mn. SCARL is under the conventional regime since 1998 for a 25-year extendable contract, and here is an example of the Article 11 of the convention (translated from the original French).

The Article 11 of the convention about exemptions specifies that the State grants to the SCARL, during the entire length of the convention, a total and complete exemption of all levies, taxes, rights, contributions, withdrawing no matter the nature thereof, direct or indirect, fiscal or parafiscal, national, regional or local, owed to the State, to local or territorial authorities, to decentralized administrative entities, existing or to come, and in particular schedular taxes on rent and furniture, real contributions, on the tax on oil products and energy, capital and registration duties, without these remunerations being considered as restrictive, with the exceptions of few points (Democratic Republic of Congo Ministry of Mines).

Another example is the company “Anvil Mining Congo” (AMC), which signed its 20-year extendable contract in 1997.

Article 8 of the contract articulates that the State grants to the AMC, during the entire length of the convention, a total and complete exemption of all levies, taxes, rights, contributions, withdrawing no matter the nature thereof, direct or indirect, fiscal or parafiscal, national, regional or local, owed to the State, to local or territorial authorities, to decentralized administrative entities, to professionals or parastatal, existing or to come, and in particular schedular taxes on rent, furniture and profession, real contributions, on the tax on oil products and energy, capital and registration duties, on stamps, on the exceptional contribution on the remuneration of expatriates without these remunerations being considered as restrictive, with the exceptions of customs and taxes specifically defined on article 9 and 17 (Democratic Republic of Congo Ministry of Mines).

These two examples illustrate that conventional regime contracts do not have a similar standard form, but rather are tailored for the companies. Aside from SCARL and AMC, the biggest producer of copper in the DRC, Tenke Fungurume Mining (an affiliate of China Molybdenum Co., Lundin Mining Corporation, and GECAMINES), is also under the exemption list of companies under the conventional regime. The 2002 mining code imposes any new mining licensees to conform to the new legislation and gives the option to mining companies under the conventional regime to either choose to conform to the new legislation, or to continue operating under the same regime. This is one of the reasons behind the motivation of the DRC government to change the mining code once again, as the state is not beneficial to mining activities revenues. To summarize
this important aspect of regulations, the government is not satisfied with the mining revenues, as the biggest mining producers are exploiting commodities under a regulatory regime that is not profitable for the government.

Finally, the regulations related to the management and the share of mining revenues between the national and provincial governments merits analysis. As the government still faces significant challenges with the revenues from mining activities, the study looked into the regulations pertaining the management of thereof. The three ways provincial governments in the DRC currently receive or could receive revenues from extractives are through mining royalties, local taxes or national taxes. According to Article 242 of the mining code, the mining royalties are paid by the holder of the mining exploitation title to the Public Treasury. The latter is in charge of distributing the receipts of the mining royalties as follows: 60% remain in the hands of the Central Government, 25% is paid into an account designated by the Provincial Administration where the project is located, and 15% into an account designated by the town or administrative territory where the exploitation activities take place (NRGI). As of today, the office responsible for collecting mining royalties is the Ministry of Finance (Direction Générale des Recettes Administratives, Judiciaires, Domaniales et de Participation, or DGRAD).

In conclusion, the DRC is equipped with regulations that are either not applied in their entirety, not enforced as effectively as they should be, or are simply weak. The reason behind the will to renew the 2002 mining code is understandable, as the mining code has not been as beneficial as expected to the government or the population. These findings help to explain the low percentage of the mining sector’s contribution to the government budget (28%) discussed in section 3.1.
Chapter 4

Findings & Discussion for the Democratic Republic of Congo

Mining activities in the DRC, and the socio-political environment in which they occur, were summarized in the foregoing chapter. The significant challenges faced by the DRC’s mining sector have also been identified. This chapter focuses on the attempts of the DRC to address these challenges, with a focus on three areas of particular consequence: 1) the artisanal mining sector; 2) the laws, regulations, and ministerial decrees on mining; and 3) good governance.

4.1 Positive Actions taken by the government

It is encouraging that the Congolese government has not been totally passive regarding the difficulties its mining sector. First, this section assesses the implementation of a “Strategic Development Plan” by the government, which was published in 2016 to boost the contribution of the sector. Secondly, this section examines the revision of the 2002 mining code sent to parliament for approval. The revision of the regulations aims to improve the state of the mining sector and the mining contribution percentage to the government.

Several attempts have been made to improve the artisanal mining sector. The government, in partnership with international organizations, has worked on enhancing accessibility of the mining sites and providing equipment to artisanal miners, in order to reduce health and safety concerns. Most of these sites are extremely difficult to access, depending on the region (e.g., mountainous or tropical rainforests), and they can only be reached on foot after long treks. Only few sites, generally where industrial or semi-industrial activities were once conducted, are more easily accessible by vehicle, motorcycle or on foot (Failly, Ntakobajira and Shonja). In 2014, the government partnered with Word Bank, private funders, industry players, and other development partners, in an effort to provide equipment including motorbikes, GPS, and computers to miners in an effort to make their work easier (World Bank). As the number of motorbikes and equipment given was not precise and distribution locations unknown to the public, knowing the importance of the ASM and the large number of miners involved, the question arises as to how much impact these efforts had for the sector as a whole.

The establishment of SAESSCAM to technically assist and train artisanal and small-scale miners was a great initiative. Given the extreme difficulty of managing artisanal mining sites populated by tens of thousands of primary and secondary workers spread out over a multitude of locations, government authorities have increasingly expressed their desire to replace artisanal
mines to small-scale mines, which would be easier to control in a more formal manner (Failly, Ntakobajira and Shonja). As of today, the Ministry of Mines obligates any person seeking to acquire an artisanal mining card to join or create a cooperative. This formalization process of the artisanal mining sector is an ongoing effort. Unfortunately, as Failly et al. point out, the objectives of SAESSCAM remain very theoretical, because the state does not provide the necessary means to carry out its mandate. For example, new and hastily recruited agents are sent to mining areas without an adequate or non-existent mission budget. These agents, as a result, see themselves as tax collectors in order to survive and are perceived as predatory collectors, because some “taxes” are not legitimate, and their receipts are sometimes bogus. In practice, destitute and hastily recruited “new units” are sent into the field, often if not always, to collect pre-determined amounts, which they must send to their own superior, and they are permitted to keep any additional sums collected. In their defense, these agents are rarely trained for the tasks that they have been assigned in accordance with the law or regulations. This flawed system undermines the SAESSCAM’s operations and impedes its ability to achieve its objectives (Failly, Ntakobajira and Shonja).

The DRC is a country-member of the Extractive Industries Transparency Initiative (EITI), which is a global standard promoting the open and accountable management of oil gas and mineral resources. This membership shows that there is a certain amount of political will to be market competitive, and to comply with international standards. The EITI ensures transparency and accountability around the governance of natural resources. This ranges from how the rights are issued, to how the resources are monetized, and how they benefit the citizens and the economy. For this initiative, three players must work in cooperation: the government, mining companies, and the civil society (Extractive Industries Transparency Initiative).

The DRC is also part of the International Conference of the Great Lakes Region (ICGLR), which has a Regional Initiative against the Illegal Exploitation of Natural Resources (RINR). The RINR initiative aims to break the link between mineral revenues and rebel financing. The initiative promotes dialogue between ICGLR Member States on issues related to the illegal exploitation of natural resources and provides them with tools aimed at breaking the link between armed conflict and revenues of natural resources. The principal approach is the set-up of a regional certification system for cassiterite, coltan, wolframite and gold. The supply chains of those minerals which have proven to be related to armed conflict will be audited and certified within the framework of the ICGLR Regional Certification Mechanism which is the core tool of the Initiative (ICGLR).

Not only is the government of the DRC member of the EITI and ICGLR, to fight against fraud and to introduce greater transparency into the supply chain, it also follows the ITRI’s Tin
Supply Chain Initiative when it comes to the exploitation of 3T: tin, tantalum and tungsten. The Industrial Technology Research Institute (ITRI) is the only organization dedicated to supporting the tin industry and expanding tin use. iTSCI is a joint industry program of traceability and due diligence (OECD) designed to address concerns over “conflict minerals” for the 3T. The iTSCI system aims to meet the needs of companies wishing to maintain trade with responsible supply chain actors in the Democratic Republic of Congo and adjoining countries, as well as to meet due diligence expectations of the international community according to guidance from the UN, OECD and national laws such as the Dodd Frank Act in the USA (OECD).

“iTSCI has demonstrated the power of market incentive to create change in the most challenging areas of the world. Even small mining cooperatives in the remotest areas of central DRC have come to understand the importance of responsible trading in order to maintain their market and earnings. They are playing an integral part in this global mechanism of information collection and exchange which also integrates technology into activities of local communities and authorities” (ITSCI).

Finally, the Congo is also in partnership with the German Federal Institute for Geosciences and Natural Resources (BGR), which leads the implementation of a certification of minerals produced in the Eastern part of the DRC and the Great Lakes Region. It is through its Certified Trading Chain project that the BGR put together a larger certification system of production sites that includes criteria for transparency and environmental and social ethics. This project permits the traceability of ores via a packaging device and a labelling process of the production coming out of mines sites (PricewaterhouseCoopers).

4.2 Discussions

This section is divided into four topics: 1) the artisanal mining sector; 2) the laws, regulations, and ministerial decrees on mining; 3) good governance; and 4) the DRC compared to other countries.

4.2.1 Artisanal & Small-Scale Mining

Key subjects were noted in the literature on artisanal and small-scale mining in the DRC to guide the study to its conclusions. A debate persists on the initiatives coming from the West to address African countries’ problems, with some experts arguing that these initiatives do not fit contextually (Mitchell). For example, Mitchell states that many origin-assurance initiatives are designed to meet the demands of consumers or governments in Western markets, rather than to meet the needs of artisanal mining communities and local traders. As the main challenge that the
SAESSCAM currently faces is the formalization of ASM, Mitchell argues that attempting to establish certification before the informal sector has been formalized is likely to undercut the ability to enforce certain standards, such as those applying to origin, on a significant scale. *In order to provide meaningful assurance of origin, national and international bodies must engage with the informal sector on two levels: 1) by helping to formalize extraction and trade and 2) by providing the informal sector with both the will and the means (i.e., incentives and capacity) to support assurance of origin that meets Western consumers’ standards. Assistance with formalization could potentially pay a far greater development dividend for local mining communities over the medium to long term, rather than compel them to provide an assurance of origin* (Mitchell).

Likewise, Kaplan states that efforts to develop the DRC along the lines of the Western model of top-down governance have failed because they were misguided. He adds that the country is vast and without enough competent administrative staff to overcome geographic distances and political fracturing. Kaplan offers a holistic prescription for the DRC, which includes securing natural resources, promoting horizontal development, and making the government accountable.

*The horizontal development model recommended is one in which the main governing structures are shaped around cities and their surrounding rural areas, with the central administration’s powers and responsibilities sharply reduced in favor of programs that build capacity from the ground up. This de-centralization will allow local Congolese citizens to reclaim government as their own, harnessing the informal institutions that have replaced the state in most places, making them more responsive to their constituents, while giving the population real “ownership” of formal bodies for the first time. The municipal government will have full control over their budgets and full responsibility for most programs* (Kaplan). The recent reorganization of the DRC’s 11 provinces into 26 provinces is a step toward that goal.

“As a consequence, international donors would also gain far more flexibility in rewarding competent regional and local governing bodies rather than penalizing the whole country. The national government would work as the head of a loosely confederated state, confining its reach to foreign affairs, monetary policy, the judiciary, customs, interregional infrastructure, the coordination of policies across the regions, and various endeavors that could strengthen competition in the national marketplace and make local institutions more robust” (Kaplan).

The author states the three factors that favor his recommended approach. *First, the weakness of the central government means that it could do little more than to verbally protest its loss of authority. Second, the widespread support of the new constitution indicates a readiness among many Congolese to embrace a profound revision of the DRC’s political structure. Third,
donors could use their control over grants, loans, and income from corporate investments to ensure that most of the money, and the authority to use it, goes to the bottom rungs of the government instead of the top (Kaplan).

Going in the same direction, Geneen and Clusters recommend a context-sensitive, bottom-up approach to ASM, along with a system of price-setting of commodities by the government to discourage smuggling and overpaid unofficial trades. Formalizing the sector can only go hand in hand with state reconstruction, so that the Congolese state become more accountable and better able to carry out its core function. The incentive needed by artisanal miners and traders to join the process of formalization will come from the state reconstruction. A stronger public service delivery to its citizens will motivate them to evacuate their production through official channels, pay taxes, and thus contribute to national development (Geneen and Clusters). The present study agrees with these recommendations and believes that the government should have control over the prices of commodities sold in its territory.

Along with the African Mining Vision on the importance of artisanal mining as a potential income generator, revenues derived from ASM activities can increase local purchasing power, catalyze Small-Medium Enterprises development, and foster local economic multipliers (African Union). In Tanzania, for example, where ASM miners are said to earn ten times more than farmers, income from ASM is invested in shops, taxis, bars, guesthouses, and farming. It also contributes to foreign exchange earnings and help reduce rural to urban migration of youth (African Union).

Because of the significant number of miners involved in artisanal mining, and because many of those activities are a-legal, the government’s effort to formalize the sector is still an ongoing challenge in 2018. Once the government successfully gains control of the subsector, its contribution to the macro-economic stability, with respect to fiscal revenues and local development, will be of great significance. On the other hand, the artisans will benefit from a more controlled system, which means fewer fraudulent trades and taxes, fairness in product sales, alleviation of health and safety concerns, and a more secure environment within the artisanal mining zones. LSM will also benefit from conflict reduction with respect to the security of their sites and minimal disturbances to their productivity. The sector will contribute to poverty reduction as well as generating national income.

4.2.2 Laws, regulations and ministerial decrees on mining

The current mining legislation could benefit from updating. Along with the weakness of mining legislation, one of the main challenges that the sector is facing is the application of the
laws. Many government agents admit that the legislative texts are not applied thoroughly. To offer a concrete example, many proposals have been written to change the 2002 mining code in the past decade, but many agree that the 2002 mining code has not been strictly enforced. A newer version of the proposal for the revision of the 2002 mining code has been sent to parliament in 2017.

Among the legislation in need of updates is the law on the use of explosives. The order 43/366 of August 1955 is still the only legislation on the use of explosives in DRC. The Directorate of Mines has written a draft to replace the previous legislation, which was written by Belgian colonizers before the independence of the Congo, but since 2015 its approval is still pending.

Other challenges persist in the realm of health, safety and hygiene in the mining environment. The service responsible for inspections of the formalized mining sector is under the supervision of the Directorate of Mines (see Figure 4). In turn, the inspections and assessments on health, safety, and hygiene of artisanal miners are to be done by the SAESSCAM (Democratic Republic of Congo Ministry of Mines). Unfortunately, the SAESSCAM does not have a database of assessments, nor does it conduct inspections. Likewise, the Directorate of Mines is not able to conduct inspections of mining sites because of the lack of financial means and equipment. Additionally, the lack of skilled inspectors among the staff of national services contributes to similar burdens.

Because of the weaknesses present in the mining sector, most of the mining companies in the DRC have many privileges and liberty when it comes to laws and regulations. However, the country does have potentially helpful decrees and laws, not only for the sector to run efficiently but also to fight against fraud in the system. As an example, in the Order 23-60 of February 14th, 1952 on silicosis medical checkups, the second chapter articulates control measures that must be taken. Article 6 states that the chief executive of the company, or his/her subordinate, is obligated to submit a clinical and radiological exam to all who are assigned to a potentially “silicose” site. Moreover, Article 15 states that the chief executive or his/her subordinate is punished with two months of penal servitude and/or a fine that will not exceed 2000 francs if he fails to comply to the article 6,7,8,11 and 14 of the same Order.

In summary, the core problems related to regulations are that they are not enforced, and they are obsolete. In order to have a strong regulative system, the appropriate authorities must demonstrate a political will to improve the system by applying the legislation literally. This will motivate mining companies and other mining players to comply with regulations or get severely penalized if they fail to do so. Additionally, the laws and regulations that were written before independence must be reviewed thoroughly and revised to meet current political and economic
contexts. Finally, it is often because of inappropriate regulation that producers and traders are working informally; therefore, instead of imposing new regulatory regimes over existing rule system, institutions must focus a enough resources to work with the existing system (Garrett, Mitchell and Levin).

Here is one concrete example that illustrates the failure of the system because of laws written without consideration of the national context. Garrett et al. compared the informal and formal artisanal sectors in the DRC and Sierra Leone and concluded that the informal artisanal diamond trade has proven to be recalcitrant to legislative change. As a result, many interventions and proposals regarding regulations and oversight have had marginal success or have completely failed. The authors’ findings suggest that the principal cause for the failure of the many interventions is that they have not considered the mechanics of an already functioning trading system, which has an unrivaled resilience. They add that often these interventions have been designed with unrealistic expectations of the regulatory capacities of the relevant institutional infrastructure, which is fundamental to effective application and enforcement. Two misjudgments lead to this failure. One is the fact that existing informal institutions, which were internally functional, had been disregarded. The second is that the institutions that were supposed to impose the new regulatory regime over existing rule systems were not provided with sufficient resources to build the capacity to do so effectively (Garrett, Mitchell and Levin).

Kaplan concludes that fragile states face fundamentally different problems than those found in more advanced countries, and interventions that emphasize programs unsuited to their circumstances are thus doomed to fail, no matter how well intentioned. More attention must be paid to improving the functioning of local governments, in order to reduce their dependency on non-governmental organizations for provision of even basic public services. Kaplan advises the West to ask what type of political system might actually foster the homegrown processes that will enable Congolese people to retake control of their lives, instead of hoping that better leaders and policies alone might reverse the fate of such territories. The present study agrees with Kaplan’s vision, as the goal should be to strengthen local governance so that “the country can wean itself off its chronic dependency on foreign aid and supervision” (Kaplan).

4.2.3 Good governance

Despite the great actions that the government has taken to improve the mining sector, many challenges still persist. As McPhail states, governemental and institutional weakness lie at the root of the problems associated with the resource curse. He adds that it is when the extractives
revenues collected at the national level do not trickle down to the local and regional governments, problems of poverty, corruption, instability, and conflicts ensue.

This study has found that the essence of hindrances in the mining sector lies in the governance of the sector. According to the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), governance means the process of decision-making and the process by which decisions are implemented (or not implemented). Governance can be used in several contexts, including corporate governance, international governance, national governance, and local governance. Many believe that only the government of a country is in charge of practicing good governance, but through the literature reveals that good governance has a political, economic and institutional dimension (Kaufmann). This is the “rule of the game” that every player should follow; therefore, good governance does not equate to good government (Kaufmann).

UNESCAP identifies eight features of good governance. 1) Accountability is a fundamental requirement of good governance. Local government has an obligation to report, explain and be answerable for the consequences of decisions it has made on behalf of the community it represents. 2) Good governance is transparent. People should be able to follow and understand the decision-making process. This means that they will be able to clearly see how and why a decision was made – what information, advice, and consultation were considered, and which legislative requirements were followed. 3) Good governance follows the rule of law. This means that decisions are consistent with relevant legislation or common law and are within the powers of council. Good governance requires fair legal frameworks that are enforced impartially. It also requires full protection of human rights, particularly those of minorities. Impartial enforcement of laws requires an independent judiciary and an impartial and incorruptible police force. 4) Good governance is responsive. Local government should always try to serve the needs of the entire community while balancing competing interests in a timely, appropriate and responsive manner. 5) Good governance is equitable and inclusive. A community’s wellbeing results from all of its members feeling their interests have been considered by council in the decision-making process. This means that all groups, particularly the most vulnerable, should have opportunities to participate in the process. 6) Good governance is effective and efficient. Local government should implement decisions and follow processes that make the best use of the available people, resources and time to ensure the best possible results for their community. 7) Good governance is participatory. Anyone affected by or interested in a decision should have the opportunity to participate in the process for making that decision. This can happen in several ways – community members may be provided with information, asked for their opinion, given
the opportunity to make recommendations or, in some cases, be part of the actual decision-making process. Finally, good governance is consensus oriented (UNESCAP).
Chapter 5

Recommendations for the Democratic Republic of Congo

In this chapter the action plan needed for the DRC mining sector, to metamorphose it to a competitive, efficient and more sustainable system, is recommended. In the short term, the plan may be impossible to achieve, but the recommendation is focused on parameters to improve the longer-term goals of no corruption, more transparency, and better development outcomes. The central point of the model is to cultivate political will. With political will and good governance in place, not only will the mining sector boost the economy, but the Congolese population will experience a significant positive change in their lives. The budget of the State will be managed with less corruption and a higher degree of transparency, and key sectors, including mining, infrastructure, and energy, will receive the financial assistance they need.

Garrett et al. argue that state capacity should also be seen as an issue of political will rather than just know-how or resources. Traders, as well as the political elite that benefit from the present system, may wish to maintain the status quo as part of their political and economic agenda. However, where there is political will, knowledge and resources, governance systems can be implemented more effectively. Along the same lines, Hentschel et al. add that the lack of political will to create an adequate enabling framework for legalization can be explained by personal interests leading to corruption, money laundering, and similar illegal practices, enabled by the informal status of the sector. It is also sometimes the case that the government attempts to attract international mining companies to invest in the country, and the ASM sector may be seen as a disincentive (Hentschel, Hruschka and Priester).

5.1 Recommendations for Artisanal and Small-Scale Mining

The opportunity for ASM to be transformed into a tool for sustainable development, particularly in rural areas, can be realized only if the sector’s challenges are met holistically (UNECA, AUC). The challenges faced by ASM operators form a vicious circle and have a self-reinforcing effect on ASM activities. Particularly, the lack of business and market knowledge, and lack of finance, can force them to sell to middlemen at low prices, perpetuating their poverty. Artisanal miners are therefore kept in poverty trap where their operations rarely graduate above subsistence and remain economically and environmentally unsustainable. Therefore, there is a need for greater governmental support (UNECA, AUC).
The present study supports the idea of learning from other countries’ experiences and success relating to ASM. Many African countries have reviewed their policy frameworks to facilitate the growth of ASM, so that it can play its role in national development and the alleviation of poverty. Some have passed legislation to simplify legal requirements, and Ghana and Zimbabwe, for example, have changed the law to improve the environment for ASM. But despite these legislative responses, the protection of mining rights and size of concessions remain minimal in some countries, including the DRC (UNECA, AUC).

The DRC can learn from examples of African countries’ attempts to deal with ASM challenges. In Ghana and Zimbabwe, for example, one approach adopted by the state-owned Precious Mineral Marketing Company is to offer guaranteed close-to-market prices, in order to reduce the number of middlemen and predatory traders. Another avenue is for the authorities to establish an audit trail of purchases of precious minerals from individual (registered) mines before issuing an export permit (UNECA, AUC). Examples of this strategy include the ICGLR Tracking and Certification Scheme, and the Kimberley Process Certification Scheme.

Another example is Tanzania, which has taken measures including liberalizing trade in ASM mineral products through explicit licensing procedures, and requiring well-structured documents indicating quantities bought and sold. Similarly, in Ethiopia, miners are required to sell their products to the central bank. The bank also allows the miner to deposit their minerals, which are held in trust for them until they sell. This enables the miners to take advantage of favorable prices. In Mozambique, the Mining Development Fund set up by the Government plays a dual role in assisting ASM financially and technically, while also acting as a gold buyer, particularly in remote sites where miners have little access to competitive markets. In these remote areas, this fund is often the only legal buyer. Lastly, in South Africa, the government helped to set up the African Mining Fund, with the support of the International Finance Corporation (the World Bank’s private sector investment arm), to provide finance for small-scale miners (UNECA, AUC).

As the sector’s biggest challenge is the governance thereof, implementing the IGF Guidance for Governments in the DRC is the first step needed to effectively manage the ASM sector. The IGF Secretariat provides capacity-building training and workshops to member countries upon request. It tailors the programs to the specific needs of member governments and provides training on all aspects of mining policy. The secretariat seeks out local and regional experts to engage in the training sessions, which further helps to build regional capacity and ensures that the program reflects local perspectives and realities (Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development). The present study believes that these steps are crucial, because the DRC mining sector needs training sessions that reflect its unique
reality. Not only does “the training examine the legal aspect of mining policy, it also analyzes the social, political, and economic aspects of mining policy”. *Workshops on contract negotiations, for instance, will typically include mock negotiations to show how the theory under discussion can be applied.* Moreover, the government must pay attention to its mining policies and management of the sector. It must pay equal attention to improving the working and living conditions of artisans. Finally, it must acknowledge that mere *monitoring of extraction activities is not sufficient for cleaning up the mining industry* (Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development).

In addition to implementing these IGF measures, the government should reinforce a rural artisanal mining development program. As Failly et al. state, serious problems associated with mining activities in the eastern DRC come from the provision of resources to armed groups who perpetrate acts of violence to terrorize populations. In other words, *the problems are not caused by diggers and their supervisors, but by armed rebel groups. The authorities must admit that preventing the trade of minerals in locations under the control of such groups will not stop them.* In the realm of proactive measures, artisanal diggers have been found to be open to receiving help with improvements of their working and living conditions, when approached sympathetically. *They may even be inclined to collaborate with control measures* (Failly, Ntakobajira and Shonja). Consequently, an integrated development strategy should be actively pursued. The resulting rural artisanal mining development would not only rely on concrete measures to train actors at a technical level and to provide them new tools through research and initiatives; it would but contribute to renewed mining policies better suited to artisanal activities (Failly, Ntakobajira and Shonja).

An artisanal mining program proposed by Failly et al. suggested actions for the exploration, exploitation, beneficiation, and marketing/investments stages. The recommended actions fall into three categories: 1) *on-site technical consultation and training*, 2) *research and development*, and 3) *policy on raw materials*. Within the first category, *miners in the exploration stage should receive specific training that covers the analysis of deposits, their mineralogy, and geological mapping.* During the exploitation stage, *there should be a specific training in the organization and implementation of exploration activities, on safety measures, on mining operations, on mechanization, and a training in the operation of machines.* Under the second category (research and development), Failly et al. recommend systematic approaches to mining methods and equipment, haulage facilities, safety procedures, and ventilation methods for miners in the exploitation stage. These measures will not only teach the miners about the minerals and their geological components but also teach them skills for beneficiation.
Once the government authorities succeed in the training of artisans and track individual performance, significant changes will have been achieved in the sector. The positive outcomes will include more knowledge among miners, a more efficient production system, less time wasted on gauge sites, fewer injuries and adverse health outcomes, more skilled miners working legally, and lower environmental costs.

During the implementation of the ASM Management Strategy with the IGF Guidance, the government needs to assist the SAESSCAM’s objectives by sending a team to participate in Capacity Building & Training Workshops offered by IGF Secretariat, as they are offered to member countries upon request. Through this process, which in turn will train Congolese miners to mine effectively.

While the revision of the new mining code has not been approved yet, the present study recommends that some sections be reviewed to prevent confusion in the interpretation of the Mining Code on ASM in sections 109-114. New mining regulation should require that each cooperative manager has a distinctive card, and all employees working under them have miner’s cards. All employees, whether diggers, shovelers or timber workers, should all have the same kind of miner’s card, to enable efficient management and tracking. Miners should be encouraged to be part of cooperatives, with a manager at the top, to help with management and strategic guidance. The manager should be the one responsible for ensuring that all his employees are holders of miner’s cards. If compliance is not upheld, the manager would be the one subject to sanctions.

To enable miners to take advantage of favorable prices when selling their products, the present study recommends that the DRC emulate the Ethiopian law that requires miners to sell their products only to the central bank. Under this system, the bank allows the miner to deposit their minerals, which are held in trust for them until they sell and guarantee them a credit score for later projects. In addition, the DRC should emulate Mozambique’s system wherein the Mining Development Fund offers financial and technical assistance while also acting as a legal buyer. The DRC should also emulate a strategy Ghana’s and Zimbabwe’s use of the state-owned Precious Mineral Marketing Company in an effort to reduce predatory trading. With all the tracking schemes available worldwide, the government should also have a way to control the sale prices of artisanal products.

The present study advises the government of the DRC to participate in the “Capacity Building and Training” offered by the Intergovernmental Forum (IGF) Secretariat, and to follow the IGF Guidance on the management of the ASM sector (Intergovernmental Forum on Mining,
Minerals, Metals and Sustainable Development). Additionally, it recommends that the government build an artisanal mining development strategy similar to the one designed by Failly et al.

Aside from the Capacity Building & Training & Workshops offered by IGF Secretariat, the Congolese government should participate in the ACP-EU Development Minerals Programme implemented by the United Nations Development Programme (UNDP). This program is a three-year initiative that aims to build the profile and improve the management of development minerals (industrial minerals, construction materials, dimension stones, and semi-precious stones). Development minerals are minerals and materials that are mined, processed, manufactured and used domestically in industries such as construction, manufacturing, and agriculture and have a high degree of economic linkage and utilization close to the location where the commodity is mined (United Nations Development Programme).

“The ACP-EU Development Minerals Programme promotes knowledge exchange to increase the sector’s productivity, to help mining operations adhere to national and international environmental and health standards, and to prevent conflict through effective community relations. It aims to help the sector fulfill the ambitious Sustainable Development Goals, and to work toward the ACP Framework of Action on the Development of Mineral Resources Sector. The program is already bearing fruit. In the first eighteen months of program implementation, more than 1,165 people from 44 ACP countries have participated in 29 training and knowledge sharing workshops. Furthermore, 22 ACP countries have directly engaged 256 small-scale private mining operators, with further engagement and support provided to 17 women mining associations. Finally, plans have advanced to have more rural roads built with domestically produced cobblestone” (United Nations Development Programme).

5.2 Poverty Reduction Plan

Poverty is a serious issue present in resource-rich countries, and its reduction should be a central objective within the DRC’s attempts to reverse the resource curse. James Cust, an economist in the office of the chief Economist for Africa at the World Bank, reports that in 2000, the share of the world’s poor living in resource-rich countries was below 25%. Cust predicts that the percentage will be almost 75% by 2030. According to the most recent statistics, 63% of Congolese population lived under the poverty line in 2012. To correct this issue, the DRC should implement a Poverty Eradication Action Plan. Current legislation, including the mining code, should be reviewed in favor of the population and the State. The experience of Ghana, Uganda and Mozambique should influence the initial measures that the DRC may take to reduce its poverty levels. Statistics confirm these other countries’ success so far. A 2009 report from UNECA
states that because of best practices, the aforementioned three countries are growing, and their poverty rates have decreased. *With the support of its development partners, sustained efforts by Ghana’s government to reduce poverty and improve the country’s standard of living have shown good results.* In Ghana, economic growth averaged 4.5% from 1983 through 2000 but accelerated to 5.8% in 2004 and 6.1% in 2006. Poverty levels dropped from 52% in 1992 to 28.5% in 2005 (UNECA,AU,WB). In 2013, only 24.2% of the Ghanaian population was below the poverty line (Central Intelligence Agency). Similarly, Uganda’s firm commitment to poverty reduction, as spelled out in its Poverty Eradication Action Plan and supported by development partners’ contributions, has brought Uganda closer to reaching the Millennium Development Goals (African Union).

Another proposition is to tackle the poverty cycle by inciting artisanal miners to focus their mining activities on aggregates, with the government’s guarantee to purchase their products at fair prices. This strategy will enable miners to meet the high national demand of construction materials and dimension stones (United Nations Development Programme). Only with AMZ (ZEA) delimited and enforced by government authorities can miners focus on “Development Minerals / Low-Value Minerals and Materials.” *This is because sand and gravel bring in economic returns four times those of gold and even copper. Therefore, an emphasis on these types of minerals should be seriously considered, as these economic gains lead to employment generation and poverty reduction* (United Nations Development Programme). Metals are usually mined for export and have strong fiscal linkage, and poor production and utilization linkage. In contrast, when development minerals are mined and used domestically, they have low fiscal linkage, and strong consumption, production, and utilization linkage (United Nations Development Programme).

### 5.3 Strategic Plan for DRC

Several key strategic changes are recommended here, focusing primarily on political will and good governance. The DRC must have a short and long-term vision for its mining sector, which must be kept in mind at all times by all stakeholders. In 2016, a strategic plan was written by the Ministry of Mines in partnership with the World Bank, wherein the following vision was stated: “Develop a competitive and sustainable sector, a base of an emerging country and the well-being of the Congolese population.” Along with this vision, this thesis recommends that the Ministry of Mines set a vision for the mining sector to tackle poverty in the country by reducing it by 50% by the year 2030. To achieve this vision, all available means should be used to reach the objective. In order to be capable of working toward this vision, the institutions of the government should be strengthened. Many challenges related to the structure of the sector have been cited.
in Section 3.6, which include weaknesses in the laws and regulations, weakness in the application of current laws, and flaws in governance practices. These weaknesses must be dealt with and transformed into strengths. Another concrete goal should be to make the DRC mining sector more competitive in an attempt to become the leading producer of its main commodities in Africa. Not only would the population will benefit from such improvements, but the state budget will receive a better contribution from the mining sector. Another long-term strategic goal the DRC should focus on is a transition plan for surviving the depletion of its numerous mineral resources. The country cannot afford to sign contracts blindly, without knowing when its reserves will reach exhaustion and what other sector can subsequently take the lead in sustaining the economy.

This need for a contingency plan leads directly to important operational recommendations. Such a plan cannot be developed without a clear awareness of the size of domestic resource endowments. Therefore, there is a strong need for in-depth geological studies and quantification of reserves in the DRC. This stage of the action plan is instrumental, because it will determine the Ministry of Mines' long-term strategic direction. Many of the country’s geological data used were done by international mining companies exploiting in the land. The DRC is not able to verify these findings without first-hand involvement in the data collection efforts. Dedicating resources to this need will lead to a more attractive climate for potential investors. To create such conditions, the government should invest in the training and education of its workforce. For example, if the education system remains ineffective in the DRC, the country should invest in opportunities for students to receive training abroad, and to return to apply their knowledge domestically. As mentioned earlier, there are many international programs available to train not only students but also government agents in management and decision-making within the mining sector.

With short- and long-term visions built on a consensus among all stakeholders, and the financial means to implement these visions, governing bodies will receive enough financial support for their equipment, the training of staff, and the training of younger generation for the mining sector. Consequently, this will enable thorough inspection and control of the mining sites by the State. Not only will these conditions enhance the effective management of the sector, but they will also improve the image of the nation and earn international respect for the DRC.

In these conditions, the formalization of the artisanal mining sector could be accomplished with relative ease, as less fraud would be allowed to go undetected. The miners will only work within the well-studied ZEA boundaries, and there would be fewer conflicts related to the invasion of LSM sites. The miners will also receive the adequate education of the commodity of the ZEA. This will contribute to poverty reduction and the creation of a strong middle class.
Mining companies already operating within the DRC will also benefit from these changes, as they will be able to work with no invasion of artisanal miners, and they will have a robust infrastructure and adequate electric power to facilitate their operations. Similarly, the State will benefit from income taxes paid by individual miners and companies. The provincial division will receive its percentage and will support the communities living near mining sites. The business climate of the country will be more competitive and attractive for investors, new employment will be generated, and the country as a whole will be stronger.

Lastly, the DRC should learn from other resource-rich countries’ mistakes and experiences. Although contexts may differ, there are always similarities that can be learned from elsewhere. This is why the present study attempts to find common solutions for challenges related to the resource curse. These links of the scheme have the potential to create a sustainable system for the mining sector in the Democratic Republic of Congo.

To conclude, the present study recognizes that the Democratic Republic of Congo has its own history and many more complex challenges that are directly and indirectly connected to its mining sector. Many of the challenges faced by the country are consequences of the resource curse. The country’s constraints are exacerbated by its history, geography, climate, and culture, but the country’s situation is not a lost case. These broader subjects are beyond the scope of the present study, but they merit further research. Further research is also encouraged on the impact and initiative to either close the weak state-owned mining company GECAMINES, or to open a stronger state-owned mining company, with the goal of strengthening the sector as a whole.
Chapter 6

Conclusion

Specific factors characterize countries that either avoid or succumb to the resource curse, as hypothesized at the outset of this study. The research objective was to formulate strategic recommendations to minimize the resource curse, and this has been accomplished through comparison of high-performing and low-performing national mining sectors. The potential symptoms of the curse are still debated among economists and researchers, but few have recommended ways to counteract the effects of the curse and to turn it into a blessing. This study has advanced the understanding of underlying factors that influence the severity of the resource curse, and with this knowledge, strategic-level recommendations can be formulated.

There are seven specific factors that will determine the performance of a government to promote development and sustainability through mineral revenues management and usage. The seven factors are: political will, competitive legislation and the enforcement thereof, strong institutions with targeted goals, economic discipline to achieve visions and goals, diversification of the economy, the application of good governance practices, and motivation to learn from other countries’ experiences.

All of these determinants of a successful response to the resource curse require special attention, but the most critical is political will. A resource-rich country’s leaders should have a firm commitment to political action. Without this critical determinant, the country could have all of the other factors and still fail to achieve successful outcomes. Political will is essential for improving the negative conditions hindering the economic growth and development of a nation. Once political will is present, an imperative for competitive and efficient legislation is the second factor. This includes the implementation of policies to prevent the effects of Dutch disease on the local currency and exports, and to restrict excessive borrowing during periods of high commodity prices.

The need for strong political institutions with targeted goals is the third factor. A country needs to have not only short-term goals but long-term strategies. Strategic measures could strengthen the mining sector by creating an attractive environment for investment. Further, a country needs to stay competitive to be attractive for investment. A country should study the implications and measures needed to attain those goals. Once the measures to achieve goals are studied, the government should leverage its political will to invest in key sectors to move
toward economic growth. Investment entails focusing on capacity building for stronger institutions by dedicating financial and human resources to the pursuit of short- and long-term objectives.

The fourth factor is the economic discipline. Some of the countries experiencing a high degree of the resource curse are solely dependent on the extractive sector. This pattern underscores the fifth factor: there should be a diversification of sectors driving the economy. This is a substantial determinant, because the valuable deposits will eventually be depleted, at which point the country will have few alternative options if economic diversification was not made a priority earlier in the life cycle of the reserve. The sixth factor is to apply good governance throughout. Good governance is accountable, transparent, and responsive. It serves the needs of the entire community, while balancing competing interests. Good governance is equitable, inclusive, effective, efficient, participatory, and consensus oriented. Lastly, a country should learn from previous mistakes of others, and use that knowledge to continually improve its responses to new challenges that arise as its resource endowment diminishes.

Attention to these seven factors will enable more successful and sustainable outcomes for those countries endowed with rich mineral resources. Admittedly, some of these factors, such as political will, are difficult to translate from the strategic to the tactical realm. Nonetheless, it is essential that a country’s leaders recognize their obligation to exercise political will, and the consequences of failing to do so. Other factors, including legislation and economic diversification, are inherently more actionable, and thus present a clearer roadmap for a country’s leaders to pursue. The experiences of countries who successfully manage the resource curse demonstrate the importance of attending to the seven factors identified in this study. Ideally, all seven should be addressed successfully, and yet, that is an unrealistic short-term goal for many developing countries like the DRC. Concrete action and progress, if only within a few of these seven factors, is to be encouraged.
References


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