NEAR EAST UNIVERSITY

INSTITUTE OF GRADUATE STUDIES

DEPARTMENT OF BANKING AND ACCOUNTING

**EVALUATING NATURAL RESOURCE, HUMAN CAPITAL, RENEWABLE
ENERGY ON FINANACIAL GROWTH IN AFRICA**

M.Sc. THESIS

MARY ALWIN TAGWI

Nicosia

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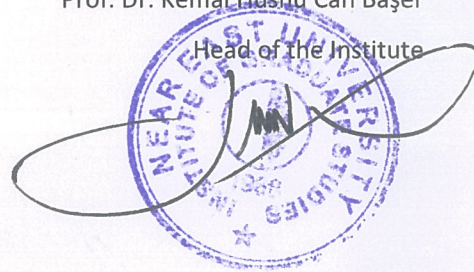
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Abstract

Evaluating Natural Resource, Human Capital, Renewable Energy on Financial development in Africa

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To assess the issue of low levels of growth and development in African countries, the relationship between natural resources, human capital, corruption, renewable energy, financial development, and economic growth was examined in ten African countries with abundant natural resources by using the PMG-ARDL approach from 1995 to 2020. The findings indicate that human capital, natural resource, growth, and renewable energy consumption have a favorable and significant link with financial development in the short and long term. Corruption has a detrimental association with financial progress in the long run, it is advised that to have a functioning system in African countries, corrupt practices most be curtailed by putting necessary policy and disciplinary actions on law breakers. The exploration of the abundant natural resource in Africa should be investigated to avoid corrupt practices and mismanagement also, diversification tactics must be used to improve natural resource extraction from the environment. The employment of technology to discover natural resources will be extremely beneficial to environmental preservation.

Key words

Özet

Afrika'da Finansal Kalkınma Üzerine Doğal Kaynak, İnsan Sermayesi,

Yenilenebilir Enerjinin Değerlendirilmesi

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Danışman

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Afrika ülkelerinde düşük büyüme ve gelişme düzeyleri konusunu değerlendirmek için, 1995-2020 yılları arasında PMG-ARDL yaklaşımı kullanılarak bol doğal kaynaklara sahip on Afrika ülkesinde doğal kaynaklar, beşeri sermaye, yolsuzluk, yenilenebilir enerji, finansal kalkınma ve ekonomik büyüme arasındaki ilişki incelenmiştir. Bulgular, insan sermayesi, doğal kaynak, büyüme ve yenilenebilir enerji tüketiminin kısa ve uzun vadede finansal kalkınma ile olumlu ve önemli bir bağlantıya sahip olduğunu göstermektedir. Yolsuzluğun uzun vadede finansal ilerlemeyle zararlı bir ilişkisi vardır, Afrika ülkelerinde işleyen bir sisteme sahip olmak için, yolsuzluk uygulamalarının çoğunun, yasaları çiğneyenlere gerekli politika ve disiplin cezaları verilerek azaltılması tavsiye edilir. Afrika'daki bol miktarda doğal kaynağın araştırılması, yozlaşmış uygulamalardan ve kötü yönetimden kaçınmak için araştırılmalı, çevreden doğal kaynak çıkarımını iyileştirmek için çeşitlendirme taktikleri kullanılmalıdır. Doğal kaynakları keşfetmek için teknolojinin kullanılması, çevrenin korunması için son derece faydalı olacaktır.

Anahtar Kelimeler: Finansal gelişme; doğal kaynaklar; beşeri sermaye; yolsuzluk; yenilenebilir enerji; büyüme; PMG-ARDL.

List of Abberviations

GDP= Gross Domestic Product

FD= Financial Development

FDI= Financial Development Index

NR= Natural Resource

EG= Economic Growth

CORP= Corruption

HC= Human Capital

RE= Renewable Energy

REC= Renewable Energy Consumption

HCI= Human Capital Index

NRR= Natural Resource Rent

MG= Mean Group

PMG= Pool Mean Group

DFE= Dynamic Fixed Effect

CSI= Cross Sectional Dependence

ARDL= Autoregression Distributive Lag

ADF= Augmented Dickey Fuller

ECT= Error Correction Term

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CHAPTER I

Introduction

Background of Study

Since time immemorial, nations are striving toward improving the living condition of the people by providing the basic facilities needed to improve the environment which will entail growth perhaps development. From the prehistorical era (the stone age, the bronze age and iron age) to the electronic generation, there have been great changes. These changes occur as a result of the desire of human race to improve its society, but the issue of maintaining stable growth still exists. As every society desires to reach these elevations, the goal for sustainable development has become a priority issue, but it has a cost to the motherland. The quest to improve the economic became crucial and the environment became the target especially nations with abundant natural resources. This research thesis wishes to evaluate natural resource, human capital, economic expansion, corruption, renewable energy on financial development. This will enable us to understand the level of growth and development in Africa and how these changes translate to their living standard.

In sthe prior stage the Africa continent has model their economy on a traditional platform which was concentrated on agriculture, but the system of agriculture was not mechanized which led to production for local consumption and less product for exportation which led to low level of revenue generation, most African countries were endowed with natural resources but the exploration and mining process was not technologize and some were backed with frivolities accompanied by unstable political policies. Of resent there has been scholarly debate on how nations with abounding in natural resources are lacking behind by way of development and widening in its economy. a significant body of research has evolved contending suggestion that mineral wealth is a burden (Gutiérrez et al., 2022) (Yilanci et al., 2021) , (Gradstein and Klemp, 2020) (Frynas and Buur, 2020) Barbier, 2005., (Cheng et al., 2021) (Machado and Paulo Davim, 2001), (Gutiérrez et al., 2022) and(H. Li et al., 2022). Countries who are bless

with abundant natural resource like forest, gold, oil and gas, zinc, iron, limestone, coal, diamond, sulfur, gemstone, aluminum, copper, ocean, platinum, arable land and many others with all these resources one might assume that natural resources abundance in Africa should have a great track record of economic success. This conclusion, however, is only true for one or two nations in Africa with the abundant natural resources. In fact, with the availability of natural resource only South Africa is a developed nation among African countries. It is impossible to generalize that having a lot of resources will lead to faster economic expansion in all resource-rich nations. Additionally, in some of the countries with abundant natural resources, there is no connection that shows in their economic despite the availability of resources.

The expansion of an economic is measured by the rise in a nation's output of goods and services. The indicators such as GDP are put to use regularly because economic growth measure the quality of the things produced and not just the volume. It is on this not we try to identify the available natural resource that are accessible to African countries and how it is been product and supply. The state of these factors can influence how national policy is developed, and during a period of slow economic growth, most of the policies will typically be geared on boosting the movement and currency exchange. The growth of an economic is also determined by the rise in production and usage of these goods and service. Where majority of the citizens have access to money, there will be increase in demand which will lead to rise in goods and services, the more of cash inflow in the society, the more the demand and the higher the supply of these goods and services which will entail economic growth.

An investigation by (Oluwaseyi Musibau et al., 2022) which studied west African nations "natural resources endowment what more does west Africa need to grow?" the investigation focuses on the 16 west African countries which among others may include Gambia, guinea, Ghana, Nigeria, Niger from 1996-2016, the research employed ARDL panel data techniques focusing on "financial development index (FDI), natural resources endowment (NRR), globalization (GI), economic-governance – regulatory quality (RQ), government effectiveness (GE) and economic growth (GDPPCGR) among the 16 West African countries;" the finding disclose that Governments in West Africa have come under fire for allegedly mismanaging the continent's natural resources severely. However,

the outcome has a considerable and long-lasting positive impact in the area. Long-term natural resource rent greatly enhanced the sub-economic region's growth. Governmental effectiveness and management Efficiency has a greater impact on the expansion of the economic, that is, excellent administration in the member nations of the West African Economic Community rises economic growth significantly both immediately and in the future. This is an indication that if the government do the needful by proper management of the available resource the outcome will improve growth which will lead to development in the region.

(Jahanger et al., 2022) conducted extensive research looked at "The linkages between natural resources, human capital, globalization, economic growth, financial development, and ecological footprint: The moderating role of technological innovations" 73 developing nations are considered using yearly periodic data from 1990 to 2016. Botswana, Congo rep, Egypt, Ghana, Namibia, Niger, Nigeria, South Africa, and Zambia are among these 73 countries. The research applied diagnosis like panel unit root, panel cointegration, ARDL pooled mean group (PMG) model both on short and long run. The findings exhibit a "positive relation between natural resource and ecological footprint," according to the research many African countries are endowed with abundant natural resources and depend on them to supply their energy needs. Therefore, these African countries extract enormous amounts of crude oil, which is refined to generate petroleum products; as a result, a sizable number of the African nations have economies that are dependent on the production and sale of oil. Hence, it can be predicted that the extraction and use of crude oil will likely put ecological pressure on the environment, which justifies the discovery of a positive relationship. Furthermore, it has been suggested that to reduce footprint, African countries can use cutting-edge technology to slow down the growth of their ecological footprints, so limiting environmental destruction. Therefore, it may be argued that technical progress helps Africa achieve environmental sustainability. According to the paper, the discovery might have a scientific reason. Technology is thought to encourage a switch to renewable energy in these economies, helping to lessen the dependence of African countries on fossil fuels. As a result, the adoption of renewable energy driven by technical innovation is projected to lower the ecological footprint measurements of the African countries. The result further explains the impact of

human capital on footprint where it was concluded that African countries are ignorance of the actual effects of environmental deterioration. The suggestion was that an increase in the human capital level in these countries could be anticipated to aid the growth of knowledge for ensuring use of natural resources are used sustainably.

Extensive research by (Yurog Li et al., 2022) to investigate "the link between natural resource and economic factors," the researcher invested the most five abundant natural resource nations Canada, China, India, Saudi Arabia, and Russia from the period of 1995 to 2019. The model used by the researchers is "the fixed effect model (FEM)" according to the researchers FEM is a powerful tool that produces accurate estimates even when "autocorrelation and heteroscedasticity" concerns present in the model. The findings reveal that population growth have a negative effect on natural resource, this is because as the population increase, consumption of economic activities will also increase, as a result "demand for food, oil, coal, natural gas, metals, stone and sand, animals, birds, fish, and plants fuel, or raw materials." Therefore, the costs of scarce resources rise. Not only has that high rate of population increased societal unrest, human right violation, and increase in corruption. This can post treat to the growth and development of the economy. (Aljarallah, 2021)in a time series data of Saudi Arabia studied "An assessment of the economic impact of natural resource rents in kingdom of Saudi Arabia" the researcher source of data was the world bank from the period of 1984 to 2014. Autoregressive distributed lag model was employed to ascertain the long- and short-term relationship of the variables. The variables considered for the research was human capital, corruption, resource rent and law and order on factors of production. The results show that "the leasing of natural resources greatly boost per capita GDP and Total Factor Productivity in the long run, indicating that natural resources are seen as a blessing for the Kingdom of Saudi Arabia in the long run. Furthermore, improvements in human capital have a considerable long-term impact on per capita GDP and total factor productivity." Considering these findings, the study indicates that making investments in human capital is an imperative step toward long-term sustainable and reduce dependence on leasing of natural resources to avoid future explosions of the resource curse.

(AL-Barakani et al., 2022) researched "Spatial analysis of financial development's effect on the ecological footprint of belt and road initiative countries: Mitigation options

through renewable energy consumption and institutional quality" the research focuses on the BRI countries using the panel data approach from the period of 1992 to 2018. The variables employed to ascertain the existence relatedness are the institutional quality (IQ), "financial development (FD), and renewable energy use (RECO) on ecological footprint" consumption (EFC) also non carbon footprint consumption (NCFC) was considered. "The study employed the Stochastic Impacts by Regression on Population, Affluence, and Technology (STIRPAT) model and econometric spatial analysis methodology and conducted a test through a heat map with labels." The findings reveal a statistically significant influence of financial development on "carbon footprint, ecological footprint consumption and non-carbon footprint consumption" though, institutional quality and renewable energy consumption has negative influence. (Bashir et al., 2022) studied "Evaluating environmental commitments to COP21 and the role of economic complexity, renewable energy, financial development, urbanization, and energy innovation: empirical evidence from the RCEP countries." The sample consists of 15 RCEP1 (regional comprehensive economic partnership) nations, according to the studies, these nations were chosen for their high rates of industrial activity, energy consumption, and urbanization, where fossil fuels still make up most of the power generation, the data covers from 1990 to 2019. To test the long- and short-term relationship of variables cross sectional ARDL, AMG, PMG, FMOLS and DOLS. They discovered that "urbanization and financial growth have a negative effect on the environment."

(Usman et al., 2022) investigated ten nations with the largest financial resource wealth and the data covered 1990 to 2018. The empirical study used the following variables for the analysis, financial development, nonrenewable and renewable energy consumption, total natural resource rent, globalization, and ecological footprint. Econometric model adopted was the (CCE-MG) "Common Correlated Effect Mean Estimator and (AGM) Augmented Mean Group". The findings disclose that long-term environmental degradation is found to be greatly accelerated in nations with abundant financial resources. The said process, which involves the financial sector of an economy encouraging human capital, labor force and an advanced financial condition distributing capital to domestic businesses, could be supported. As a result, rapidly industrializing activities increase, which in turn increases industrial waste and releases more carbon

dioxide into the atmosphere. As a result, the effects of capitalization regulate the technological effects and, eventually, the growth of the financial system, leading to increased environmental damage in these nations. The fact that industrialized economies' banking systems are putting more money into both small and large-scale production facilities is also encouraging. In this way, bankers raise their capital to compensate small businesses for things like low-cost or environmental reduction. Another reasonable explanation is that the growth of the financial sector may increase consumer purchasing power by supplying affordable loans. This makes it easier for the buyer to buy expensive and luxurious items like air conditioners, cars, and commercial buildings, all of which put a lot of pressure on the environment. Therefore, highly developed nations should take drastic measures to address the impact of the financial industry on the environment. The study recommended that highly developed nations should take drastic measures to address the impact of the financial industry on the environment.

Figure 1

Financial Development chart
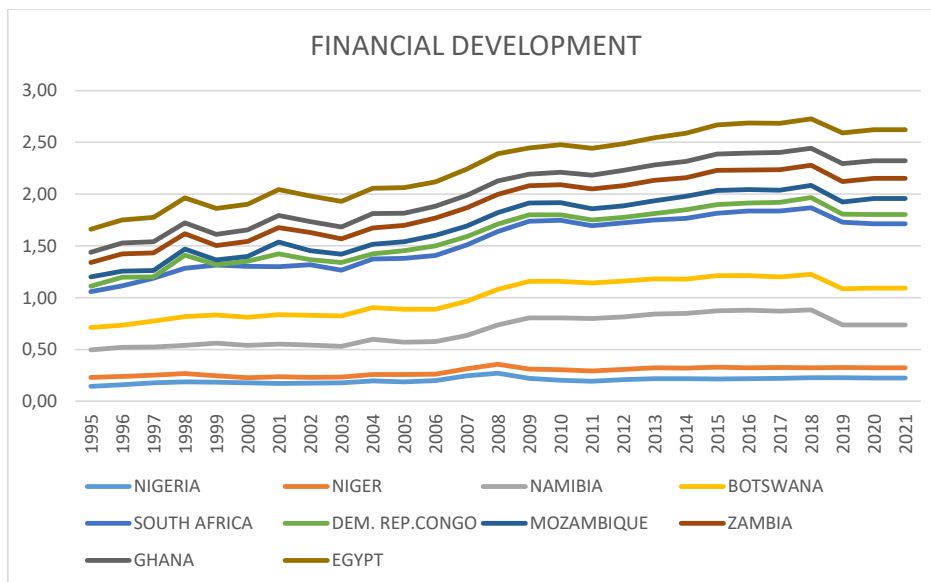
The chart above shows the movement of financial development for each of the country, Nigeria has the lowest indicator for financial development since 1995 to 2021,

the country has no improvement in its financial development, and this is as a result of the rising problem that affect the nation's growth in finance. The country is rich in natural resource but yet has no positive increase in its financial development. Niger financial development is relatively low. These two countries (Nigeria and Niger) share bothers and are faced with the same problem of insurgency, corruption, misappropriation of fund, political instability, poor infrastructural development, and Niger is faced with natural disaster which some time heavy rainfall that may cause flooding or drought and these problems could be the major causes of their low financial development. Egypt has the highest growth rate in financial development, and it show a positive increase as the year's passes.

(Usman et al., 2022) looking into the intersection of using "renewable energy and natural resources". Results show that "the coefficient of interaction variable (lnNRR*lnREC) has a negative impact on ecological footprint" when this interaction term is considered. The study shows that natural resources and renewable energy have lesser coefficients over their interactions. This means that, if managed properly and the usage of these mineral wealth is allowed to regenerate, the combination of both mineral wealth and renewable sources of energy has the potential to protect environmental quality. These nations consume fewer resources (mining and deforestation) and more renewable ones (water, biogas, wind, solar, thermal, etc.). Therefore, effective utilization of natural resources can boost renewable energy's capacity to maintain environmental performance over the long term. To boost resources of finance and accelerate economic expansion in resource-rich countries, it is therefore necessary to use these resources efficiently and responsibly. It will also be beneficial to consume fewer nonrenewable resources to decrease the negative effects of natural resources on the environment.

The development of human capital of a country will describes the financial worth of the economy and worker's knowledge and expertise will give room for a good working economy, this includes the following characteristic, training, education, health, intelligence, not only that, service provision, technology, innovation and creativity was a great deal to African countries. The governments are not encouraging individuals who have skills, creativity and innovative to build and develop their skills in other to improve and promote human capital. Also, education which is supposed to service as a tool to

improve human capital is not affordable to every individual, as if that is not enough corruption became a cancer warm to African nations, where culprit who are involve in corrupt practices are not brought to book.

Corruption has been a major source of concern in Africa counties for a long time. Since the middle of 1990s, there has been a rising need to examine the various economic consequences associated with this phenomenon, particularly in terms of economic growth. The World Bank (1997: 2) provided a commonly cited definition of corruption, which described it as "the misuse or abuse of public office for private gain." Economic growth is said to be harmed by corruption because it discourages entrepreneurship, idles resources, stifles tax income, and obstructs regulation. Corruption in African countries like Nigeria, Niger, Guinea, Ghana, Mozambique, Namibia, Zambia, South Africa, D.R. Congo and Egypt has become business of the day, it is viewed as a universal phenomenon that has existed in all societies for a long time, and is thus regarded as the bane of most political, social, and economic expansion, as well as democratic stability, in many countries throughout the world (Nkwede and Nwogbaga, 2017). The high level of corruption can affect the production and exploration of the abundant natural resource. (Gaygısız and Lajunen, 2022) disclosed that corruption is associated with the cultural influence. Most African nations are culturally related and they tend to influence each other and sabotaging any effort to fight these killer diseases called corruption. . (Lima and Delen, 2020) in a prediction reveal that most pertinent corruption related research has given an insight of knowledge in all field either administratively, politically academically and community. Therefore, this study evaluates natural resource, human capital, economic growth, corruption, renewable energy on financial development in ten African countries.

Figure 2

Ten African countries under review

NIGERIA	NIGER	NAMIBIA
SOUTH AFRICA	ZAMBIA	BOTSWANA
DEM. REP. CONGO	GHANA	EGYPT

MOZAMBIQUE
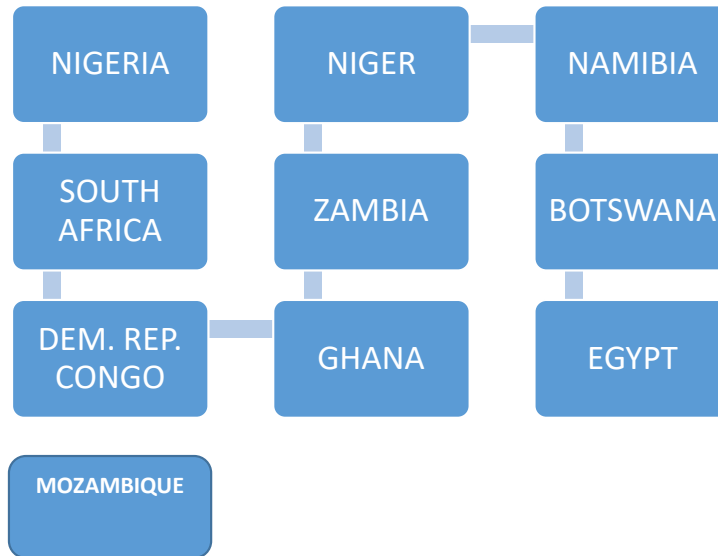
African nations suffer from abject poverty leading to low economic growth, poor infrastructural development, low level of literacy, insurgency, and many others. A greater percentage of these countries are faced with the problem of corruption. The high rate of population of some African countries are surging beyond the availability of resources in the country and this stems up because the population is progressing at a geometrical without implementing a control system and this furthermore hampers the economic growth. For instance, the rate of population growth in Nigeria and its increasing number of problems but yet, the government has not made any policy to control the growing number. (Mamudu et al., 2019) Nigeria continues to be the top oil producer in Africa with"reserves estimated at 37.2 billion barrels and output at 2.28 million barrels per day (ranked 13th globally)". Angola, which has a reserve of 9.5 billion barrels, is the closest contender in the region, with all this, they suffer from abject poverty leading to low economic growth, poor infrastructural development, low level of literacy, insurgency corruption and many others. Botswana resources include coal soda ash, potash, silver, iron ore, copper and diamonds. Diamond mining accounts for roughly 70-80% of total export revenues and second producer of diamond in the world. The country's mining sector, particularly diamond mining, is crucial to its economy (https//www.worlddatlas.com). Just like every other African country, they are faced with environmental, political, and social problems. South Africa is endowed with abundant

natural resources like platinum, silver, manganese, copper titanium, iron ore, uranium, chromium, diamond, and gold which is the major source of income to the country. It is considered as the only developed country in Africa and produces more than 10% of the gold in the world The nation is also fortunate to have abundant supplies of lumber and sugar for export. South Africa happens to be one of the world's top 10 wine producers. With all this achievement, they also have some challenges that are associated with their community, these challenges may include social tension, political issue, inequality, unemployment, poverty, corruption, inadequate access to education and so many others (https//www.borgenmagazine.com).

Namibia is one of the less populated nations in African with about 2.5 million. It has a rich cultural heritage and is the highest in the production of uranium in the world. Namibia is known with the production of uranium with other natural resources such as diamond, zinc, sulfur, lead. copper, tin, arable land, silver ocean and fish. With all these, it is identified as one of the poorest nations in Africa and is faced with corruption and poor governance. The country struggle with environmental problems such as bad climate condition and prolong drought which make it very difficult for agriculture (https//www.myguidenamibia.com). Zambia has about 18 million population and is also faced with environmental problem like land degradation and drought which occur periodically. The level of literacy in Zambia is very high and yet they are faced with unemployment, extreme poverty, hunger, poor leadership corruption among others (https//icetonline.com). Ghana is one of the most improving countries among Africa nations, they have stable power supply than any other African countries, and it is estimated to have 31 million population. Natural resource in Ghana are diamond, gold, timber, limestone, salt, silver, ocean, manganese, bauxite, and oil. Nevertheless, the country has some challenges ranging from corruption, unemployment, poverty, low literacy, marginalization, and lack of access education (https//yen.com.gh112130). The democratic republic of Congo has the estimated population to be about 89 million, just like most African countries, it is richly blessed with abundant natural resource which include forest, tin, diamond, hydropower, uranium, gold, coltan, arable land, iron, and has good potential for agriculture. The D.R Congo is the biggest in the production of copper in Africa and the world largest source of cobalt also it is recorded to be the second world

largest rainforest which can be as an advocate for greenhouse gasses. Despite all the abundant resource, the Congolese are face with the worse scenario which include lack of human right and constant crisis leading displacement of its citizens not only that, but the Congolese also suffers from poor governance and is considered to be one of the poorest countries in the world (https//www.worldatlas.com.articles/).

Niger is estimated to have about 24 million population, and it is recorded to have the largest land area in Africa with about 1,270,000 square kilometers though most of this land is covered by the desert leaving only about 20% green land this leave the people with nothing much to fall to not even enough farm land for former to cultivate. Available natural resource in Niger includes gold, coal, uranium, ore, salt, petroleum, iron, gypsum, tin and molybdenum. Niger is considered to be one of the highest illiteracy rates, corruption is very high, poor infrastructural development and is faced with natural disaster which some time heavy rainfall that may cause flooding or drought https//www.datlas.com/article. Mozambique estimated population is about 33 million, available natural resource found in Mozambique includes, aluminum, oil, and gas, gemstone, gold, uranium, steel, salt, hydropower, ocean and arable land. Despite the available natural resource, the nation is recorded to be one of the poorest countries in Africa with about half of its population is below the line of poverty, literacy rate is very low, just like every other Africa country, Mozambique is faced with the problem of poor governance and corruption (https//www.worldatlas.com/article). Egypt is the third populated nation in Africa with the estimated population of 106 million, natural resource is Egypt includes iron ore, petroleum, phosphate, and natural gas. The nation is periodically faced with environmental problem which is drought and wind. It is recorded to be the most obese county in the world. It also has the record of bad leadership; funds are not distributed equally and are faced with corruption (https//www.worldatlas.com/article).

Statement of Problem

Humanity dictates that we try to change with the times and do our best to find remedies to our difficulties. Over the period of years, the worldwide rate of environmental degradation has drastically increased. Environmental disasters such as intense weather events and sea-level rise are caused as a result of manmade invention or

natural causes, this disaster however, can sometime be prevented or reduced, when adequate measures are taken. Due to this many African nations are under obligation to deal with ecological consequences while also seeking to preserve economic expansion. The emissions of carbon are widely recognized as a significant cause to climate change and environmental degradation. Hence, the need to advocate for consumption and improvement of renewable energy usage will reduces carbon emissions.

African countries are richly blessed with abundant mineral like forest, gold, oil and gas, zinc, iron, limestone, coal, diamond, sulfur, gemstone, aluminum, copper, ocean, platinum, arable land and many others, these resources might cause an assumption that the abundance of them in Africa has a great track record of economic success. This conclusion, however, is only true for South Africa as it is the only developed nation in Africa.

Despite having all these abundant natural resources, the economic expansion of these Africa nations is very slow, whereby there is no connection between economic growth and the availability of resources. The growth and development of these countries are well known to be hindered by many problems such as urbanization, political greed, lack of good policy, corruption, high dependent on fossil fuel, deforestation, drought, insurgency, insecurity, unemployment, poverty, no access to good education, poor social amenities, and infrastructure among many others. These problems have lingered for decades hindering the financial development of these countries; therefore, it is on this backdrop this study is carried out to evaluate natural resource, human capital, economic growth, corruption, and renewable energy on financial development in African countries.

Purpose of the Study

The purpose of this research thesis is to understand the influence of financial development on environmental and economic forces on long-term economic development. A model is developed to examine the connections between these traits over time and the achievement of long-term financial and economic objectives. A quantitative method of research based on panel ARDL (augmented dickey fuller) PMG, "panel unit root", "Westerlund panel cointegration", and" Dumitrescu & Hurlin panel causality test" will be employed.

Objectives of Study

1. To review scientific literatures on financial development, economic growth, and natural resources

2. To evaluate natural resource, human capital, economic expansion, corruption, and renewable energy on financial development in Africa.

3. To determine the level of economic expansion, renewable energy, and human capital on financial development in African countries

4. To give appropriate recommendations on how Africa countries can improve its financial development an economic growth.

Research Hypothesis

It is crucial to this investigation's goals that the following hypotheses be developed: The use of more renewable energy sources, improved human capital, the abundance of mineral, economic expansion, and anti-corruption efforts do not considerably aid in the development of the financial sector in Africa. Rejecting a null hypothesis has the effect of accepting the alternative hypothesis.

H 1; there is no relationship between abundant natural resource and financial development.

H2 there is no relationship between economic growth and financial development.

H3; there is no relationship between human capital and financial development.

H4; there is no relationship between corruption and financial development.

H5; there is no relationship between renewable energy and financial development.

Significance of Study

Poor governance is a major cause of the problems of developing countries, corruption have been seen to flourish in an atmosphere of secrecy and thus damages the weak and the poor disproportionately. In vulnerable regions corruption has undermine public confidence in the government, it has weakened the forces that provides peace and

has been linked to the emergence of violence's and insurgency in these areas. Corruption is known to cause a setback social amenity, infrastructure, national treasury, among others on the financial development of a Nation. On the other hand, natural resources if not well managed by the government also negatively affect the financial development of a nation.

An effective, legislative frameworks and public and private participation in the development of a nation can positively affect its financial development for instance through adequate use of renewable energy, innovation, human capital, birthrate control, good policies among others.

This study narrows to Africa developing nations. Primarily developing nations are no to be faced with diverse challenges such as poverty, over population, natural disaster, deviating economy:

1. The study describes the characteristics of expansion of the economic and financial development

2. It investigates the historical relationship between mineral wealth, renewable energy, and the development of a nation on a worldwide scale.

3. It claims that for developing countries to overcome problems, exploration of natural resources should be investigated and necessary policy and disciplinary actions on law breakers should be set in other to curtail corruption. Improved energy services are also required. Notably, the five countries with the lowest incomes worldwide have the worst levels of poverty.

Limitation of the Study

The study tried to investigate the fifteen most abundant natural resource in Africa and their level of financial development but due to unavailable data for five countries out of the fifteen, the researcher narrows its study to (10) countries due to the inadequate scientific data available to carry out the study. The ten countries include South Africa, Ghana, Nigeria, Egypt, Botswana, Namibia, Zambia D.R Congo, Niger, and Mozambique.

The study needed to acquire data for the study from the period of 1970 to 2021 but not all the ten countries have the data up to that period hence, the study was limited to 1995 to 2021 limiting the total observation to 532.

Contribution to the study

Although numerous studies have examined African nations and their natural resources, none of the papers examined the ten African nations under study. The selection of these ten African nations was made due to their rich natural resources and poor level of financial development. Once more, the study tries to examine the degree of human capital and the use of renewable energy, both of which could enhance financial development and contribute to the body of literature. The PMG ARDL model was used to assess the relationship between the variables to examine the financial development of the ten countries. The research related economic expansion, human capital, natural resources, corruption, and renewable energy.

Definition of Terms

Financial Development

"Financial development entails some advancements in information gathering about investment opportunities and capital allocation, corporate governance, and firm oversight, "trading, risk diversification, and management, mobilization, and pooling of savings, and facilitating the exchange of goods and services".

Natural Resource

"Natural resources are materials that can be utilized to support human life and basic requirements. They are present on the earth. They consist of soil, water, air, sunlight, metals, oil, coal, natural gas, and minerals like stone and sand. Besides plants and animals, natural resources can also include fish, birds, and wildlife. Natural resources are used to produce raw materials for production, food, and fuel. All the food that peoples eat comes from plants and animals. Natural resources like coal, natural gas, and oil are used to generate heat, light, and power".

Human Capital

"The economic value of a worker's experience and talents is referred to as human capital. Employers respect traits like loyalty and timeliness as well as assets like training, education, intelligence, talents, and physical and mental health".

Economic Growth

"Economic growth is a rise in the production of goods and services on a comparative basis between two periods of time. It can be calculated in nominal or real (inflation-adjusted) terms. Although other metrics are also employed, gross national product (GNP) or gross domestic product (GDP) are the most common ways to quantify overall economic growth".

Renewable Energy

"Renewable energy is energy that is produced through natural processes and is renewed constantly by the natural sources. heat, water, Sunlight, wind geothermal tides, and other biomasses are examples of this. Its energy never runs out and is always replenished".

Corruption

"Corruption is dishonest conduct on the part of those in authority. Those who abuse their authority can be either individuals or members of groups, such as corporations or governments. The World Bank (1997: 2) provided a commonly cited definition of corruption, which described it as "the misuse or abuse of public office for private gain."

Africa

"Africa is the second-largest continent in the world (after Asia), making up around one-fifth of the planet's land area. The Atlantic Ocean borders the continent on the west, the Mediterranean Sea on the north, the Red Sea and the Indian Ocean on the east, and the waters of the Atlantic and Indian seas on the south".

CHAPTER II

Literature Review

Considerable number of authors looked at issues concerning the topic under review, to have a better understanding about the study, this chapter focuses on reviewing related literature of published articles, their views and findings. Taking in to considerations the

variables that made up the key areas of the study which is the detailed insight of financial development which is the dependent variable and natural resource, economic growth, corruption, human capital, renewable energy is the independent variables. The research investigated 10 African countries with abundant natural resource, these countries include Nigeria, Niger Namibia, Ghana, South African, Zambia, Mozambique, Egypt, Botswana, and democratic republic of Congo.

Figure 3

Conceptual framework
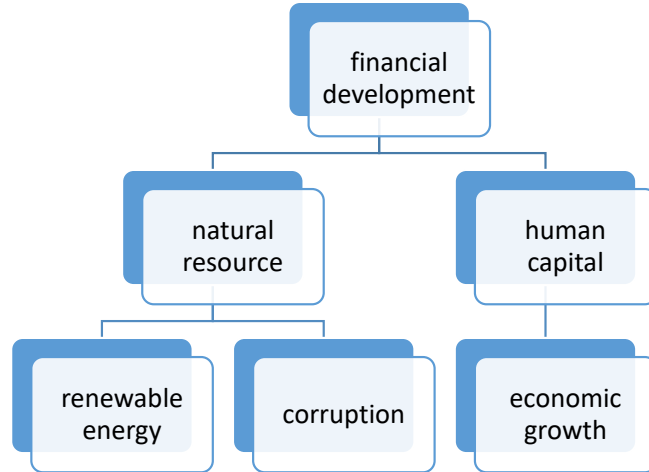
The study investigated 10 African countries with abundant natural resource, these countries include Nigeria, Niger Namibia, Ghana, South African, Zambia, Mozambique, Egypt, Botswana, and democratic republic of Congo.

Natural Resource and Financial Development

There has been scholarly debate on abundant natural resource a curse or a blessing, many Authors believe that all resources found in nature are advantageous to the growth of an economic and financial development while number of them believe that abundant natural resource is a curse. (Zafar et al., 2019) reveals that "financial development (FDI) decreases energy intensity and replaces energy-intensive commodities with energy-efficient ones", bringing with it cutting-edge technology and new innovations, and minimize potential pollution. This is a positive impact which indicate

that an "increase in financial development will lead to decrease in pollution". The study identifies positive impact of FDI on economic development, energy use, the use of mineral wealth, and especially the ecological footprint. Another study (Rashid Khan et al., 2019) investigate the indicators of "financial development on natural resource", the study employed the GMM model with the data period of 1967 to 2016, the findings demonstrate that real interest rates benefit the energy and resource markets by boosting national agriculture, oil, and energy production. Demand for fossil fuels, energy efficiency, and agricultural and livestock production all rise as money supply does. With a few exceptions, domestic financial sector credit has a detrimental impact on the markets for resources and energy. Except for sum "fisheries production, which significantly boosts FDI inflows in a country", FDI inflows were mostly influenced by FDI inflows to lower natural resource rents and agricultural and animal productions. (Hadj and Ghodbane, 2021) support that natural resource can only be negative to countries that have a better developed system of finance, while countries that do not have a good developed financial system will have a positive relationship on the cursed of natural resource. Another research reveals that oil export in short run does not have a quantitative influence on economic development but in long run the financial integration is statistically significant to the growth of the economic (Erdoğan et al., 2020).

(Zafar et al., 2019) in a time series data of united states from 1970 to 2015 researched "The impact of natural resources, human capital, and foreign direct investment on the ecological footprint:" the researchers employed the ARDL model to estimate the long- and short-term relationship of human capital, natural resource, financial development, gross domestic product, energy consumption on ecological footprint. The relationship between natural resources and ecological footprint indicates a negative relationship hence reducing environmental deterioration. As a result, the ability of natural resources to regenerate themselves can guarantee an enhancement of the environment's value. This suggests that natural resources can counterbalanced the drawbacks of carbon fuels by lessening the nation's reliance on traditional fossil fuels that are manufactured and due to pollution. This finding demonstrates that, over the long term, "natural resources have a major impact on the ecological footprint". A study by (Aljarallah, 2020) looked at "Natural resource dependency, institutional quality and

human capital development in Gulf Countries" applying a time series approach the study cover the period of 1984 to 2014, ARDL method was used to determine the relationship of long and short term of the variables, the researcher identifies that richness in natural resources forces nations to give the education sector little focus and minimal funding, according to the researcher nations with abundant natural resources fail to invest in their people because they see these lump sums as a reliable source of income and a foundation for their ability to survive. Furthermore, both the government and the general populace view their country' wealth in natural resources as their most important asset since it fosters a false perception of safety and overconfidence. The findings also discloses that abundant of natural resource in kingdom of Saudi Aribia, Kuwait and UAE hampered with development of human capital. However, it has been identifying that human capital in the three nations is reduced in the presence of corruption. (Usman et al., 2022) investigated ten nations with the largest financial resource wealth and the dataset covered the period of 1990 to 2018. "The use of natural resources has a huge negative impact on the environment". Countries with a wealth of natural resources can experience a longer-term growth in their environmental deficiency level. This shows that in these nations, "the destruction of the environment is primarily caused by the mining of natural resources".

Figure 4

Natural resources a blessing or a curse
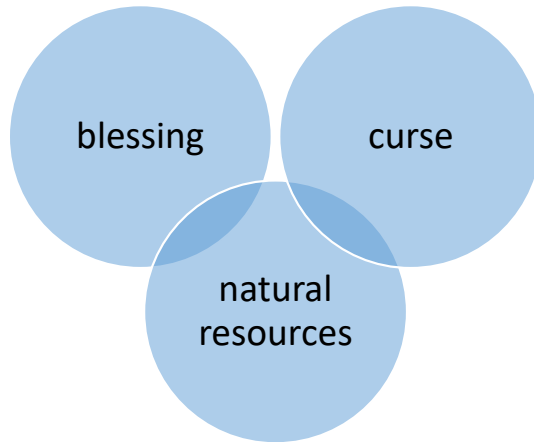
Natural Resources a Blessing

Mineral wealth is very important to the expansion of the economy. It contributes to the manufacturing operation and the growth domestic products through exporting basic products. The exported items benefit from wealth creation, which brings in foreign earnings. (Atil et al., 2020) in a time series data of Pakistan researched "Are natural resources a blessing or a curse for financial development in Pakistan? The importance of oil prices, economic growth, and economic globalization" the data for the study cover the period of 1972-2017 Based on the direction of the reliability test, natural resources and financial development are interrelated and favorably connected with one another. Despite a low correlation coefficient and a wide range of confidential intervals, there is a strong association between financial progress and oil prices. These findings may seem unexpected at first glance, given that rising oil costs may hinder both economic activity and financial expansion. However, it demonstrates that a rise in the price of oil results in a rise in the demand for credit, as well as more financial activity and development. An increase in pricing will encourage the formation of credit, demanding financial activity for a nation like Pakistan that depends largely on oil imports.

(Hussain et al., 2021) conducted a study that investigated "A nexus of natural resource rents, institutional quality, human capital, and financial development in resource-rich high-income economies" the researcher explores 23 countries which includes Canada, Australia, Germany, France, and Japan are among these twenty-three rich nations. Annual panel data from 1992-2017 was used, "cross sectional dependence

(CSI), unit root unit (CADF and CIPS), cointegration test and autoregressive distributive lag (ARDL) diagnoses was employed". The findings disclose that mineral wealth is said to be blessings in these nations given the availability of human capital and good institutions because the natural resource rent coefficient is considerable in both the short- and long-term. Financial development increases natural resource rent. It points to the finding that natural resources are a blessing for resource-rich nations with high incomes.

(Ali et al., 2022) in a time series data investigated "Financial development and natural resources. Is there a stock market resource curse?" though the result discloses economic growth is unfavorable and negligible, indicating that it does not promote total financial progress. The findings have a strong and positive coefficient of natural resource rents, suggesting that in the long term, natural resources drive global financial development. Natural resource revenue improves in overall financial development efficiency. This shows that natural resources have played a significant role in the overall financial development of the Malaysian economy.

(Frynas and Buur, 2020) studied the effect of anticipation of resource and how this anticipation can affect the economic, the study used factual data from three African nations (Madagascar, Sao tome e Principe and Mozambique) to examine the degree to which the expectation of future extraction profits results in "presource curse" consequences. In order to better understand how future income expectation can influence current economic and political calculations. The research discovered that the expectation of future extractive profits had adverse repercussions on all three countries, including unstable economic development, elevated levels of national debt, deteriorated governance, and societal tensions. This inquiry provides an insight into the many varied implications of anticipating future resource availability on the economy, governance, and conflict. The study discovered that the effects of the "presource curse" varied greatly between the three nations. For instance, the repercussions of the "presource curse" associated with national debt. The government began taking out covert loans in 2012 in expectation of future gas earnings. "In Madagascar, which benefited from foreign debt relief at the beginning of the anticipated resource boom", they remained substantial but far less noticeable. This anticipation can possibly slow down the financial development

and growth of the economic, as a result, the dependency on resource could lead to high exploitation of the resource.

(Namazi and Mohammadi, 2018) investigated "Natural resource dependence and economic growth: A TOPSIS/DEA analysis of innovation efficiency" in 141 countries. The paper discloses that encouraging creativity in the natural economies with abundant natural resources may be protected from the resource curse. The conclusion was that nations need innovation, particularly those that are heavily reliant on oil shipments or have bad government security. Investigating the "Role of financial development for sustainable economic development in low middle income countries" (Hunjra et al., 2022) applying "FGLS (feasible generalized least squares) and panel quantile regression" for the period of 1991 to 2020 suggested that wealth of environmental assets, global trade, real exchange rate, and foreign investment all have a favorable influence on long-term economic progress. Furthermore, the richness of environmental assets serves a beneficial stabilizing impact in capital formation. The wealth of natural resources, global tourism, foreign direct investment, and trade openness, all are favorable impact on sustainable economic development. Additionally, mineral wealth helps financial development play a beneficial regulating function.

Natural Resource a Curse

A panel data research by (Tang et al., 2022) studied "Natural resources and financial development: Role of business regulations in testing the resource-curse hypothesis in ASEAN countries" the studies covers the duration "from 1984 to 2018" identified that natural resource rent coefficient in the ASEAN sample states shows a negative relationship between financial development and these states, supporting the financial resource curse hypothesis. It suggests that price fluctuation for mineral wealth slows financial development. This would support the claim that the resource curse hypothesis is significantly present in the study, "where a higher level of natural resource rent denotes a lesser impact of financial development and inversely". The high cost, price, and production unpredictability, as well as the need for qualified labor, are the driving forces that produce the negative impact of natural resource rent on financial development. Inadequate borrowing and spending are frequently associated with wealth

economies, which hinders the growth of their organizations. Vast volumes of cash and manpower are more frequently connected with resource-dependent businesses, which is another characteristic that contributes to the unfavorable correlation between natural resources and financial growth. Therefore, natural resources have a detrimental effect on economic growth and financial development.

The support of resource curse hypothesis by (Gokmenoglu and Rustamov, 2022) in a time series data, the investigating " The role of the natural resource abundance in the short and long run: The case of the Kingdom of Saudi Arabia" from 1970 to 2017 found that there is an inverse association among the availability of natural resources and financial development rise in natural abundance will results in a decline in financial development. The long-term relevance of the resource curse in KSA is supported by this conclusion. The researchers identify some valid point as to why natural resource abundant may have a negative effect. A powerful transmission mechanism is created by issues in a nation with a thriving manufacturing sector. Businesses in resource-rich nations seek to operate in the more profitably lucrative natural resource-related sectors. The export industry's predominance of natural resources prevents businesses from adding value in the manufacturing sector. The national currency's overvaluation because of natural wealth exports reduces the country's competitiveness in the global industrial sector. According to (Asif et al., 2020) studied "Dynamic interaction between financial development and natural resources: Evaluating the 'Resource curse' hypothesis" from the period of 1975 to 2017 disclose that even though financial development has a positive effect in short run it does not stand the taste of time it has a negative effect in long run. This is an indication that the exploitation of resource found in nature such as natural gas, oil, forest, and coal are believed to be curse since the result support the hypothesis.

According to (Khan et al., 2020) studied "Natural resource abundance, technological innovation, and human capital nexus with financial development: A case study of China" the study covers the period of 1987 to 2017. The findings suggested that the availability of mineral wealth has a negative impact on financial progress. In China, a 1% increase in mineral wealth richness slows financial development due to the presence of the resource curse. The resource curse may be the result of increased natural resource exports and the growth of resource-related companies, which discourages investment in

manufacturing sectors. Furthermore, resource reliance may hinder financial development and domestic investment, thus lowering the openness level. Other potential causes of China's resource curse include single-industry arrangements and ineffective resource exploitation, particularly in wealth nations. Furthermore, (Jiang et al., 2021) in a study investigated the curse resource and financial development in a time series of China for the period of 1981 to 2018. The model employed is "QARDL (quantile autoregressive lag)" According to the results, it is important to note that for China, the long-term cointegration test metric estimated time Natural Resource Rent is negative, showing a fall in long-term "relationship between Natural Resource Rent and Financial development". The result support the hypothesis of curse resource.

(Guan et al., 2020) researched "Natural resources rents nexus with financial development in the presence of globalization: Is the "resource curse" exist or myth?" to measure the improvement of economy the researchers use four independent variables (human capital index, globalization index, gross domestic product, and natural resource rent) whereas, the dependent variable is financial development. The period covered is from 1971 to 2017, various testing was applied to test the relatedness of the variables and as to whether they are cointegrated. "ARDL model" was used to test the long-term relationship and FMOLS for robust check and DOLS and measuring "the causality of the variables". The findings disclose that both in short and long run "natural resource" have a considerable negative impact on financial progress. The result reveals that a rise in rent from natural resource will result in the decline in long run of financial progress. The result implies that China is affected by the resource curse. The "resource curse" may result from increased resource exports and the growth of resource industries, which prevent enough investment in manufacturing. The ineffective utilization of resources and reliance on just a few industries, particularly in China, are other potential causes of the country's resource curse. The ineffective use of resources and reliance on a few industries, especially in resource-rich regions, are other potential causes of China's resource curse.

An evidence of the "curse resource" (Ying Li et al., 2022) indicate negative relationship between natural resource and financial development but human capital and financial development are positively related. The research covers the durations from 2000

to 2020 investigated "Natural resource abundance and financial development: A case study of emerging (E− 15) economies" The results support the resource curse theory for the fifteen emerging nations by demonstrating that mineral wealth has a negative impact on financial growth (E15). On the other side, financial growth is absolutely impacted by investments in human capital. It has also been demonstrated that trade openness in the Emerging E-15 economies fosters economic expansion. This study suggests increasing the need for various resources and efficiency to make more efficient utilization of the natures resources in the banking industry. The banking industry should be given more consideration than that of the non-financial sector to make the most of natural resources. If human capital is put to use in the correct places, the abundance of mineral wealth might well be utilized more effectively. (Rahim et al., 2021) even though the resource cause hypothesis is positive, human capital and financial development improves growth of the economic According to evidence supporting the resource curse theory, natural resource extraction and use practices are ineffective at promoting national development. This might be caused by a number of additional elements, such as institutional quality, political rent-seeking, volatility in goods price and absence of diversification is among others, in other to diminish the effectiveness of endowed resources in terms of economic development and resource curve validation, the element mentioned above need to be looked into.

Figure 5

Natural resources
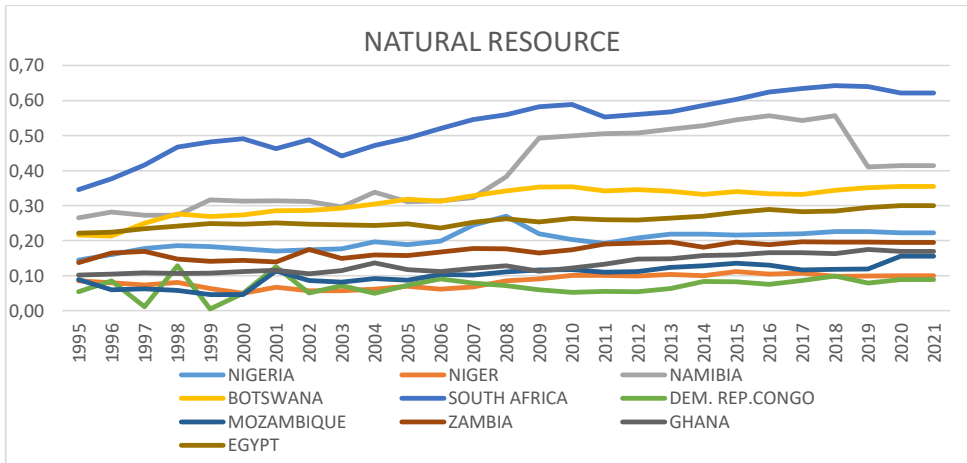
NATURAL RESOURCE

The natural resource chat shows that democratic republic of Congo, Mozambique and Niger overlap each other until 2000 where Mozambique started rising, the reason for the rise could be because of good policy that improve the production of natural resource in Mozambique, Niger natural resource rose in 2008 until the period of pandemic where the two nations overlap each other again. The rise could be because of a good policy implementation and probably good management until the period of pandemic. South Africa has the highest outcome of natural resource where it indicates a positive increase since 1995. South Africa seems to manage its abundant resource more appropriately with a better policy that enable them to have a productive growth.

Financial Development and Human Capital

A countries financial development is associated to how skilled, productive, and experienced its citizens are to improve its economy. According to (Zafar et al., 2019) A rise in human capital results in a decrease in "ecological footprint". This implies that when a nation has a healthy supply of "human capital", the demand for environmental quality rises, leading individuals to seek out ways to enhance it through power generation, resource conservation, and the development of new technologies. Workers from the US's domestic and foreign labor markets are included in the human capital pool. Another study (Hussain et al., 2021) looked into "A nexus of natural resource rents,

institutional quality, human capital, and financial development in resource-rich high-income economies" the researcher explores 23 countries which includes; Canada, Australia, Germany, France and Japan are among these twenty-three rich nations. Annual panel data from 1992-2017 was used, "cross sectional dependence" (CSI), "unit root unit" (CADF and CIPS), "cointegration test" and autoregressive distributive lag (ARDL) diagnoses was employed. The findings indicate both in long-run and short-run human capital is important with positive coefficients of 0.33 and 0.327, respectively. This suggests that a long-term growth in human capital of 1percent can result in a financial development rise of 0.33%. It points to the finding that high-income countries' financial progress is being significantly improved by human capital.

(Wang et al., 2022) investigated "Is resource abundance a curse for green economic growth? Evidence from developing countries" using panel data, the study looked at three continent Africa, Asia and Latin America among the other African countries are Ghana, Egypt, Nigeria, Mozambique, south Africa, and Namibia which also constitute the present study. The researchers adopted the GMM regression method from the time period of 1990 to 2012. The findings indicate that the abundance of resource in Latin American and African countries has a detrimental effect on the expansion of green economy, although this link was insignificant in Asian nations. At the same time, Africa has a higher inhibitory influence than Latin America. The basic variations in economic development can account for this. It further explains that the development of economic in Asian nations is generally higher than that of Africa and Latin America. People in past economies are more motivated to escape poverty than to pursue economic progress, hence, the two continent that have a "negative effect" of abundant resource on "economic growth" is because of over dependance on resource for wealth growth. The researcher further explain that Africa and Latin America has problem of technological advancement, low social development and limited talent hence, the implementation of green economic and development are slowed by these challenges. (Gokmenoglu and Rustamov, 2022) data of time series, investigating "The role of the natural resource abundance in the short and long run: The case of the Kingdom of Saudi Arabia" from 1970 to 2017. Though, the result displayed a negative impact mineral wealth on the development of finance, literacy education has a positive impact on financial development. The result indicates a

significant relationship of human capital and financial development in Saudi Arabia. This means that an investment in education will improve skill acquisition encourage innovation this will improve financial development, perhaps solve the problem created by abundant natural resource.

(Khan et al., 2020) studied "Natural resource abundance, technological innovation, and human capital nexus with financial development: A case study of China" the time series data between 1987-2017. The results demonstrate that, technology advancements and human capital combine or multiply to have a favorable impact on financial prosperity. increase in the interaction term boosts financial development. This demonstrates that the expansion of technology breakthroughs and education, especially higher education such as graduate and master's degrees, are essential components for the progress of the financial sector in China. Another study (Guan et al., 2020) identify that Human capital enables businesses and people to make greater usage limited resources and raise the standard of output. Through the creation of new technologies and business processes, human capital strengthens the financial system, enhances livelihoods, and promotes economic growth. (Hadj and Ghodbane, 2021) reveals that human capital has a good impact on financial development. (Zafar et al., 2019) in a time series data of united states from 1970 to 2015 researched "The impact of natural resources, human capital, and foreign direct investment on the ecological footprint:" the researchers adopt the ARDL model to estimate "the long- and short-term relationship of human capital, natural resource, financial development, gross domestic product, energy consumption on ecological footprint". The result discloses that "human capital lessens the environmental impact". This implies that when a nation has a healthy supply of "human capital", the demand for environmental quality rises, leading individuals to seek out ways to improve it through energy planning, resource conservation, and the development of new technologies. Workers from the US's domestic and foreign labor markets are included in the human capital pool. The utilization of financial development, natural resources, economic growth, energy consumption, and the ecological imprint in the US can all be strongly influenced by "human capital". "Ecological footprint and human capital" have a strong correlation, which supports the inclusion of human capital in ecological modeling.

(Rahim et al., 2021) mentioned in their study "Do natural resources abundance and human capital development promote economic growth? A study on the resource curse hypothesis in Next Eleven countries" the result observed a significant impact of "human capital on growth", this is because a better standard of education enables a nation to be more productive, encourage innovation and recognize potentials. This means that when human capital is developed (that is acquiring skills, knowledge and encouraging creativity) it led to a better extraction and proactive management of the abundant resource which will improve the development and growth of the economy. (Zallé, 2019) studied the effect of dependence on natural resource in Africa, the study looked at 29 countries from 2000 to 2015. The finding demonstrates a favorable impact of human capital on growth. The result discloses that, one percent increase in human capital leads to 12 percent rise in growth. On the other hand, natural resource negatively affect growth, the result show that any rise in "natural resource revenue" will leads to decrease in the rate of growth in the long term.

Empirical research that studied the G7 countries from 1971 to 2014 (Ahmed et al., 2020) disclose a negative correlation between human capital and ecological footprint, human capital is thought to slow down ecological damage. Reduced environmental impact results from increased "human capital". "Human capital" plays a beneficial impact in reducing ecological footprint. This is related to education and skilled labor that improve environmental awareness and environmentally friendly behavior. By encouraging a sustainable lifestyle, environmental awareness and knowledge improve the standard of the environment.

Figure 6

Human capital causes financial development

financial development → ← human capital
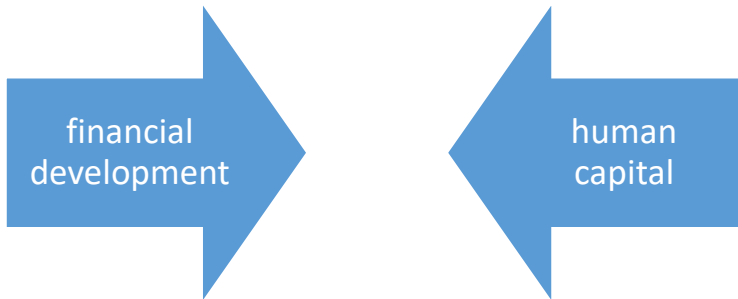
Economic Growth and Financial Development

A nation needs a robust and effective financial system that serves as the foundation of its economic progress in order to encourage economic activity. (Atil et al., 2020) research "Are natural resources a blessing or a curse for financial development in Pakistan? The importance of oil prices, economic growth and economic globalization" the data for the study cover the period of 1972-2017. The researchers employed four variables (natural resource, real oil price, economic growth and financial development) the finding disclosed that Economic growth and financial progress are positively correlated. The intervals of 90% and 95% confidence around the correlation coefficient between economic growth and financial development are low and high, respectively. This suggests that while economic growth, oil prices, and natural resources are all positively correlated with financial development, economic globalization is negatively correlated with it. (Jiang et al., 2021) in a study investigated the curse resource and financial development in a time series of China for the period of 1981 to 2018. The model employed for the study is QARDL (quantile autoregressive lag) Given that the correlations in the specified observed values are favorable, China's GDP and financial development have a long-term rising trend. In China's case, the Gross domestic product encourages financial progress.

(Ali et al., 2022) in a time series data investigated "Financial development and natural resources. Is there a stock market resource curse?" the period covered was 2002 to 2018, diagnoses test (unit root test, cointegration test,) the researcher applied ARDL, DOLS model to test the long-term relationship and the elasticity of the extensive term of variables. The findings show that economic growth is unfavorable and negligible,

indicating that it does not promote total financial progress. According to the researchers, Malaysians economic growth does not influence financial development due to the situation that the public sector's leading position and the private sector's inability to provide economic activities that can stimulate overall financial development, i.e., the private sector's superior resource utilization and ability to produce economic activity.

According to (Khan et al., 2020) studied "Natural resource abundance, technological innovation, and human capital nexus with financial development: A case study of China" for the time frame of 1987 to 2017, the researcher adopted for variables financial development, human capital measured by (the total number of school graduates, the undergraduate, the master and PHD holders) was use to ascertain the level of human capital, natural resource abundance was measured by (total rents from forest, gas oil and mineral). The findings reveal that Technology advancements are essential for fostering financial development. According to the findings of the relationship between technical advancements and financial development, a 1percentage rise in technological advancements will cause a boost in financial development of 0.03percent. Financial development increases as a result of openness. These trade openness statistics indicate that trade openness for China is advantageous as it will enhance and encourage financial advancement. (Guan et al., 2020) findings shows that Both in the short and long terms, economic expansion has a favorable and important impact on financial development. the findings indicate that 1percent increase in economic growth will have a positive effect on financial development by 1.098percent in the short term and 0.691percent in the long run. It suggests that growing economic activity generates jobs and raises incomes across the board for all aspects of society. As a result, under these circumstances, investment and consumption patterns are expanding, which supports the market for financial services and advances financial advancement.

(Tran et al., 2020) researched "The impact of local financial development on firm growth in Vietnam: Does the level of corruption matter", the study covers about 40, 000 firms in a search to measure employed workers sales per person from the period of 2009 to 2013. The result identifies a significant relationship of financial development and growth of firms. This means that any rise in firms' productivity rises in financial progress of Vietnam.

Am empirical study by (Nasreen et al., 2020) adopting a "panel data of 23 European countries" from 1989 to 2016 using GMM model to investigate "How do financial globalization, institutions and economic growth impact financial sector development in European countries?". The result shows a significant correlation between financial progress, "economic growth", and institutional quality. It identifies a greater benefit of economic growth from the private sector, this is because confidence level of the investors increases both demand for credit and supply of credit. In a panel data of 142 countries investigated by studied relationship among financial development economic expansion, corruption for the period of 2002 to 2016. The sample was divided into two that is, the developing and the developed nations. Testing the long-term relationship of the variables, diagnosis test such as panel cointegration was employed, panel unit root was used to verify the nature of stationary of variables. The FMOLS estimating method, which can generate both individual samples and panel estimators, is frequently used to demonstrate the existence of a cointegrated relationship. It simply indicates that financial development will benefit from economic expansion, which is understandable. A growing economy increases the need for financial development. The financial sector will proactively respond to these requirements without outside assistance. (Song et al., 2021) In a panel data of 142 countries investigated by studied relationship among financial development economic expansion, corruption for the period of 2002 to 2016. The sample was divided into two that is, the developing and the developed nations, the total number of developing nations that constitute the sample is 124 and 18 developed countries. GDP and financial markets are moving positively together. It implies that improve in financial development results from economic growth. According to the analysis, the main factor is economic expansion, which stimulates financial development by increasing investment and altering financial arrangements. The demand for financial services will rise significantly when people's incomes rise, it means that when the economy grows and income levels rise, financial demand rises as well. Financial development must serve as the foundation for both qualitative and quantitative improvements to financial services. Economic expansion is therefore the primary driver of financial progress.

Empirical research by (Hussain et al., 2021) studied "A nexus of natural resource rents, institutional quality, human capital, and financial development in resource-rich high-income economies" the researcher explores 23 countries which includes; Canada, Australia, Germany, France and Japan are among these twenty-three rich nations. Annual panel data from 1992-2017 was used, "cross sectional dependence" (CSI), "unit root" (CADF and CIPS), "cointegration" test and autoregressive distributive lag (ARDL) diagnoses was employed. Identifies a country financial development depend on how the nation invests in its human capital. According to them a nation financial position will have to do with the level of experience, skills, and knowledge that a nation possess.

(Krifa-Schneider et al., 2022) in a "panel data set" of 80 emerging economies for the period of 2003 to 2019 investigated "FDI, corruption and financial development around the world: A panel non-linear approach" The study adopted a panel regression and econometric model, generalized method of moment (GMM) to enable the researcher to observe the influence of corruption on the financial development. For advanced economies and the entire sample, "the GDP growth coefficient was positive and statistically significant", indicating that strong growth rates were a direct cause of high financial development index rates. The financial development index is based on how quickly economic growth is changing. "An improvement in economic forecasts is anticipated to encourage investment to meet future demand, while a downturn in the economy and a decline in GDP growth will cause businesses to reduce their investment". However, for the emerging economies, more economic development does not necessarily translate into higher FDI "(the estimated coefficients were only statistically significant at the 10% level)". The researchers gave an explanation as to why there was a difference approach of the two categories, one explanation would be that certain nations experience shortages of social infrastructure like bridges, roads and other underdeveloped infrastructure. The supply limitations could pose a significant barrier to investment and economic growth and cannot be resolved without concerted government investment.

In a study of Pakistan (Zeeshan et al., 2022) researched "Exploring symmetric and asymmetric nexus between corruption, political instability, natural resources and economic growth in the context of Pakistan" the study employed ARDL nonlinear model from 1996 to 201s8. The long-term asymmetry relationship between natural resources

and economic growth demonstrates a rising in natural resource (positive shocks) accelerates economic growth, a decline in natural resource (negative shocks) has small or no impact on it. The results for short-run relationships, however, are statistically negligible. The Wald test results, however, do not take into account asymmetric when assessing whether equal positive and negative shocks of natural resource.

Figure 7

Economic growth causes financial development
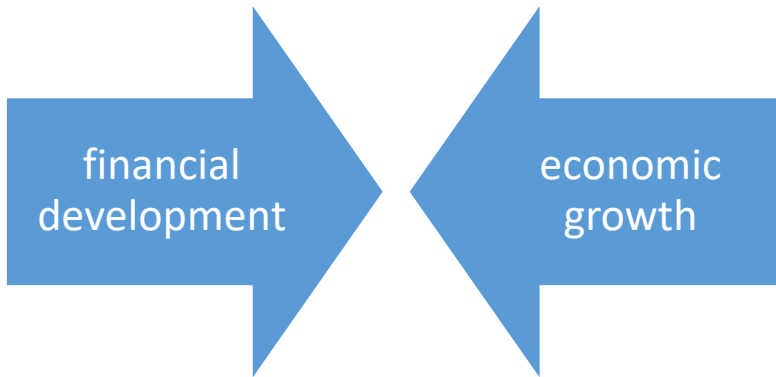
Figure 8

Growth
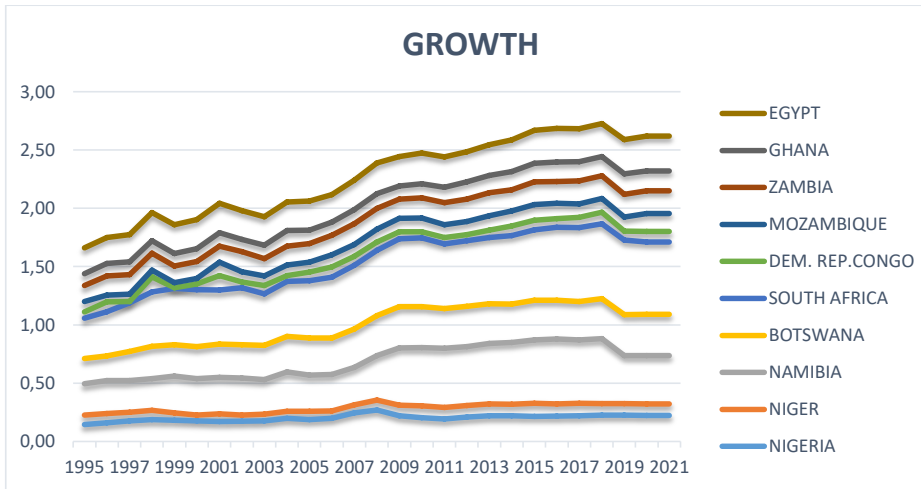
Nigeria has the lowest rate of growth since 1995, it has not indicated any positive increase in its growth since 1995. The country is faced with some major challenges which include bad leadership, political instability, high level of corruption, cultural crisis, misappropriation of fund and many other issues that hinder the progress of the economy in Nigeria. This could explain the low financial development in Nigeria, since the outcome of financial development and economic growth are similar that Nigeria has the lowest outcome among the ten African countries. Niger is followed by the Nigerian low level of growth; these countries are neighbors and they appear to have the same movement in both financial development and growth of the economy. The explanation to this outcome is that most problems like tension, crisis and insurgency affect both countries which have a great impact to the progress of the countries. Egypt economic growth has a positive progress since 1995 this could be as a result of good policy and better leadership which have a great impact on its economy and a positive impact on the financial development.

Financial Development and Renewable Energy

Renewable energy comes from natural sources that replace themselves more quickly than they are used up. Examples of such sources that are continuously renewed are the sun and the wind. There are many different types of renewable energy available to

us, this includes Bioenergy which are derived from charcoal and wood, hydropower from water either a reservoir, rivers or water fall from high to lower elevation.

Measuring the environmental sustainability in China a time series data from 1990 to 2020 (Chen et al., 2022) investigated the function of financial development (FD), natural resource rent (NRR), economic growth (GDP) and green technology innovation (GTI), the researchers employed a QARDL (Quantile Autoregressive Distribute Lagged). The result illustrates how excessive use of natural resources and their extraction accelerates destruction of the environment at higher levels of pollution. The influence of NRR, however, is minimal at low pollution levels. The widespread availability of conventional energy sources encourages excessive consumption and not "taking into account its consequences on the environment". Furthermore, over exploitation of natural resource rent as a resource curse undermines sustainable management of these resources and results in significant habitat loss, which messes with the system's built-in reducing Greenhouse gas. The result further explains that in long term "financial development" has a high impact on carbon emission It has been stated that the financial development increases China's carbon emissions at all levels of pollution. The introduction of dirty industries to achieve rapid economic expansion, which mainly rely on fossil fuels and have a negative environmental impact, is one potential cause. In addition to these factors, inadequate environmental regulations are to blame for excessive carbon emissions since they fail to generate enough "foreign direct investment" to support the stability of the banking sector. In addition, China's stock market has a "significant impact on economic growth" and carbon emissions due to the country's growing financial development. The study believes that perhaps the high economic growth's impact on financial development has accelerated the use of fossil fuels, increased their production, and increased carbon emissions.

Mankind requires the use of energy to be able to carry out activities, hence, "consumption of energy has a great negative influence on the habitat and the environment". The problem of climate change is mostly course from the use of energy. Company's, /firms, industries and house hold increases the consumption of energy that produce carbon emission. To improve the problem of carbon emission there's need to encourage green energy and its sustainability in long run. That's why the need for the

consumption of renewable energy is important for mankind. (Zafar et al., 2019) in a time series data of United States from 1970 to 2015 researched "The impact of natural resources, human capital, and foreign direct investment on the ecological footprint:" the researchers employed the ARDL model to estimate the long- and short-term relationship of the variables. The findings indicate that energy consumption has a positive and significant impact on the ecological footprint, such that any increase in energy consumption would lead in a larger ecological footprint. This indicates that energy use is among the major contributors to environmental deterioration, possibly as a result of the US's reliance on "conventional energy sources like oil, coal and gas". The nation's dramatic expansion in the consumption of carbon fuels has had detrimental either directly or indirectly repercussions on the environment. The highest use of carbon fuels in the United States is linked to power production, resulting in a detrimental impact on the environment, including land, air, and water quality. With this finding, there is need to encourage the consumption and production of renewable energy for environmental sustainability. Another study on N 11 countries and BRICS (Yao et al., 2021) applied econometrics model of GMM for the period of 1995 to 2014 demonstrate negative relation between financial development and energy efficiency, according to the study provision of loan can contribute to poorer energy efficiency level. In the sense that, the degree of renewable energy could be raised if the monetary regulators cautiously authorize loans to do so. The BRICS economy experiences energy inefficiency as a result of the negative consequences of energy usage. For an agency to effectively carry out a policy, honesty is crucial. Innovation increases energy efficiency and lowers energy prices. Innovation's beneficial effects on enhancing energy efficiency mostly highlight these industries' ability to produce more modern machinery while using less energy.

(Xu et al., 2022) studied "Financial development, renewable energy and CO2 emission in G7 countries: New evidence from non-linear and asymmetric analysis" employing the NARDL (nonlinear autoregressive distributed lag) over the period of 1986 to 2019. The result shows a significant relationship between financial development and renewable energy, that the consumption of renewable energy will reduce carbon emission, switching from the consumption of energy that causes emission to energy that are renewable will have a better environment. The results of this study show that by

investing in green initiatives and switching to green or renewable energy, financial development and utilizing renewable energy improves environmental quality. (Gallagher et al., 2018) in a time series that of China which encompassed the 2000 to 2017 period. The study looked at "Energizing development finance? The benefits and risks of China's development finance in the global energy sector" the finding points out that China's have more advantage globally this is because they have dominated market in poor nations with the production of renewable energy and improving in financial development.

(Usman et al., 2022) investigated ten nations with the largest financial resource wealth and the dataset covered the period of 1990 to 2018. The empirical study employed the following variables for the analysis, financial development, nonrenewable and "renewable energy consumption, total natural resource rent, globalization and ecological footprint". Econometric model adopted was the (CCE-MG) "Common Correlated Effect Mean Estimator and (AGM) Augmented Mean Group". The findings display ecological footprint variable is significantly and favorably impacted by the non-renewable energy discoveries. According to the elasticity value, a long-term increase in the usage of non-renewable energy will result in an ecological footprint. The consumption of non-renewable energy promotes environmental harm in these nations; without a hesitation, the high-minded tax haven economic activities in such (developed) nations goes hand in hand with high demand for conventional energy resources, which will unquestionably guide towards the environmental crash. The results also analyzed how using renewable energy dramatically lessens environmental harm. This clarifies how healthier renewable energy sources have an impact on a smaller ecological footprint. The level of the ecological footprint will eventually decline as more renewable energy is consumed.

According to (Ibrahim et al., 2022) regarding "series data of 1996 to 2018" employed the ARDL "(autoregressive distributed lag) model" researched "On the criticality of renewable energy to sustainable development: Do green financial development, technological innovation, and economic complexity matter for China?" The empirical findings show that "if the other indicators are to provide desired and consistent growth and environmental consequences that support sustainable development, renewable energy (RE) and technological innovations (TECIN) are key components whose engagement is not negligible". Particularly for China, empirical evidence supports

the critical functions of green financing in sustainable development. It's interesting to note that the robustness analyses undertaken provide strong support for the primary findings. Based on research findings, practical policy implications are developed that support green financing, "renewable energy, and technical innovation for promoting sustainable development in the Chinese economy".

(Sovacool, 2021) investigated four countries with different market and types of the renewable energy that are consume in the area. The research identify that Mexico consume largely wind energy, over the past ten years, wind energy projects in Mexico have increased dramatically due to both aggressive development goals and significant regulatory incentives imposed by the government. They have experienced expansion in their market since 2019 and it still anticipate continues expansion as there are diversified spread of project across the county. The second nation is Malaysia, this nation source of renewable energy is the hydropower. According to the study, a large increase in hydroelectric power in Malaysia has been supported by a plan for energy policy that diversifies away from fossil fuels plus profuse rainfall. The study identified 3 factors that make the Malaysian market unique. First, it exhibits a significant number of government-affiliated businesses, showing a combination of public and private actors in the hydropower sector, Secondly, Malaysia has a flourishing mini-hydro industry. Last but not least, Malaysia offers a wealth of hydropower potential for huge projects. The study identifies Kenya to consume off grid solar energy, it has been identified that those with the responsibility of financing the energy project is the "World Bank or the African Development Bank, as well as other government-affiliated organizations" according to the report, the nation is well known the problem of corruption they are identified as "diverting public spending, Inefficiently allocating public contracts based nepotism or patrimonialism, allowing bribery, mismanagement and inefficiency, failing to prevent theft , encouraging or failing to prevent the theft of energy equipment or energy services, the use of unlawful tactics such as torture or violence or unfair land grabbing or procurement processes." These problems are the mean courses of Kenya's low financial development and growth. The fourth country is South Africa, the "renewable energy in South Africa" is the grid connected solar, the study reveal that the nation has a potential of solar energy and is identified to have involved the manufacturing agencies, policy

makers and government regulators. They disbursement of finance by the government to improve facilitated the production of renewable energy

Figure 9

Renewable energy causes financial development
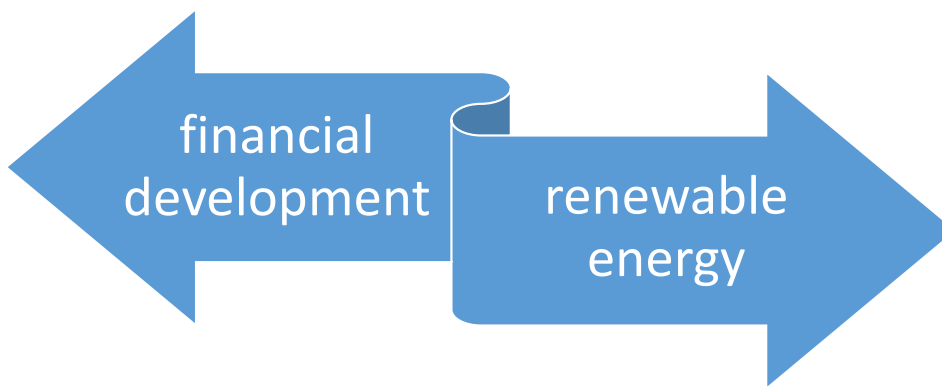
Figure 10

Renewable energy
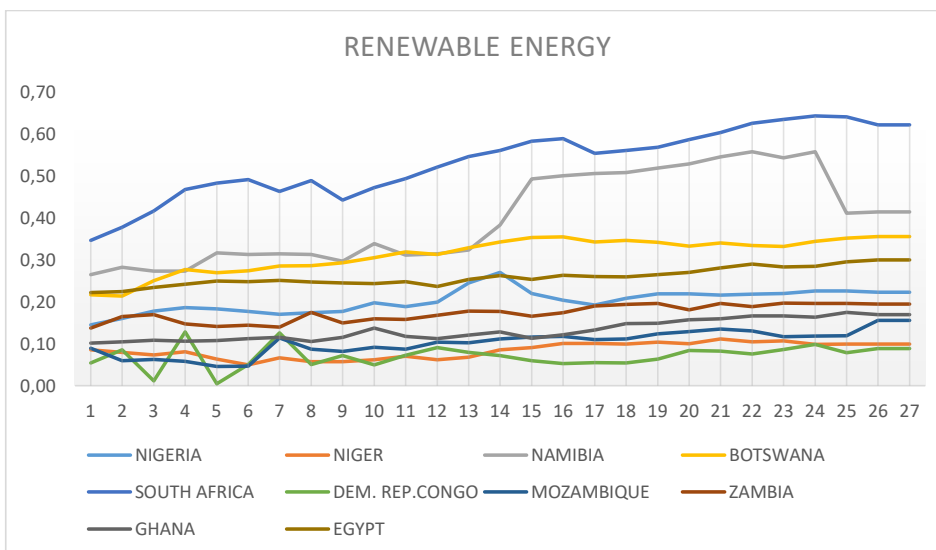
The consumption of renewable energy in democratic republic of Congo, Mozambique, and Niger are over lapping each other from 1995 to 2007, it is indicating a low consumption of renewable energy in these countries. Democratic republic of Congo appears to be the lowest country that consume renewable energy, Mozambique experience increase from 2001 compared to Niger and democratic republic of Congo. This could be as a result of change in policy that improve the "consumption of renewable energy". South Africa appears to have the highest level of renewable energy consumption it shows an improvement at every passing year, this can be concluded that South Africa has a better stable government when compared to other countries under study and are utilizing their abundant natural resource since they have the highest level of abundant natural resources. Consumption of renewable energy in Africa will benefit the public and allow small company owners to prosper due to frequent power outages, resulting in increased financial development.

Financial Development and Corruption

(Tran et al., 2020) researched "The impact of local financial development on firm growth in Vietnam: Does the level of corruption matter", the time series data covers about 40, 000 firms in a search to measure employed workers sales per person from the period of 2009 to 2013. The findings show a negative impact of corruption on financial development. This means that where there is corruption it hinders the financial progress of the economic. According to (Le and Doan, 2020) examine "Corruption and financial fragility of small and medium enterprises: International evidence" researched 62 nations over the period of 2012 to 2018 provide little or no indications that the financial instability of businesses in industrialized nations is strongly correlated with fraud. But discover that nations with very little economic liberty have a more noticeable negative effect of corruption on business financial instability. The finding also shows that businesses in nations with higher levels of liberty are better able to reduce the danger of fraud than businesses in nations with lower levels of press reliance.

(Song et al., 2021) In a panel data of 142 countries investigated by studied relationship among financial development economic expansion, corruption for the period of 2002 to 2016. The sample was divided into two that is, the developing and the

developed nations, the total number of developing nations that constitute the sample is 124 and 18 developed countries. Testing the long-term relationship of the variables, diagnosis test such as panel cointegration was employed, "panel unit root" was used to verify the nature of stationary of variables. The FMOLS estimating method, which can generate both individual samples and panel estimators, is frequently used to demonstrate the existence of a cointegrated relationship. The result of the findings shows a different outcome for both the developed and the developing nations. Corruption negatively affect financial development. This means that financial progress and corruption do not get along, corruption in developing countries decline the progress of money. The researchers try to provide some potential explanations as to why corruption does not impact financial progress in industrialized nations. First, wealthier countries that are less corrupt than poor countries make up developed countries. Their flawless setting and enforcing standards and comprehensive legal framework greatly reduce the likelihood of corruption. According to certain studies, the variation in the prevalence of transnational corruption is mostly caused by the level of transnational prosperity. In general, wealthy nations have lower levels of corruption than developing nations. The second argument is that industrialized nations have better regulatory standards, sound monitoring and control procedures, and fewer routes through which corruption can affect financial progress.

(Zallé, 2019) studied "Natural resources and economic growth in Africa: The role of institutional quality and human capital." the study looked at 29 countries from 2000 to 2015. Having a negative impact on economic productivity is corruption. In fact, corruption increases the price of investment, which inhibits economic progress. Because of this, the majority of African nations' economic reforms have been undermined by corruption. Corruption has raised corporate costs in these nations by deterring international investment. The study further identify corruption not to be the only major problem than hinder growth in Africa. Religion or ethnic conflict causes instability, it reveals that real sources of instability, such as racial and religious strife, result in weak economic performance. Internal strife makes it difficult for governments in many African nations to control the significant tax income derived from natural resources. These disputes impair property rights and obstruct development. In fact, conflicts result in a redistribution of public spending away from structuring investments, the destruction of

infrastructure, the loss of household assets, the interruption and disruption of some economic activities, a decline in trust in the institutions, and ultimately a flight of capital to the most stable nations. Conflicts can heighten the level of uncertainty that pervades private investment and income from abundant resource is misallocated as a result of these disputes.

(Guo et al., 2021) tried to measure the impact of anti-corruption in an economy uses an observation of 241 China energy companies' dataset of 2010 to 2018. The study employed econometric model and the result reveals that energy companies are heavily regulated and involved with the government as a result of security concerns. As a result, corruption has a significant impact on resource allocation and productivity in the energy sector. More bank loans and long-term loans are given to more productive businesses as a result of the anti-corruption campaign's improved bank loan allocation efficiency. Additionally, the increased effectiveness of bank loan allocation. Similarly, in the study of anticorruption in China (He et al., 2022) discover that the financial success of manufacturing firms has been severely harmed by the environmental laws put in place in China. However, by fostering a more equitable institutional climate, anti-corruption not only considerably enhances the financial performance of industrial businesses but also lessens the adverse effects of environmental regulations. Also, (Zhou et al., 2022) studied "The power of anti-corruption in environmental innovation: Evidence from a quasi-natural experiment in China" dataset of 2243 firms from 2010 to 2017 and (Kong et al., 2022) "Anti-corruption and CEO compensation: Evidence from a natural experiment in China" dataset of 2000 to 2016. The studies proposed that, the growth in business innovative activity is strongly correlated with anti-corruption. Using strong control variables and all determinants, we discover that the anti-corruption campaign significantly influenced firm environmental innovation. According to the aforementioned empirical findings, anti-corruption campaigns can motivate companies to take into account how their production practices affect the environment and adopt environmentally friendly practices. The result further explain that corruption give room for misallocation of resource and high costs of transaction and make innovation more difficult. Companies view compliance with environmental regulations as an opportunity rather than a hardship when corruption is reduced and environmental regulations are more strictly implemented.

The articles reveals that the total factor productivity (TFP) of energy companies increases as a result of anti-corruption shock, it has brought changes in most sectors of the economy in China, for instance improving corporate governance, increasing innovative outputs, and increasing investment efficiency, anti-corruption policies raise total factor productivity and effective distribution of financial resources and government grants. (Tran et al., 2020) found that corruption hinders economic growth.

(Krifa-Schneider et al., 2022) in a panel data set of 80 emerging economies for the period of 2003 to 2019. The study adopted a panel regression and econometric model, generalized method of moment (GMM) to enable the researcher observe the influence of corruption on the financial development. The findings show a positive and have a significant relationship with financial development, it means that, a lower level of corruption increases financial development. The result has different impact on the two categories, the advance economies and the emerging economies. The interaction term is favorable but less significant for advanced economies. According to the studies, nations with strong financial institutions are less likely to experience corruption than those with weak systems (or institutions that are reticent to provide credit facilities to investors). Therefore, as income levels rise, the advantages of creating strong financial institutions should be greater for low-income (emerging) countries. Additionally, a decrease in the financial development index could result from tighter credit restrictions on financial institutions in the destination countries.

A study to evaluate the influence of corruption on the oil abundant nations economic (Matallah, 2022) explore 11 abundant oil nations and 3 diversified nations Malaysia, Norway and Canada for the period of 1996 to 2019. The study adopted the GMM estimator. The result demonstrates the extent to which MENA oil exporters must improve their anti-corruption measures in order to catch up that of Canada and speed up the path of economic transformation. Furthermore, oil-exporting nations, better diversity is associated with greater levels of corruption control, whereas poorer diversification is linked to increased oil rents (Zeeshan et al., 2022) researched "Exploring symmetric and asymmetric nexus between corruption, political instability, natural resources and economic growth in the context of Pakistan" the study employed ARDL nonlinear model from 1996 to 2018. According to the theory that there is a long-term relationship between

corruption and economic growth, an increase in corruption will lowers economic growth. The asymmetric is supported by the Wald test results for determining the equality of corruption's negative and positive shocks, which demonstrate that it is significant over the long term.

Corruption is associated with the cultural values (Gaygısız and Lajunen, 2022) investigating 64 countries disclosed that, it is widely acknowledged that various regulations apply to those in higher positions than those in lower positions, nations with a high-power distribution make it simple to grasp the link between corruption and strong power distribution. As a result, the services supplied by state officials to citizens are viewed as "favors" that are dependent on the bureaucrat's goodwill rather as "rights of citizens." As a result, those with lesser social standing have the right to offer bribes or other "presents" to officials of greater rank in order to facilitate or hasten procedures associated with their demand. Additionally, the connection involving uncertainty and corruption is that officials will be more tempted to take bribes and people will have less possibilities to influence them if citizens believe they are powerless against authorities and therefore should leave decision making to "experts." According to the findings, poor governance and a lack of effective anti-corruption measures make it simple for corruption to occur and decrease the likelihood that it will be discovered and dealt with. The customary administrative procedures, the web of family and friends, and "institutionalized bribery and in-group favoritism" may even supersede the regulations and partially replace the role of governmental agencies. disclosed that corruption is associated with the cultural influence. Most African nations are culturally related and they tend to influence each other and sabotaging any effort to fight these killer diseases called corruption.

Figure 11

Corruption causes financial development
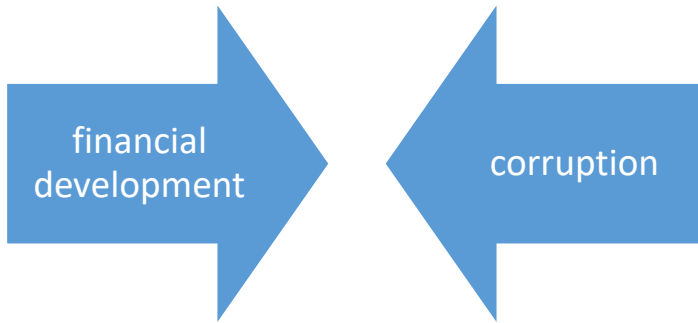
Figure 12

Corruption
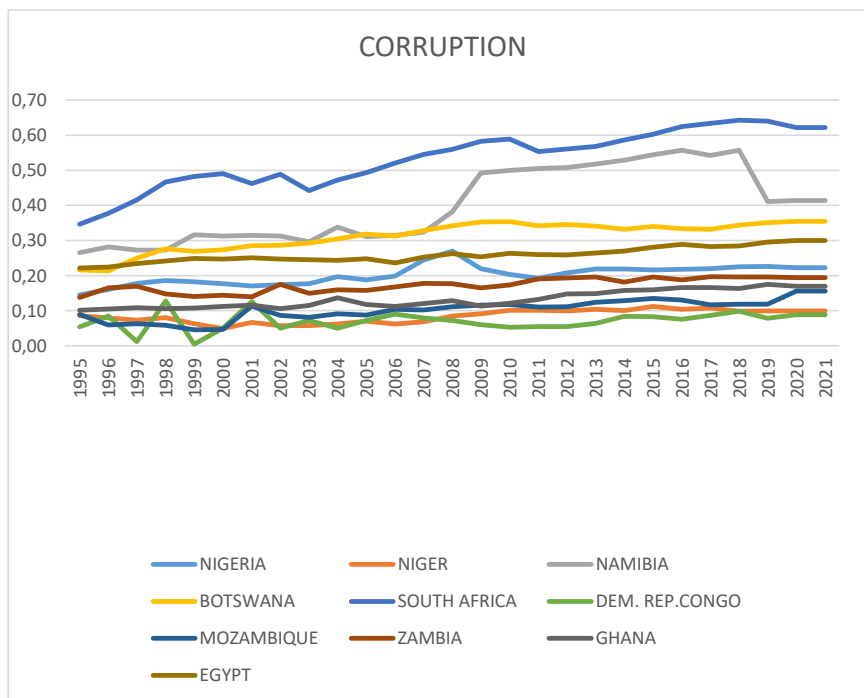
South Africa have the highest level of corruption indicated on the chat above, despite having the highest indication of abundant natural resource and highest level of renewable energy consumption, the level of corruption in south Africa is high. This implies that if the government of South Africa implement measures to deal with the problem of

corruption will improve the financial development of the country. This is because the nations disbursement of funds will take the right channel and proper allocation of resource this will increase revenue generation and wealth creation. To have a functioning system in African countries, corrupt practices most be curtailed by putting necessary policy and disciplinary actions on law breakers. The public officials must be honest, transparent and accountable as much as possible, and their activities must be closely monitored to make sure they are complying to the governing rules and regulations in order to strengthen the legal system.

Table 1

Summary of empirical findings used in this study according to the categories of the dependent matching each of the independent variable

AUTHOR	REGION	PERIOD	METHODOLOGY	FINDINGS
(Zafar et al., 2019)	United state	1970-2015	ARDL	financial development (FDI) decreases energy intensity and replaces energy-intensive commodities with energy-efficient ones, bringing with it cutting-edge technology and new innovations, and minimize potential pollution. This is beneficial effect that suggests that more financial

				development causes population decline. The study identify positive impact of financial development (FDI) has an impact on economic development, energy use, the use of natural resources, and especially the ecological footprint.
(Rashid Khan et al., 2019)	China	1967-2016	GMM	the findings demonstrate that real interest rates benefit the energy and resource markets by boosting national agriculture, oil, and energy production. Demand for fossil fuels, energy efficiency, and agricultural and livestock production all rise

				as money supply does. With a few exceptions, domestic financial sector credit has a detrimental impact on the markets for resources and energy.
(Hadj and Ghodbane, 2021)	Ten countries	1984-2016	Quantile regression estimator	support that natural resource can only be negative to countries that have a better developed system of finance, while countries that do not have a well-developed financial system will have a positive relationship on the cursed of natural resource.
(Aljarallah, 2020)	Gulf countries	1984-2014	ARDL	the researcher identifies that richness in natural resources forces nations to give the education sector little focus and

				minimal funding, according to the researcher nations with abundant natural resources fail to invest in their people because they see these lump sums as a reliable source of income and a foundation for their ability to survive.
(Usman et al., 2022)	Ten nations with the largest financial resource wealth	1990-2018	AMG and CCE-MG	The environment is greatly harmed by the usage of natural resources. In particular, countries with a wealth of natural resources can experience a longer-term growth in their environmental deficiency level. This shows that in these nations, the destruction of the environment is primarily caused by the mining of

				natural resources.
(Atil et al., 2020)	Pakistan	1972-2017	Cross quantilogram	natural resources and financial development are interrelated and favorably connected with one another.
(Hussain et al., 2021)	23 countries	1992-2017	ARDL	Natural resources are said to be blessings in these countries given the availability of human capital and good institutions because the natural resource rent coefficients is considered to be considerable in both the short- and long-term.
(Ali et al., 2022)	Malaysia	2002-Q1-2018-Q4	Bootstrapped ARDL	The findings have a strong and positive coefficient of natural resource rents, suggesting that in the long term, natural resources drive global financial development.

				Natural resource revenue improves in overall financial development efficiency.
(Frynas and Buur, 2020)	Three countries	1995-2015	Effects	The research discovered that the expectation of future extractive profits had adverse repercussions on all three countries, including unstable economic development, elevated levels of national debt, deteriorated governance, and societal tensions. This inquiry provides an insight into the many varied implications of anticipating future resource availability on the economy, governance, and conflict. The study discovered

				that the effects of the "presource curse" varied greatly between the three nations.
(Namazi and Mohammadi, 2018)	141 countries			The paper discloses that encouraging creativity in the natural economies with abundant natural resources may be protected from the resource curse. The conclusion was that nations need innovation, particularly those that are heavily reliant on oil shipments or have bad government security.
(Hunjra et al., 2022)	50 developing countries	1991-2020	Fixed effects, FGLS and bootstrap pane quantile regression	the richness of environmental assets serves a beneficial stabilizing impact in capital formation. The wealth of natural resources, global tourism, foreign

				direct investment and trade openness, all have a favorable impact on sustainable economic development.
(Tang et al., 2022)	ASEAN countries	1984-2018	CS-ARDL	It suggests that price fluctuation for natural resources slows financial development. This would support the claim that the resource curse hypothesis is significantly present in the current study, where a higher level of natural resource rent denotes a lesser impact of financial development and inversely.
(Gokmenoglu and Rustamov, 2022)	Saudi Arabia	1970-2017	ARDL	rise in natural abundance will results in a decline in financial development. The

				long-term relevance of the resource curse in KSA is supported by this conclusion.
(Asif et al., 2020)	Pakistan	1975-2017	ARDL	financial development has a positive effect in short run it does not stand the taste of time it has a negative effect in long run. This is an indication that the exploitation of natural resource such as natural gas, oil, forest, and coal are believed to be curse since the result support the hypothesis.
(Khan et al., 2020)	China	1987-2017	ARDL	The findings suggested that the availability of natural resources has a negative impact on financial progress. In China, a 1% increase in natural

				resource richness slows financial development due to the presence of the resource curse.
(Jiang et al., 2021)	China	1981-2018	QARDL	Natural Resource Rent is negative, showing a fall in long-term relationship between Natural Resource Rent and Financial development. The result support the hypothesis of curse resource.
(Guan et al., 2020)	China	1971-2017	ARDL, FMOLS and DOLS	The findings disclose that both in short and long run natural resource have a considerable negative impact on financial progress. The result reveals that a rise in rent from natural resource will result in the decline in long run of financial progress. The

				result implies that China is affected by the resource curse.
(Ying Li et al., 2022)	E15 economies	2000-2020	AGM	The results support the resource curse theory for the fifteen emerging nations by demonstrating that natural resource rent has a detrimental effect on financial growth (E15). On the other side, financial development is positively impacted by investments in human capital.
(Rahim et al., 2021)	Eleven countries	1990-2017	AGM	though the resource cause hypothesis is positive, human capital and financial development improves growth of the economic According to evidence

				supporting the resource curse theory, natural resource extraction and use practices are ineffective at promoting national development.
. (Zallé, 2019)	29 countries	2000-2015	PMG and MG	The finding demonstrates a favorable impact of human capital on growth. The result discloses that, one percent increase in human capital leads to 12 percent rise in growth. On the other hand, natural resource negatively affect growth, the result show that an increase in natural resource revenue will leads to decrease in the rate of growth in the long term.

(Wang et al., 2022)	40 resource rich countries	1990-2012	GMM	abundance of resource in Latin American and African countries has a detrimental effect on the expansion of green economy, although this link was insignificant in Asian nations. the development of economic in Asian nations is generally higher than that of Africa and Latin America.
(Ahmed et al., 2020)	G7 countries	1971-2014		there is a negative correlation between human capital and ecological footprint, human capital is thought to slow down ecological damage. Reduced environmental impact results from increased human capital. Human capital plays a beneficial

				impact in reducing ecological footprint.
(Nasreen et al., 2020)	23 European countries	1989-2016	GMM	The findings show a positive relationship between financial progress, economic growth and institutional quality. It identifies a greater benefit of economic growth from the private sector, this is because confidence level of the investors increases both demand for credit and supply of credit.
(Song et al., 2021)	142 Countries	2002-2016	FMOLS	According to the analysis, the main factor is economic expansion, which stimulates financial development by increasing investment and altering financial

				arrangements. The demand for financial services will rise significantly when people's incomes rise, it means that when the economy grows and income levels rise, financial demand rises as well. Financial development must serve as the foundation for both qualitative and quantitative improvements to financial services. Economic expansion is therefore the primary driver of financial progress.
(Krifa-Schneider et al., 2022)	80 emerging economies	2003-2019	GMM	An improvement in economic forecasts is anticipated to encourage investment to meet future

				demand, while a downturn in the economy and a decline in GDP growth will cause businesses to reduce their investment. However, for the emerging economies, more economic development does not necessarily translate into higher FDI
(Zeeshan et al., 2022)	Pakistan	1996-2018	ARDL	The long-term asymmetry relationship between natural resources and economic growth demonstrates a rising in natural resource (positive shocks) accelerates economic growth, a decline in natural resource (negative shocks) has little or no impact on it. The results for

				short-run relationships, however, are statistically negligible.
(Chen et al., 2022)	China	1990-2020	QARDL	The result illustrates how excessive use of natural resources and their extraction accelerates destruction of the environment at higher levels of pollution. The influence of NRR, however, is minimal at low pollution levels. The widespread availability of conventional energy sources encourages excessive consumption without taking into account its effects on the environment.
(Yao et al., 2021)	N 11 countries and BRICS	1995-2014	GMM	according to the study provision of loan can

				contribute to poorer energy efficiency level. In the sense that, the degree of renewable energy could be raised if the monetary regulators cautiously authorize loans to do so. The BRICS economy experiences energy inefficiency as a result of the negative consequences of energy usage.
(Xu et al., 2022)	G7 countries	1986-2019	NARDL	The result shows a significant relationship between financial development and renewable energy, that the consumption of renewable energy will reduce carbon emission, switching from the consumption of energy that

				causes emission to energy that are renewable will have a better environment.
(Gallagher et al., 2018)	China	2000-2017		the finding points out that China's have more advantage globally this is because they have dominated market in poor nations with the production of renewable energy and improving in financial development.
(Ibrahim et al., 2022)	China	1996-2018	ARDL	renewable energy (RE) and technological innovations (TECIN) are key components whose engagement is not negligible. Particularly for China, empirical evidence supports the critical functions of green financing in

				sustainable development.
(Sovacool, 2021)	4 Countries			The result identified that each county consumes different type of renewable energy that is available and accessible to each nation. The nations consume wind energy, hydropower, off grid solar penal.
(Tran et al., 2020)	China	2009-2013		The findings show a negative impact of corruption on financial development. This means that where there is corruption it hinders the financial progress of the economic.
(Le and Doan, 2020)	62 nations	2012-2018		discover that nations with very little economic liberty have a more noticeable negative effect of

				corruption on business financial instability. The finding also shows that businesses in nations with higher levels of liberty are better able to reduce the danger of fraud than businesses in nations with lower levels of press reliance.
(Guo et al., 2021)	china	2021-2018		the result reveals that energy companies are heavily regulated and involved with the government as a result of security concerns. As a result, corruption has a significant impact on resource

				allocation and productivity in the energy sector.
(He et al., 2022)	China			discover that the financial success of manufacturing firms has been severely harmed by the environmental laws put in place in China. However, by fostering a more equitable institutional climate, anti-corruption not only considerably enhances the financial performance of industrial businesses but also lessens the adverse effects of environmental regulations.
(Zhou et al., 2022) and (Kong et al., 2022)	China	2010-2017 2000-2016		The studies proposed that, the growth in business innovative activity is strongly

				correlated with anti-corruption. Using strong control variables and all determinants, we discover that the anti-corruption campaign significantly influenced firm environmental innovation.
(Matallah, 2022)	11 abundant oil nation	1996-2019	GMM	The result demonstrates the extent to which MENA oil exporters must improve their anti-corruption measures in order to catch up that of Canada and speed up the path of economic transformation.

CHAPTER III

Materials and Method

Data Source

This section constitutes the panel data set derived from 10 African countries with abundant natural resource from the period of 1995 to 2020. These data were obtained from World Bank governance indicator. The dependent variable is the financial development index (FDI). Financial development is employed to evaluate the financial health of countries and the financial system of African countries with abundant resources. Financial development will be used to measure the relationship of natural resource, renewable energy, economic growth, corruption, and human capital. These five variables constitute the independent variable. The 10 African countries under study include; Nigeria, Niger Namibia, Ghana, South African, Zambia, Mozambique, Egypt, Botswana, democratic republic of Congo, and Zimbabwe. We believe these nations are perfect for this study because of their abundant natural resources like forest, gold, oil and gas, zinc, iron, limestone, coal, diamond, sulfur, gemstone, aluminum, copper, ocean, platinum, arable land and many others, despite all that have low level of economic growth. This study's framework allowed it to investigate the relationship in the following manner.

$$\cap fd = \beta_o + \beta_1 \cap NR + \beta_2 EG + \beta_3 \cap CORP + \beta_4 \cap HC + \beta_5 \cap NR$$

Econometric Model

To determine the level of financial development, economic growth, natural resource, renewable energy, human capital and corruption in African countries also, looking into the long and short-term effects of sustaining the abundant natural resource.

Due to endogeneity in our data collection for 10 African countries, For the estimation of panel data in this study, innovative methods were used.(Pesaran and Shin, 1998) assert that the Autoregressive Distributed Lag [PMG-ARDL] co-integration process is a useful tool since it gives both short- and long-term estimation in response to the endogeneity query asked by (Pesaran, M et al., 2001)

Panel Unit Root Test

Verifying the reliance of cross-sectional data is crucial when working with panel data analysis because it might produce inaccurate results and lead to estimator inconsistencies. (Grossman and Krueger, 1995; (Pesaran, 2004); Bilgili and Ulucak, 2018). Hence (1980 Breusch and Pagan) propound Lagrange Multiplier (LM) statistics adopt the cross-sectional dependence panel data:

$$\mathcal{LM} = \sum_{i=1}^{\mathfrak{N}-1} \sum_{j=i+1}^{\mathfrak{N}} \mathcal{T}_{ij} \tilde{\mathcal{P}}_{ij} \to X^2 \frac{\mathfrak{N}(\mathfrak{N}-1)}{2}$$

Furthermore, the CD test of (Pesaran 2004) is applied.

$$\mathcal{CD} = \sqrt{\frac{2\mathcal{T}}{\mathfrak{N}(\mathfrak{N}-1)}} \sum_{i=1}^{\mathfrak{N}-1} \sum_{j=i+1}^{\mathfrak{N}} \frac{(\mathcal{T}-\mathcal{K})\tilde{\mathcal{P}}_{ij}^2 - \mathbb{E}[(\mathcal{T}-\mathcal{K})\tilde{\mathcal{P}}_{ij}^2]}{var[(\mathcal{T}-\mathcal{K})\tilde{\mathcal{P}}_{ij}^2]} \tag{1}$$

The period is denoted by $\mathcal{T}$, $\mathfrak{N}$ is the sample size, $\tilde{\mathcal{P}}_{ij}^2$ and is the pair-wise correlation coefficient for each cross-section dimension I that was determined through OLS estimation.

The first-"generation panel unit root tests" can be used to take into account the impact of reliance in cross-sectional data., Augmented Dickey-Fuller (ADF), PhillipsPerron (PP), Levin-Lin Chu (LLC), and ImPesaran-Shin (IPS), the validity of the logic was questionable and cannot be regarded as valid (Pesaran, 2007). Due to that, (Pesaran, 2007) the panel unit root tests (second-generation) was propounded among which the cross-sectionally augmented Dickey-Fuller (CADF) and cross-sectionally augmented LM-Pesaran-Shin (CIPS), which are valid in the presence of cross-sectional dependence. To calculate CADF statistics the following are used:

$$\Delta \text{Ⱦ}_{\forall,t} = u_i + u_\forall \,\text{Ⱦ}_{\forall t-1} + u_\forall \,\bar{x}_{t-1} + \sum_{\forall=0}^{n} u_{\forall I} \,\Delta \bar{\bar{\text{Ⱦ}}}_{t-I} + \sum_{I=1}^{n} u_{\forall I} \,\Delta \text{Ⱦ}_{\forall,t-I}$$

$$+ \propto_{it} \qquad\qquad (2)$$

Where $\bar{x}_{t-1} \; and \; \Delta \bar{\bar{\text{Ⱦ}}}_{t-I}$ shows the first differences of individual series, the cross-sectional averages of lag levels, The following is how the value of CIPS is obtained:

$$\widehat{CIPS} = \frac{1}{N} \sum_{\forall=1}^{n} CADF_\forall \qquad\qquad (3)$$

The techniques from equation (2), i.e., cross-section augmented Dickey-Fuller is represented by the term CADF in Equation (3).

Cointegration Test

A long-term relationship between the variables must be verified, whether series are integrated. (FD, NR, EG, CORP, HC and NR) are related to each other in long run. The null hypothesis state that, there is no cointegration equation, which means, variables are not related to each other. 5% significant level to either reject the null or fail to reject the null. (Westerlund, 2007) and (Pedroni, 1999) approach was used to verify the long run relationship of variables we employed the test. Following (Ahmed et al., 2020), (Isiksal et al., 2022). To determine cointegration, the equation adopted are as follows:

$$\Delta \text{Ⱦ}_{i,t} = \grave{}_i R_t + \delta_i \big(\text{Ⱦ}_{i,t-1} - \acute{B}_i X_{i,t-1} \big) + \sum_{k=1}^{\Re} p_{ij} \,\text{Ⱦ}_{i,t-j} + \sum_{k=0}^{\Re} p_{ij} X_{i,t-j} + \propto_{i,t} \qquad\qquad (4)$$

Equation must be adjusted to achieve equilibrium. The adjustment term in equation (4), I is utilized to calculate the speed.(Westerlund, 2007) The null hypothesis assumes that there is no cointegration, and the test is constructed using the least squares estimates of _i. The following is how group means statistics are calculated:

$$G_t = \frac{1}{\Re} \sum_{i-1}^{\Re} \frac{\delta_i}{Se(\delta_\iota)} \quad And \quad G_a = \frac{1}{\Re} \sum_{i-1}^{\Re} \frac{T \delta_i}{\delta_\iota(1)}$$

Where $G_t \; and \; G_a$ means existence of cointegration in at least one cross-sectional unit of panel, thereby; we reject the null hypothesis.

We drive the following formular from panel statistics.

$$\mathcal{P}_t = \frac{\delta_i}{Se(\delta_\iota)} \quad And \quad \mathcal{P}_a = T \delta_i$$

The panel as a whole rejected the null hypothesis, leading to the conclusion that cointegration exists.

Panel PMG-ARDL Approach

Financial development, natural resource, gross domestic product, human capital, corruption and renewable energy in African counties was investigated using ARDL panel approach. To estimate the heterogenous data the dynamic panel data was employed. Three estimators were used in the error correction, and ARDL with autoregressive distributed lag was also used. MG, PMG, and DFE for both the short and long term are also included. (PMG), the pooled mean group will be taken into account and examined since it is the most reliable and effective, and because the estimator falls somewhere between MG and DFE. The three models are thought to be the heterogeneity of the dynamic adjustment process and long-term equilibrium. (Alam, M. M., & Murad, 2020).. The (PMG) model, The (ECT) error correction term incorporates dynamic non-homogeneous panel regression according to(Samargandi, 2019) as follows:

$$FD_{it} = \omega_i + \sum_{k-1}^{a1} \tau ik\, CRR_{index\ it-k} + \sum_{k-1}^{a2} \delta ik\, Growth_{index\ it-k} + \sum_{k-0}^{v} B_{ik}\, X_{it-k} + \mu_{it} \qquad (5)$$

Where $= [1,2,..,i]$ is the nation's number, $[1,2,3,..,t]$ the annual periods, $[k]$ represent the number of time lags, $[a]$ is the lag variable of the dependent, and $[v]$ represent the lag variable of the independent. $CRR_{index}\ and\ growth_{index}$ are the corruption and growth index, respectively, are the crucial elements at play. A vector of variables regulator is represented by [X], and includes$HCI, NRR\ and\ REC$, and $[\mu_{it}]$ the fixed effects error term.

(Johansen, 1995); (Phillips and Hansen, 1990)A relatively new cointegration test is the ARDL technique in error correction form. However, these researchers stressed the significance of making straightforward adjustments to conventional methodologies in order to provide precise and effective parameter estimations in a long-term relationship. These studies found that long-term partnerships can only exist when several factors are taken into account. Whereas, (Pesaran and Shin, 1998) The hypotheses were underlined, and several quantitative advantages of the PMG and MG approaches over other techniques were demonstrated. To begin, researchers can use PMG and MG estimators,

as well as the integration between variables and level of stationary to calculate long-term relationships and the pre-test for unit roots. This is because the approach gives room for forecasting the variables with varied stationary orders, this means that variables are either in the order of I(0) or I(1). Moreso, it is proper and fitting model for panel data with large N and T dimensions. Also, the estimator has a favorable effect on ARDL in the short and long terms. Another reason is that, due to endogeneity problems in the model, there is a worry that projections on coefficient estimations over the long term would be overlooked. (Engle and Granger, 1987) The technique can be defeated by employing the ARDL model. However, in order to select among the possibilities offered, it must strike a balance between consistency and efficiency. It will be preferable to have entire knowledge, facts, and conditions for the estimator's approach in order to achieve satisfaction. Pesaran, Shin, and Smith (Pesaran, M et al., 2001) propound the following equation Eq. (3), thus, it is a reformulation

$$\Delta FD_{it} = \omega_i + \nexists FD_{it-1} + \acute{\Gamma}_i X_{it-1} + \sum_{k-i}^{\sigma-1} \gamma_{ik} \Delta FD_{it-k} + \sum_{k=0}^{\theta-1} \Re_{ik} \Delta X_{it-k}$$
$$+ \mu_{it} \qquad (6)$$

Where:

$\Delta FD_{it} = -1\,(1 - \sum_{k=1}^{\sigma} Y_{ik}), \dot{B}_i = \sum_{k=0}^{\sigma} \wedge_{ik}, \; G_{ji} = -\sum_{k=1}^{\sigma} G_{im}, k = 1,2,3,..,\sigma - 1, and \wedge_{ik} = -\sum_{m=k+1}^{\sigma} G_{ik}, j = 1,2,..,\theta - 1$.

Eq. (4) can also be rewritten from the formula of the error correction model by way of categorizing the variables at their levels.

$$\Delta FD_t = \omega_i + \vartheta_i\big(FD_{it-1} - \acute{\Gamma}_i X_{it-1}\big) + \sum_{k-i}^{\sigma-1} \eta_{ik} \Delta FD_{it-k} + \sum_{k=0}^{\theta-1} \Re_{ik} \Delta X_{it-k}$$
$$+ \mu_{it} \qquad (7)$$

Where $\acute{\Gamma}_i = (B_i / \mathcal{g}_i)\; mean$ the long-term equilibrium correlation between $FD_{it}\; and\; X_{it}$. In contrast, $\eta_{ik}\; and\; \Re_{ik}$ represent the short-term coefficient based on historical data and the development of other elements, such as changes in X_{it}. Finally, g i indicates the error correction coefficient, which illustrates how quickly FD it adapts to a change in X it in order to reach the long-term equilibrium. A long-term association must meet two requirements: the coefficient must be negative (g i0) and significant. The integration

between EFP it and X it is therefore supported where the (g i) is substantial and negative. Consequently, the estimations are determined as follows:

$$\widetilde{\widehat{U}}_{PMG} = \frac{\sum_{i=1}^{n} \hat{U}_i}{n}, \widetilde{\check{A}}_{kPMG} = \frac{\sum_{i=1}^{n} \check{A}_i}{n}, \widetilde{\check{E}}_{kPMG} = \frac{\sum_{i=1}^{n} \check{E}_i}{n}, and \ \widetilde{\check{R}}_{kPMG} = \frac{\sum_{i=1}^{n} \check{R}_i}{n} \qquad (8)$$

Where, $k = 0,1, ..., \ i - 1$, $\widetilde{\widehat{U}}_{PMG} = \hat{U}$. The formulated model based on the following Eq. (7) methodology.

$$\Delta FD_{i-t} = \omega_i + \propto_i \left[FD_{i,t-1} - \mathbb{A}_1 CRR_{i,t-1} - \mathbb{A}_2 NRR_{i,t-1} - \mathbb{A}_3 HCI_{i,t-1} - \mathbb{A}_4 Growth_{i,t-1} \right.$$
$$\left. - \mathbb{A}_5 REC_{i,t-1} \right] + \sum_{k-1}^{\sigma-1} \gamma_k^i \Delta(FD_{it})_{t-1} + \sum_{k-0}^{\sigma-1} \theta_{1k}^i \Delta(CRR_{it})_{t-1}$$
$$+ \sum_{k-0}^{\sigma-1} \theta_{2k}^i \Delta(NRR_{it})_{t-1} + \sum_{k-0}^{\sigma-1} \theta_{3k}^i \Delta(HCI_{it})_{t-1}$$
$$+ \sum_{k-0}^{\sigma-1} \theta_{5k}^i \Delta(Growth_{it})_{t-1} o + \sum_{k-0}^{\sigma-1} \theta_{6k}^i \Delta(REC_{it})_{t-1} \qquad (9)$$

Independent variables are displayed in Formula (9). The serial correlation and endogeneity bias of the ARDL panel technique are two benefits that are highlighted. In order to counteract the serial correlation, the dependent variable categorically starts the difference operator. The long-run coefficients vector shows the rate of readjustment, which should be slow and important. Long-term non-heterogeneity is assumed while short-term heterogeneity is permitted if there is adequate connectivity in the lag of the dependent.

Panel Causality

We utilize the causality test to assess the significance of one variable in relation to the other. (Dumitrescu, & Hurlin, 2012) established the test, which is used to ascertain whether there is causality among the series. when T > N or T N, the Granger causality test is used in an imbalanced panel and heterogeneous model (Dumitrescu and Hurlin 2012). The following is how the study used the heterogeneous linear model:

$$Y_{i,t} = \theta_i + \sum_{i-1}^{f} \beta_i^k Y_{i,t,-k} + \sum_{i-1}^{f} \forall_i^{(f)} X_{i,t,-k} + \mu_{i,t}$$

Where $f, \mu, \widetilde{\mathfrak{R}}^+$ a constant term, $f, \mu, \widetilde{\mathfrak{R}}^*$ is the lag parameter, $\forall_i = \left(\forall_i^1, \dots, \forall_i^f\right), \theta_i, \beta_i^k, \forall_i^f$ indicate the coefficient's slope. "The absence of Granger causality between all units" causes the conclusion to be non-homogeneous, which serves as a confirmation on the null hypothesis. Depending on the findings of the panel, a different hypothesis on Granger causality will be tested. The following is the estimator for alternative and null hypotheses:

$$H_0 = \forall_i = 0 \quad \text{And} \quad H_1 = \begin{bmatrix} \forall_{i=0}\, \mathfrak{H}_i = 1,2,3, \dots \mathfrak{R} \\ \forall_{i\neq0}\, \mathfrak{H}_i = \widetilde{\mathfrak{R}}_1 + 1, \widetilde{\mathfrak{R}}_2 + 2, \dots, \mathfrak{R} \end{bmatrix}$$

Descriptive Statistics

Table 2

Descriptive statistics

			Descriptive results		
	Obs.	Mean	Standard Deviation	Min	Max
FD	270	0.2270	0.1512	0.00441	0.6426
Growth		4.4042	3.546	-8.7261	15.329
HCI		1.9650	0.534	1.0870	2.9318
CRR		49.960	20.971	6.3792	91.219
NR		9.743	7.262	0.5326	36.494
RE		57.937	33.037	5.1	98.34

The table above contain the measures of central tendency the mean, median, maximum, minimum, standard deviation. Mean is the average value of each of the variable, median value tells us the middle value of each of the variables, maximum tells us the highest value and minimum tells us the lowest value of each of the variables, standard deviation tells us the deviation from the sample mean for each of the variable. The result of financial development shows that the mean value if 0.2270, the deviation from sample mean is 0.1512, the minimum value is 0.0044 and the maximum value is 0.6426. Growth has the mean value of 4.4042 and the deviation from the sample mean is 3.546, the minimum value -8.7261 and the maximum value is 15.329. The variable of human capital has the mean value of 1.9650 and the deviation from sample mean is 0.532, while the minimum value is 1.0870 and the maximum is 2.9318. Corruption has a

mean variable of 49.960 and the deviation from sample mean is 20.971, the minimum value is 6.3792 and the maximum value is 91.219. Natural resource has the mean value of 9.743 and the deviation from the sample mean is 7.262 and the minimum value is 0.5326 while the maximum value is 36.494. Lastly, the value of renewable energy has the mean value of 57.937 and the deviation from the sample mean is 33.037, the minimum value is 5.1 and the maximum value is 98.34

CHAPTER IV

Result Presentation and Discussion

This chapter contain results presentation and discussion. Unit root test, cointegration test, PMG-ARDL test and causality test are presented and the result are critically discussed.

Unit Root Test

The findings of the unit root test, which is used to gauge the degree of stationarity in time series, are presented in Table 3. The result of CIPS and the CADF are contain in the table. The CIPS results indicate that human capital and natural resource "are not stationary at level but after first difference the variables" became stationary. However, CADF result shows that human capital and renewable energy are not stationary at level but after first difference they became significant. Therefore we can conclude that series are free from spurious regression but a mixture of I(1) and I(0).

Table 3

Unit root test results

Variables	Level		First Difference	
	CIPS	CADF	CIPS	CADF
FD	-3.077*	-4.296 [0.00]*	-5.490*	-12.160 [0.00]*
Growth	-3.485*	-5.623 [0.00]*	-5.666*	-12.733 [0.00]*
HCI	-2.082	-1.051 [0.14]	--2.722*	1.140 [0.00]*
CRR	-2.763*	-1.339 [0.09]*	-5.371*	-8.061 [0.00]*
NR	-2.565	-1.321 [0.9]*	-5.326*	-7.244 [0.00]*
REC	-2.321*	-0.593 [0.276]	-5.131	-6.449 [0.00]*

Table:4

Correlation results

	FD	Growth	HCI	CRR	NR	RE
FD	1.00					
Growth	0.2413	1.00				
HCI	0.6556	0.1656	1.00			
CRR	-0.5505	-0.5505	0.5439	1.00		
NR	0.5439	0.1079	-0.4124	0.6716	1.00	
RE	0.7811	0.1553	-0.6853	-0.6327	0.6176	1.00

To check the association between variables we employ correlation test. Table 4 above contend the result of correlation test. The result showed that financial development and growth were weakly corelated with a coefficient of .24 which is below the moderate and strong outcome. The outcome also revealed that financial development and human capital were statistically noble, and powerful positive correlation with a coefficient of .66. The association between financial development and corruption is negative insignificant. Financial development and natural resource have a strong positive significant relationship with the outcome of .59. Finally, the association of financial development and renewable energy were statistically significant, strong positive correlation with the outcome of .78. Furthermore, the analysis showed that there are no multicollinearity issues in the model, hence the p-values between the series are less than the 0.80 rule of thumb.

Wester Lund Panel Cointegration Results

Following "the unit root test is the cointegration" test shown in Table 5, the testing of the null hypothesis to whether the variables are cointegrated is substantiate by Gt, Ga, Pt, and Pa probability value of no cointegration against the alternative hypothesis of cointegration. The Gt and Ga is "hypothesis of no cointegration" while Pt and Pa is the alternative hypothesis. The result disclosed 1% and 5% probability value of significance.

Table 5

Westerlund panel cointegration results

Westerlund panel cointegration results			
Statistic	Value	Z-Value	P-Value
Gt	-3.609	-4.384	0.000

Ga	-15.130	-1.403	0.080
Pt	-10.816	-3.982	0.000
Pa	-13.520	-2.182	0.015
Notes: ** refer significant at 1%.			

ARDL Results

To investigate financial development, natural resource, human capital, economic growth, corruption and renewable energy in African countries, we apply the ARDL panel approach in table 6. The heterogeneous data used in the dynamic panel structure are estimated in this study. The result content both the long and short term ARDL panel approach with three categories, the mean group, pooled mean group and the dynamic fixed effects. However, we will focus on analyzing the pooled mean group (PMG) since it is the most reliable and effective estimator, based on the Hausman test outcomes. Therefore, the result for long term, for every 1% increase in human capital, financial development will increase by 0.43. Thereby we can infer that human capital positively affects financial development. This means that productivity levels are intimately related to the abilities, knowledge, and credentials. Similar to how firms spend money on equipment that boosts output, employee's creativities, communication and social skills or businesses spend money on training, recruiting and instruction that quality of personnel. To achieve this, African countries should focus on providing services, use technology, encourage innovation and creativity, also improve the level of literacy. With that, value is created via invention and creativity rather than using raw commodities. This finding is related to (Hussain et al., 2021) (Rahim et al., 2021), and (Ahmed et al., 2020) Whereas, short run result says otherwise, human capital negatively affects financial expansion and is statistically insignificant. The result displays a reduction in financial development by 0.380% decrease as a result of 1% increase in human capital. The implication of this result means that in short run, human capital does not increase financial development in Africa countries. Natural resources positively influence financial growth and statistically significant both in short and long run. The result signifies that for every 1% increase in natural resource financial development will increase by 0.01 and 0.005 respectively. This implies Natural resources are crucial and serve as the foundation for future growth; nevertheless, they must be regulated to achieve the best outcome. Although it may be

difficult to accept, it is true that a nation's prosperity and development are not determined by the amount of its resources. Alternatively, her people' capability to exploit and appropriately utilize her riches. This finding is in consensus with (Zafar et al., 2019), (Rashid Khan et al., 2019), (Hunjra et al., 2022) and (Asif et al., 2020) which believe in the hypothesis "resource are blessing". Corruption on the other hand have negative effect on financial development both in short and long term. The result discloses that for every 1% increase in corruption, financial development will decrease by 0.28%. This means that it imperils a nation's stable and sustained economic growth as well as its moral principles and legal power. The legal system is put in peril by corruption, which has a tendency to fracture democracy. It undercuts the structures and principles of the constitution that the public and the leadership of a democratic nation uphold, this finding is in accord with (Krifa-Schneider et al., 2022) (Yao et al., 2021) (Song et al., 2021). Not only corruption, but Africa as a continent has also more pressing problems that need prompt actions, such problems may include, improper democratic government, high population, unemployment, political instability, security treats and so many others. Economic growth has a positive effect and is statistically significant on financial development in African countries both short and long term. The result discloses that for every 1% increase in growth, financial development will increase by 0.040% and 0.008% respectively. This finding is in agreement with (Nasreen et al., 2020) (Song et al., 2021). This means that the amount of aggregate supply, expenditure and revenue measures the growth of an economy. Financial development increases standard of living rises educational system and increases infrastructural development. Hence, African countries should reduce importation of goods and service but encourage citizens to consume homemade goods this will increase revenue generation and wealth creation. Not only that, increase in literacy level will reduce conflict and harmonize cultural differences. Renewable energy consumption in Africa positively influences financial development and is statistically significant in long and short term. The result reveals that, for every 1% increase in renewable energy consumption, African countries will experience positive change in financial development. The result is in consistent with (Xu et al., 2022) (Usman et al., 2022) and. (Ibrahim et al., 2022). it is logical for the government to encourage the consumption of renewable energy this will reduce carbon emission and

will solve the problem of power failure. Consumption of renewable energy will improve small scale businesses who depend largely on electricity in daily operation.

Table 6

Model Results [PMG-ARDL]

Model Results [PMG-ARDL]						
Variable	MG		PMG		DFE	
	Long term	Short Run	Long term	Short term	Long term	Short term
ECT	-0.69 [0.00]*		-0.49 [0.00]*		-0.22 [0.00]*	
HCI	0.17 [0.03]*		0.43 [0.00]*		0.078 [0.06]*	
NR	0.02 [0.38]		0.01 [0.00]*		0.005 [0.70]	
CRR	-0.08 [0.02]*		-0.28 [0.00]*		0.012 [0.16]	
Growth	0.01 [0.46]		0.040 [0.03]*		0.015 [0.00]*	
REC	0.90 [0.01]*		0.001 [0.00]*		-0.002 [0.15]	
HCI		-0.69 [0.36]		-0.380 [0.16]		0.118 [0.36]
NR		0.001 [0.05]*		0.005 [0.00]*		0.04 [0.00]*
CRR		-0.01 [0.71]		0.009 [0.74]		-0.05 [0.15]
Growth		0.02 [0.00]*		0.008 [0.07]*		0.65 [0.01]*

REC		0.01 [0.08]*		0.008 [0.09]*		-0.001 [0.87]
Constant	0.0665 [0.047]		0.195 [0.000]*		0.0467 [0.073]*	
Hausman	213.37 [0.731]		0.11 [0.03581*			
Observations	532		532		532	
Notes: ECT: Error Correction Term.						
*, Denote statistical significance at, 5%. The value of the coefficient is out of brackets.						

Dumitrescu & Hurlin Panel Causality Results

"Dumitrescu and hurlin result of causality test" in table 7 shows the existence of bidirectional relationship among four variables. Financial development has a cordial relationship to corruption, human capital index, renewable energy consumption and natural resource. These variables cause each other in the same way. Financial development and growth have unidirectional relationship, this implies that FD and Growth does not cause each other, an increase in financial development in Africa countries does not lead to increase in growth but a decrease. similarly, any increase in growth will lead to decrease in financial development, the outcome of the result shows that these two variables move in opposite direction to each other, this result is similar to (Jiang et al., 2021),. On the other hand, financial development and corruption have a bidirectional relationship, this means that any increase in financial development in African countries will lead to an increase in corruption, also increase in corruption leads to increase in financial development, they both move in the same direction. Based on the outcome of this result, it can be suggested that Africa countries should have standard policy to control and monitor the flow of money and disciplinary measures on culprit fund involve in corrupt practices. When corruption is control, financial development will improve growth of a country.

Again, the result of the financial development and human capital shows a bidirectional relationship, the variables move in the same direction this means that financial development causes human capital, any improvement in human capital will cause financial development. It is an indication that if African countries give access to loan and at a low interest rate, citizens of these nations will improve their small-scale business leading to a great boost in progress and expansion of a nation. The result of

financial development and renewable energy is bidirectional, that is, they cause each other. Any increase in financial development in Africa will lead to an increase in renewable energy and any increase in the consumption of renewable energy will lead to an increase in financial development. If African nations invest in renewable energy, it will reduce the problem of power failure, carbon emission and pollution also it will give room for job opportunity because many small businesses will have employ people the result corelate to (Destek and Sarkodie, 2019). Finally, financial development and natural resource has a bidirectional relationship they move in the same direction. This means that an increase in one will lead to increase in the other, this result is related to (Jiang et al., 2021). Whereas, the result of (Asif et al., 2020) shows that natural resource no causal relationship with financial development.

In summary, as financial development increases in African countries, CRR, HCI, REC, and NR will increase and vice versa. Nevertheless, financial development causes natural resource. This shows that any change of policy in the independent variable causes shifts in financial development, whereas any change in policy of financial development will result in change of the explanatory variables. this match the result of (Jiang et al., 2021), (Destek and Sarkodie, 2019) but contradict (Asif et al., 2020).

Table 7

Dumitrescu & Hurlin panel causality results

Hypothesis				
FD $\rightarrow$ Growth	1.106	0.239 [0.811]	0.022 [0.982]	Unidirectional
Growth $\rightarrow$ FD	1.887	1.984 [0.04]*	1.503 [0.132]	
FD $\rightarrow$ CRR	2.24	2.792 [0.00]*	2.188 [0.02]*	Bidirectional
CRR $\rightarrow$ FD	3.599	5.812 [0.00]*	4.751 [0.00]*	
FD $\rightarrow$ HCI	5.456	9.964 [0.00]*	8.274 [0.00]*	Bidirectional
HCI $\rightarrow$ FD	3.661	5.950 [0.00]*	4.868 [0.00]*	
FD $\rightarrow$ REC	2.535	3.432	2.732	Bidirectional

		[0.00]*	[0.00]*	
REC → FD	3.216	4.955	4.023	
		[0.00]*	[0.00]*	
FD → NR	2.552	3.471	2.764	Bidirectional
		[0.00]*	[0.00]*	
NR → FD	2.373	3.070	2.425	
		[0.00]*	[0.01]*	

Notes: ** refer significant at 1%.

CHAPTER V
Conclusion and Recommendations

Conclusion

This study examined the relationships between financial development, renewable energy, human capital, economic growth, corruption and natural resources in African nations between 1995 and 2020. Recent research has centered on whether natural resources are a curse or a blessing for progress. The researcher employed these variables to help in identifying the major problem that slow growth of African countries with their abundant natural resource. Also, to explore the necessary measures that can help African countries to grow and develop. African countries are richly blessed with abundant "natural resource" like forest, gold, oil and gas, zinc, iron, limestone, coal, diamond, sulfur, gemstone, aluminum, copper, ocean, platinum, arable land and many others, these resources might cause an assumption that the abundance of natural resources in Africa has a great track record of economic success.

Despite having all these abundant natural resources, the economic growth of these Africa countries is very slow, whereby there is no connection between economic growth and the availability of resources. The growth and development of these countries are well known to be hindered by many problems such as urbanization, political greed, lack of good policy, corruption, high dependent on fossil fuel, deforestation, drought, insurgency, insecurity, unemployment, poverty, no access to education, poor social amenities and infrastructure among many others. These problems have lingered for decades hindering the financial development of these countries; therefore, it is on this backdrop this study is

carried out to evaluate natural resource, human capital, economic growth, corruption and renewable energy on financial development in African countries.

The research employed the PMG's ARDL approach because it is the suitable model since the unit root result is a mixture of i(1) and i(0). The findings indicate that HC, NRR, CRR, GROWTH, and REC have a substantial long-term association with FD; as a result, African countries should make good use of their natural resources and take the necessary steps to prevent resource mismanagement. Thus, productivity levels are closely correlated with skills, expertise, and credentials. Businesses must invest in training, hiring, and instruction to develop employees' creativity, communication, and social skills. African nations should prioritize offering services, utilizing technology, encouraging innovation and creativity, as well as raising the literacy rate. In that case, value is produced using innovation and creativity as opposed to using raw materials. Additionally, this will lessen corruption and promote growth and development.

Recommendations

The following are recommendations based on findings that will be beneficial in formulating future strategies for government and non-state entities seeking to improve growth and development in African countries**.**

- Human capital positively influences financial development, therefore African countries should focus on providing services, use technology, encourage innovation and creativity, also improve the level of literacy. Funds should be channel on equipment that boosts output, communication and social skills alone with feedback will improve growth in African counties.
- The exploration of the abundant natural resource in Africa should be investigated to avoid corrupt practices and mismanagement also, to enhance the exploitation of natural resources from environment, diversification method must be included. The employment of technology to discover natural resources will be extremely beneficial to environmental preservation.
- To have a functioning system in African countries, corrupt practices most be curtailed by putting necessary policy and disciplinary actions on law breakers. The public officials must be honest, transparent and accountable as much as

possible, and their activities must be closely monitored to make sure they are complying to the governing rules and regulations in order to strengthen the legal system.

- Renewable technology such as solar can be used to mitigate the consequences of power outages in African countries, most of African countries are faced with the problem of power failure and most of the time they leave in black out, small scale businesses are forced into using alternative energy source, such as generator which produces carbon and high expenditure to the business owner due to the purchase of the fuel. African countries should focus on financial development by making access to low interest on loan for the citizens to acquire loan so that they can purchase energy that are renewable for their business and house consumption resulting in lower carbon emissions more profit generation. Consumption of renewable energy in Africa will benefit the public and allow small company owners to prosper due to frequent power outages.

- Country like Nigeria is blessed with abundant natural resource but it appears to be among the least country with growth due to its weak policy in its economy. Hence, African countries should reduce importation of goods and service but encourage citizens to consume homemade goods this will increase revenue generation and wealth creation. Not only that, increase in literacy level, will reduce conflict and harmonize cultural differences leading to peaceful society and entail growth.

REFERENCES

Ahmed, Z., Zafar, M.W., Ali, S., Danish, 2020. Linking urbanization, human capital, and the ecological footprint in G7 countries: An empirical analysis. Sustain. Cities Soc. 55, 102064. https://doi.org/10.1016/j.scs.2020.102064

AL-Barakani, A., Bin, L., Zhang, X., Saeed, M., Qahtan, A.S.A., Hamood Ghallab, H.M., 2022. Spatial analysis of financial development's effect on the ecological footprint of belt and road initiative countries: Mitigation options through renewable energy consumption and institutional quality. J. Clean. Prod. 366, 132696. https://doi.org/10.1016/j.jclepro.2022.132696

Alam, M. M., & Murad, M.W., 2020. The impacts of economic growth, trade openness and technological progress on renewable energy use in organization for economic co-operation and development countries. Renew. Energy 145, 382-390. https://doi.org/10.1016/j.renene.2019.06.054

Ali, A., Ramakrishnan, S., Faisal, 2022. Financial development and natural resources. Is there a stock market resource curse? Resour. Policy 75, 102457. https://doi.org/10.1016/j.resourpol.2021.102457

Aljarallah, R.A., 2021. An assessment of the economic impact of natural resource rents in kingdom of Saudi Arabia. Resour. Policy 72, 102070. https://doi.org/10.1016/j.resourpol.2021.102070

Aljarallah, R.A., 2020. Natural resource dependency, institutional quality and human

capital development in Gulf Countries. Heliyon 6, e04290. https://doi.org/10.1016/j.heliyon.2020.e04290

Asif, M., Khan, K.B., Anser, M.K., Nassani, A.A., Abro, M.M.Q., Zaman, K., 2020. Dynamic interaction between financial development and natural resources: Evaluating the 'Resource curse' hypothesis. Resour. Policy 65, 101566. https://doi.org/10.1016/j.resourpol.2019.101566

Atil, A., Nawaz, K., Lahiani, A., Roubaud, D., 2020. Are natural resources a blessing or a curse for financial development in Pakistan? The importance of oil prices, economic growth and economic globalization. Resour. Policy 67, 101683. https://doi.org/10.1016/j.resourpol.2020.101683

Bashir, M.F., MA, B., Hussain, H.I., Shahbaz, M., Koca, K., Shahzadi, I., 2022. Evaluating environmental commitments to COP21 and the role of economic complexity, renewable energy, financial development, urbanization, and energy innovation: Empirical evidence from the RCEP countries. Renew. Energy 184, 541–550. https://doi.org/10.1016/j.renene.2021.11.102

Chen, F., Wang, L., Gu, Q., Wang, M., Ding, X., 2022. Nexus between natural resources, financial development, green innovation and environmental sustainability in China: Fresh insight from novel quantile ARDL. Resour. Policy 79, 102955. https://doi.org/10.1016/j.resourpol.2022.102955

Cheng, Z., Li, X., Wang, M., 2021. Resource curse and green economic growth. Resour. Policy 74, 102325. https://doi.org/10.1016/j.resourpol.2021.102325

Destek, M.A., Sarkodie, S.A., 2019. Investigation of environmental Kuznets curve for ecological footprint: The role of energy and financial development. Sci. Total Environ. 650, 2483–2489. https://doi.org/10.1016/j.scitotenv.2018.10.017

Engle, R.F., Granger, C.W.J., 1987. Co-Integration and Error Correction : Representation , Estimation , and Testing. Econom. Soc. Stable 55, 251–276.

Erdoğan, S., Yıldırım, D.Ç., Gedikli, A., 2020. Natural resource abundance, financial development and economic growth: An investigation on Next-11 countries. Resour. Policy 65. https://doi.org/10.1016/j.resourpol.2019.101559

Frynas, J.G., Buur, L., 2020. The presource curse in Africa: Economic and political effects of anticipating natural resource revenues. Extr. Ind. Soc. 7, 1257–1270.

https://doi.org/10.1016/j.exis.2020.05.014

Gallagher, K.P., Kamal, R., Jin, J., Chen, Y., Ma, X., 2018. Energizing development finance? The benefits and risks of China's development finance in the global energy sector. Energy Policy 122, 313–321. https://doi.org/10.1016/j.enpol.2018.06.009

Gaygısız, E., Lajunen, T., 2022. Cultural values, national personality characteristics, and intelligence as correlates of corruption: A nation level analysis. Heliyon 8. https://doi.org/10.1016/j.heliyon.2022.e09506

Gokmenoglu, K.K., Rustamov, B., 2022. The role of the natural resource abundance in the short and long run: The case of the Kingdom of Saudi Arabia. Resour. Policy 77, 102699. https://doi.org/10.1016/j.resourpol.2022.102699

Gradstein, M., Klemp, M., 2020. Natural resource access and local economic growth. Eur. Econ. Rev. 127. https://doi.org/10.1016/j.euroecorev.2020.103441

Guan, J., Kirikkaleli, D., Bibi, A., Zhang, W., 2020. Natural resources rents nexus with financial development in the presence of globalization: Is the "resource curse" exist or myth? Resour. Policy 66. https://doi.org/10.1016/j.resourpol.2020.101641

Guo, J., Wang, Y., Yang, W., 2021. China's anti-corruption shock and resource reallocation in the energy industry. Energy Econ. 96, 105182. https://doi.org/10.1016/j.eneco.2021.105182

Gutiérrez, D.S., Paz, M.J., Vite, A.M., 2022. Industrialization of natural resources as a strategy to avoid the natural resource curse: Case of Chilean copper. Extr. Ind. Soc. https://doi.org/10.1016/j.exis.2022.101133

Hadj, T.B., Ghodbane, A., 2021. Do natural resources rents and institutional development matter for financial development under quantile regression approach? Resour. Policy 73, 102169. https://doi.org/10.1016/j.resourpol.2021.102169

He, W., Chen, X., Liu, Z.J., 2022. Can anti-corruption help realize the "strong" Porter Hypothesis in China? Evidence from Chinese manufacturing enterprises. J. Asian Econ. 80, 101473. https://doi.org/10.1016/j.asieco.2022.101473

Hunjra, A.I., Azam, M., Bruna, M.G., Taskin, D., 2022. Role of financial development for sustainable economic development in low middle income countries. Financ. Res. Lett. 47, 102793. https://doi.org/10.1016/j.frl.2022.102793

Hussain, M., Ye, Z., Bashir, A., Chaudhry, N.I., Zhao, Y., 2021. A nexus of natural

resource rents, institutional quality, human capital, and financial development in resource-rich high-income economies. Resour. Policy 74, 102259. https://doi.org/10.1016/j.resourpol.2021.102259

Ibrahim, R.L., Al-mulali, U., Ozturk, I., Bello, A.K., Raimi, L., 2022. On the criticality of renewable energy to sustainable development: Do green financial development, technological innovation, and economic complexity matter for China? Renew. Energy 199, 262–277. https://doi.org/10.1016/j.renene.2022.08.101

Isiksal, A.Z., Assi, A.F., Zhakanov, A., Rakhmetullina, S.Z., Joof, F., 2022. Natural resources, human capital, and CO2 emissions: Missing evidence from the Central Asian States. Environ. Sci. Pollut. Res. https://doi.org/10.1007/s11356-022-21227-5

Jahanger, A., Usman, M., Murshed, M., Mahmood, H., Balsalobre-Lorente, D., 2022. The linkages between natural resources, human capital, globalization, economic growth, financial development, and ecological footprint: The moderating role of technological innovations. Resour. Policy 76, 102569. https://doi.org/10.1016/j.resourpol.2022.102569

Jiang, C., Zhang, Y., Kamran, H.W., Afshan, S., 2021. Understanding the dynamics of the resource curse and financial development in China? A novel evidence based on QARDL model. Resour. Policy 72, 102091. https://doi.org/10.1016/j.resourpol.2021.102091

Johansen, S., 1995. Identifying restrictions of linear equations with applications to simultaneous equations and cointegration. J. Econom. 69, 111–132. https://doi.org/10.1016/0304-4076(94)01664-L

Khan, Z., Hussain, M., Shahbaz, M., Yang, S., Jiao, Z., 2020. Natural resource abundance, technological innovation, and human capital nexus with financial development: A case study of China. Resour. Policy 65, 101585. https://doi.org/10.1016/j.resourpol.2020.101585

Kong, D., Zhu, L., Wang, X., 2022. Anti-corruption and CEO compensation: Evidence from a natural experiment in China. Econ. Model. 106, 105697. https://doi.org/10.1016/j.econmod.2021.105697

Krifa-Schneider, H., Matei, I., Sattar, A., 2022. FDI, corruption and financial development around the world: A panel non-linear approach. Econ. Model. 110,

105809. https://doi.org/10.1016/j.econmod.2022.105809

Le, A.T., Doan, A.T., 2020. Corruption and financial fragility of small and medium enterprises: International evidence. J. Multinatl. Financ. Manag. 57–58, 100660. https://doi.org/10.1016/j.mulfin.2020.100660

Li, H., Usman, N., Coulibay, M.H., Phiri, R., Tang, X., 2022. Does the resources curse hypothesis exist in China? What is the dynamic role of fiscal decentralization, economic policy uncertainty, and technology innovation for sustainable financial development? Resour. Policy 79, 103002. https://doi.org/10.1016/j.resourpol.2022.103002

Li, Yurog, Cong, Z., Xie, Y., Wang, Y., Wang, H., 2022. The relationship between green finance, economic factors, geopolitical risk and natural resources commodity prices: Evidence from five most natural resources holding countries. Resour. Policy 78, 102733. https://doi.org/10.1016/j.resourpol.2022.102733

Li, Ying, Mehmood, N., Iqbal, N., 2022. Natural resource abundance and financial development: A case study of emerging (E−15) economies. Resour. Policy 79, 103018. https://doi.org/10.1016/j.resourpol.2022.103018

Lima, M.S.M., Delen, D., 2020. Predicting and explaining corruption across countries: A machine learning approach. Gov. Inf. Q. 37, 101407. https://doi.org/10.1016/j.giq.2019.101407

Machado, C., Paulo Davim, J., 2001. The curse of natural resources. Manag. Sustain. Dev. 45, 827–838.

Mamudu, A.O., Igwe, G.J., Okonkwo, E., 2019. Process design evaluation of an optimum modular topping refinery for Nigeria crude oil using hysys® aspen software. Cogent Eng. 6, 1–29. https://doi.org/10.1080/23311916.2019.1659123

Matallah, S., 2022. Rampant corruption: The dilemma facing economic diversification in oil-abundant MENA countries. Resour. Policy 75, 102541. https://doi.org/10.1016/j.resourpol.2021.102541

Namazi, M., Mohammadi, E., 2018. Natural resource dependence and economic growth: A TOPSIS/DEA analysis of innovation efficiency. Resour. Policy 59, 544–552. https://doi.org/10.1016/j.resourpol.2018.09.015

Nasreen, S., Mahalik, M.K., Shahbaz, M., Abbas, Q., 2020. How do financial

globalization, institutions and economic growth impact financial sector development in European countries? Res. Int. Bus. Financ. 54, 101247. https://doi.org/10.1016/j.ribaf.2020.101247

Nkwede, J.&, Nwogbaga, M., 2017. Insurgency and the Crisis of Sustainable Socio-Economic Development in Africa : A Study of Nigeria. Middle-East J. Sci. Res. 25, 703–715. https://doi.org/10.5829/idosi.mejsr.2017.703.715

Oluwaseyi Musibau, H., Olawale Shittu, W., Yanotti, M., 2022. Natural resources endowment: What more does West Africa need in order to grow? Resour. Policy 77, 102669. https://doi.org/10.1016/j.resourpol.2022.102669

Pedroni, P., 1999. Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors. Oxf. Bull. Econ. Stat. 61, 653–670. https://doi.org/10.1111/1468-0084.61.s1.14

Pesaran, M, H., Shin, Y., Smith, R.J., 2001. Bounds testing approaches to the analysis of level relationships. J. Appl. Econom. 16, 289–326. https://doi.org/10.1002/jae.616

Pesaran, M.H., 2007. A simple panel unit root test in the presence of cross-section dependence. J. Appl. Econom. 22, 265-312.

Pesaran, M.H., 2004. General diagnostic tests for cross section dependence in panels..

Pesaran, M.H., Shin, Y., 1998. An Autoregressive Distributed-Lag Modelling Approach to Cointegration Analysis, Econometric Society Monographs. https://doi.org/10.1017/ccol0521633230.011

Phillips, P., Hansen, B., 1990. Statistical inference in instrumental variable regression with I(1) processes. Rev. Econ. Stud 57, 99–125.

Rahim, S., Murshed, M., Umarbeyli, S., Kirikkaleli, D., Ahmad, M., Tufail, M., Wahab, S., 2021. Do natural resources abundance and human capital development promote economic growth? A study on the resource curse hypothesis in Next Eleven countries. Resour. Environ. Sustain. 4, 100018. https://doi.org/10.1016/j.resenv.2021.100018

Rashid Khan, H.U., Islam, T., Yousaf, S.U., Zaman, K., Shoukry, A.M., Sharkawy, M.A., Gani, S., Aamir, A., Hishan, S.S., 2019. The impact of financial development indicators on natural resource markets: Evidence from two-step GMM estimator. Resour. Policy 62, 240–255. https://doi.org/10.1016/j.resourpol.2019.04.002

Samargandi, N., 2019. Energy intensity and its determinants in OPEC countries. Energy 186, 115803. https://doi.org/10.1016/j.energy.2019.07.133

Song, C.Q., Chang, C.P., Gong, Q., 2021. Economic growth, corruption, and financial development: Global evidence. Econ. Model. 94, 822–830. https://doi.org/10.1016/j.econmod.2020.02.022

Sovacool, B.K., 2021. Clean, low-carbon but corrupt? Examining corruption risks and solutions for the renewable energy sector in Mexico, Malaysia, Kenya and South Africa. Energy Strateg. Rev. 38, 100723. https://doi.org/10.1016/j.esr.2021.100723

Tang, C., Irfan, M., Razzaq, A., Dagar, V., 2022. Natural resources and financial development: Role of business regulations in testing the resource-curse hypothesis in ASEAN countries. Resour. Policy 76, 102612. https://doi.org/10.1016/j.resourpol.2022.102612

Tran, V.T., Walle, Y.M., Herwartz, H., 2020. The impact of local financial development on firm growth in Vietnam: Does the level of corruption matter? Eur. J. Polit. Econ. 62, 101858. https://doi.org/10.1016/j.ejpoleco.2020.101858

Usman, M., Balsalobre-Lorente, D., Jahanger, A., Ahmad, P., 2022. Pollution concern during globalization mode in financially resource-rich countries: Do financial development, natural resources, and renewable energy consumption matter? Renew. Energy 183, 90–102. https://doi.org/10.1016/j.renene.2021.10.067

Wang, S., Wang, X., Lu, B., 2022. Is resource abundance a curse for green economic growth? Evidence from developing countries. Resour. Policy 75, 102533. https://doi.org/10.1016/j.resourpol.2021.102533

Westerlund, J., 2007. Testing for error correction in panel data. Oxf. Bull. Econ. Stat. 69, 709–748. https://doi.org/10.1111/j.1468-0084.2007.00477.x

Xu, D., Sheraz, M., Hassan, A., Sinha, A., Ullah, S., 2022. Financial development, renewable energy and CO2 emission in G7 countries: New evidence from non-linear and asymmetric analysis. Energy Econ. 109, 105994. https://doi.org/10.1016/j.eneco.2022.105994

Yao, X., Yasmeen, R., Hussain, J., Hassan Shah, W.U., 2021. The repercussions of financial development and corruption on energy efficiency and ecological footprint: Evidence from BRICS and next 11 countries. Energy 223, 120063.

https://doi.org/10.1016/j.energy.2021.120063

Yilanci, V., Aslan, M., Ozgur, O., 2021. Disaggregated analysis of the curse of natural resources in most natural resource-abundant countries. Resour. Policy 71, 102017. https://doi.org/10.1016/j.resourpol.2021.102017

Zafar, M.W., Zaidi, S.A.H., Khan, N.R., Mirza, F.M., Hou, F., Kirmani, S.A.A., 2019. The impact of natural resources, human capital, and foreign direct investment on the ecological footprint: The case of the United States. Resour. Policy 63, 101428. https://doi.org/10.1016/j.resourpol.2019.101428

Zallé, O., 2019. Natural resources and economic growth in Africa: The role of institutional quality and human capital. Resour. Policy 62, 616–624. https://doi.org/10.1016/j.resourpol.2018.11.009

Zeeshan, M., han, J., Rehman, A., Ullah, I., Hussain, A., Alam Afridi, F.E., 2022. Exploring symmetric and asymmetric nexus between corruption, political instability, natural resources and economic growth in the context of Pakistan. Resour. Policy 78, 102785. https://doi.org/10.1016/j.resourpol.2022.102785

Zhou, K., Luo, H., Ye, D., Tao, Y., 2022. The power of anti-corruption in environmental innovation: Evidence from a quasi-natural experiment in China. Technol. Forecast. Soc. Change 182, 121831. https://doi.org/10.1016/j.techfore.2022.121831

APPENDICES I

Similarity Report

APPENDICES I

Similarity Report

EVALUATING NATURAL RESOURCE, HUMAN CAPITAL, RENEWABLE ENERGY ON FINANACIAL GROWTH IN AFRICA- 20215587-Mary Tagwi

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APPENDICES II

Ethics Committee Report

NEAR EAST UNIVERSITY

SCIENTIFIC RESEARCH ETHICS COMMITTEE

05.06.2023

Dear Mary Alwin Tagwi

Your project **"Evaluating Natural Resource, Human Capital, Renewable eneygy on financial development in Africa"** has been evaluated. Since only secondary data will be used the project does not need to go through the ethics committee. You can start your research on the condition that you will use only secondary data.

Prof. Dr. Aşkın KİRAZ

The Coordinator of the Scientific Research Ethics Committee