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QGRL WORKING PAPER

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# Maximizing the Gains from Natural Resources for Sustainable Development in Africa

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## Abstract

Africa is rich in natural resources. The region boasts of over 10 percent of world reserves of oil, about 40 percent of gold, 90% of chromium and the platinum group of minerals, extensive fisheries, forests, as well as vast tourism resources which can support economic development. Evidence on the role of natural resources in fostering sustainable development is mixed: while some resource rich countries have succeeded, some have not yielded the full benefits of natural resources. In the case of Africa, benefits from natural resources have remained rather below potential, with resource rich countries failing to sustain strong growth rates for longer durations. This has raised some questions about the prospects of Africa's development paradigm in light of its resource abundance. What needs to be done to maximize the benefits of natural resources for sustainable economic development? This paper analyses the potential role of natural resources in fostering economic development in Africa. We argue that natural resources can foster economic development if right strategies and policies are implemented throughout the value chain of natural resources: from discovery of natural resources, extraction, and management of natural resource rents. Using evidence of some countries which have benefited from natural resources, we argue that successful leveraging of natural resources for sustainable economic development requires development of strong institutions for efficient and effective exploitation of natural resources; sound fiscal policy management including fiscal expenditure rules; as well as establishment of resource funds, particularly sovereign wealth funds. Policies supporting economic development in Africa have to account for the relative rich presence of natural resources.

Keywords: Natural resources, Sustainable economic development, Resource rents, Africa

JEL Codes: O13, Q01, Q32

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The views expressed in this paper are those of the authors and do not necessarily represent those of the Quantum Global Research Lab and the Botswana International University of Science and Technology

## 1. Introduction

Africa is rich in natural resources. The region boasts of over 10 % of world reserves of oil, 40 % of gold, 80 – 90% of chromium and the platinum group of minerals, over 50% of diamonds, over 85% of phosphate reserves, and many other minerals. Also, about half of the world's arable land, extensive fisheries and forests, abundant renewable and non-renewable energy resources and vast tourism resources, are in the region. Five of the top 30 oil-producing countries in the world, which accounts for 85% of the continent's oil production, are also in Africa. Explorations in the last decade across many African countries have led to discoveries of more natural resources. Recent resource discoveries in the region include the rich oil deposits in Ghana (2011), natural gas in Mozambique (2010), Tanzania (2010 and 2015), Uganda (2006), and Kenya (2012) among others. According to the IMF classification, about 32 countries in Africa are resource rich, of which 28 are in SSA and 4 are in North Africa<sup>3</sup>. Resource rich SSA countries account for more than 80% of the region's GDP.

The natural resource sectors, especially the mining sector, have been very important in driving economic growth in Africa and continue to hold strong potential for future development. Since 2000, the strong growth realized in many African countries has been largely driven by growth of the resource sectors, supported by rising commodity prices, development assistance and increased production. However, benefits from natural resources have remained rather below potential, with resource rich countries failing to sustain strong growth rates for longer durations. The benefits of resource abundance are not obvious- some countries have developed from natural resources, while others have not. McKinsey Global Institute (2013), noted that almost 80% of resource-driven countries have below-average levels of per capita income globally since 1995. In Africa, a lot of resources are yet to be transformed from underground wealth to above ground assets, which can help to drive and sustain long term economic development and poverty reduction. Some important questions that require urgent answers for African countries include: i) what are the prospects of Africa's development paradigm in the light of the prevalence resource abundance? ii) What are the steps that need to be taken to maximize the benefits of natural resources for sustainable economic development? iii) Why have some countries (both within and outside the region) developed from natural resources while some others have not? iv) What are the lessons that can be drawn from successful resource rich countries? This paper therefore analyses the potential role of natural resources in fostering economic development in Africa. It also identifies strategies that can be implemented in resource rich countries to maximize the potential gains from natural resources for sustainable development.

There is an enormous and inconclusive literature on whether natural resources are a blessing or a curse. Some studies have found that natural resources help economies to develop (see for instance Lederman and Maloney, 2007; Mehlum et al, 2006; and Alexeev and Conrad, 2009). While other studies found evidence that natural resources have impeded economic development (e.g. Sachs and Warner, 1995; Auty, 2001; and Gylfason, 2001). These studies

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<sup>3</sup>The classification is based on a threshold of at least 25% of the value of its total exports derived from non-renewable natural resources such as oil, minerals and metals, or natural resources account for least 20% to the country's GDP. The countries are presented in Figure 1.

argue that very few resource-driven countries have sustained strong GDP growth for longer than a decade. In this paper, we argue that natural resources can play an important role in economic development if there are right strategies, and policies are implemented throughout the value chain – from the discovery of resources, extraction, and management of resource rents. Using evidence of some countries which have benefited from natural resources, we argue that successful leveraging of natural resources for sustainable economic development requires development of strong institutions for efficient and effective exploitation of natural resources. These forms of institutions include sound fiscal policy management including fiscal expenditure rules, and establishment of resources funds, particularly sovereign wealth funds.

The rest of the paper is structured as follows: the immediate next section outlines some theories and evidence on natural resources and sustainable development. The third section presents some stylized facts on natural resources and development dynamics in Africa, while the fourth section discusses some challenges that resource rich countries face in leveraging resources for development. The fifth section elaborates on the possible strategies to maximize the benefits from natural resources by African countries. This is immediately followed by an illustration of some country case studies and imminent lessons in the sixth section. The conclusion and policy recommendations are included in the seventh section.

## **2. Natural Resources and sustainable development: Theory and evidence**

To establish the theoretical link between natural resources and sustainable development, we present a review of different theoretical assertions and empirical evidence that explains this relationship.

### ***Theory***

The World Commission on Economic Development (1987) report defines sustainable development as that kind of development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It emphasises on the ability of natural resources to maintain and enhance human well-being across generations. The discussion on the role of natural resources in development dates back to Adam Smith and David Ricardo who considered them as the basis for economic development. Later, scholars such as Rostow (1961) noted that natural resource endowments enable developing countries to transition from underdevelopment to industrial takeoff, as done by developed countries such as Australia, United States, Canada and Norway.

A related line of thought has also considered natural resources as part of total capital that is essential in the production process. The World Bank (2006) considers the wealth of a nation as composed of natural capital, produced capital, and intangible capital<sup>4</sup>. Natural capital is the sum of nonrenewable resources (oil, natural gas, coal, and mineral resources), cropland, pastureland, forested areas, and protected areas. Produced capital is the sum of machinery, equipment, and structures (including infrastructure), and urban land. Intangible capital is composed of raw labor, human capital (stocks of skills and know how embodied in the labor

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<sup>4</sup> The standard national accounts measure the change in a country's wealth by focusing solely on produced assets/capital.

force), social capital, and other factors such as the quality of institutions<sup>5</sup>. Wealth of a nation only increases if resources are discovered, and their extraction produces a rent used to create above ground assets. Inefficient extraction of natural resources, and dissipation of the rent do not lead to value addition, but to reduced national wealth instead. As such, sustainable economic development requires the building of both total wealth and composition of wealth, especially transforming underground wealth into above ground assets. Thus, governments should seek to reinvest rents from exhaustible resources into other productive assets, such as infrastructure or human capital, in order to increase the wealth of the nation and sustain growth.

Boulding (1993) argues that the use of natural resources in current production activities imposes a heavy burden on the earth's capacity and depletes the current stock of natural resources. This implies that for development to be sustainable, the current stock of total natural capital has to be at least maintained at the current levels. Hartwick, (1977) and Daly (2008) argue that, since most natural resources are exhaustible, resource rich countries should invest the proceeds from natural resources into the long-term accumulation of other forms of capital (human, physical, social and “institutional”), as opposed to financing current consumption to achieve sustainable development. Goodland (1992) suggests that depletion of natural capital is one of the factors that limit growth, development and wellbeing. Anand and Sen (2000) also considered intergenerational equity and environmental issues, arguing that the depletion of natural resources implies that the future generation may be made worse off by inheriting fewer resources from the current generation than they need for their well-being. While Padilla (2002) proposes that the loss of environmental amenity to the future generation should be compensated for by alternative sources of wealth creation.

The other literature on the role of natural resources in development has centred on the resource ‘curse’ or ‘blessing’ thesis (Gelb, 1988; Auty, 1993). The resource curse literature seeks to explain why resource rich countries have not been able to use their natural resources to develop their economies compared to non-resource rich countries. This literature argues that natural resources can impede economic development rather than promote it, through the Dutch Disease effects, volatility nature of natural resource revenues, corruption, and rent seeking behaviour by political elites, and the perpetration of civil conflicts.

The Dutch Disease argument contends that natural resource booms increase domestic income and the demand for consumable goods. This increase generates appreciation of the real exchange rate, which reduces the competitiveness of the other tradable sectors such as manufacturing. In addition, increases in labour productivity in a booming export sector, pulls the work force and attract economic resources away from other economic sectors. This could lead to deindustrialization. In the long run, the economy become specialized in the production and export of natural resources, and consequently economic growth could be slow and intermittent as industrial sectors are hindered (Corden and Neary, 1982).

Economies with abundant natural resources are subject to periodic fluctuations of commodity prices, resulting in volatile export revenues and fiscal revenues. Volatility of government

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<sup>5</sup> Intangible capital is calculated as a residual, the difference between total wealth and the sum of produced and natural capital

revenues and foreign exchange earnings could reduce investment, government spending, and hurt growth (Gylfason, 2001). Market instability also increases uncertainty, makes it difficult to measure revenues from the natural resource sector, and hampers effective planning for economic development.

The literature on corruption and rent seeking argues that natural resources have potential to promote corruption and rent seeking by elites who seek to grab the rents from natural resources. Torvik (2002) showed that greater amount of natural resources increases the number of entrepreneurs engaged in rent seeking and reduces the number of entrepreneurs running productive firms, which will hurt welfare. In many developing countries, huge resource rents may also lead to a concentration of economic and political power in the hands of elites who use those rents to maintain their control. Acemoglu and Robinson (2006) argues that political elites can intentionally block technological and institutional development because such development may erode the elites' advantage to loot from public income, leading to poor economic development. Mehlum *et al* (2006) contends that rent-seeking, predation and other non-productive behaviour, may be stimulated by lack of good quality institutions in resource rich countries.

Resource abundance has also often resulted in civil conflicts and political instability in some resource rich developing countries. Collier and Hoeffler (2002) present a model in which conflict is promoted by firstly, available financing from resource rents, and second, warring parties anticipating lucrative prize in the possible event of winning the war. Furthermore, Acemoglu *et al* (2004) argue that dictators in resource rich countries use resource rents to buy off political competitors, which may often worsen civil strife and political instability. Overall, resources are diverted from productive use and hence stall growth and development.

### **Empirical evidence**

Empirical evidence on the relationship between natural resources and economic development is mixed. Some studies find a positive relationship between natural resources and economic growth/development; while others find evidence of negative correlations. The literature which find negative relationships argue that natural resources can slow long-term growth through the Dutch Disease effects, macroeconomic volatility, deterioration in governance, increased corruption and rent seeking behaviors, and civil conflicts. On the other hand, proponents of resource blessing argue that natural resource contributes to growth by providing necessary resource to finance such growth, only with a strong institutional framework (Mehlum *et al* 2006; Atkinson and Hamilton, 2003).

In the analysis of 97 developing countries, Sachs and Warner (1995) find evidence that resource-rich economies have grown more slowly than less resource intensive economies. They attribute this failure to lack of appropriate macroeconomic frameworks supported by strong governance and fiscal regimes to support effective use of resources for economic development. Collier and Goderis (2007) find positive short run effects and long run adverse effects of resource booms on national income. While Arezki and van der Ploeg (2010) find cross country evidence of a negative relationship between resource abundance and income per capita,

especially for countries with poor institutional quality. Sala-i-Martin and Subramanian (2013) also show that for a given level of institutional quality, natural-resource abundance has no direct impact on growth in Nigeria. Rather, natural resource abundance negatively impacts economic growth indirectly via their deleterious effect on institutional quality, especially when resources are geographically concentrated. Similarly Goldberg *et al* (2008) find that the presence of natural resource rents alter democratic environments, which often results in institutional decay, slow growth, corruption, and conflict. Ross *et.al.* (2011) argue that political instability in the Middle East and North Africa (MENA) is attributed to poor institutions and inefficient state interventions and redistribution financed through resource rents.

Gylfason (2001) argues that resource abundance may reduce private and public incentives to accumulate human capital because of high levels of non-wage income (e.g. dividends, social spending, low taxes) and because of the predominant tendency in resource-rich economies to underestimate the long-run value of education. Daly and Cob (1989) show that while countries realise economic growth over time, once depletion of natural resources, pollution costs, and income distribution effects are taken into account, the economies exhibit no growth at all. For example, the episodes of slow growth and low income per capita in some Africa countries such as Nigeria and Democratic Republic of Congo can widely be attributed to the resource curse phenomenon.

However, some empirical studies find evidence for the positive role of natural resources for economic development. Lederman and Maloney (2007) find that the negative effect of natural resources on growth vanishes once measures of export concentration and intra-industry trade are included in their regression estimations. Similarly, Pineda and Rodríguez (2010) find evidence that changes in human development indicators, particularly the non-income components of human development (literacy and life expectancy), are positively correlated with natural resource abundance. They argue that the positive effects of natural resource abundance on human development mainly comes through education and health dimensions. This is consistent with the view that resource wealth offers opportunities for countries to build human and institutional capital.

Mehlum *et al* (2006) find that resource abundance actually increases growth when there are good institutions, even though the independent effect of resource abundance is negative. In fact, the impact of natural resources on growth and development depends on whether the country is well endowed with two types of capital that can be considered to be complimentary to natural resources – i.e. human capital and “governance or institutional capital”. Without these, the country is more likely to experience a “resource curse”. There is also evidence that countries with lower levels of these complementary assets will find it more difficult to diversify and to advance up the export technology ladder. Atkinson and Hamilton (2003) find that resource-rich countries (with good quality institutions) have enjoyed greater rates of gross investment and saving. Using a similar framework, Dietz *et.al* (2007) find positive impact of institutional measures on savings in the interaction with resource abundance. This evidence suggests that in the long run, development needs a balance with the endowment of factors to grow. Resource wealth also offers countries a choice of whether to invest in ways that decrease

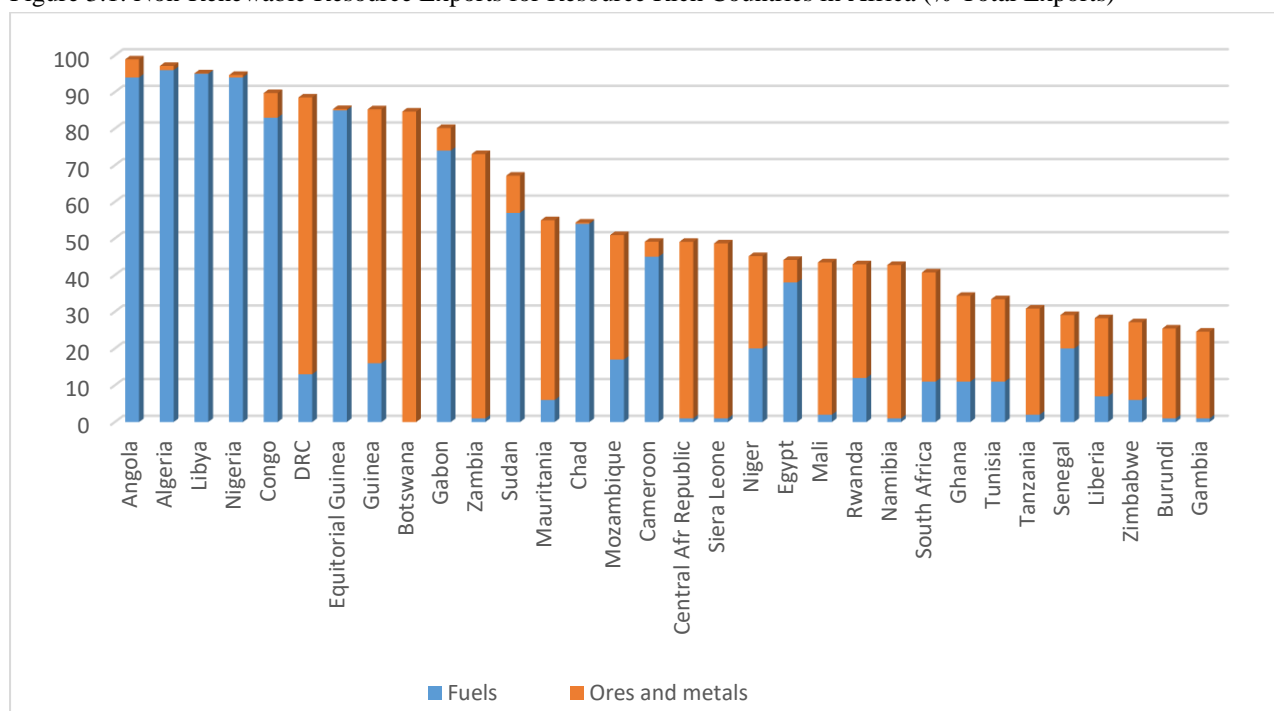
costs and increase productivity in the non-resource traded sectors, or to spend it in other ways that will reduce resource dependence.

On the study of major oil producing countries, Alexeev and Conrad (2009) conclude that the effect of a large endowment of oil and other mineral resources on long-term economic growth and income levels is positive. Daniele (2011) also presents evidence of a positive relationship between human development and natural resource abundance.

### 3. Natural Resources and Economic Development in Africa: Trends and Patterns

According to the IMF, there are 32 resource rich countries in Africa. Amongst these resource rich countries, there are 12 oil producing countries. They include Angola, Algeria, Cameroon, Chad, Congo Republic, Gabon, Egypt, Equatorial Guinea, Libya, Nigeria, Sudan and South Sudan<sup>6</sup>. Of the nine oil producers from SSA, production is mostly concentrated in Angola and Nigeria, supplying 75% of the region’s total oil output, while in North Africa, Libya and Algeria dominates. Oil exports from SSA countries account for about 50% of the region’s GDP and approximately 25% of the oil exporters’ GDP (International Monetary Fund - IMF, 2015). More than 90% of the continent’s natural gas production is being driven by Nigeria, Libya, Algeria and Egypt. Figure 3.1 indicates that eleven of the twelve oil exporting countries were among the largest 21 non-renewable resource exporting countries over the 1995-2015 period.

Figure 3.1: Non-Renewable Resource Exports for Resource Rich Countries in Africa (% Total Exports)



**Note:** The values in the Figure are the averages for the period 1995-2015. The countries in the Figure are the resource rich countries that have non-renewable natural resources exports that consist of at least 25% of total exports.

**Source:** UNCTAD 2016 Database. Classification: Fuels (SITC 3), Ores and Metals (SITC 27 + 28 + 68 + 667 + 971).

<sup>6</sup> Angola, Cameroon, Chad, Congo Republic, Gabon, Equatorial Guinea, Nigeria, Sudan and South Sudan are in SSA, while Algeria, Egypt, and Libya are in North Africa.



Non-renewable resources accounted for a minimum of 45% of total exports in each of the eleven countries. In addition, oil accounts for at least 80% of total exports in Angola, Algeria, Libya, Nigeria, Congo Republic and Equatorial Guinea, while at least 40% of exports in Gabon, Chad, Cameroon, Chad and Egypt. These statistics highlight the concentration of oil and gas resources and the extent of oil dependence by African countries.

On the other hand, Figure 3.1 indicates that over the 1995-2015 period, minerals and metals accounted for at least 70% of total exports in Botswana, DRC, Zambia and Guinea. Over the same period, Chile, Mauritania, Central African Republic, and Sierra Leone had at least 50% of total exports from minerals and metals. In other resource rich countries such as Namibia, Mali, Mozambique, Rwanda, South Africa, and Tanzania, minerals and metals accounted for at least 30% of the countries' total exports.

Export growth in African countries highly depends on natural resource exports. Table 3.1 further substantiates the high dependency on natural resources by African countries. Three quarters of the countries listed in Table 3.1 fall within the classification of countries heavily dependent on non-renewable natural resources<sup>7</sup>.

Table 3.1: Primary Commodity Exports in selected African Countries (% of GDP) (2000-2015)

Congo	72	Chad	31
Equatorial Guinea	67	Zambia	26
Angola	57	Namibia	25
Libya	51	Nigeria	23
Gabon	50	Somalia	22
Botswana	38	Zimbabwe	22
Algeria	36	Swaziland	21
Mauritania	33	Ghana	21
Seychelles	33	Mozambique	20
Cote d'Ivoire	32	Togo	20

Source: UNCTAD 2016 Database

Primary products exports in more than a third of African countries accounts for at least 20% of GDP between 2000 and 2015. Amongst this group, the contribution of primary product exports to GDP in Congo Republic and Equatorial Guinea is as high as 72% and 67% respectively.

Table 3.2 in the Appendix provide evidence that for non-oil exporting resource rich countries, gold, diamonds, and other precious stones are the major commodity exports. Amongst this group, Niger and Zambia depend heavily on base metals and uranium, while DRC, Guinea, Namibia, and Sierra Leone depend on a broad mixture of commodities. As of 2015, minerals and metals accounted for at least 80% of export earnings in Botswana (mainly diamond, copper and nickel), Congo Republic (diamond, petroleum, and cobalt), Guinea (bauxite, alumina, and gold) Sierra Leone (diamond), and Sudan (gold) in 2015. Furthermore, more than a quarter of the resource rich countries had at least 50% of total export earnings derived from minerals.

<sup>7</sup> These are countries where at least 25% of total exports are accounted for by non-renewable natural resources.

These include Mali (gold), Mauritania (iron ore), Mozambique (aluminium), Namibia (diamond, uranium, gold, and zinc), and Zambia (copper and cobalt).

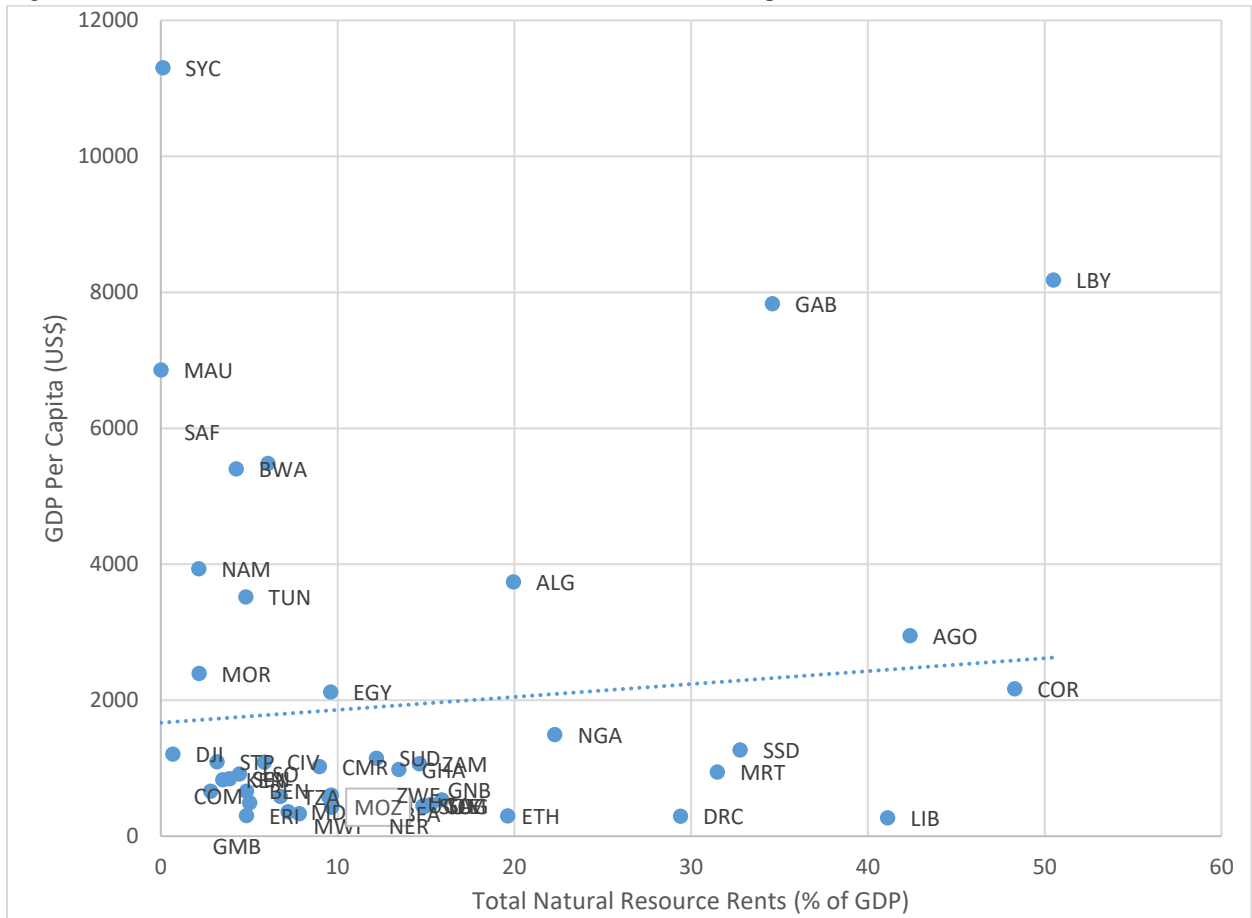
Pertaining to renewable natural resources, Table 3.2 (see Appendix 1) suggests that coffee, cocoa, tea, cotton, and livestock are the major export commodities. Renewable resources account for at least two thirds of exports in Malawi (tobacco, sugar, and tea) and Seychelles (fish). In addition, renewable natural resources accounts for at least 50% of total exports in Burkina Faso (cotton and livestock), Burundi (coffee and tea), Sao Tome and Principe (cocoa, coffee and palm oil), Somalia (livestock), and Uganda (coffee, tea, and fish). The data suggests that African countries have both renewable and non-renewable natural resources, which can be used for sustainable development.

Table 3.2 further indicates that on the average, resource rents accounts for about 15% of GDP in Africa, however, more than 40% of these countries report resource rents above this average. In fact, resource rents account for more than 40% of GDP in countries such as Libya, Congo Republic, Equatorial Guinea, Angola, and Liberia. All oil exporting SSA countries, except Cameroon, derive more than 50% of their revenues from oil. Amongst these countries Nigeria and Equatorial Guinea oil revenue is more than 90% of total revenue. In North Africa, Libya and Algeria top the pack with about 90% of government revenue derived from oil.

Resource rich African countries have immensely benefited from abundant natural resources due to rising demand for natural resources (especially from China and India), and rising commodity prices since 2000. Rising commodity prices have catalyzed significant investment in resource exploration that has helped to increase production and boost national incomes of many Africa countries. Figure 3.2 shows a positive relationship between resource abundance and GDP per capita. This highlights that natural resources have the potential to steer Africa's development and poverty reduction.

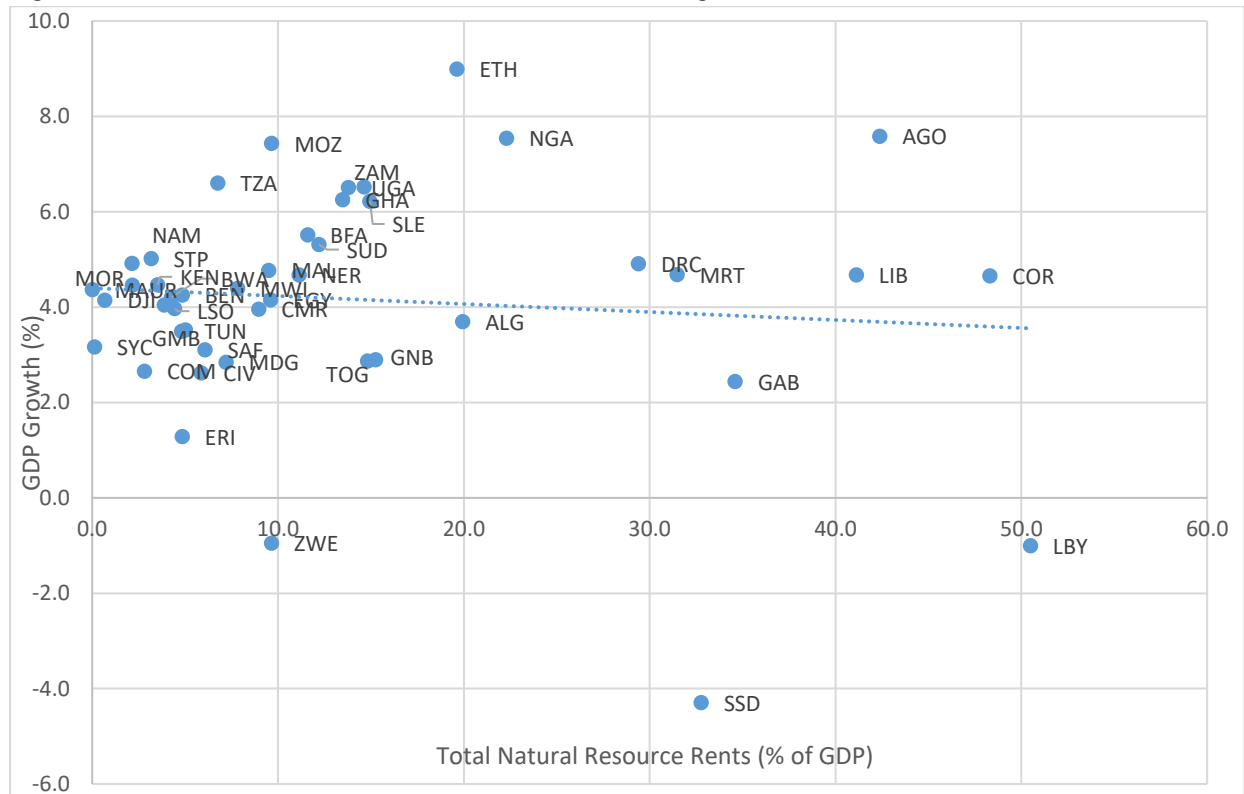
While large endowments of natural resources have the potential to steer up economic growth, some African countries have not fully realised the potential of natural resources. In some countries, economic growth has only been strong during commodity boom periods, and have not been sustained for longer periods, reflecting the level of commodity dependence. For instance, the recent slump in commodity prices since 2014 has reversed some of the gains achieved during the super cycle commodity boom, leaving some large African economies (e.g. South Africa, Egypt, Angola, Nigeria) growing at slower pace or in recession in 2016. Figure 3.3 suggests a negative correlation between natural resource rents and economic growth. The factors that could have contributed to this poor growth performance especially by resource rich African countries could possibly include poor management of resource rents, failure to diversify the economies and build resilience, conflicts, weak institutions and even Dutch Disease effects.

Figure 3.2: Total Natural Resource Rents (% of GDP) and GDP Per Capita in Africa (2000-2015)



Source: World Bank (2017)

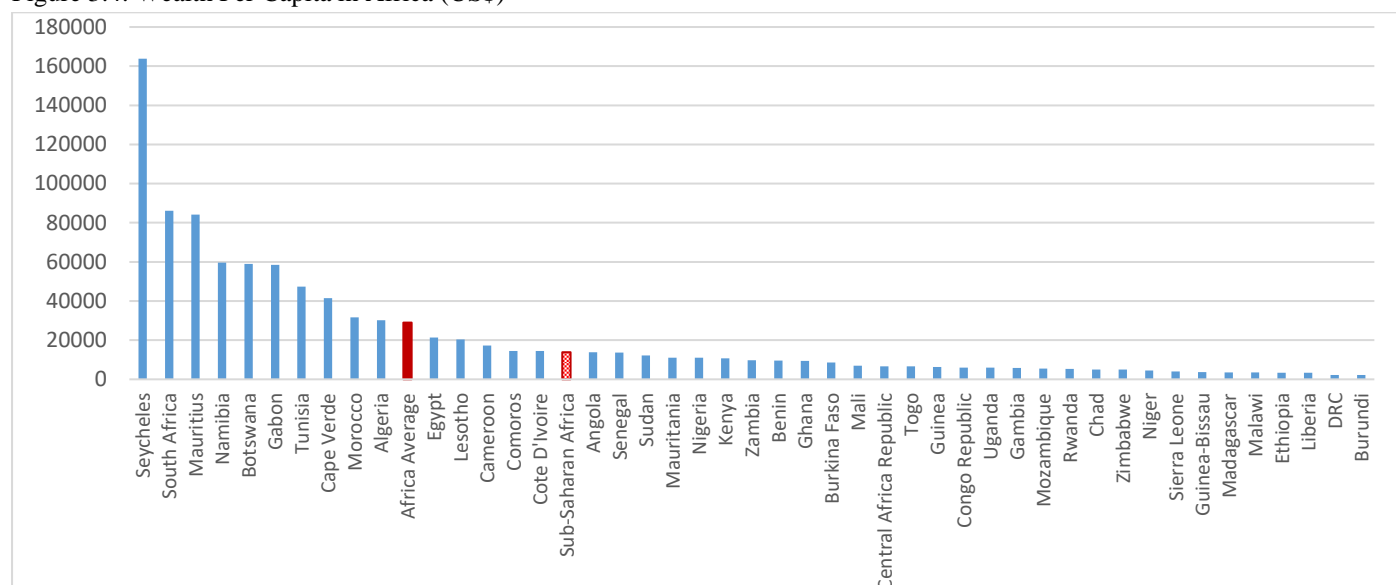
Figure 3.3: Total Natural Resource Rents (% of GDP) and GDP growth in Africa (2000-2015)



Source: World Bank (2017)

The World Bank (2011) estimates of wealth for African countries highlights the development challenge facing most resource rich countries, which is transforming natural wealth into other forms of wealth that can sustain economic growth and development such as produced capital and intangible capital wealth. Figure 3.4 shows that Seychelles, South Africa, Mauritius and Botswana, for example, have the highest wealth per capita (of about \$29 000) that significantly exceeds the average for the whole of Africa. Botswana and South Africa are resource rich countries that have turned most of their natural capital into other forms of capital such as produced capital (e.g infrastructure and intangible capital – human capital). The economies of these countries have been significantly transformed through the utilization of their natural resources for sheer economic and social prosperity. Seychelles and Mauritius have managed to harness their intangible capital especially human capital to increase their wealth per capita. The average for the whole of Africa is double that of the SSA region, reflecting higher wealth of North African countries.

Figure 3.4: Wealth Per Capita in Africa (US\$)



**Note:** The data is based on the 2005 estimates of the Wealth of Nations.

**Source:** World Bank (2011)

Table 3.3 shows the composition of wealth for world regions. Natural resources make up a very significant share of the total wealth in low-income countries, larger than the share of produced capital. Intangible capital generally appears to dominate other forms of wealth especially in Europe and Latin America. This could reflect large investments in education to boost human capital, possibly using resources from other forms of capital such as natural capital. This demonstrates the ability to transform natural capital into intangible capital, which is helping to sustain higher income per capita. Sub Saharan Africa and the Middle East and North Africa (MENA) regions are very rich in natural capital with 27% and 34% of total wealth respectively, compared with Latin America and the Caribbean and East Asia and Pacific with 15% and 21%. However, SSA has the lowest produced capital stock of 14 %, compared with East Asia and Pacific with 28 %. This points to the challenges, which SSA have in transforming its huge natural capital (mostly underground assets) into above ground assets – produced capital and intangible capital.

Table 3.3: Composition of Wealth in the World Regions (% of Total)

	Natural Capital	Produced Capital	Intangible Capital
East Asia and Pacific	21	28	50
Europe and Central Asia	21	18	61
Latin America and Caribbean	15	15	69
Middle East and North Africa	34	24	42
South Asia	25	17	57
Sub Saharan Africa	27	14	60

Source: World Bank (2011)

The importance of natural resources to Africa's development is set to increase, considering that Africa's natural resource wealth is largely unexplored, and these resources (especially mineral and oil reserves) are likely to be underestimated. With increase in investment in exploration, new technologies for lowering the cost of discovery, and the rising demand for these resources, the level of known reserves will likely increase. Consequently, African countries would benefit in terms of resource rents. Furthermore, effective utilisation of resource revenue will translate to growth and development.

#### **4. Challenges of Maximising Gains from Natural Resources to Finance Sustainable Development**

African countries face a number of challenges in trying to leverage and maximize the potential of natural resources for development. These relate to governance of natural resource sectors, contract negotiations, extraction and management of resource rents. The negotiating capacity of African countries, fairness of contracts, and the inefficient management of the resource sector remains a huge challenge. Concession and licensing agreements play an important role in determining the revenues that countries receive for their natural resource wealth, yet asymmetry of information remains an important challenge. For instance, companies have much more information about the costs involved in extraction, compared to the governments or its officials, which may lead to poor contract negotiation and undervaluation of concessions and eventual capturing of less rent. In some cases, governments have failed to capture the appropriate share of resource rents, leading to nationalization of resource sectors, which have reduced the efficiency of extraction of natural resources.

African countries have also suffered huge losses in resource rents due to illegal and unethical practices by national elites, who collude with multinational extractive companies for private interest. In some cases, resource rents have been plundered through tax evasion and illicit flows facilitated by transfer pricing, non-transparent trade concessions, underreporting of profits, undervaluation of resource assets, illegal fishing, and overexploitation of forests amongst others (Africa Progress Report, 2014). This has been exacerbated by capacity constraints to manage these resources and monitor companies to prevent actions that will reduce the rent from resource exploration and even reduce government income (such as tax evasions).

Resource abundance has often led to conflicts in many African countries. For example Democratic Republic of Congo and Sierra Leone have not fully optimized the benefits of diamonds compared to Botswana, because of conflicts. The political realm of resource rich countries have been characterised by corruption, autocratic rule, and paradoxically weak governmental institutions. Most countries have failed to put in place strong institutions that support transparency and accountability in handling resource wealth. Natural resource rents have also been prone to rent-seeking behavior. Mehlum et al (2006) and Acemoglu et al (2002) find that the quality of institutions is critical in determining whether countries avoid such resource curse. The Africa Growth Panel (2013) notes that poor governance of some state-owned resource companies can lead to revenue losses through corruption, inefficiency, and low capacity.

The discovery of natural resources often results in the distortion of incentives for investing in robust and efficient institutions, and other public services. This has often led to the use of resource rents on current consumption rather than investment, which support long-term economic development. Gylfason (2001) notes that higher rents from increasing terms of trade tend to discourage investment in innovation, particularly in education. In some cases, the discovery of natural resources has often been associated with the Dutch Disease phenomenon, which has seen manufacturing sectors declining, amid booming resource sectors. The Dutch Disease has also been associated with pro-cyclicality of government spending to resource revenues and increase in the prices of non-traded goods relative to traded goods. Hence, this has the capacity to slow down the process of industrialization.

Natural resource rents are often spent in ways that promote entrenchment of resource dependence, which is not conducive for economic diversification and broad based development. This often results in failure to develop resource sectors and linkages of resource sectors to other sectors, which can raise costs to other sectors. Resource driven countries are often very inefficient domestic users of natural resources due to the presence of significant subsidies. Table 3.1 suggests about 20 African economies are highly dependent on natural resources, with primary commodity exports exceeding 20% of GDP.

The spending of natural resource rents is usually associated with macroeconomic volatility, which can dampen investment, and growth, especially when government spending is pro-cyclical to natural resource revenue flows (Hamilton and Ley, 2011). Pro-cyclicality in spending entails overspending during booms and reduced spending and borrowing during busts, which tends to destabilize the whole public sector. For instance, Zambia's government banked on booming copper revenues in the 1970s to construct an extensive welfare state, which was later phased out when copper prices fell. Many governments use resource rents to finance recurrent expenditures such as public sector wages and salaries, which would be difficult to reduce when resource prices slump. The volatility of commodity prices also poses challenges for monetary policy as they may lead to volatility in exchange rates, export earnings, output, and employment.

## **5. Strategies to Optimise the Benefits of Natural Resources**

What can be done to optimize the benefits from the extraction of natural resources for sustainable development? What lessons can African resource rich countries learn from other countries that have developed and transformed their economy by leveraging on natural resources? In this section, we argue that to transform natural resource wealth into development gains, African countries should consider a holistic and coherent approach to the management of the entire extractive industries value chain. They should promote institutions and policies that support discovery and efficient extraction of natural resources to capture resource rents, invest in infrastructure to enhance competitiveness, and leverage on natural resources for industrial development. In addition, these countries should design robust fiscal policies, institute strategies to transform underground wealth to above ground assets, and set up natural resource funds – especially sovereign wealth funds.

**Discovery, extraction and effective capture of natural resource rents:** This involves developing effective institutions and governance structures for natural resource sectors and setting up effective fiscal instruments to ensure full capturing of natural resource rents. Government policies should encourage investment in explorations to discover and efficiently extract resource rents. This requires credible and consistent policies and favorable business conditions. The extraction of natural resources should be efficient and the capturing of resource rents should make other sectors competitive that is help to reduce costs in other sectors, promote investment, sectorial linkages and support local development. Higher tax rates reduce investment spending in exploration and dampen competitiveness. There are several ways in which the government can capture rents from natural resources. They include the regular taxation of resource sectors (e.g. royalties and income taxes), and production sharing agreements (which split gross income into a cost-recovery component and a profit component that is shared between producer and government according to an agreed formula). The government can also ensure that they have the full ownership of the resource asset (where the government is fully involved in the production of the resource and obtain the full rent from the resource). Since the economic value of a resource asset is the present value of total resource rents, the perfect revenue instrument should capture all available rents.

The choice of the fiscal regime for resource rents capture has important implication for firm's profitability and competitiveness. African governments need to review current extractive industry tax regimes in the light of changing world market conditions to ensure the effectiveness and competitiveness of these tax regimes. It is also important for the governments to create stable and predictable business environment for investors.

**Developing robust fiscal management systems:** Resource rich countries need to develop robust fiscal management systems, that is, taxes and royalties that enable the governments to recover resource rents. Robust fiscal management also entails applying fiscal rules in order to ensure that resource revenues are saved and invested, rather than consumed. Procyclical spending should be avoided. A fiscal policy rule is a permanent constraint on fiscal policy, which is expressed as a summary indicator of fiscal performance, such as the government budget deficit, borrowing, debt, or a major component thereof. According to Kopits and Symansky (1988), fiscal rules should be well defined, transparent, simple, flexible, and adequate, relative to the final goal. This should be complemented with sound policies that are enforceable, and consistent, including structural reforms, if needed. Fiscal rules help governments to smoothen expenditures, balance their budgets, and manage citizens' expectations, while shifting government mindset from consumption to investment. Fiscal rules can also establish targets for long-term savings, and stipulate what portion of resources revenue should be saved or invested.

Chile is a classic example of a country that has successfully established a budget balance rule, which is defined in structural terms and includes provisions that correct for deviations in copper prices. Similarly, Norway has a fiscal rule that limits the structural non-oil deficit to the expected income from the sovereign wealth fund, estimated to be 4% of the value of the fund. This has led to budget surpluses averaging more than 10% of GDP since 2000 (Hamilton and



Ley, 2011). Good fiscal policy design also entails building strong public investment management system, and sound macroeconomic management over the resource cycle.

**Establishing Sovereign Wealth Funds:** Resource rich countries can also establish resource funds, especially sovereign wealth funds. The Hartwick rule (Hartwick, 1977) suggests that if natural resources are exhaustible, the best way of sustaining development from their use is to reinvest resource rents into some forms of capital that can generate some return<sup>8</sup>. Many countries around the world have established sovereign wealth funds (SWF) in recent years. To date, global SWF assets under management have topped \$7.2 trillion as at 2015, and largely drawn from natural resources<sup>9</sup>. In Africa, there are about 19 sovereign wealth funds, and 83% of African sovereign wealth fund assets are drawn from oil and 17% from minerals and other sources (Table 4.1)

**Table 4.1: Sovereign Wealth Funds in Africa**

Country	Name of SWF	Date of Establishment	Assets Under Management (US\$ Billion)	Source of Funding
Algeria	Fonds de Regulation des Recettes	2000	77.2	Oil
Libya	Libyan Investment Authority	2006	67	Oil
Botswana	Pula Fund	1994	6.9	Diamonds
Angola	Fundo Soberano de Angola	2012	5	Oil
Congo Republic	Fonds de Stabilisation de Recettes Budgetaries	2005	1.64	Oil
Nigeria	Nigeria Sovereign Investment Authority	2012	1.4	Oil
Morocco	Morocco Sovereign Wealth Fund (Ithmar Capital)	2012	1.4	Oil
Senegal	Senegal Fonsis	2012	1	Non Commodity
Gabon	Gabon Sovereign Wealth Fund	1998	0.4	Oil
Ghana	Ghana petroleum Funds	2011	0.54	Oil
Mauritania	National Funds for Hydrocarbon Reserves	2006	0.3	Oil and Gas
Equatorial Guinea	Future Funds for Generations	2002	0.08	Oil
Chad	Fonds de Stabilisation de Recettes Budgetaries	2006	0.03	Oil
Sao Tome and Principe	National Oil Account	2004	0.01	Oil
Sudan	Oil Revenue Stabilsation Fund	2008	0.2	Oil
Rwanda	Agaciro Development Fund	2013	0.041	Non-Commodities
Tanzania	Natural Gas Reserve	2013	-	Gas

<sup>8</sup> The Hartwick rule prescribes reinvesting resource rents in reproducible capital (human and physical), that earns a rate of return, in order to offset natural resource depletion and thus keep output constant and sustain consumption through time.

<sup>9</sup> The largest SWF in the world include Norway's Government Pension Fund Global, China Investment Corporation, Abu Dhabi Investment Authority, Saudi Arabia Monetary Authority, and Kuwait Investment Authority.

Kenya	Kenya Sovereign Wealth Fund	2014	0.12	Minerals
South Sudan	Oil Revenue Stabilization and Future Generations Fund	2013	-	Oil
Zimbabwe	Zimbabwe Sovereign Wealth Fund	2014	-	Minerals

*Sources: SWFI, 2015, ESADE geo (2015), Investment Frontier (2015), Sovereign Wealth Funds websites.*

Natural resource funds can also help to buffer economies from the volatility of natural resource markets by delinking the economy from resource price fluctuations, limit Dutch Disease effects and support domestic and infrastructure development, while ensuring a provision for savings for future generations and wealth diversification. They can also provide a useful source of liquidity for the government that is concerned with running counter-cyclical fiscal regimes. This highlights four common motives for SWF: economic stabilization, intergenerational savings accumulation, wealth diversification, and asset preservations and domestic investment (e.g. in infrastructure).

The stabilization mandate helps to manage and mitigate the effects of high volatility of government revenues and expenditures that emanates from volatile natural resource revenues. The intergenerational savings motive focuses on building savings or reserves to provide for future generations when the resource has been depleted. Wealth diversification reflects the desire to minimize economic risks from volatile natural resource rents and prudent management and preservation of assets. Domestic investment reflects the desire to promote domestic infrastructure and industrial development. Some African countries like Nigeria, Angola and Ghana have allocated a significant amount of SWF assets towards domestic infrastructure and economic development.

**Transforming underground wealth to above ground assets:** Resource rich countries can also invest at least a portion of their resource revenues at home in infrastructure, human capital and other key areas. Botswana, for instance, earmarks mining revenue for specific development purposes such as education and health through its Sustainable Budget Index (SBI). Some countries direct a share of revenue to specific regions for both investment purposes. Channeling some of the resource wealth into domestic investment and savings is crucial to start transforming natural resource wealth into long-term prosperity. For instance, the development of infrastructure enhances productivity in other sectors, reduces costs of doing business, and facilitates the flow of information, and integration of markets for long-term economic development. Collier et al (2009) argues that capital is scarce in many resource-driven economies and therefore investment in domestic infrastructure can potentially offer high rate of returns. Developing public infrastructure also raises the productivity of private capital and induces greater private investment. Countries can also use natural resources rents to build human capital, which can help to sustain growth. Bravo-Ortega and de Gregorio (2007) find that the larger the stock of human capital, the more positive is the marginal effect of natural resource abundance on growth. Lederman and Maloney (2007) noted that rich countries that have successfully used their natural resources to further developmental outcomes, such as Australia and Norway, have done so on the basis of high and growing levels of human capital.

The failure to invest in human capital usually result in difficulties to diversify the economy (Maier and Wood, 1998).

**Leveraging natural resources for industrial development and structural transformation.**

Extractive industries typically operate as economic enclaves, with few links to local firms and employment markets, and little value added in production. Thus, extractive industries can make substantial contributions to economic development by supporting local employment and development of other sectors through linkage and value chains. For instance, in the petroleum and mineral sectors, there could be forward linkages in value addition, while backward linkages may connect resource sector firms with suppliers of equipment, installation and other services. African resource sector linkages are still weak. For example, only a small fraction of its crude oil is refined locally, there are few petrochemical related industries, and there are significant loses of its gas reserves through flaring. Thus, there is great potential to develop linkages with other sectors to support economic growth in Africa. Natural resources can also be used to build capacity and finance the upgrading of the country's endowments, human and physical capital, as well as institutional development. This helps to encourage diversification and reduce dependence. Malaysia, Indonesia, and Chile have successfully leveraged natural resources to industrialize and diversify their economies. The United Arab Emirates have managed to use hydrocarbon wealth to improve infrastructure, create jobs, and improve education and health care systems.

**Building strong institutional structures:** Build strong institutional frameworks help to manage rents especially if they entail a shift of the mindset from short term rent extraction to long term rent management. Improving governance and accountability frameworks are central to building strong instructions to maximize gains from natural resources and overcoming the resource curse (Bannon and Collier, 2003). However, ways of building accountability and good governance in resource-rich countries are not well understood. Accountability can be built through transparency and equitable participation of citizens in the resource governance process (World Bank, 2011). Accountability and transparency are needed along the entire value chain of the extractive sector, including awarding of contracts and licenses, regulation and monitoring of operations, collection of taxes and royalties, revenue management and allocation, and the implementation of projects and policies.

## **6. Country Case Studies and Lessons for Africa's Development**

Some countries such as Norway, Malaysia, Indonesia, Chile, and Botswana have succeeded in leveraging natural resources to foster economic development.

### **6.1. Country Case Studies**

**Norway** discovered oil in 1970 and took important policy steps to integrate the oil sector into the rest of the economy. By exploiting natural linkages of the oil sector with other sectors, Norway managed to develop other economic sectors, which has helped to diversify the economy. The government focused on technological transfers from foreign companies to develop Norwegian industries to make them competitive. Norway established a sovereign wealth fund, the Government Pension Fund Global (GPF) in 1990, which has become the largest sovereign wealth fund in the world with USD850 billion assets under management by

end of 2016 (Sovereign Wealth Fund Institute, 2016). The fund has helped to delink the economy from oil price fluctuations, minimize the potential corrosive power of oil dependency, and foster Norway's economic development. It has one of the most sophisticated investment strategies, yet most transparent institutional set-ups among other SWFs. Its fiscal policy involves: (i) effective revenue instruments; (ii) fiscal rules to limit discretion; (iii) the operation of natural resource fund; and (iv) effective public investment management. A key policy rule associated with the fund is that only the expected earnings from SWF, estimated to be 4% of the domestic value of the fund would be transferred to the state budget every year, while any changes in the transfer rules is expected to be approved by parliament. This spending rule ensures the use of the real returns from the petroleum fund assets to fund the budget. The rule is forward looking, taking into account Norway's demographic dynamics and attendant large future spending commitments. The setting of the SWF stresses the importance of converting oil and gas resources under the ground into above ground assets and decoupling resource income from spending.

Norway invested in education and proactively developed research and development as well as technical capabilities. The country now spends about 2% of GDP on research and development. The government provided direct and large funding to universities and research institutes to set up education and research infrastructure to boost skills and develop new technologies. There was a strong drive to invest in new technologies. For example, the Statoil (the Norwegian Oil Company)'s LOOP program focused on supporting startup companies by providing expertise, facilities for pilot tests, and financial support<sup>10</sup>. Norway also innovatively set up strategic collaborations and partnerships with domestic and foreign private companies, which ensured transfer of knowledge, while matching Norway's industrial needs. By the late 1980s, Statoil had developed proprietary technologies and skills through a long-term partnership with British Petroleum (Mckinsey Global Institute, 2013).

Norway's fiscal policy and the management of its oil wealth have played an important role in developing and stabilizing the economy. It has managed to weather large shocks such as the global financial crises of 2007/08 and the recent oil price shock of 2014. To date, Norway is boasting of GDP per capita of \$62 084, up from \$18 434 in 1990 (World Bank, 2017). Its wealth per capita is estimated at US\$861 797, with 62% of the wealth in intangible capital (especially human capital), 21% to produced capital and urban land, and 13% to natural capital and the remaining 4% share attributed to net foreign assets (World Bank, 2011). Norway's development story highlights the importance of good and complimentary policies, such as stability-oriented macroeconomic policies, flexible and competitive product markets, a high degree of exposure to foreign trade, flexible labor markets, adequate financing and provision of education and training, a low level of taxation, and significant public spending on research and development from natural resource funds.

**Malaysia** started with diversified resource endowment, which included oil, rubber and tin, forest products, good geographic location and deep-sea ports. Manufacturing accounted for only 7% of GDP in 1970, but has considerably increased to 67% of GDP by 2015. Natural

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<sup>10</sup> LOOP is a program supported by Statoil(Norwegian Oil company), that provides project funding, technical expertise and piloting support to start-up companies, without taking an ownership stake in the companies

resources were used to boost and sustain high levels of savings, which were used to support investments in land development, replanting schemes to expand and modernize the production of rubber and palm oil. The Malaysian government also made heavy investments in technology and infrastructure, especially in energy, and communications and transport. To support the young manufacturing industries, Malaysia started out on a protectionist path in the 1960s, but shifted to export promotion in the 1970s. They instituted measures to hold down costs in non-resource sectors, which included policies to reduce the costs of labor.

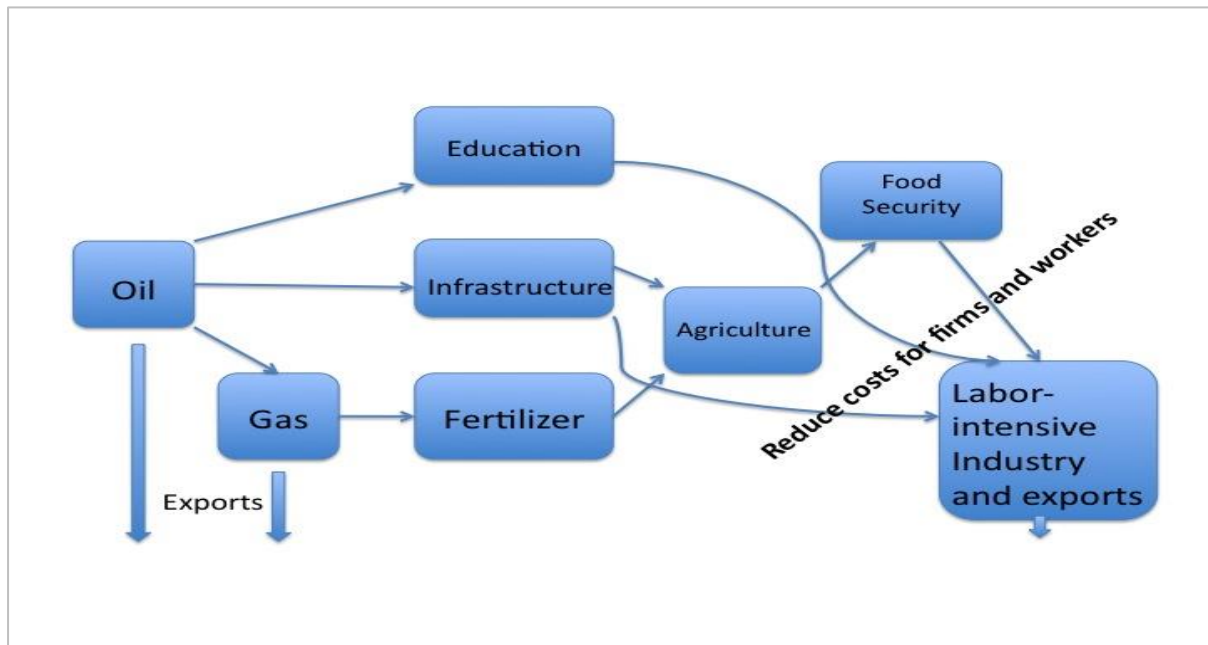
In the mid-1980s, the strategy shifted towards higher-technology products and skills upgrading. Policies included liberalizing skilled immigration, massive enrolment in polytechnics, and exchange relations with universities in Australia and Canada. In addition, skill development programs jointly sponsored by the Federation of Manufacturing and the University of Science and Technology were also part of the strategies that was adopted by the Malaysian government. The macroeconomic policy also focused on lowering costs that are consistent with other structural policies, while the trade policy moved steadily towards a relatively open trade regime (Gelb, 2010). Investments and targeted support were provided through a variety of programs including free economic zones, export financing facilities, assistance with research, product development and marketing, aimed at reducing production costs and increasing competitiveness. Today, Malaysia boasts of high GDP per capita of \$26, 950, with savings rates of about 30% of GDP as at 2015. 100% of the population has access to electricity, while 98% of the population has access to improved water (Word Bank, 2017).

**Indonesia** largely used its endowments in oil to develop the agriculture and manufacturing sectors. They used broad based policies to boost development of the agricultural sector and bring down domestic costs to further encourage diversification of exports. They developed disease-resistant and high-yield rice varieties. Oil resource income was used to develop natural gas resources, both for export to Japan and as an input to fertilizer production. Fertilizer was then distributed at subsidized prices, which greatly lowered agriculture production costs and significantly boosted yields. Agriculture and the rural economy were further strengthened by a series of successful community-based programs that absorbed large quantities of labor and produced local infrastructure, including schools, roads, and other local construction. Infrastructure, particularly in the rural areas absorbed one quarter of public investment during the oil boom (Auty, 1994).

The boom in agriculture was able to feed a growing industrial workforce relatively cheaply, and provided industrial inputs at low costs. This helped Indonesia to move towards low-wage manufacturing and an export-oriented strategy in the early 1980s. The authorities also took measures to prevent the real exchange rate from large appreciations and depreciations (Gelb, 2010). Prudent management of public spending helped to stabilize the budget, but fiscal surpluses and reserves were accumulated nonetheless. Government was also ready to rapidly restructure public spending and scale back planned projects when oil prices began to fall. Trade policy was progressively liberalized after 1985, and exporters were able to access imported inputs at world prices. FDI was liberalized, especially into exporting sectors. By 2015, the manufacturing exports represented 47% of merchandise exports and up from 2% of

merchandise exports in 1980. Gross savings jumped from 20% of GDP in 1981 to 32% in 2015 (World Bank, 2015), reflecting the availability of resources for investment.

Figure 6.1: Strategic use of natural resources in Indonesia



Source: Gelb, 2012

**Chile** has developed into a dynamic and more diversified commodity exporter largely from its large copper endowments. It placed great emphasis on high-value primary-based products that draw on its diversified resource base, which also includes fish, petroleum products, and wood. Chile has also been successful in implementing countercyclical fiscal policy. It established a budget balance rule, defined in structural terms with provisions that correct for deviations in copper prices from their long-term levels. This has helped in stabilizing the economy by accumulating high levels of savings during the copper bonanzas and dissaving when prices began to fall. Chile also focused on improving the business climate, to become the highest rated Latin American country on the “Doing Business” indicators.

Through prudent fiscal policy, incentives, and favorable business climate, Chile managed to attract a lot of foreign direct investment. For instance it provided incentives, and waived mining royalties until the mid-2000s and lowered taxes on profits, which were reinvested domestically rather than repatriated. Later on, Chile increased tax rates gradually in line with improved cost efficiency in production and lower country risk. The government also developed the salmon and wine industries by encouraging technical development and adaptation, disseminating information on standards, and provided infrastructure (Benavente, 2006). Long-term public-private partnerships were encouraged, with the aim of achieving critical mass and capabilities. In 2005, Chile established a Competitiveness and Innovation Fund, financed from minerals and the private sector to help develop industrial clusters, some centers of excellence and high-level human capacity building.

**Botswana** is the largest producer of diamonds in the World. It is credited with prudent management of its diamond revenues. Diamonds were discovered in 1967, and now provide

tax revenue equivalent to a third of the country's GDP. Botswana established a sovereign wealth fund (the Pula Fund) in 2004 to help manage its diamond revenues, which now has an asset base of US\$6.9 billion. Since the 1990s, the government has used the Sustainable Budget Index (SBI) to monitor the use of mineral revenue in promoting sustainable development and financing "investment expenditure" such as development and recurrent spending on education and health (Hamilton and Ley, 2011). The SBI is calculated as recurrent expenditure /recurrent revenue, where recurrent expenditure excludes spending on health and education, which are part of development expenditure, and recurrent revenue excludes revenue from the mining sector. Botswana's policy aims to ensure that the SBI does not exceed one, since that would indicate that resource revenues are being consumed. Resource revenues are invested domestically in infrastructure, health, and education, or invested in financial assets. The holding of some diamond revenues offshore is done to deal with issues of absorptive capacity, revenue stabilization, and Dutch Disease effects from currency appreciation. Government policy has generally been successful in following the SBI rule, although it has exceeded one in some few years (e.g. 1994–95 and 2004–05).

Botswana uses mineral rents to support rapid growth that has made it one of the most prosperous countries in Africa. With GDP per capita of \$15, 839 in 2015, Botswana has surpassed South Africa, which has GDP per capita of \$13, 195, and is three times higher than Nigeria and way above the SSA average of \$3, 714 (World Bank, 2015). The government also used diamond resources to finance human capital development. Gross secondary-school enrolment ratio rose from 19% of each cohort in 1980 to over 82% in 2015, way above the Sub-Saharan average of 42%. Between 1980 and 2015, Botswana increased its public expenditure on education from 6% of GDP to over 10%, as compared to Mauritius with 5%. Botswana's savings rate, at 46% of GDP, is almost three times higher than the SSA average. About 19.3% of Botswana population lives below the poverty datum line, compared with 60% in Zambia and 28% in Namibia.

## ***6.2 Lessons from success stories for Africa's development***

There are many important lessons to learn from these success stories. One common lesson from successful countries is the importance of avoiding macroeconomic volatility induced by swings in commodity prices. Successful countries have instituted coherent counter cyclical policies (fiscal, monetary and exchange rate policies). This has helped them to build resilience and stabilize their economies from boom-bust cycles, contributing to stronger economic growth.

The success of these countries also highlights the need to reduce costs for the non-resource sectors, whether through macroeconomic management and exchange rate policy, trade policy, well-focused public investments, and other measures. It is important to pay attention to the crowding out of non-resource sectors in many rich countries in Africa, given the potential Dutch Disease effects that are likely to occur in these countries.

It is also clear from these case studies that resource wealth opens up opportunities for countries to invest in high quality human and physical capital (such as infrastructure). This helps to transform natural capital to produced capital and intangible capital for sustaining higher growth rates, lower costs of doing business and enhance competitiveness. African countries could thus

take the opportunity of their natural resources to build human capital and physical capital before such resources are exhausted.

Attention was paid to linkages and comparative advantages, which helped to boost economies of scale, and speed up industrial production and structural transformation. Use of natural resource rents to finance other sectors of the economy greatly helped to diversify the economies. In addition, efforts to supplement market incentives in various ways helped to promote development in other non-resource intensive sector of the economy and encouraged economic diversification. These include subsidized credit, local content programmes, tax breaks, and temporary protection to enhance competitiveness especially of local firms. Natural resources were also used to boost savings, which supported investments and growth of other sectors of the economy and to strengthen linkages between resource and non-resource sectors.

In these success stories, the establishment of SWF has helped to unlock resources for national development, provided saving for future generations and helped to stabilize economies, prudent management of natural resource rents, and develop economies while diversifying assets. However, it is not sufficient to only set up a fund management scheme, but to combine this move with clear legal and policy frameworks that governs their use for effectiveness.

Good and complimentary policies also matter. Countries such as Norway, Malaysia and Indonesia benefited from stability-oriented macroeconomic policies, flexible and competitive product markets, and a high degree of exposure to foreign trade, flexible labor markets, adequate financing and provision of education and training, a low level of taxation, and significant public spending on research and development from natural resource funds. Countries such as Norway, Malaysia, Indonesia, and Chile were more open to foreign investors, foreign skills, and development of new markets.

These countries also realized the importance of building strong institutions and improve governance of resource sectors. This has helped to limit corruption and rent seeking behavior of political elites. Transparency and accountability in the exploitation and use of natural resources helped to unleash their potential for economic development. Spending of resource rents was transparent, and benefits of resource windfalls were visible. This helped to manage citizens' expectations and ensure checks and balances on the government's use of natural resource rents. For instance, the publication of the report of Botswana's SBI, which monitors whether the mineral revenue collected is being used to promote sustainable development and finance investment, has helped to ensure transparency and accountability and proper implementation of its programs with limited spending pressures.

## **Conclusion**

Africa has potential to utilize its rich natural resource endowments for sustainable development. Evidence on the role of natural resources to foster sustainable development is mixed. This paper analyses the potential role of natural resources in fostering economic development in Africa and what can be done to maximize the gains from rich natural resources. The paper notes that resource rich countries in Africa have faced a number of challenges, which have prevented them from realizing the full potential of natural resources. These include



political instability, revenue management amid spending pressures, the Dutch Disease effects, macroeconomic volatility, and entrenchment of resource dependence.

To maximize the gains from natural resources and sustainable economic development, African countries need to develop institutions and policies that support discovery of natural resources. Furthermore, these countries should develop and efficiently extract natural resources to effectively capture resource rents, design robust fiscal policies with fiscal rules, make concerted efforts to transform underground wealth to above ground assets, and support the development of other sectors instead of displacing them. They also need to establish sovereign wealth funds to help to foster savings and manage natural resources, while building assets for future generations and fostering economic development.

Resource rich countries, such as Norway, Malaysia, Indonesia, Chile and Botswana, have successfully leveraged natural resources (especially minerals) to support high levels of savings and investment. These countries have also supported the development of other sectors that has helped to diversify their economies. Resource rents have also been used to support human capital development, strengthen linkages and help to reduce costs for the industrial sectors, thereby fostering structural transformation and economic development. These countries have also built strong institutions, and promoted transparency and accountability, which helped them to achieve their goals. Policies supporting economic development in Africa have to account for the relative rich presence of natural resources.

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## Appendix 1

**Table 3.2: Natural Resource Rents and Commodity Exports in Africa: Average 2000-2015**

Country	Natural Resource Rents: (% GDP)	Commodity exports (% of total exports)	Main Commodity exports
Algeria	22	98	Oil and gas
Angola	42	97	Oil and gas, diamonds
Benin	5	84	Cotton, cashews
Botswana	6	89	Diamonds, copper, nickel,
Burkina Faso	15	91	Gold, cotton, livestock,
Burundi	24	89	Coffee, tea
Cameroon	9	45	Oil and gas, cocoa beans
Cape Verde	1	91	Oil and gas, fish
Central African Rep	11	95	Diamonds, timber, cotton
Chad	24	95	Oil and gas, cattle, cotton
Comoros	3	63	Vanilla, ylang-ylang (perfume essence)
Congo, Rep.	48	98	Oil and gas, copper, wood
Cote d'Ivoire	6	81	Cocoa, coffee, timber
Djibouti	1	95	Hides and skins, coffee
DRC	29	65	Diamonds, gold, copper
Egypt	11	57	Oil and gas, cotton,
Equatorial Guinea	42	94	Oil and Gas, timber, cocoa
Eritrea	6	63	Livestock, sorghum
Ethiopia	20	92	Coffee, gold, animals
Gabon	35	96	Oil and gas, timber, manganese
Gambia	5	74	Peanut products, fish, cotton
Ghana	18	91	Gold, cocoa, oil and gas, timber
Guinea	22	93	Bauxite, alumina, gold
Guinea-Bissau	15	96	Cashew nuts, shrimp, peanuts
Kenya	4	68	Tea, horticulture, coffee
Lesotho	4	23	Wool and mohair, animals
Liberia	41	41	Iron ore, rubber, timber
Libya	51	95	Oil and gas
Madagascar	7	54	Coffee, vanilla, titanium
Malawi	8	86	Tobacco, tea, sugar
Mali	9	91	Gold, cotton, oil seeds

Mauritania	31	92	Iron ore, oil and gas, gold
Mauritius	0	32	Textiles, sugar, flowers
Morocco	2	35	Phosphates, oil, fish
Mozambique	11	91	Aluminum, iron ore, cashews
Namibia	2	75	Diamonds, copper, gold
Niger	15	64	Uranium ore, gold, livestock, cowpeas
Nigeria	22	98	Oil and gas, cocoa, rubber
Rwanda	7	89	Coffee, tea, tin ore
Sao Tome Principe	3	61	Cocoa, coffee, palm oil
Senegal	4	68	Fish, groundnuts, oil and gas
Seychelles	1	88	Fish, copra
Sierra Leone	15	69	Diamonds, iron ore, titanium,
Somalia	16	92	Sheep, goats, oil seeds
South Africa	7	52	Gold, Diamonds, Platinum,
South Sudan	33	48	Oil and gas
Sudan	12	88	Oil and gas; gold, cotton
Swaziland	3	39	Sugar, wood, cotton
Tanzania	7	86	Gold, coffee, cashew nuts
Togo	15	63	Cotton, phosphates, coffee
Tunisia	5	24	Oil and gas, Textiles, phosphates
Uganda	15	78	Coffee, fish, tea, gold
Zambia	18	86	copper, cobalt, tobacco
Zimbabwe	12	76	Gold, Platinum, tobacco

Sources: WDI, World Bank, UNCTAD 2016 Statistics