SAMPSON O. GEORGE, JR.

ACCENTUATING IMPEDIMENTS TO ECONOMIC DEVELOPMENT. -NEXUS OF CORRUPTION, ENERGY POVERTY AND ECONOMIC DEVELOPMENT.THE AFRICAN PERSPECTIVE

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Dedication

Having grown up in a poor country (Liberia) and wanting to do something to change it, I decided to further my education abroad.

The presidents of every African country are the intended recipients of this thesis. Your foresight has the key that can liberate us (Africans) from our current economic plight and into a better one. We Africans have endured untold hardships despite our continent's abundant natural resources.

Please take the recommendations in this thesis seriously and help Africa regain her proper place in the world. You have the authority to do so.

Finally, a unified Africa will benefit its population much, and I urge our leaders to see things from this perspective.

Declaration

I certify that the data, materials, analysis, and results contained in this thesis were obtained and presented in accordance with the regulations and standards of the Graduate Studies Institute at Near East University. I further attest that all non-original material used in this investigation has been appropriately credited and referenced as per these guidelines and standards of behavior.

Acknowledgement

The success of this academic journey would not have been possible without the help and support of everyone who responded to my SOS call and were on the front lines of the support team.

I will be eternally grateful to God Almighty, the source of my entire being, for the kindness He have shown me throughout my life. It had all been you, from my birth until this point.

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Abstract

ACCENTUATING IMPEDIMENTS TO ECONOMIC DEVELOPMENT.

NEXUS OF CORRUPTION, ENERGY POVERTY AND ECONOMIC DEVELOPMENT.

THE AFRICAN PERSPECTIVE.

Sampson O. GEORGE, Jr.

February 2023,Page 211

Africa is the most resource-rich continent in the world, but the continent is struggling economically and developmentally. Researchers have worked tirelessly over the years to determine the origin of this tragic problem that threatens the lives of millions of Africans. This study used secondary data from 38 African states to investigate the root of the problem and propose potential solutions to aid in the problem-solving process.

We employ econometric modeling to evaluate the connection between corruption and GDP growth, as well as the connection between energy poverty and GDP expansion. Corruption was found to be a barrier to economic growth using the Generalized Method of Moments (GMM). This research concluded that corruption has a direct and negative impact on economic growth, with a one-unit rise decreasing growth by 0.99 percentage points.

Considering the second estimate of the connection between Energy Poverty and Economic Development, this study discovered a negative impact of Energy Poverty on Economic Development in African States. This study found that a change of one percentage point in the proportion of the population with access to electricity reduced energy poverty by 0.001383 percent.

Therefore, it's safe to say that corruption and energy poverty are two major impediments to progress in the African continent's economies.

Keywords: Words: Economic growth, Corruption, Africa, Energy Poverty, Generalized Method of Moment (GMM)

Özet

EKONOMİK GELİŞİMİN ÖNÜNDE VURGULANAN ENGELLER. YOLSUZLUK, ENERJİ YOKSULLUĞU VE EKONOMİK KALKINMA İLİŞKİSİ. AFRİKA PERSPEKTİFİ.

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Afrika, dünyadaki kaynaklar açısından en zengin kıtadır, ancak kıta ekonomik ve kalkınma açısından mücadele etmektedir. Araştırmacılar, milyonlarca Afrikalı'nın hayatını tehdit eden bu trajik sorunun kaynağını belirlemek için yıllarca yorulmadan çalıştı. Bu çalışma, sorunun kökenini araştırmak ve sorun çözme sürecine yardımcı olacak potansiyel çözümler önermek için 38 Afrika eyaletinden gelen ikincil verileri kullandı.

Yolsuzluk ile GSYİH büyümesi arasındaki bağlantıyı ve enerji yoksulluğu ile GSYİH büyümesi arasındaki bağlantıyı değerlendirmek için ekonometrik modelleme kullanıyoruz. Genelleştirilmiş Momentler Yöntemi (GMM) kullanılarak yolsuzluğun ekonomik büyümenin önünde bir engel olduğu bulundu. Bu araştırma, yolsuzluğun ekonomik büyüme üzerinde doğrudan ve olumsuz bir etkiye sahip olduğu, bir birimlik artışın büyümeyi 0,99 puan azalttığı sonucuna varmıştır.

Enerji Yoksulluğu ve Ekonomik Kalkınma arasındaki bağlantının ikinci tahmini göz önüne alındığında, bu çalışma Enerji Yoksulluğunun Afrika Devletlerindeki Ekonomik Kalkınma üzerindeki olumsuz etkisini keşfetti. Bu çalışma, elektriğe erişimi olan nüfus oranındaki yüzde birlik bir değişikliğin, enerji yoksulluğunu yüzde 0,001383 oranında azalttığını bulmuştur.

Bu nedenle, yolsuzluk ve enerji yoksulluğunun Afrika kıtası ekonomilerinde ilerlemenin önündeki iki büyük engel olduğunu söylemek yanlış olmaz.

***Anahtar Kelimeler**:* Ekonomik büyüme, Yolsuzluk, Afrika, Enerji Yoksulluğu, Genelleştirilmiş Moment Yöntemi (GMM)

Table of Contents

CHAPTER III

CHAPTER IV

CHAPTER V

CHAPTER VI

CHAPTER VII

CHAPTER I

INTRODUCTION

1.1 Introduction

Africa is home to 53 distinct nations and covers 30,000,000 square kilometers (12,000,000 square miles), or 20% of the Earth's total usable land area. Africa's 41,184 coastline is a vast geological feature (25,596 miles). Africa is home to 1.37 billion people, or 17.5% of the global population, and generates around 2.8% of the global gross domestic product. (https://www.worlddata.info/africa)

The instability of the African economy has compromised the human advancement of Africans. As a result, human development has regressed, as seen by increased poverty rates, food insecurity, forced migration, and severe inequality.

A first in the index's history, Africa's HDI has reverted to a position immediately before introducing the 2030 Agenda for Sustainable Development. In the previous decade, negative feelings such as stress, sadness, anger, worry, and physical discomfort have increased among the general population in Africa. A small percentage of African nations see a decline in HDI each year, but in 2020 and 2021, that number increased to more than 90%. (https://www.statista.com).

The significance of economic growth must be balanced. African nations have some of the lowest per capita incomes in the world, yet their abundance of natural resources has garnered considerable media attention. This thesis identifies two fundamental obstacles to Africa's economic development: Corruption and Energy Poverty.

1.2 Problem Statement

1.2.1 Corruption

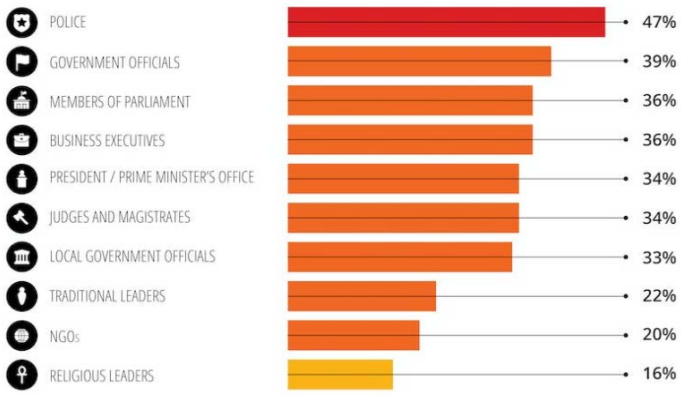
Corruption is a significant issue that impedes growth in many African societies and economies. It presents a grave danger to the economy, development, good governance, and fundamental rights, such as the right to free expression and the ability to hold governments responsible. In addition, Corruption negatively influences the well-being of individuals, families, and communities.

Research shows that more than half of the population feels Corruption is growing and that the government needs to tackle it more adequately. (Corruption perception index).

Moreover, a quarter of respondents who used public services like healthcare or education paid a bribe in the preceding year, which amounts to roughly 130 million people throughout the 35 countries studied.

The Global Corruption Barometer (GCB) is the most extensive and in-depth study of African residents' views on corruption and experiences with bribery, conducted in collaboration with Afrobarometer and Omega Research. The survey included around 47,000 people from 35 different African countries.

Figure 1: Percentage of people who think most or all the following institutions are corrupt.



It is hardly surprising that African police officers get the greatest bribes of any profession. High bribery rates are also prevalent in providing utilities (such as power and water) and identification documents (such as licenses and passports).

The researcher investigates the far-reaching ramifications of Corruption to draw detailed conclusions about how Corruption might hurt a country. Some of these elements have apparent implications, while others have subtle effects. Specifically, they are:

They are indirectly Undermining the Sustainable Development Goals. If Corruption is permitted to endure, the United Nations' goals for unsustainable development cannot be attained (SDGs). Since the SDGs are all-encompassing, it is not unexpected that they are susceptible to Corruption. It is possible that " and more

sustainable prospect for all" repeatedly clashes with the concerns of a minority and as a result, could be derailed by various forms of Corruption. When governments cannot provide for their population, poverty and hunger continue. The resident's lack of access to adequate health care and progress is hindered by problems such as ensuring that women and men have equal rights, decreasing educational inequality and eliminating child labor. " Justice, Peace, and Strong Institutions" is Goal 16 of the Sustainable Development Agenda. To achieve this objective, the research seeks to "promote peaceful and inclusive communities for sustainable development; give equitable access to justice; and build effective, responsible, and inclusive institutions at all levels."

Ineffectiveness and Economic Loss. According to a 2016 IMF estimate, the yearly cost of bribery is between $1.5 and $2 trillion, or roughly 2% of global GDP. The total economic impact of corruption does not reflect in this evaluation. The millions of stolen documents referencing the Mossack Fonseca Papers reveal the substantial economic effects of offshore businesses on the economic disparities of several nations (usually called the Panama Papers). Think about both economic inefficiency and deadweight economic loss. Competition is hampered when employment (or contracts) are provided to persons (or firms) who offer bribes or have a personal connection.

Consequently, more qualified applicants and businesses are denied. The more prevalent these actions are, the less effective the economy becomes. Suppose international economic and humanitarian efforts are impeded due to the diversion or distribution of cash from loans and help to inferior contractors who won their bids via corrupt tactics. In that case, this might contribute to underdevelopment in developing countries (kickbacks, bribery, and nepotism). Physical and human capital investments diminish when resources are diverted from their most profitable use.

Inequality and Destitution. Corruption is seldom an instrument of the weak. When corrupt actors enlist political and economic institutions to their service, wealth is transferred to the poorest and least significant sources. For example, more than $1.1 billion intended for the national budget of Nigeria was diverted to corrupt officials instead in a notorious bribery case involving the global oil corporation Shell in Nigeria (Global Witness, 2017). Approximately fifty percent of the population of the oil-rich nation lives in severe poverty, according to the World Bank (2019).

Corruption may benefit party leaders, bureaucrats, and contractors at the expense of programs providing basic needs, including education, healthcare, eradicating poverty, elections, and the running costs of political parties. This has a chilling effect on political regimes' ability to redistribute wealth and social programs. Moreover, self-dealing and hidden transactions weaken institutions like political representation and productive capacity.

In all of these hypothetical situations, persons who are part of a corrupt network are given preferential treatment.

Reputational Harm, Dread, and Discomfort: It is only sometimes a pleasant experience for people to come into contact with Corruption. Corruption often results in personal gain, intimidation, and more convenience for the perpetrators than for the victims unless the perpetrators are apprehended by law enforcement. One must pay a bribe to obtain health care, a building permit, mail delivery, or telephone service. A judge finds against a defendant not on the case's merits but due to familial ties, shared racial or cultural heritage, or the payment of a bribe. A court rules against a party, not because of anything in the case but because that party is related to an influential person, have the same ethnic background, or paid a bribe. Suppose a citizen refuses to give a police officer the money they have requested in a bribe. In that case, the officer may resort to physical force, put them in jail, or increase their fine—the theft or misuse of retirement funds by criminals.

The accumulation of corrupt deeds results in dysfunctionality. Both the Governmental and Private Sectors are in Disarray. Whether offered by the government or the private sector, goods, and services are becoming less reliable, more complex, time-consuming, and unequal to acquire. Presume that bribery of law enforcement, medical professionals, and government employees is possible. If this is the case, individuals who are best at securing these funds will rise to the top at the expense of their more ethical coworkers and competitors who may perform better on merit.

Furthermore, businesses can damage competitors by gaining governmental favors. In that case, they will have less incentive to deliver superior services and products. State-owned firms and industries are structured to enrich government officials rather than to promote innovation and efficiency. Because of this,

employees may lose interest in their work. Employees and supervisors are disheartened. People begin to question the importance of diligence and creativity.

Failures in Infrastructure: When a bridge in Genoa, Italy, collapsed in August 2018, killing at least 39 people, authorities had to determine the cause (NZHerald, 2018). Even though corruption was initially hard to spot, investigations have revealed that a construction business run by the Mafia appears to have used "weakened cement" during the building process. It is well known that the Mafia uses the construction industry to launder their illicit profits. Corruption in business and industry can weaken both regulation and competition. On the other hand, the 2017 Mexican Against Corruption and Impunity research blames corruption for the collapse of roughly 40 buildings in Mexico City after the September 2017 earthquake. Bribery, corruption, and influence trafficking were used to overcome land use and authorization constraints, leading to the construction of potentially hazardous buildings in and around the capital.

Institutions of both the economy and the government are corrupt. What was once considered dysfunctional might be transformed through corrupt practices into something profitable and beneficial for those who engage in it. Pervasive patterns of private and public corruption establish institutions rigged for personal gain. This is true whether we refer to it as political cronyism, crony capitalism, political party cartels, plutocracy, or even kleptocracy. As a direct consequence of this, morally upstanding individuals (those who do not have a great deal of money, friends, favors to give, or "hard power" over others, such as firearms and private enforcers) have less influence in government and less ability to enforce the law.

Impunity as well as an insufficient amount of justice. The general public loses faith in the ability of prosecutors and judges to conduct their jobs when widespread corruption is present. As a result, influential persons can dodge punishment. It is also conceivable for citizens to be erroneously convicted of wrongdoing, denied a fair trial, and wrongfully detained. These things can all happen at the same time. On the other hand, this is particularly relevant for persons who are economically or politically vulnerable.

Growing Illiberal Populism. According to several academic studies and a report published by Transparency International in 2017, corruption is a major factor in the

growth of authoritarianism. Corruption is responsible for a rise in inequality, a decrease in public accountability and political responsiveness, and an increase in dissatisfaction and unhappiness among citizens. They are more prone to tolerate authoritarian and intolerant policies, or even to demand them. When utilizing these approaches, immigrants and other members of the country's minority groups are blamed for the country's economic and political collapse. It is advised that immediate and decisive action be taken against economic and political elites. Tolerance, regard for human dignity, and adherence to the rule of law are examples of liberal principles contributing to an atmosphere resistant to change.

Criminal Organizations and the Threat of Terrorism In a society in which money can be easily laundered and hidden, as well as in which bribes can be given to judges, lawyers, and politicians, the underworld can flourish (including gifts, favors, and other benefits). There is a connection between the rise in violent crime, drug usage, prostitution, sexual enslavement, kidnappings, and intimidation. This connection may be shown through a direct link. The arrow of causality can point either forward or backward. It is possible for organized crime to produce corruption as a byproduct, but a feeble, foolish, or incompetent state may also contribute to the expansion of organized crime.

The capacity of the State Is Decreased. Even if voters demanded angrily that the problems stated above to be fixed, the effectiveness of politics would still be undermined by corruption. Take, for instance, a society where corrupt practices such as bribery, influence peddling, and state capture are the norm. In this scenario, political regimes cannot address societal issues since the solutions to such problems could endanger powerful vested interests. Naturally, this is something that is only occasionally tolerated on the inside.

Despite this, the failure of a state can sometimes appears in confusing and distracting ways. Yet, the fundamental structural issues are hidden from view by contentious issues, political party reorganization, the appearance of scandals, and huge obstacles posed by the outside world. Political arbitrage might be a feasible and advantageous strategic outcome of a state takeover. By pitting diverse concerns against one another, it will be possible to obstruct efforts to alter the system. In addition, corruption destroys the honor of those who work in public service. It alters

the political culture, which makes meaningful reforms that are motivated by public interest unfeasible (Della Porta & Vannucci, 2005).

The level of polarization and instability is rising.

State capture is a form of corruption that can cause a country's people to be divided into two groups: those who are willing to accept corrupt regimes in exchange for bribes and favors, and those who are opposed to such regimes. Rather than focusing on ideology or the positive aspects of the initiative, consideration is given to those who support the policy and the possible benefits it could bring to rival networks. When two or more political factions are at war with one another, compromise and reason are the first things to go out the window.

Loss of biodiversity and the impact of climate change. Corruption undermines efforts to combat climate change and the financing of such initiatives, as well as programs aimed at protecting forests and managing them in a sustainable manner. It also encourages illegal activities involving animals and fisheries.

Infractions of Human Rights. Several historical texts, most notably Cato's Letters, a collection of articles on tyranny and corruption written in the seventeenth century, support the idea that corrupt rulers frequently view civic rights as obstacles to gaining power. The Office of the High Commissioner for Human Rights (OHCHR) asserts a correlation between corruption and human rights abuses in recent years. Sin not only puts the lives of those who speak out against it in danger by making them targets for assassination and other breaches of human rights, but it also puts the lives of innocent people in danger. Yet, this also makes it more difficult for states to defend the civil and political rights of their citizens by establishing the regulations and processes necessary to do so. It also makes it more difficult for states to guarantee citizens' socioeconomic rights. This frequently necessitates actions from the government that are equally difficult.

According to the United Nations High Commissioner for Human Rights, corruption is "a structural impediment to the enjoyment of human rights." It has been shown through research that it overlaps with several other fields.

Conflicts in Armed Forces and Crimes Against. Humanity Corruption can raise the possibility of instability and possibly violent conflict by thwarting the development and capability of the state (World Bank, 2011; World Bank, 2017).

Corrupt activities are a source of instability and even a "catalyst of conflict" (USIP, 2010, p. 7). It is now well acknowledged that corruption primarily contributes to violent conflict and catastrophic events. On the other hand, it is challenging to provide concrete evidence of a connection between corruption and crimes of atrocity (such as genocide, war crimes, and crimes against humanity). Two examples of this can be found in the "Consolidated Final Report of the Liberian Truth and Reconciliation Commission" and "Report of the Sierra Leone Truth and Reconciliation Commission" (2004, chapter 2, section 13). (2009, vol. II, pp. 16-17). During the time of the Arab Spring, corruption was identified as the principal source of tension in Tunisia; however, the process of transitional justice was not yet in place at that time. The Truth and Dignity Commission, also known as the Instance vérité et dignité (IVD), was mandated by law to be established in Tunisia in 2013 to address the country's extensive history of institutionalized corruption as well as violations of human rights and to encourage institutional reform. In a report published in 2018, the Open Society Justice Initiative presents evidence suggesting a connection between crimes against humanity and corrupt practices in Mexico.

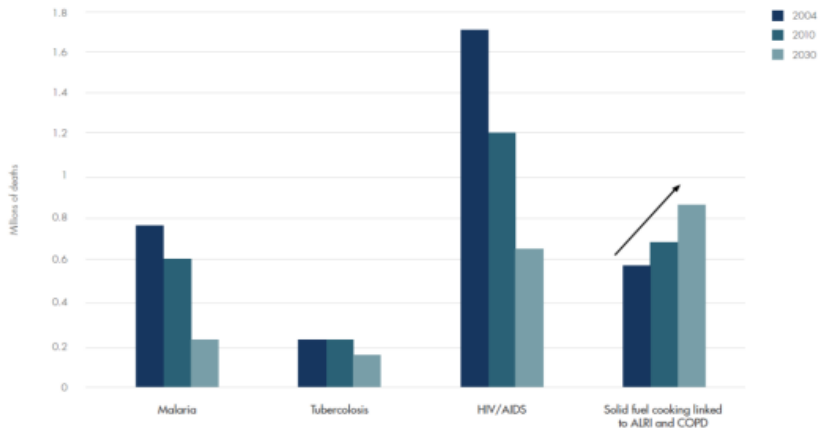
The annoyance and mistrust of the public. The public's trust in the government and other institutions and broad moral norms can be damaged when corrupt officials are shielded from accountability. These views remain for extended periods of time and contribute to a decrease in political engagement when there is a rise in the non-accountability of political institutions. Individuals may be motivated to engage in corrupt behavior by factors, including general dissatisfaction and a pervasive belief in corruption. People are more likely to participate in an unethical activity if they believe to themselves, "Since everyone else is doing it, I might as well do it too," because this line of thinking makes people more prone to act unethically. (Köbis, 2018). Imagine if the public's requests for strict anti-corruption measures are not satisfied. If this occurs, it can erode people's trust in their government and lower the value of formal standards that businesses and individuals are expected to follow, which could lead to an increase in people's readiness to tolerate impolite and self-centered behavior.

The consequences of corruption, which were discussed before, can be broken down into the following categories: economic, political, moral or psychological, humanitarian, ecological, and security-related consequences.

1.2.2 Energy poverty

In terms of expansion, one of the most critical limiting factors is access to energy. Imagine, for instance, that people cannot use their lights after the sun has set. In that scenario, it indicates that there will be no more assignments, cleaning, or working additional jobs. If people cannot regulate the temperature in their homes during the hottest and coldest times of the year—summer and winter—this can threaten the health of young children and older people, respectively. To make matters even worse, the fact that individuals living in energy poverty can purchase fuel puts them at a much-increased risk of being seriously harmed. In sub-Saharan Africa alone, traditional biomass burning in people's houses is responsible for the deaths of 600,000 people per year (Africa Progress Panel, 2015). By 2030, the number of deaths caused by polluted indoor air will have exceeded the total deaths caused by tuberculosis and AIDS combined.

Figure 2: Deaths caused by major infectious diseases compared with acute lower respiratory infections, in 2004, 2010, and 2030.



Source: World Bank Group, 2012, in Africa Progress Panel, 2015.

It is necessary to have access to dependable and cutting-edge energy services to meet the fundamental demands placed on society, encourage economic progress, and promote human development. Energy services affect productivity, health, education, and the availability of clean water and communication. In addition, the availability of contemporary amenities such as electricity, natural gas, cooking fuel, and mechanical

power can lead to improvements in areas such as public health, education, accessibility to information, and agricultural output. Yet, the patterns of energy consumption in industrialized nations and developing nations, as well as the patterns of energy consumption among rich and poor people within each nation, are significantly different and are related to varying degrees of human progress. How energy is generated, distributed, and utilized has a substantial bearing on the ability of the underprivileged to provide for themselves and fulfill their full potential, which, in turn, affects the environment on a local, regional, and global scale.

In 2019, the UNCTAD reported that in LDCs, more than fifty percent of the population did not have access to electrical power. It is estimated that around two thirds of the world's population, or nearly 570 million people, do not have access to electricity.

People cannot access electricity in over three-quarters of the world's least developed countries (LDCs). Around 458 million people, or two-thirds of the total population of LDCs, live in rural areas characterized by relatively low electrification rates.

Even in the most populous cities of LDCs, up to one-third of the population requires access to contemporary forms of energy. Even in locations with convenient energy access, there is a widespread prevalence of reliability issues.

During this time of responding to the COVID-19 outbreak as well as other healthcare issues, having access to energy sources that are both dependable and economical is more vital than it has ever been. If vaccinations, for example, needed to be chilled while being transported or stored, and if these places required more access to energy, the distribution of vaccines could be improved.

Increased energy poverty, defined as a lack of access to modern, sustainable energy services and products, significantly impacts the prospects for sustainable development of LDCs. This is true regarding individual well-being, human capital development, and productive capacity.

In the United Nations Conference on Trade and Development's (UNCTAD) Productive Capacities Index, the Least Developed Countries (LDCs) have a low score, indicating that they have low energy productivity (UNCTAD). A lack of energy for productive reasons can make it difficult for firms to generate new products competitively. This is because exporting commodities and services, in

particular in rural non-agricultural industries, diminishes a country's ability for economic growth. This is the case because exporting commodities and services lowers economic growth.

Energy shortages and widespread corruption have both harmed the African economy. Sadly, the African nation is still vulnerable to the influence of these two factors on the continent's growth. Africa, with all of its resources, may have been able to evolve into a separate and peaceful continent if these limitations on economic progress could have been lifted.

1.3 Aims and Purposes of the Research

This quantitative study's overarching mission is to single out the most significant barrier to economic development in Africa so that appropriate mitigation measures can be taken. Although they have a wealth of natural resources, the countries of Africa still need to make further progress in their economic development. Sub-Saharan African nations have predominated on the list of developing countries ever since the United Nations first established the category in 1971. Sub-Saharan Africa has the largest representation in the organization more than 40 years after its formation, with 33 members (just 14 of the region's 47 countries are not LDCs). A representative is gathered here from every part of the subcontinent. Two African nations, Botswana and Cape Verde, have recently withdrawn from this organization. According to the opinions of several specialists, it is projected that only two states, namely Angola and Equatorial Guinea, will join them. Several things need to be corrected in the currently available information about Africa. This essay sheds light on Africa's continuous underdevelopment's structural roots by analyzing several factors.

Because the researcher was interested in alleviating poverty in that region, he focused on Africa, where the vast bulk of LCDs is manufactured. The research pays particular attention to two significant obstacles that stand in the way of economic expansion. In addition, there must be more corruption and adequate access to energy sources.

Attempting to Recognize and Avoid Corruption. Corruption in the public sector can have extremely negative repercussions if it is not identified and brought under

control. The mismanagement of public funds and resources, the unfair treatment of particular persons or groups compared to others, and the loss of public trust in the government are just a few instances of the potential problems that could follow. As a result of ineffective business practices and a tarnished reputation, it is challenging to hire and retain talented employees and to compete successfully for the most demanding contracts. Also, it may be challenging to entice business investment, which is fantastic for expanding the economy.

According to estimates provided by the World Economic Forum, the annual cost of corruption to the global economy is $2.6 trillion. The vulnerable and helpless are the ones who suffer the most when there is corruption. In addition, there is a need to lessen the prevalent corruption that frequently causes investors to withdraw their capital in order to advance the rule of law and the economic development of the nation.

There are over 600 million individuals living in Sub-Saharan Africa who do not have access to electrical power. An injustice of this magnitude cannot be tolerated in a country where the disparity between rich and poor is widening.

A lack of power makes it difficult to carry out the activities of daily life that the vast majority of us consider routine. Vaccines that can save lives need to be kept at a cold temperature, necessitating electricity use in businesses, hospitals, and educational institutions. For households in Sub-Saharan Africa to achieve the same quality of living as families in other regions of the world, they need to have access to energy production on an industrial scale.

Despite technological advances, the worldwide commitment to ensure everyone can access sufficient energy by 2030 must move forward according to the original schedule. As a direct consequence of the predicament involving Covid-19, there have been significant setbacks. The number of individuals living in sub-Saharan Africa who do not have access to electricity increased in 2017, marking the first time in the past eight years that this trend has been observed. Because of the outbreak, it is now more challenging to establish communication between hospitals, households, companies, and schools. In contrast, the global economic downturn has severely constrained the budgets of African nations, reduced their ability to finance the development of renewable energy sources, and driven millions of people into a state

of extreme poverty in which they cannot pay for basic power services. In addition, the global economic downturn has reduced the ability of African nations to export their goods, which has further reduced their ability to finance the development of renewable energy sources. If nothing is done to prevent it, this could become a harmful pattern that is impossible to eradicate.

This essay explains how energy poverty and corruption can severely impede economic growth when they operate together.

1.4 Research Problem

1. What kind of an effect does corruption have on the economy of Africa?

2. Would a reduction in energy poverty encourage economic progress in Africa?

1.5 Significance of the Research

The findings of this study will have a significant positive impact on society as a whole as a result of the fact that corruption thrives in an atmosphere of secrecy and, as a result, preys disproportionately on those who are vulnerable and underprivileged. We are aware that, together with war and violence, unrestrained population expansion, the repercussions of climate change, and natural disasters, weak governance is one of the four key drivers of poverty. All of its effects can be felt directly. The provision of life-saving pharmaceuticals and medical supplies is delayed, new schools need to be built, roads are damaged, and the national budget is exhausted owing to corruption. Corruption undermines the forces that maintain peace and prevent the growth of extremism and violence in some of the world's most vulnerable regions. Corruption undermines public confidence in the government, which slows down development.

The second key finding from this study is the danger of energy poverty in Africa.

This research investigates whether less fortunate people, particularly in developing countries, have access to energy sources that are both more economical and less polluting. The study shows the importance of developing objectives to give Increasingly significant segments of the poor access to affordable, healthier, and

more practical energy sources. A legislative framework and public and private investment are needed to realize this.

This article covers the difficulties of acquiring energy sources that are more economical and friendlier to the environment. This objective aligns with the GEA goal for 2020: to ensure everyone has access to electricity and cleaner cooking fuels.

Significant resources will need to be committed to achieve this goal by the year 2030. Conventional solid fuels like biomass and coal must make way for cleaner energy sources like electricity, natural gas, and liquid fuels. Low-income nations also need enough time to set up their institutions. Regulations and policies must also be in place to mobilize and deploy the capital investments required to enjoy their benefits and accomplish the shift.

This study focuses specifically on developing countries for several reasons. The majority of the world's impoverished population resides in developing countries, which have a high need for energy due to the need to combat poverty, grow local economies, and foster social cohesion and development:

1. The study examines the characteristics of the destitute and the locations where they live.

2. It focuses on the historical relationship between development and the provision of energy services worldwide.

3. It states that improved energy services are also essential for emerging countries to overcome poverty. Notably, the five countries with the lowest incomes worldwide have the worst poverty levels.

The findings of this research also illustrate the crucial role that energy plays in encouraging economic growth, agriculture, trade, transportation, and employment—all of which are essential components in the fight against poverty. This research acknowledges the significance of energy as a source, recognizing its significance in ensuring the delivery of essential social services such as education, healthcare, and some other similar services. After that, there was a discussion of the unique challenges women encounter while using traditional energy systems and how these challenges impact women's use of their time, literacy levels, and overall health. The necessity of energy for accomplishing the Millennium Development Goals (MDGs) is also quickly highlighted by proving that energy is a critical input for each

MDG. Last but not least, local, regional, and global research is done to explore how energy usage in developing countries impacts the environment. The poor's small historical and current contribution to global greenhouse gas emissions must be emphasized.

The importance of energy as a source for securing the delivery of services like education, healthcare, and a few other social services is also acknowledged in this study.

1.6 Limitations of the Study

This study may have several limitations, including, for example, data accessibility and estimation. It is challenging to compare later perceived corruption dates to data gathered before 2012 because the study's measure of corruption (Corruption perception index) changed its methodology in 2012. As a result, the study required data on corruption from 2000 to 2011. Due to a lack of data, the estimated effect of corruption on the African economy from 2012 to 2020 is only available for 19 nations (Angola, Botswana, Burkina Faso, Congo Republic, Cote d'Ivoire, Cameroon, Ethiopia, Gabon, Ghana, Kenya, Madagascar, Mauritius, Mali, Mozambique, Namibia, South Africa, Tanzania, Togo, and Zimbabwe).

On the other hand, the variable determining whether or not a population is poor in terms of access to power is the population's elasticity. Despite the available statistics, not all forms of energy poverty are addressed. Life is employed as a stand-in for education in the model for the link between energy poverty and economic growth because most African countries lack access to the variable education.

These are the study's most important limitations. The researcher urges readers to remember these while they read this work.

1.7 Crucial Words Definition Africa

After Asia, the continent with the most people living on it is Africa, which also happens to be the second largest. It covers about 30.3 million km2 (11.7 million square miles), or 6% of the Earth's total surface area and 20% of its land area, including nearby islands. With 1.4 billion people, it will have a population of about 18% of the world in 2021. With a median age of 19.7 in 2012, well below the

worldwide median age of 30.4, Africa has the youngest population in the world. Africa is the second-least wealthy continent, behind Oceania, and has the highest per-capita level of micro-wealth.

Corruption

Those in authority often act dishonestly or unlawfully to earn illicit benefits or exploit their position for personal gain. The term "corruption" can refer to various actions, including bribery, influence peddling, embezzlement, and, in some countries, legal violations.

energy scarcity

Lack of access to stable, contemporary energy sources is known as energy poverty. The quality of life for millions of people in developing countries, especially in industrialized countries, is substantially impacted by low energy utilization, the use of dirty, polluting fuels, and the additional time needed to collect fuel to satisfy basic demands.

economic expansion

Economic and social development is described as "the process through which a country, region, local community, or person improves its economic well-being and quality of life by specified aims and objectives" by economists who investigate the public sector.

Panel evaluation

In the social sciences, microbiology, and economics, panel analysis is a well-liked prediction approach for assessing two-dimensional (usually cross-sectional and longitudinal) data sets. Generally, data acquired from the same individuals across time is utilized to do a regression on these two variables.

CHAPTER II
LITERATURE REVIEW

2.1 Theoretical Literature

2.1.1 Africa

Despite possessing immense natural riches, Africa is the world's poorest and least developed continent. Numerous causes contribute to Africa's underdevelopment, including corrupt administrations that have repeatedly exploited people's rights negatively. In addition, common tribal and armed conflict, high illiteracy, low self-esteem, a scarcity of foreign money, and the lasting consequences of colonialism, the slave trade, and the Cold War all contribute to the country's general dysfunction (varying from guerrilla warfare to genocide) (ranging from guerrilla warfare to genocide) (ranging from guerrilla warfare to genocide). [Citation needed] (Richard, 1985) .

Extreme poverty, low levels of education, food insecurity, a lack of good water and sanitation infrastructure, and poor health are common throughout Africa. These may be linked to the failure of economic liberalization attempts promoted by transnational firms and governments outside. Yet, another study has indicated that weak domestic government policies are more likely to blame than overseas forces.

Africa is home to the world's majority supply of minerals, including 90% of the world's cobalt, 90% of platinum, 50% of gold, 98% of chromium, and 70% of tantalite. The impact of advanced nations on Africa. Uranium at 33% and manganese at 64%. (Africa: China's Next Frontier, June 29, 2011) Seventy percent of the coltan mined presently comes from (DRC) Congo. Coltan is a mineral used to manufacture tantalum capacitors in electronic gadgets. More than 30% of the world's diamonds are in the Democratic Republic of the Congo. The BBC noted on November 16, 2006, that the forthcoming election in the Democratic Republic of the Congo is crucial for Africa. Bauxite is Guinea's primary export. This is because most of Africa's economic success has been driven by industry, agriculture, or other areas that might result in net job creation or poverty alleviation.

With raw resources making up such a significant component of Africa's export portfolio, the region's capacity to produce cash from those sales is sensitive to swings in commodity prices. Yet, this exposes it to external shocks and highlights the need for export diversification. Nonetheless, trade in services, especially travel, and tourism, rose in 2012, showcasing Africa's great economic potential. (Economic

Outlook, John J. Saul and Colin Leys). Furthermore, "African Economic Outlook" (2012; accessed June 13, 2012) (2012; accessed June 13, 2012) (2012; accessed June 13, 2012) (Sub-Saharan Africa under Global Capitalism, Monthly Review, 1999, Vol. 51, No. 3, July–August).

2.1.2 Corruption

Corruption refers to fraudulent or illegal conduct by those in roles of power to receive improper benefits or abuse their influence for private gain. Corruption may encompass multiple behaviors, such as bribery, influence peddling, embezzlement, and other crimes in many nations.

Corruption and crime are problems in nearly every country, though to differing degrees and in varied amounts. Hence, each nation invests local resources in combating crime and controlling and regulating corruption.

2.1.2.1 Theory of Corruption

The Redistributive Corruption Theory. Redistributive corruption characterizes the connection between the state and society in which the state is the losing party. The government and the ruling class are not the only ones who benefit from corruption; other well-organized and powerful social and economic groups, interests, and people do. As a result, the political and state-based elite need to reap the full profits of resource extraction, privatization, and consumption. Instead, the power structure of a country dictates who gets what from the state's resources.

Some of the world's most broken states serve as inspiration for the concept of redistributive corruption. Examples include places like Bangladesh, where the creation of clientelist networks has undermined the state, and Russia, where the development of mafia activity has caused a loss in government legitimacy. Corruption in government and the economy is a serious concern, with particular attention paid to "subversive" individuals and forces. For example, politically influential and well-organized groups can employ corruption to weaken the administration's legitimacy here. Corruption will forcibly build links with officials who will then deliver services and goods on behalf of the state. Paying off politicians will result in more favorable legal protections and laws for the donors. Given that the regime's very survival may depend on political support from these organizations, they will be extorted or paid to demonstrate their power. What forces are available in

each area will decide who will gain the most from this corruption. Influential ethnic or regional groups or clans desiring an unfair share of government resources, development initiatives, foreign support, regional autonomy, and membership in national institutions are examples of potentially disruptive players. (Inge Amundsen, 2019).

National resources, concessions, unique treatments, permits, and tax incentives may be sold to foreign and local firms at a discount. In addition, privileges like tax refunds, subsidies, pensions, unemployment insurance, and preferential access to major educational institutions, medical facilities, and real estate are accessible for purchase to the general public and individuals.

The state and its regulatory authorities come out on the losing end of this game. People, businesses (domestic and international), and interest groups (formal and informal, modern and historical) can pay public personnel for favorable treatment. As a result, access to sensitive information, protection from prosecution, and other elements of governmental authority inevitably weaken.

Redistributive corruption weakens and paralyzes the state. As a result, the state's ability to collect taxes, provide key services, reform society and the economy to reach political goals, and carry out practical development plans would suffer.

If an allocation is corrupted, resources would be privatized and redistributed depending on the strength of institutions to influence choices by force and bribery. Rather than on the principle of "one man, one vote." "universalist" or ideological grounds will not decide needs and fairness. Those most in need of political redistribution will be hit hardest by changes to the state's capacity to deliver fundamentals like decent education, healthcare, social services, and security.

State authority will weaken when private persons, businesses (domestic and international), and interest groups (formal and informal, current and past) pay public officials for special treatment, access to personal information, and immunity from prosecution.

The Extractive Corruption Theory. According to the competing hypothesis of extractive corruption, the state is the more powerful actor in this dynamic. This notion holds that the state or agency (the tainted) earns the most from corruption. At the same time, the corruptor plays a secondary role. The ruling elite retains a significant amount of authority in our culture. This group utilizes their societal rank to extort money and other resources from the rest of the society. The operation of

authoritarian and neo-patrimonial administrations partly informs this concept. The state is not simply the most potent institution in modern society. The ruling elite has likewise positioned themselves as a leading and exclusive group regulating all facets of state life. Another thing this theory brings up is the apparent truth that power corrupts and that absolute power ultimately corrupts. Under this approach, the bigger the incentive for power abuse, egocentric wealth-seeking, and primitive extraction, the greater the degree to which political power is concentrated in the hands of a small number of individuals.

The conventional political science premise is the cornerstone for the extractive corruption argument. This is the belief that a society established on coercion is largely in the best interests of the rulers. Authoritarian tyrants exploit state power to gain and consolidate control, enrich themselves at the expense of their subjects, and expand their empires. The ancient Greek philosopher Aristotle distinguished between "the rule of law" and "rule of force" in his works. This concept of authoritarianism extends back to his time. A democratic government for the good of its citizens was the rule of law (all citizens, the public, or the nation as a whole) (all citizens, the public, or the nation as a whole) (all citizens, the public, or the nation as a whole). On the contrary, tyranny was a corrupt, authoritarian administration that exclusively served the ruler's interests (the tyrant or some oligarchs) (the tyrant or some oligarchy) (the tyrant or some oligarchy).

The state is not only the most powerful entity in modern society. Hence, the ruling elite has established itself as a prominent and exclusive group with jurisdiction over all sectors of state life. But, the state is more than just the most powerful institution in society. Authoritarian leaders utilize a wide range of methods in power, from subtle persuasion to open brutality. For example, they may use presidential systems, single-party regimes, or the elimination of rivals through mergers and acquisitions to limit participation and power sharing. Human rights breaches, including political monitoring and intimidation, arbitrary incarceration, and torture, are also achievable when such governments are in power.

There are several techniques of economic accumulation and private appropriation that authoritarian tyrants pursue, corruption being just one of them.

Moreover, neo-patrimonial political systems, present throughout most of Africa and in a few Latin American and Asian states, offer the ideological framework for extractive corruption. In political science, neo-patrimonialism is a famous

appellation for a subset of non-democratic and semi-democratic regimes typified by substantial patron-client structures, a blurring of public and private domains, and political weakness.

2.1.2.2 Scales

Petty Corruption. There is rampant corruption at the bottom level of government in developing countries when ordinary inhabitants and companies contact the government.

Petty corruption happens on a smaller scale during the implementation phase of public services when public employees come into contact with ordinary people. For example, in several secondary settings (Transparency International, 2009)

Petty corruption may not involve significant sums of money, but it can seriously harm the economy and society. According to some estimates, up to one-fourth of the world's population, or roughly two billion people, maybe hurt by petty corruption. This includes Transparency International's Global Corruption Barometer (GCB) (Klarity Blog, 2018). (Klarity Blog, 2018). (Klarity Blog, 2018).

Research reveals that the poor suffer the most from small corruption since they rely more on public services. Small, frequent bribes could pile up to a large sum when averaged nationally or worldwide. Additionally, because petty corruption often occurs at the point of service delivery, it quickly damages individuals' access to public services and degrades their living standards. (Klarity2018).

At the basic level, where regular inhabitants and companies contact with government officials, corruption is rampant in developing countries.

Transparency International (2009). (2009). (2009). Petty corruption happens on a lesser scale when public employees connect with the general public to implement governmental services, for example, in a wide variety of secondary contexts, including public and private registration and police departments, as well as state licensing boards.

The ramifications of petty corruption on the economy and society are substantial, despite the comparatively tiny sums of money involved. Transparency International's Global Corruption Barometer (GCB) indicates that as many as two billion individuals, or one-fourth of the global population, may be touched by low-level corruption (Klarity Blog, 2018). (Klarity Blog, 2018). (Klarity Blog, 2018).

The cost of moderate, recurring bribes can be relatively substantial when added up on a national or international scale. Additionally, because petty corruption often occurs at the point of service delivery, it quickly weakens individuals' access to public services and decreases their living conditions.

Since it encourages corrupt bureaucrats to adopt more rules, regulations, and red tape to broaden their possibilities to extort bribes from individuals and firms, minor corruption has a long-term harmful effect on a nation's governance and regulatory environment (Chêne, 2013). Additionally, minimal corruption may result in a vicious loop when dishonest bureaucrats have less desire to reduce red tape and administrative inefficiencies, offering them the opportunity to demand bribes. Thus, facilitation incentives will motivate corrupt officials to establish phony bottlenecks rather than decrease redundant paperwork, thereby contributing to inefficiency and bureaucratic load (Dzhumashev, 2008). (Dzhumashev, 2008). (Dzhumashev, 2008).

Petty corruption reduces the legitimacy of governmental institutions, hinders democratic processes, and threatens the rule of law since people regularly interact with them. This is corroborated by research looking at how citizens in Mexico feel about corruption and how they feel about the government (Morris & Kleiner, 2006). (Morris & Kleiner, 2006). (Morris & Kleiner, 2006). Loss of faith in government institutions can have devastating implications, as seen during the Ebola pandemic of 2014. People in Sierra Leone and Liberia allegedly shunned medical aid from groups they did not trust due to petty corruption, leading to the Ebola virus's spread (Steiner, 2017; Mackey et al., 2016). (Steiner, 2017; Mackey et al., 2016). (Steiner, 2017; Mackey et al., 2016).

There is evidence that corruption impairs the progressiveness of the tax system, leading to a tax system that benefits the wealthy and is well-connected and eventually affects income distribution (Nawaz, 2010; Chêne, 2014) since bribes can be used to facilitate tax evasion. Petty corruption has been demonstrated empirically to diminish people's propensity to pay taxes. Data collected by the Afrobarometer in 31 African nations reveals that people's tax motivation is already low due to their experiences with petty corruption and fears that the tax authority is

not doing what it should (Jahnke, 2015). (Jahnke, 2015). (Jahnke, 2015). Rule of law institutions are weakened when corrupt practices are allowed to persist. Regardless of the bribe amount or its motivation (whether to speed up bureaucratic procedures or to receive an unjust benefit), bribery always leads to a breach of public office

norms and inconsistent implementation of the law. This is why bribery threatens the rule of law: it always leads to a breach of public office norms and inconsistent implementation of the law (David-Barrett, 2012). (David-Barrett, 2012). (David-Barrett, 2012).

Corruption on a massive scale. There is no concept of large-scale corruption that is generally accepted. Instead, throughout the course of time, specialists have developed many general definitions, each of which incorporates a different level of what they consider "great corruption." In spite of this, there is a degree of consensus regarding certain aspects, such as I the misuse or abuse of high-level power; (ii) massive scale and vast sums of money; and (iii) the occurrence of negative outcomes. These categories have also made it easier to discriminate between other types of corruption, such as small-scale and large-scale corruption, which are both examples of corruption. As high-level corruption scandals are typically met with little to no repercussions, increased efforts have been made to reduce impunity for corrupt high-level officials; it is necessary to define grand corruption in the law as a first step toward giving national and international agencies more effective legal tools to pursue such people. In this case, a legal definition of grand corruption is important because it will help national and international authorities pursue corrupt high-level officials with more effective legal instruments. Countries with authoritarian or totalitarian regimes and lax enforcement of anti-corruption laws are especially vulnerable to this corruption.

In light of what has been said up until this point, grand corruption can be defined as the misuse of high-level power to favor a minority to the detriment of the majority. It is a methodical or well-organized plot that causes serious damage, such as severe human rights violations, and involves high-level government officials as participants. Consider a situation in which a physician agrees to take a bribe from a patient to move them up the waiting list. On the other hand, grand corruption occurs when the minister of health colludes with other public officials and shady businesses to siphon off funds from the entire medical system of the country and put the money in their own wallets. This is corruption, even if it is only a small bribe.

In this scenario, the minister's close cronies may be awarded government contracts despite their lack of qualifications for the purpose of establishing new hospitals or acquiring new medical equipment. These companies may be permitted to up their rates and give some of the illegal profits they make to corrupt government

officials. The World Bank identifies anonymous shell businesses as one of the most egregious forms of corruption because it allows the concealment of the transfer of financial assets.

At the expense of those who should legitimately benefit, massive sums of public funds are routinely siphoned off to the accounts of a few influential people through grand corruption. This happens at the same time that financial institutions and other facilitators help people who are involved in money laundering. When large-scale corruption and state capture occur, high-level officials may use their legislative and regulatory authority to justify their acts while also limiting their monitoring and enforcement responsibilities.

People who engage in grand corruption profit from impunity by intervening directly with the judicial system and hindering law enforcement in order to escape being held accountable. This allows them to avoid being held accountable for their actions. It is possible that using the levers of state power will inhibit the efforts of civil society and the media to investigate and expose corruption on their own.

In the most extreme cases of grand corruption, "the entire government has changed into a criminal organization whose only goal is to make money for itself, and it has redesigned the essential gears of state authority to achieve this goal." This statement describes when the government has become a criminal organization whose only goal is to make money for itself.

In many nations, the legislative, executive, and judicial departments of government are maintained distinct from one another to provide services that are less susceptible to being tainted by corruption.

The corruption of the system. Those working within the system, whether officials or agents are corrupt. The fundamental reason behind systemic corruption, also known as endemic corruption, is flawed in either the system itself or the way things are carried out.

When corruption occurs in a system, dishonorable behaviors such as bribery, blackmail, and theft become the norm rather than the exception. Many variables contribute to systemic corruption, including opposing interests, monopolistic power, discretionary authority, a lack of transparency, poor remuneration, and a culture of avoiding getting caught. Experts categorize systems of corruption as either "centralized" or "decentralized" according to the degree to which they are rooted in state or federal government corruption. Both types can be found in nations formerly

part of the Soviet Union, such as those in Eastern Europe and Central Asia. A school of thought among academics holds wealthy nations accountable for preventing the widespread corruption plagues less developed nations' governments.

2.1.2.3 Causes

If the gain from being dishonest is greater than the punishment multiplied by the likelihood of getting detected and punished, there will be corruption in the system. (Klitgaard Robert, 2018)

The "mentality problem" is meant to be understood by the "intrinsic component" of the moral dimension. Some people have suggested adding a fourth aspect, "morality" or "integrity," to the combination. While having a lot of power, discretion, and secrecy may not inevitably lead to corruption, some people have added this factor to the mix. On the other hand, extrinsic factors include poverty, insufficient salary, terrible working conditions, and procedures that could be more workable or concise. These things discourage people and drive them to seek "alternative" solutions.

According to the results of a survey conducted in 2017, all of the following have been associated with corruption:

A sign of greed is when someone wants more money. We are witnessing an increase in the monopolization of both industry and the government. A democracy with pitiful levels of citizen participation, political transparency, and openness to the public. The administration needs to grow more inefficient while also becoming more cumbersome. Less journalistic freedom, less economic opportunities, less cultural tolerance, and more intra-group prejudice than before. Severe poverty, as well as discrimination based on gender, The unpredictability of politics, protections for private property that are woefully inadequate, Infection by corrupt nations located on the country's perimeter, poor education, a failure to devote oneself to society, superior kinship, a lack of anti-corruption measures, and high unemployment rates, are all contributing factors. It has been observed that social and economic inequality levels correlate with the levels of corruption in society. Countries with high levels of corruption typically have cultures and economies that are more unequally distributed. (Khair Tabish, 2019)

There have been numerous credible reasons regarding corruption produced over the years12, many of which are based on various civilizations' moral and cultural aspects. For instance, it has been stated that cultural norms inherited from a

patrimonial past such as bargaining, gift-giving, and unconditional solidarity with extended families, clans, and other community organizations are factors that contribute to the pervasiveness of corruption (de Sardan, 1999, p. 25). This may help put some insight on the cultural contrasts that exist between Catholic states in Western Europe that have a "Latin" cultural background, Protestant nations in the Nordic region, and the gap that exists between Africa and Europe. In addition, in certain nations, engaging in private activities for the purpose of furthering one's own interests is not only not considered unlawful. Nonetheless, many in government positions working for the benefit of their families and friends view it as a moral obligation. It has been the position of certain cultural relativists that corruption is not immoral if most people approve of it. As a consequence of this, the same behavior may be frowned upon by society as well as the law. In addition, whether or not corrupt behavior becomes a criminal offense is determined by both national law and cultural standards.

It is necessary to develop all-encompassing theories to combat the pervasive corruption problem. According to the concepts and ideas we looked at earlier, economic and political factors are the ultimate root causes of corruption, especially in politics. This is especially true in the political sector. Explanations based on culture tend to be overly particular. As a result, solutions that focus on structures and institutions (both economic and political) are selected.

2.1.2.4 Methods

Bribery. Bribery is the practice of someone in a position of power accepting something of value in exchange for changing a decision, supporting fraud, or breaking the law. On behalf of the people they serve, leaders in industry and government are responsible for making tough decisions and allocating limited resources. Bribery is the illegal and immoral practice of offering or accepting something of value from a public or corporate official in exchange for that official's help in influencing a decision, committing or permitting fraud against the official's organization, or violating the official's other duties.

Bribery can be defined as the corrupt act of giving or accepting gifts or favors in exchange for an inappropriate benefit. Bribery can also refer to the activity itself. Money, presents, real estate, promotions, sexual acts, salary and benefits, corporate shares, privileges, entertainment, jobs, and political rewards are only some of the

items that can be exchanged for favors. Here are a few instances of such things: The advantage gained could be anything from a temporary reprieve from normal procedures to an outright erasure of any record of wrongdoing. One of the most widespread forms of corruption is bribery.

There are instances in which bribery is utilized as a component of a more extensive network of corruption that serves various purposes, including the furtherance of corruption. It's possible that extortion and blackmail are easier to pull off on authorities when there's corruption in the system.

Theft, Fraud, And Embezzlement. A person who has access to a corporation's finances or other assets has a responsibility to protect those assets for the benefit of the firm and to utilize them only as intended. Embezzlement is the act of stealing money or property from a company or organization and using it for one's own personal gain. Individuals commit this type of theft. Embezzlement is a white-collar crime that occurs when a person entrusted with money, property, or other assets steals or otherwise illegally uses them for their own profit. This might include using them for their own business or personal gain. When someone with access to money or property commits theft or embezzlement, they unlawfully seize custody of or control over the assets in question.

They are committing fraud when someone cheats the system by lying, using trickery, or breaching trust to get an unfair or illegal advantage. Someone is committing workplace fraud when they intentionally use or mishandle the resources or assets of their employer to gain money for themselves. An essential aspect of the concept of fraud is cheating. Someone is guilty of fraud if they deceive another individual or organization by providing them with false information or by trying to conceal information from them in order to gain financially or to escape legal liability. Fraud and corruption are closely related, yet they are not the same thing at all, despite the fact that there is some overlap between the two. Fraud is the intentional deception or misleading of another person in order to gain an advantage that is either illegal or unjust. Corruption, on the other hand, is the misuse of authority for personal gain. As a violation of criminal law or of civil law, fraud can be penalized because it falls into either of these categories. Some examples of corrupt activities include diverting firm finances into "shadow corporations" (which ultimately line the pockets of dishonest personnel), the theft of cash intended for overseas help, frauds, electoral fraud, and other schemes that are very similar to these types of scams.

Graft. Government employees or elected officials should award contracts to the companies who have submitted bids that are both the lowest and the most transparent. This would allow for the most efficient use of taxpayer funds. A political graft may be said to have occurred when an official abuses authority by, for example, manipulating the procurement process or diverting public monies to the advantage of the official's private interests.

A public official is said to be engaging in corruption when they take money or other government resources to line their pockets with the stolen funds or resources. These vested interests typically consist of either private companies in which the corrupt official has invested money or associates willing to pay kickbacks or bribes in exchange for preferential treatment. Vested interests are a form of conflict of interest that arises when one party has a financial stake in the outcome of an event. When public authorities pick a vendor or contractor to execute a government contract, this presents a prime opportunity for corrupt behavior in politics. A corrupt official may provide a huge contract to a "friendly" business in exchange for bribes, and the contract's price may be marked up greatly.

This "friendly" corporation could then pay a financial kickback to the corrupt official or pay bribes to other government officials to remain undetected.

Blackmailing and other forms of coercion. When a person or group tries to coerce or frighten a victim into giving them money, property, or other assets, they engage in extortion. The person or item in question could threaten to attack the victim, inflict physical harm on them, or reveal a secret that would put them in a precarious position regarding their relationships with other people, their finances, or their legal standing.

A key distinction between extortion, sometimes known as blackmail, and bribery is that the latter include issuing threats, while the former involves delivering an inducement. Intimate partner abuse can be actual or threatened physical violence, illegal imprisonment, or the disclosure of the victim's private information or past indiscretions.

Take, for instance, the scenario in which a prominent person threatens to go to the media in the event that they do not obtain prompt medical attention as an illustration. If police officers drag out an inquiry into a powerful person, they risk losing their jobs. They either demand money in exchange for keeping a secret to themselves or

threaten to reveal the secrets of a public official if that official does not vote in a certain way.

Buying and Selling Influence

The unethical and unlawful practice of contacting or utilizing one's position in government to obtain one's interests, such as favorable legislation or other benefits, in exchange for money is referred to as "influencing others" and is referred to by the term "influence peddling."

2.1.2.5 According to Sector

Corruption can exist in governmental institutions, commercial businesses, and even non-profit organizations. To counteract either active or latent forms of corruption, however, democratically run organizations are the only ones in which the public (as the owner) is incentivized to establish internal policies and procedures. The government imposes no regulation on private companies or non-governmental organizations. Consequently, the ability of the investors or sponsors to make a profit is the most crucial issue to consider.

The corrupting of politics. Politicians are corrupted when public workers abuse their power to benefit themselves through bribery or extortion. Bribery and extortion are two common forms of political corruption. Corruption can also occur when persons in positions of authority are able to maintain their positions by buying voters with legislation that would, in the end, cost more money to the general population. According to the research findings, corruption might have political ramifications because individuals approached for money are less likely to care about their country or locality.

The term "graft" (American English) refers to a sort of government corruption common in today's society and widely acknowledged. It is unethical and illegal to exploit political authority to obtain private gain when the money intended for public initiatives is used to benefit the corrupted person(s) and their friends the most. It is also fairly uncommon for government agencies to change their initial mission, commonly known as "repurposed," to fulfill new goals, which are often corrupt.

Public. Under the umbrella phrase "public corruption," we refer to the inappropriate use of public resources such as contracts, grants, and employment and the bribing of government officials and workers such as tax collectors and police officers.

According to the findings of a recent study conducted by the World Bank, the incentives that different policymakers (elected officials vs. bureaucrats, for example) confront may have a major impact on the level of corruption that exists (Hamilton Alexander 2013).

Judicial. Corruption in the judicial system can manifest itself in a variety of ways, including judges accepting or offering bribes, meting out harsher punishments to convicted offenders than are warranted, and displaying prejudice in the way they handle cases. It is also possible for defense attorneys and prosecutors to participate in corrupt behavior in the court system. Court corruption on the part of the government is a common problem in many developing and transitioning countries, especially those in which the executive branch controls practically the entire budget. The fact that the court will be financially reliant on the government as a result of this presents a significant challenge to the idea of the separation of powers.

It takes work to eradicate corruption in the legal system. Actions taken by the government or private parties, such as preparing the budget or doling out special privileges, can taint the judicial system. In the event that the judicial system is tainted, the government may try to suppress opposition groups by using the legal system.

Military. When personnel of the armed forces abuse the authority they have been given for unethical reasons, this is an example of corruption in the military. Corruption in the military can take many forms. One example is when an officer favors a member of the enlisted ranks by giving them special treatment or promoting them to a higher rank because of their race, sexual orientation, ethnicity, or gender. Nonetheless, some of them are not because of their merit but rather because of their religious convictions, their social class, or personal links with higher-ranking officials. In addition, there have been countless reports of sexual misconduct involving members of the armed forces in various countries all over the world. It has been stated that officers of the same or higher rank have put victims under pressure to keep quiet in order to cover up several assaults.

A high-ranking officer or enlisted member committing a crime, such as stealing goods for the purpose of reselling them on the black market, is an additional example of military corruption. In addition, abundant evidence indicates unauthorized instances of military commanders sending guns and other forms of combat assistance to criminal gangs, private military corporations, and terrorist organizations. As a

consequence of this, a lot of countries have specialized military police services that are in charge of making sure the personnel of their armed forces act appropriately when they are at home. Yet, military police are not immune to the influence of unscrupulous officials.

Natural Resources. Natural resources like diamonds, gold, oil, and wood can all make corruption worse in places with less democracy. Massive corruption happens, for example, when a large amount of money is paid to a company. On the other hand, petty corruption happens when a poacher pays a park warden a small amount of money to ignore poaching. Corruption goes hand in hand with the extraction and export of fuel, while the export of minerals encourages corruption in less-developed countries. Countries that sell valuable goods like gold and diamonds tend to have less corruption in their governments. The Extractive Industries Transparency Initiative (EITI) is working to make transparent and responsible resource management the same across the industry. The way that states handle the money they get from gas, oil, and minerals is getting a lot of attention. Corruption can hurt a wide range of resources, such as fisheries, logging forests, hunting, irrigation water, and grazing land.

Corruption, whether real or imagined, is another thing that hurts efforts to protect the environment. For example, criminal activity can be blamed for Kenya's low agricultural output. Because of this, farmers are less likely to use methods that keep the soil from washing away and the nutrients it contains from being lost. Small farmers in Benin were also reluctant to do anything about climate change because they thought the government was corrupt and didn't like the way it ran things. (Tacconi; Williams, 2020).

The police being crooked. Corruption in the police force happens when an officer or officers break the law in exchange for money, personal gain, or a higher position in the department. One common way for police to be corrupt is to ask for or accept money in exchange for not reporting drug networks, prostitution rings, or other illegal activities. Here's an example of both asking for and taking one of these kinds of payments. When members of the "thin blue line" work together to cover up wrongdoing by their departments, unions, or other officers. Also, when people see police brutality, officers often retaliate by harassing and threatening the people who saw it. They do this to stop the people from telling anyone else about the bad behavior.

Education. Corruption is a big problem in the education system all over the world. In the history of the education industry, corruption in university admissions has been seen as one of the most corrupt parts of the industry. When there is a lot of corruption in schools, it leads to tainted hierarchies that can last for a long time. Because of the corruption in the educational system, people have less faith in the government, inequality worsens, and economic growth is slowed. Corruption can happen in elementary and secondary education in a number of ways, including academic dishonesty, bribery, hiring teachers based on family ties, and bid-rigging for textbooks and school supplies. These are just a few of the many ways corruption can look.

Healthcare. Corruption causes much trouble for the healthcare system and hurts it in the long run. Evidence shows corruption hurts people's health and well-being (McPake et al., 1999; Gupta et al., 2002; Azfar, 2005; Lewis, 2006; Rose, 2006). Transparency International's definition of corruption says that there are many examples of it in the health industry. Corruption is when people use their power to make money for themselves. For corruption to happen in the healthcare system, there must be centralized service delivery, reliable discretionary power for those in charge, and little responsibility to others. Because of this, corruption in the medical field is a big threat to the well-being of the whole population.

2.1.2.6 Repercussions of Corruption

When there is political corruption, people are more likely to ignore or break the rules. This is bad for democracy and good government. When there is corruption in elections and laws, it changes how people are represented when the policy is made. This makes it hard to hold people responsible for what they do. When judges are corrupt, the rule of law is in danger, and when public workers are corrupt, it's hard to meet the needs of the people. It goes against one of the most important ideas of republicanism: people should pay attention to their civic responsibilities. Corruption makes government institutions less effective, even when rules are followed, resources are used well, and public offices are bought. Corruption can make it hard for people to trust their government and undermine democratic values like tolerance and openness. Recent evidence shows that decision-makers responsibility plays a big role in explaining why corruption rates in wealthy countries are so different.

Evidence shows that corruption and bribery can make people lose faith in institutions. The information comes from weak countries. It may be necessary for the government to become more corrupt to be able to provide more services and goods. If production and distribution are less efficient, goods and services prices go up. Government programs that were beneficial when looking at their actual costs may no longer be beneficial when looking at the costs of corruption. This will affect the supply of goods and services.

Effects on the current state of the economy Corruption makes it more expensive to do business in the private sector because it costs money to spend money illegally, it costs money to talk to the authorities, and there is a chance of breaking deals or getting caught. Some people think that corruption can save money by cutting down on the amount of paperwork that needs to be done. However, the fact that officials can accept bribes may lead them to add more rules and delays. It is better to sneak around rules that are hard to follow or cost a lot of money than to make people pay to get around them. Corruption makes doing business more expensive and makes it harder to find out what went wrong and fix it. It keeps businesses that could be better at what they do from going out of business and protects businesses with connections.

Corruption can immediately and directly affect a company's effective marginal tax rate. If the marginal bribe rate is lower than the marginal tax rate, a company can lower its tax bill by giving money to tax officials. If this is the case, a company might decide to do this. But in Uganda, paying bribes is a much bigger deterrent to business than paying taxes. For every point that bribery is allowed to go up, an organization's annual growth slows by 3 percentage points. On the other hand, growth only slows by one percentage point when taxes go up by one percentage point. (Nicaise, 2019)

The economy needs to be fixed when public money is moved to private capital projects so that kickbacks and bribes can be made more easily. This is one of the many bad things that happen when public sector employees are dishonest. Officials in the public sector could also add many layers to projects to hide or make it easier for illegal deals, which would further distort investment. Corruption also hurts the quality of government services and infrastructure by making it harder for people to follow rules about construction, the environment, and other things.

Economists think that rent-seeking corruption in Africa is one of the reasons why the continent has yet to develop as much as it could have. It's done by keeping

money from investments in the home country (hence the stereotype but the often-accurate idea that African tyrants have Swiss bank accounts). For example, from 1960 to 1999, Nigeria's government stole more than $400 billion from the national treasury.

Society and the environment both have to deal with the results. Regarding corruption, the worst offenders are almost always places where medical care is paid for with money from other countries. For example, local politicians in countries in sub-Saharan Africa often take money from people outside of their country. According to a study done by the World Bank in 2006, more than half of all donations to health-related causes are never actually used to help people who need it. Some things bought with the stolen money were "fake medicines, pharmaceuticals shipped to the black market, and ghost labor." There are enough financial resources for health care in developing countries. On the other hand, local government corruption makes it impossible for the people to get the services they need.

Corruption is one of the main causes of the destruction of the natural environment. Even in countries with a bad track record on human rights, laws may be in place to protect the environment. But if the government can be bribed, these laws will never be enforced. The same goes for policies that try to protect people who work for social rights, ban labor unions, or limit how much children can work. One thing that all of these plans have in common is that they all fail. Countries with much corruption can get an unfair economic edge by not following these rules and rights.

A Nobel Prize winner in economics named Amartya Sen has said, "There is no such thing as an apolitical food problem." Famine is a natural result that can happen when natural disasters like drought happen. On the other hand, the actions or inactions of governments often have an effect, not only on how bad famines are, but also, in some cases, on whether or not they happen.

The 20th century is full of examples of governments that did things to hurt their countries' food security on purpose. Even when there are a lot of crops, governments with a strong tendency toward kleptocracy can make it hard to get enough food. Often, people in power steal things that belong to the state. In the Indian state of Bihar, for example, dishonest officials steal more than 80% of the food aid meant for the poor that is paid for by the government. Similarly,

governments, criminals, and warlords would sometimes steal food supplies at gunpoint to sell them on the black market for money.

What will happen if humanitarian aid is given? Aid for some of the most dangerous and poor parts of the world has never been better. To put that in perspective, bribery and other forms of corruption are especially likely to happen with food aid, building aid, and other high-value aid. Changes to assessment criteria, like target demographics, registration processes, and patterns of food aid distribution, can be used to keep food aid from going to the people it was meant for. Along with direct food assistance theft, this is also done. There are a lot of ways to cheat and make money in the building and real estate industries. These problems include bad work, paying bribes to get contracts, and unequal distribution of things like bricks and shingles. So, people getting help care more about keeping their health than getting too much help.

On the other hand, humanitarian aid agencies worry more about helping the wrong people by adding too many. It's possible that the only people who can get help will be those who have a lot of connections, are willing to pay bribes, or are forced to do sexual favors. In the same way, anyone who knows how to do it can change data to increase the number of people who get money and steal even more.

During armed conflicts, people often go hungry, get sick, get hurt, are tortured, are persecuted for being part of the community, go missing, are killed without a trial, or are forced to move. Also, disasters have effects that are felt not only by the people who have been affected right away but also by the infrastructure in the area. They can damage crops and places with a lot of cultural significance. They can also break down economic infrastructure and shut down important services like hospitals.

What It Means for Health Corruption is a big problem in the healthcare system as a whole. It starts with medical facilities like hospitals and goes on to include government agencies and other groups that work to improve access to affordable, high-quality health care. For a country's health care delivery system to work, it must have responsible and clear procedures, good financial and human resources management, and timely care for the most vulnerable people.

At the most basic level, greed is the main reason corruption has reached heights never seen before. Since the structure of the healthcare system needs to be controlled

well, starting with the rules for healthcare delivery, drug supply, and the bidding process, money will inevitably be mismanaged or stolen.

Corruption can also make it hard to get health care, which would make the lives of the poor even more unstable. People who thought the government would give them basic medical care are also being turned away because of practices driven by dishonesty and greed. So, for a country to keep the health of its people in good shape, it needs to have good systems and the money to deal with problems like corruption that are at the root of the problem.

Effects on the Way People Learn Education not only sets a person up for a successful life, but it also makes life better for everyone in every way. Unfortunately, there is a lot of corruption in higher education, which means that something must be done immediately. More and more people, including students and professors, are worried about the possibility of corruption in higher education institutions. Universities and colleges put a lot of pressure on their employees, putting their work quality at risk. Corruption in higher education makes it less likely that people will work hard and get credit where it's due. This makes it one of the worst kinds of academic misconduct. Also, workers and students start to think that their performance doesn't depend on how hard or smart they are, but on how much they lobby their instructors and take other shortcuts. They start to think this way because they think taking these shortcuts is easier.

Because of corruption in higher education institutions, there is no longer any way to make progress in the classroom. At the moment, getting ahead in a career depends more on how well you get along with other people than on how well you do at work. Because of this, there has been a big rise in the number of lecturers, which shows that the status of these professionals is going down. Also, graduates need more time to be ready for work because schools use bad methods. When there is corruption in an educational system, the standards for the whole system go down.

Also, plagiarism taints academic research because it impedes students' learning goals and stops them from having their own ideas. When people break a system's rules, their actions directly affect how that system works. For example, many high-ranking CEOs and government workers choose to get a PhD instead of college. This allows them to take advantage of business and networking opportunities with institutions. Education quality is worsening because of things like

money, power, and other forces. Because of this, the legitimacy of higher education is questioned, and the quality of the student's thesis report needs to improve.

There are also problems with public safety, police corruption, and labor unions. It's not true that corruption only happens in countries that are just starting to develop or are in the middle of a political or economic change. Bribery and other forms of corruption are a big problem in the whole of Western world. Patients have been known to pay off-the-books fees to well-known surgeons to move up the waiting list for elective surgeries. This is done so that you can get help first. Low-quality connectors used in safety equipment like airbags have been linked to bribery in the auto industry. The people who sell these connectors give kickbacks to those who buy them. The auto industry is involved in the claims. Most of the time, the capacitors that suppliers sell to companies that make defibrillators are better than what is needed. Buying votes with bribes is a common way for politicians to get elected. This taints the election process and makes it hard to trust the results. As an example, there are countless possible situations.

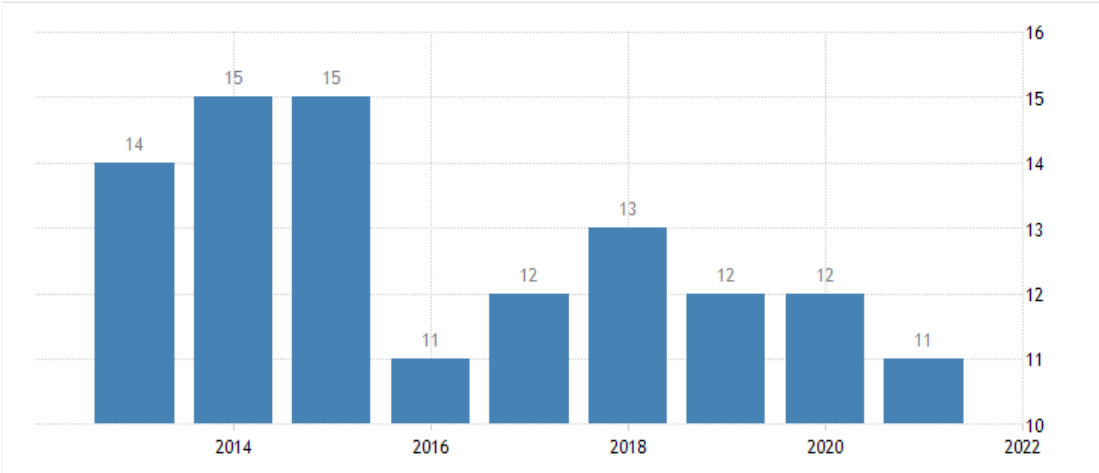
Corruption can put a person's health at risk, and any of these kinds of corruption has the potential to weaken important social bonds and institutions. Referees, players, doctors, and lab technicians are some of the people who look for doping. Members of international committees and national sports federations are also in the sports industry and could be corrupt. The job of these committees and federations is to give out tournament spots and contracts, respectively. When the police interact with the people in a community, they need to follow the same standards of ethics and professionalism that help police work move forward. Community police units have to deal with a lot of problems. One of the hardest is keeping the honesty and commitment they need to keep the community safe. (Office of the United Nations on Drugs and Crime, New York, 2006) "How honest and responsible the police are" How people think of police officers is important to the success of any plan to improve people's quality of life or make them feel safer in their communities. Disciplinary hearings have shown that bad behavior by police officers, like abusing their power, using too much force, or trying to get money from people, makes the public less safe. Any time a police officer acts dishonestly, it immediately and directly affects the organization's reputation and the goals and plans made for the good of all the people in the community. Corruption erodes citizens' confidence in police duties.

2.1.2.7 Corruption in Africa's Most Corrupt Nations

South Sudan endures some of the world's most incredible corruption and is Africa's most corrupt country. The people in power in South Sudan have set up a kleptocratic government, which means they steal from everyone and run the economy. In 2005, when South Sudan was still a part of Sudan, Sudan gave it the right to govern itself. In 2011, South Sudan gained complete independence from Sudan. This system has come a long way in a short amount of time. Transparency International's 2021 Corruption Perception Index, which looks at how corrupt people think their governments are, put the country last out of 180. (Index of Public Trust in the Government of South Sudan in 2021).

South Sudan got 11 out of 100 points on the 2021 Corruption Perceptions Index from Transparency International. In 2014-2015, the score on the corruption perception index was 15, which was the highest score since 2012. It was thought that the score would be 11 in 2021. It is the most corrupt country in the world. It got a score of 180 out of 180.

Figure 3: Corruption perception index Report on South Sudan



A member of parliament raised concerns on the need for legislation to "combat fraud and corruption among top government officials," notably among government procurement employees in the ministry of finance and economic planning. The legislator was concerned about the need for legislation to "combat fraud and corruption among high government officials." (2013) To paraphrase (Achien, Mel Wal May). Some South Sudanese members of parliament were reportedly "brought to tears" by the severity of the incidents of corruption and ineptitude documented in

the Auditor General's report for the years 2005 and 2006. A 2012 investigation revealed that since self-governance was implemented in 2005, more than $4 billion in government revenues have vanished." (Uma, Julius.

Throughout the period of self-government, the "Dura Saga" is the incident of bribery that has attracted the most public attention. On the other hand, there have been numerous additional famous examples of comparable misbehavior. Yet, due to the complexity of the cases, the chance of prosecution or penalty could be a lot higher.

The Africa Review reported in 2013 that the government of South Sudan has authorized numerous investigations into various issues. Despite this, most of them were either ignored or stopped on purpose. (Amos & Rachel Mache)

The corruption's structural composition. According to the U4 Anti-Corruption Resource Center, political, bureaucratic, and patronage corruption are the three most common forms of corruption in South Sudan. They are prevalent in the extractives industry, as well as in law enforcement, public finance management, and the armed forces (overview of anti-corruption efforts and their effects in South Sudan). According to a report by The Sentry, South Sudan's level of corruption is significantly different from that of other nations. It describes the four primary avenues through which the nation's wealth reaches the hands of the wealthy. The mining industry, which generates most of the nation's income, must be more secretive and better administered. Crude oil is the government's primary source of hard money and collateral for economically beneficial loans from international lenders. To wit: (Sentry, 2015)

The country's second-largest source of income, the military, is mismanaged and lacks transparency.

The military state exerts a both direct and indirect influence on the economy due to its tight relationships to enterprises and contracts. The majority of South Sudan's budget is allocated to military preparations. The need for more transparency about funding for the armed forces is problematic and may be illegal. The military's payroll expenditures are rarely made public, and the ministries of Defense, Interior, and Intelligence rarely publish their own payroll data. There have been several reports of military members in higher ranks stealing pay. According to reports, tens of thousands of "ghost troops” do not exist outside of payroll records. The estimated number of "ghost troops" is in the tens of thousands. The use of so-called "ghost

troops" is by far the most prevalent method employed by members of the military and other security services to profit themselves financially. The military has considerable sway over the government's budget, and generals routinely shift funds intended for other programs to the armed forces. The method by which the military acquires weapons and supplies is marked by corruption, excessive price, a lack of documentation, and a lack of transparency. Several items in the president's proposed budget are excessively overstated and appear to conceal spending on the military. Despite this, it is subject to "very little oversight."" (Sentinel, 2015)

Due to a procurement system that gives lucrative contracts to businesses with connections to government officials, there is considerable corruption and waste in how the government spends its money. Corruption and poor management are two of the most destructive elements plaguing most public institutions. Contracts for developing roads and importing autos are nearly invariably awarded at exorbitant prices and without any monitoring to firms owned by the country's political leaders. The South Sudanese government has a "widespread disregard" for reporting, oversight, and verifying financial transactions. One must cope with a complex bureaucracy when starting a business, which allegedly enabled officials to build vast fortunes through corrupt methods such as buying illegal company shares and accepting bribes. People in control frequently disregard the rules requiring annual financial reporting. Significant sums of federal funds are now being laundered using the same "shell" companies used to launder state funds. Occasionally, the government gave contracts to organizations that manifestly lacked the required knowledge and had likely just been created a few days or hours before the contracts were awarded." (Sentinel, 2015).

The elites of the country use the country's underdeveloped banking system to acquire and conceal money. South Sudan's elites' speculating on the black market is increasing the currency's devaluation and inflation, respectively. Since gaining independence, the business has thrived, making it easier for elites to participate in illicit money flows. "bulk cash couriers" refers to a service that expedites international money transfers by transmitting and monitoring fewer data. The fact that several banks' boards of directors are comprised of elites from the same nation is further evidence that these institutions serve the ruling class in that nation. Private FOREX bureaus facilitate illegal operations such as money laundering and other criminal conduct. According to reports, some of them have been under the control of

high-ranking members, resulting in a severe conflict of interest." (Sentinel, 2015). Tribalism is an additional crucial factor to consider.

Historical instances of bribery and corruption.

Dura Saga. In 2008, the South Sudanese government reportedly spent over one million dollars on cereals that were never delivered due to worries of famine. This information comes from a report that Voice of America presented in 2013. South Sudanese for sorghum is dura, where the name "Dura Saga" comes from. In February 2013, auditors for the World Bank discovered that 290 enterprises had been paid without a contract, and 151 businesses had been paid significantly more than they were owed. Due to the audit's discovery that third-party vendors had been paid for things that were never delivered, a criminal investigation was initiated. There was a suspicion that government officials were participating in the plot, as the whole price had escalated to an excessive amount. Initially, it was intended that Attorney General Filberto Mayout Mareng would lead the probe. Grain Swindle The "Dura Story," Which South Sudan Will Examine, Is Well-Known (Rwakaringi, Mugume Davis, 2013)

The author stated in a Sudan Tribune piece published in February 2012 that the Dura Saga was the most high-profile and expensive incident of corruption in South Sudan since the country's inception in 2005. Instead of being spent on building and maintaining grain storage facilities and procuring grain, billions of dollars were lost due to the event. In a June 2012 essay, Dr. Jok Madut Jok, Under Secretary of the National Ministry of Culture, indicated that grain merchants were responsible for the theft of four million dollars, as reported in a Sudan Tribune article from February 27, 2012. In addition, some governors lied about the delivery, and finance ministers in Juba authorized payments above the national budget allocation. 13 June 2012: Jok (Jok Madut) wrote the following:

Moreover to the Events. Following a thorough examination, federal investigators concluded that between 2005 and 2006, more than one billion dollars disappeared. Parliament eventually declared former minister of finance and economic development Arthur Akuin Chol and former governor of the Central Bank of Southern Sudan Elijah Malok Aleng guilty of establishing an environment conducive to corruption. Chol failed not to make an appearance. Malok doubted his responsibility by asserting that Akuin had taken some of the money for his own purposes, thereby denying his guilt. Cardinal Company was the supplier of the

government vehicles for which Akuin was alleged to have overpaid. According to Akuin, Vice President Riek Machar ordered the product. Machar stated that he had persuaded Akuin to acquire autos, but claimed ignorance of the transaction's specifics. Today is the 27th day of February in 2012. (Sudan Tribune)

From 2006 to 2012, the nation spent $1.7 billion on road construction, yet only 75 kilometers of new or paved roads were built. It (Nguen, Nyol Gaar, 19 juillet 2013) (Nguen, Nyol Gaar, 19 juillet 2013) In 2008, Stephen Madut Baak, a presidential adviser, was held at Heathrow Airport in London for reportedly having three million dollars in cash. To operate a liaison office for the Government of Southern Sudan in London, Mr. Baak requested a budget exceeding the minimum requirement of $137,000, as confirmed by the Southern Sudanese government. H.M. Revenue and Customs was forced to seize the cash since the United Kingdom prohibits the importation of such large sums of money from countries outside the European Union without first registering the currency. However, the local authorities ruled out the potential of misconduct and returned the cash to him the same day. In 2008, it was alleged that former Finance Minister Arthur Akuien Chol had caused the country to lose $600 million. According to fresh research (Nguen, Nyol Gaar, July 19, 2013)

In 2009, $323,000 intended for students in East African nations was transferred to an untraceable private bank account in Uganda. In conformity with (Amos, Machel, May 21, 2013)

President Kiir gave $488 million (roughly $244 million) to ABMC Company, a private construction firm owned by Kiir's close friend Benjamin Bol Mel, on September 5, 2011. Without consulting the Council of Ministers, this donation was made. In spite of this, the funds were intended for the construction of roads. According to Nyol Gaar Nguen, beginning in 2013, this was required to be demonstrated with more clarity. According to a recent inquiry (Nguen and Nyol Gaar, 19 July 2013), President Kiir reported in 2012 that the government had been robbed of a total of $4 billion. In 2013, it was rumored that six million dollars had been stolen from the president's office. Recent research indicates that (Nguen, Nyol Gaar, July 19, 2013) The Ministry of Roads and Bridges reported a 1,513 percent budget overrun between 2012 and 2013. In South Sudan, corruption and conflict are intricately interwoven (The Sentry, "The Nexus of Corruption and Conflict in South Sudan"). In March of 2013, It has been alleged that a total of 55,000 USD (14,000 USD) and 176, 000 GBP (55,000 GBP) were stolen from the president's office. On

May 21, 2013, President Kiir fired Elias Wako Nyamellel from his position as deputy foreign minister for international cooperation and suspended Yel Luol from his position as executive director of the president's office, Mayen Wol from his position as president's assistant, and Nhomout Agoth Cithiik from his position as president's accounts controller (Amos, Machel). Even Elias decided to leave. Considering the information at hand, the (Sudan Tribune) published an article on the subject on April 12, 2013.

Payii Roads and Bridges Company manager Rex Abdalla Nicholas was caught stealing money in May 2013 that was supposed to be used to build a road between Juba and Kajokeji. He was arrested and hauled to court after dodging many requests for his presence from the South Sudan Anti-Corruption Commission (SSACC). The committee that looked into the loss of monies from the president's office reportedly delivered its findings to the president on June 1, 2013, as reported by the Sudan Tribune (May.31, 2013).

The $323,000 was supposed to go to students in East African countries, but instead it went to an untraceable private bank account in Uganda in 2009. On September 5, 2011, President Kiir gave $488 million (about $244 million), as reported by (Amos, Machel, 21 May 2013), to ABMC Corporation, a private construction company run by Kiir's close friend Benjamin Bol Mel. The Ministerial Council was consulted prior to this decision being made. Nyol Gaar Nguen claims that beginning in 2013, there needs to be greater evidence that the funds are being used for road building. This was the case even though the money had been set aside for road construction. Recent research (Nguen and Nyol Gaar, 19 July 2013) claims that in 2012, President Kiir revealed that $4 billion had been stolen from the government. Six million dollars were allegedly taken from the president's office in 2013. The Ministry of Highways and Bridges reportedly experienced a 1,513 percent budget overrun between 2012 and 2013 (Nguen, Nyol Gaar, 19 July 2013). Corruption and violence in South Sudan are intertwined (The Sentry, "The Nexus of Corruption and Conflict in South Sudan"). The president's office had $14,000 and 176,000 taken in March of 2013. This is almost $55,000 in today's currency. On May 21, 2013, President Kiir fired Elias Wako Nyamellel from his position as deputy foreign minister for international cooperation and suspended Yel Luol from his position as executive director of the president's office, Mayuen Wol from his position as president's assistant, and Nhomout Agoth Cithiik from his position as president's

accounts controller (Amos, Machel). Mayuen Wol was also reportedly suspended on April 12, 2013, as the (Sudan Tribune) reported.

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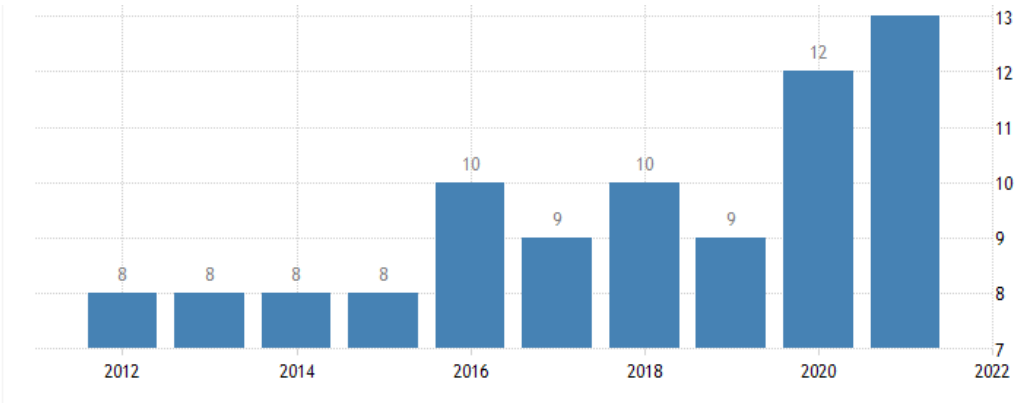
Figure 4: Corruption perception index Report on Somalia



Somalia has been a highly precarious and turbulent nation for over thirty years. The civil war led to the complete breakdown of government and the infrastructure supporting it. State-building efforts in Somalia have been hampered by widespread corruption, which has eroded respect for human rights and the rule of law. As one of the countries with the longest record of state instability, Somalia has also had to deal with a variety of corruption issues. Corruption at all levels of government and in all public institutions has eroded their legitimacy. Transparency International ranks Somalia as the 178th least corrupt nation in the world in their Corruption Perceptions Index for 2021.

In the "Corruption Perceptions Index" for 2021, Somalia placed 87th among the countries that were evaluated based on their public sector corruption. On this scale,

which spans from 0 to 100, the level of corruption gets worse as the number increases. As a direct consequence of this, Somalia is positioned 178th. In addition, in Transparency International's Corruption Perceptions Index for 2021, Somalia scored 13 out of a possible 100 points. The Corruption Perception Index predicts that in 2021, the country will have its highest score since 2012, which will be 13, while its lowest score will be 8 in the years 2012–2015.

Agriculture in Somalia is responsible for approximately sixty percent of the country's gross domestic product (GDP) and provides jobs for at least sixty-five percent of the population (ReliefWeb, 2016; Ahali & Ackah, 2015). Because Somalia is a failed state, a sizeable portion of its economy is conducted unofficially (Venugopalan, 2017). Cattle, electronic funds transfers, and telephones are the pillars of the economy (KnowYourCountry, 2017). Most of the nation's commercial dealings with the rest of the world are under the authority of a small group of wealthy businesspeople affiliated with powerful political groups or militias (Bertelsmann Stiftung, 2016). Even if the United Nations Security Council is correct in stating that there has been a considerable drop in the incidence of piracy since 2012, it is still an important source of revenue for certain regions inside those countries (Bertelsmann Stiftung, 2016; KnowYourCountry, 2017).

The degree to which corruption exists. Among the government, corrupt behavior is pervasive, and the country is consistently ranked as the second-most corrupt nation in all of Africa. Nonetheless, since 2012, Somalia's score on Transparency International's Corruption Perceptions Index (CPI) has remained in the low teens out of a possible 100. This indicates that there is a significant amount of corruption in the country.

Instability and insecurity impede the creation of states and the democratic process. Weak or nonexistent integrity institutions, insufficient or nonexistent legal and regulatory frameworks, and inadequate legal and regulatory frameworks contribute significantly to the ranking. These reasons contributed to the habit of government officials sanctioning criminal activities in exchange for bribes, which fostered corruption and contributed to its spread. Allegations have been made against the political leadership, including theft of public funds, pervasive bribery across all public agencies, non-transparent allocation of procurement contracts, and violation of current rules. According to the 2019 Financial Governance Report, there are a number of challenges, one of which is the political influence of Somalia's business

community. Other challenges include a deficiency in the legislative framework, a lack of technical capacity to implement the due process in procurement among the majority of stakeholders, and a need for more transparency in the procurement process.

The failed state that has persisted for such a long time in Somalia is unique in its visibility and duration. Despite this, it suffers from many of the same fundamental forms of corruption as nations that have been ripped apart by conflict, such as an absence of a powerful central authority, resources, administrative capability, leadership structures, and the ability to pay public personnel (Legacy Centre for Peace and Transparency 2016). The scope of the problem is difficult to estimate because corruption can take various forms, many of which are unlawful. Yet, a few unique kinds of corruption stick out (Legacy Centre for Peace and Transparency 2016).

Stealing of public resources, unethical and non-professional negligence, unfair administration of justice, and avoidance of the rule of law are all examples of corruption.

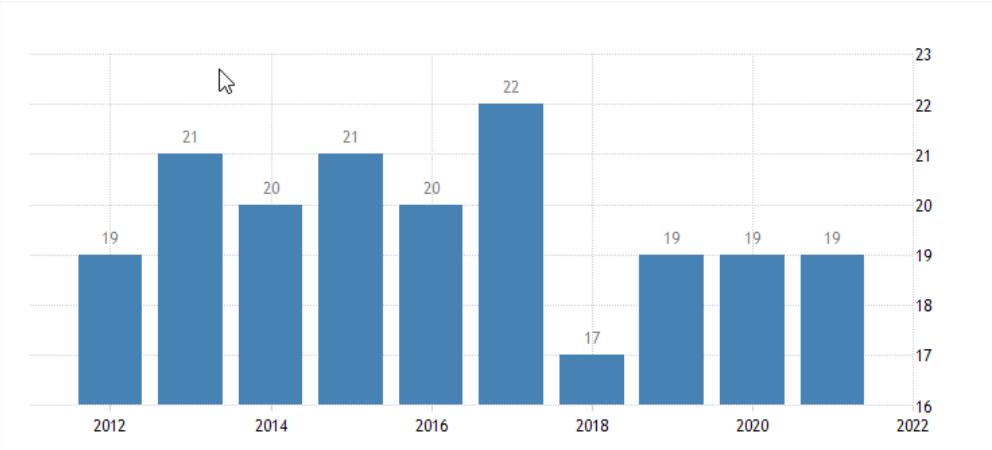
Burundi.

Burundi is a landlocked country in East Africa located at the northernmost tip of Lake Tanganyika. The total land area is 27,830 km2 (kilometers squared) (10,745 mi2). Burundi is a small country, ranking 147th worldwide regarding its total land area. Yet, with 440 people living in each square kilometer, it is one of the most populous nations in the world. The rural areas are home to 86 percent of the population, which is significantly high.

Burundi is one of the tallest countries in the world due to its average elevation of 1,504 meters above sea level. The highest point of any mountain is Mont Heha, which is 2,670 meters above sea level. It is not possible to get out onto the open sea. Natural boundaries exist with the three bordering countries of Congo (Democratic Republic), Rwanda, and Tanzania. (https://www.worlddata.info)

The 2021 Corruption Perceptions Index published by Transparency International awarded Burundi a 19 out of a possible 100. Since 2012, the Corruption Perception Index achieved its highest score ever, 22, in 2017. The index dropped to its lowest level, 17, in 2018.

Figure 5: Corruption perception index Report on Burundi



Pierre Nkurunziza, a Burundian politician, took office as the country's ninth president in August 2005 and remained in that role until his death in June 2020. He served for more than 15 years. On August 26, 2010, he gave the inaugural address for his second term and did an excellent job of making an impression. His thoughtful comments were welcomed with enthusiastic applause from the audience. Guillaume Nicaise investigated Burundi based on a field study examining the disconnect between good governance policies and the informal activities carried out by frontline public employees (tax collectors, local accountants). These activities include bribery and cronyism among relatives and neighbors. His research demonstrates that we can gain a deeper understanding of the dynamics of state and society, the workings of government, and the influence of cultural norms on public workers' behaviors by investigating corruption. In light of such an understanding of corruption, the purpose of development aid, particularly funding to projects promoting good governance and decentralization, should also be called into question.

In Burundi, corruption can be found at every rung of the social hierarchy. Weak controls on corruption are mostly to blame for the corrupt activities. This is because controllers responsible for regulating corruption at the national and local levels continue to repeat the same corrupt dynamic being investigated. It would be counterproductive for those in control of the situation to criticize influential local leaders publicly. By utilizing this strategy, the National Council for the Defense of Democracy-Forces for the Defense of Democracy (CNDD-FDD) can maintain its position of dominance. This will be explained in the following research, and it is far more practicable for them to develop informal arrangements, leading to more corruption.

Because there is a risk that whistleblowers will face punishment from their peers and the security agencies, the CNDD protects FDDs from losing their positions of authority and offers amnesty to public agents and local leaders linked with the party. In particular, the extensive influence of the CNDD on FDD in government decision-making makes officials less willing to confront corruption. As a direct consequence, public officials mistakenly believe that maintaining loyalty to social norms and the party is more important (or poses less of a risk) than obeying the law.

For example, a communal accountant gave the following response when questioned why he disguised the mayor's corruption: "it was too dangerous to challenge the administrator, whose influence and party support would injure anyone who sought to protest this scenario." (Guillaume Nicaise, 2019)

Contrasting the informal rule with social networks. It is common knowledge that most citizens no longer trust their government. The people of Burundi are susceptible to corruption due to their lack of faith in their leadership. As a direct consequence, social networks have greater support than charitable organizations. A goat farmer is accused of bribing a tax collector to avoid paying market taxes when selling goats at the Kiziguro community market. This is one example of an allegation that has been made against the goat farmer. Most of those in attendance concurred with the assertion made by the alleged culprit. Stealing is a common problem in our country, and Kiziguro is not the place to start cracking down on corrupt individuals as a deterrent. According to Guillaume's most recent research, this is the case (Nicaise, 2019).

This demonstrates that statutory rights and entitlements are only occasionally the motivating force behind the utilization of public services or the interaction with public personnel. On the other side, cultivating relationships with those who work for the government can make anxieties more manageable and open doors to necessary services. As a result, formal rules are ingrained across the entire society. To carry out their responsibilities and use their perks, public officials must rely on their social inclusion (identification or status) as well as their legal power.

It is common knowledge that a nation's socioeconomic condition significantly impacts the degree of petty corruption. For instance, many people working in tax collection assert that the low pay makes it impossible to avoid breaking the regulations. Not only is there an economic necessity behind many unofficial hobbies, but there is also a power game behind them. In this instance, a provincial government

investigator uncovered a municipal official's corrupt behavior. Despite this, the local administrator was appointed governor and head of the inspection for the province. By concealing the report and making threats against the inspector's family, he swiftly put an end to any questions raised about his integrity. According to the findings of recent studies (Nicaise, Guillaume, 2019),

Strong relationships between public officials are one of the numerous factors that might facilitate corrupt behavior. One illustration of this would be tax collectors dividing up their unauthorized revenues and sharing them with the group. Still, others consider the relationships between those working in public service and the citizens they assist. These examples illustrate how unethical behaviors can be rationalized by appealing to various reasons.

Investigation into the administration of taxes. Consequently, it is intriguing to study how social standards affect the pursuit of individual wealth at the micro level. Public workers are free and restricted by the social order now in place since the norms and ties of solidarity that define their socio-professional milieu bring them together. An inquiry into tax enforcement can be utilized to compare and contrast the formal and informal ways of governance adopted by employees and officials of local governments. For instance, in the province of Cibitoke, villages that were given support through an effort promoting good governance have renovated their infrastructure to increase tax collection. This project aimed to improve communication between local officials and the residents they serve.

Although the preexisting legal and administrative procedures were modernized, the system still needed more corruption. In addition to this, the simultaneous implementation of these policies had the effect of lowering the incentive for hill leaders to boost tax collection. They were less eager to support the tax system once they stopped getting bribes, a sign that it needed reform. The result was a decline in tax collection, notwithstanding the fast-increasing incidence of tax avoidance.

Especially after hill representatives were withdrawn from the process of revenue collection, there was a considerable increase in the level of mistrust that taxpayers had in their local officials, which was a big element in the practice of tax avoidance. They were the ones who established the legitimacy of taxation by connecting it to social interactions among people. Furthermore, power games have developed between resentful hill representatives who have recently been rejected and professional tax collectors. These power games occur in situations such as when hill

representatives do not facilitate the tax process or no longer guarantee the safety of tax collectors (a job that can be dangerous in Burundi).

The earlier reliance on the credibility of hill politicians was ultimately overcome by the support for tax reforms provided by the good governance program. This ultimately resulted in a tipping of the delicate balance on tax consent. In addition, the informal sector relied on low-level bribery to stay afloat. According to Nicaise et al. (2019), all evidence points to the fact that politicians are aware of corruption issues and that penalizing corrupt persons would enhance tax collection, attract more foreign aid, and stimulate local and international investment. Nicaise et al. Nonetheless, they are concerned about eventually upsetting the equilibrium of the forces that maintain the CNDD-FDD system's stability.

2.1.3 Energy Poverty

Boardman's book "Fuel Poverty: From Cold Houses to Affordable Warmth" (1991) is mostly credited with popularizing the term "energy poverty." As "energy poverty" was given a name, it sparked the development of governmental policies intended to combat the issue and increased research into the factors that contribute to it, as well as the symptoms and impacts it has on society. Towards the beginning of Boardman's book, energy poverty was discussed, and an example of it was given as insufficient power to heat and cool magnificent dwellings. Many believe that energy poverty is caused by intricate systemic imbalances that make accessing affordable contemporary energy sources difficult. Because it is experienced privately within homes, is context- and culture-specific, and evolves dynamically through time and geography, energy poverty is difficult to quantify and analyze. This is because energy poverty is experienced privately. (Simcock, N., Thomson, H., Petrova, S., & Bouzarovski, S. (Eds.), 2017)

In 2010, the World Economic Forum defined "energy poverty" as the absence of access to contemporary and sustainable energy services and supplies. On the other hand, to be more specific, this issue is not merely one of sustainability. Energy poverty occurs when there is an insufficient supply of energy services that are suitable, reasonably priced, dependable, secure, and environmentally friendly to facilitate development.

to ensure that people have residences that are efficient with energy, that their living standards are high, that they have thermal comfort, and that they are healthy. They

require essential utilities such as adequate heating and cooling, lighting, and electrical power to power their electronic equipment. However, households with limited access to basic energy services require increased availability of these resources. If more people in Africa had access to these energy services, they would be able to realize their full potential and become more socially integrated during this time of transition in the energy sector.

People live in energy poverty when their energy bills consume a significant portion of their income, making it difficult for them to pay for other necessities. It is also possible for it to happen when people are coerced into reducing the amount of energy they consume in their homes, which is detrimental to their physical and mental health. In addition, the challenge is compounded by low household incomes, inefficient structures and equipment, and specific energy requirements for each household.

A person considered to be "energy poor" cannot pay for or receive consistent energy services. As a direct consequence of this, it is estimated that one billion people across the globe are living in energy poverty due to low energy consumption, the use of dirty or polluting fuels, and the excessive amount of time required to obtain fuel to fulfill fundamental requirements.

Developing countries are unable to combat poverty, improve their health, increase their production, or become more competitive, according to the International Electricity Agency (IEA). Instead, they will build their economies even though they do not have dependable access to electricity. As part of the Sustainable Energy for All initiative, United Nations Secretary-General Ban Ki-moon has urged all people to have access to current energy services by the year 2030. Concerning the fight against poverty, he emphasized the significance of this point.

2.1.3.1 An Overview of the Seventeenth Sustainable Development Goal in Brief

SDG 7, commonly called Global Goal 7, is one of the 17 Sustainable Development Goals approved by the United Nations General Assembly in 2015. It is a particularly noteworthy example. Its mission is "to ensure that everyone has access to cheap, sustainable, and modern energy," as it is stated on its website. (Towards a Sustainable World: The 2030 Agenda for Agenda for Sustainable Development) Having reliable access to electricity is vital to social and economic growth and the

eradication of poverty. (doing a quick assessment of where we stand concerning the Sustainable Development Goals)

There are a total of five goals that must be fulfilled by the year 2030 to succeed. Six metrics are used to analyze how well the targets are being met. In addition, there are three "outcome objectives" among the five aims. Raising the worldwide proportion of renewable energy and efficiency improvement rates might power the entire planet and give everyone access to reliable Electricity.

These two goals are "means of reaching objectives" for the first two goals. Increase access to clean energy research, technology, and investments; and grow and improve energy services for emerging nations. Increasing access to inexpensive and reliable Electricity is another goal, coupled with increasing the amount of renewable energy in the global energy mix. This would call for better energy efficiency and international cooperation to expand the availability of clean energy technology and encourage investment in clean energy infrastructure. Help with infrastructure is planned with an emphasis on the least developed countries, tiny islands, and landlocked growing governments.

SDG 7 and SDG 13 (climate change mitigation) are complementary and closely related. With the current rate of advancement, the world will need to accomplish SDG 7 by 2030, according to a study published in 2019. The world must invest more in renewable energy to guarantee long-term climate targets.

2.1.3.2 By Industry.

Energy and Education.

While delivering primary education and literacy without moving to cleaner energy sources is achievable, having access to energy services can raise the quality of schooling. (IEA, 2010a; UNDP, 2005; UN-Energy, 2005).

Education is a great tool for relieving the effects of energy poverty, which has numerous aspects. Students' access to electricity effects the quality of their education since they can only study after sunset if they have regular electricity access. (Apergis, Polemis, Soursou, 2022) In addition, the continuous supply of energy allows female children, responsible for fetching fuel for the household, for dedicating more time to their studies and attending school. (Apergis, Polemis, Soursou, 2022).

More youngsters can afford education, and fewer will drop out if poor nations access cleaner, cheaper energy (Mapako, 2010; UNEP, undated). (Mapako, 2010; UNEP, undated). For many people, the availability of cleaner and more economical energy sources might be the difference between having access to clean water, sanitation, lighting, space heating/cooling, and cooking energy (and other meals in the case of boarding schools) (and other meals in the case of boarding schools).

90% of pupils in sub-Saharan Africa attend elementary schools without electricity. In Burundi and Guinea, only 2% of schools are electric. In DR Congo, with a population of 75.5 million (43% are under 14 years old), just 8% of schools are electrified. According to these figures, about 30 million pupils attend school without Electricity in the DRC alone. (2013) (The dark side of education, Phil Goodwin)

Education is crucial to generating human capital, and encouraging economic growth by enabling individuals to be more productive workers. In addition, when growing nations amass income, they can invest in constructing contemporary energy services. At the same time, homeowners will have more options to pursue new energy sources and alleviate energy poverty. (Apergis, Polemis, Soursou, 2022).

Powering classrooms and houses with electricity can improve students' access to instructional materials and communication networks. It could boost people's willingness to adopt distance learning modules. In addition, using current teaching technology (such as overhead projectors, computers, printers, photocopiers, and science equipment) is made possible by having access to power, resulting in a broader selection of specialized course materials and possibilities (Mapako, 2010).

Since most lessons occur during daylight hours, we often need to consider the importance of proper lighting as a barrier to learning in third-world nations. Nevertheless, instead, when it comes to energy, we value education.

A recent award-winning documentary by Eva Weber, "Black Out," illustrates the importance of energy in the classroom. In the video's first scene, hundreds of youngsters in Conakry, Guinea's city, work in the international airport parking lot, heedless to the roar of approaching jets. None of the students have access to electricity at home; they congregate in well-lit public spaces every night to accomplish their coursework.

A recent piece in Time magazine revealed that 90% of elementary school kids in Sub-Saharan Africa do not have access to electricity in their classrooms. Considering that only 2% of schools in Burundi and Guinea have access to electricity, you can

understand why this is the case. True, these African countries are on the smaller side. However, on the other hand, just 8% of schools in the Democratic Republic of the Congo have Electricity, despite having a population of 75.5 million (43% of whom are under 14). As a result, an estimated 30 million children in the DRC go to school without access to electricity.

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In conclusion, access to cleaner and more economical energy sources can contribute to the following:

Achieving universal primary education and improving school quality (Meisen & Akin, 2008; Mapako, 2010; Harsdorff & Peters, 2010) (Meisen & Akin, 2008; Mapako, 2010; Harsdorff & Peters, 2010)

Maintaining high enrollment in rural primary schools is dependent on supplying updated cookstoves that reduce the cost of school food programs;

Increased school enrollment, and lower dropout rates are two outcomes of making the community more child-friendly through improvements to infrastructure, including water, sanitation, Electricity, and climate control.

Increased school enrollment, and lower dropout rates are two outcomes of making the community more child-friendly through improvements to infrastructure, including water, sanitation, Electricity, and climate control.

Providing teachers in country areas with access to power to retain them.

Providing access to advanced instructional aids and apparatus (overhead projector, computer, and science apparatus);

Permitting access to educational media and communication in schools and at home expands educational opportunities and enables distance study. Allowing children to study beyond school hours may significantly affect their grades, especially for girls who otherwise have to choose between studying at home and attending school.

Energy and Health: Electricity and cleaner, cheaper fuels for institutional and household usage are necessities for modern health services, the facilities that deliver them, and the specialists and health sector workers that provide them.

Healthcare institutions rely on constant, uninterrupted Electricity to power life-saving and data-protecting equipment. Modern healthcare facilities can only function with dependable, consistent electrical power. Even short power outages can be dangerous for people in intensive care or about to have surgery. Critical parts of these facilities need to have unique protection systems put in so that network outages do not happen. (Eschwane, 2019)

From a human development perspective, the most detrimental effects of poor living conditions include early deaths, especially among the youngest and most defenseless members of society, and shortened life spans. The worldwide focus in recent years has been on decreasing infant mortality rates. While the percentage of under-5 deaths in developing nations decreased by more than 25% between 1990 and 2008, the absolute number of such deaths grew (UN, 2010a; World Bank, 2010a) (UN, 2010a; World Bank, 2010a). In Sub-Saharan Africa, one child in seven does not live to see their fifth birthday (World Bank, 2010a) (World Bank, 2010a).

Inadequate access to cleaner and more cost-effective energy sources is closely linked to diarrhea and pneumonia, the two leading causes of death among children under five worldwide after neonatal causes (14% each). (UN, 2010a)

Using traditional biomass for cooking contributes significantly to indoor air pollution, a significant cause of pneumonia in children under five living in low-income households (WHO, 2006). (WHO, 2006). When used inefficiently, an open fire or conventional stove emits hundreds of pollutants into the air, including carbon monoxide, tiny particles, nitrogen oxides, benzene, butadiene, formaldehyde, polyaromatic hydrocarbons, and many more that are harmful to human health. Women and toddlers inhale enough smoke to smoke two packs of cigarettes daily for

hours on end. In addition, sulfur, arsenic, and fluorine emissions may increase in areas where coal is burned for power. Energy-related contributing issues include more pumping systems from clean water sources, energy or fuels to boil water, and industrial water treatment and purification procedures.

In the case of waterborne infections, such as diarrhea, have an incredibly harmful influence on the health of children. In addition, a healthcare facility's ability to provide high-quality medical care may be affected by its access to energy services.

One of the most critical times for a woman to have access to health care is during her pregnancy and delivery. While most complications during pregnancy and childbirth are avoidable, tens of thousands of women lose their lives yearly. Roughly 99% of all deaths occur in developing countries. Moreover, childbirth and its consequences are still the most significant cause of death for women aged 20-45 in low-income nations (UNFPA, 2005). (UNFPA, 2005). In some parts of the world, maternal mortality rates are as high as one in seven (WHO, 2008). (WHO, 2008).

Better maternal health and lower infant mortality have been linked to increased access to health care during the first trimester of pregnancy and the presence of physicians at birth. Sadly, women in rural parts of sub-Saharan Africa often give birth without access to modern medical care. As a result, one-third of maternal deaths are attributable to hemorrhaging that could have been prevented with the presence of medical personnel.

Modern technology like ultrasound machines, which need a reliable power source, makes it possible to find and treat several pregnancy-related problems early on. However, inadequate infrastructure, particularly a lack of electricity, prohibits rural women from accessing these services. Hence, having access to electricity in rural areas can help prevent preventable maternal deaths directly (by making it easier for health services to be provided) (by making it easier for health services to be provided). Moreover, indirectly (by making it easier for medical professionals to work there) (by making it easier for medical professionals to work there).

Traditional gender roles place the burden of gathering biomass for fuel on women. Women typically devote a large portion of their time to the kitchen. Due to the job's physical demands, women who spend significant time acquiring energy resources have less time for other activities and report feeling exhausted. Another issue is that using traditional biomass fuels can create long-term exposure to indoor air pollution, especially for women and children who assist out around the house.

While burning, harmful substances like carbon monoxide, dust, and benzene are released and can be inhaled. Many cases of lung infections, lung cancer, and asthma in children and women can be attributed to this. Unsustainable biomass use has shocking consequences for human health. According to the World Health Organization, indoor air pollution causes an estimated 4% of the worldwide illness burden and over 2 million additional deaths yearly from cancer, respiratory infections, and lung diseases, especially in women and children. Biomass pollution is responsible for more deaths annually than both malaria (1.22 million) and tuberculosis (1.5 million) combined (1.6 million) (1.6 million).

Even in developed countries, the complex interplay of energy, poverty, and health is felt. High levels of debt to energy utilities, disconnection from supply due to debt, frigid homes in the winter, and more disease and death caused by the cold are indicators of the energy challenges of the poor in industrialized countries with a higher quality of life. Energy is needed to run fans and air conditioners in the summer. A decline in health or even death might arise from inadequate access for the elderly. For instance, 35,000 people died from the heat wave that hit Western Europe in 2003. (Bhattacharya, 2003).

The internationally agreed-upon development goals for human health are being worked on in a coordinated way globally. Greener, low-cost energy solutions for powering pro-poverty health services, however, require more significant investment.

In conclusion, there are many reasons why it is beneficial for a country to have access to cleaner, cheaper energy options:

Electricity at health centers allows doctors to see patients at night. , and more advanced medical equipment and trained staff to stay at health centers in rural areas.

Refrigeration energy can facilitate the preservation of vaccines and medications to prevent and treat infectious diseases and disorders.

Health services require energy to generate and maintain primary sanitary conditions.

In addition to developing, manufacturing, and distributing pharmaceuticals, treatments, and immunizations, energy is required to access health education media via information and communication technology.

Production and Energy.

Nearly every economic activity, whether for profit or not, has energy requirements (Modi et al., 2006; UN-Energy, 2005). (Modi et al., 2006; UN-Energy, 2005). New types of energy are used in the industrial process as it grows more technologically

advanced. The most basic form of mechanical energy is that provided by human or animal labor, which is used to transport things, perform manual labor or power primitive machinery like mills. This is the thermal energy utilized in manufacturing operations that use ovens or kilns and necessitate fuel use. The result, which might be anything from bread to bricks, is influenced by several factors, including the quality of the heat, the availability and cost of the fuels utilized, and the efficiency of the ovens employed. Motors, machines, and other instruments are used in other productive tasks. These are often driven by liquid fuels (such as gasoline for motors) or Electricity (for sewing machines, welders, etc). (for sewing machines, welders, etc.).

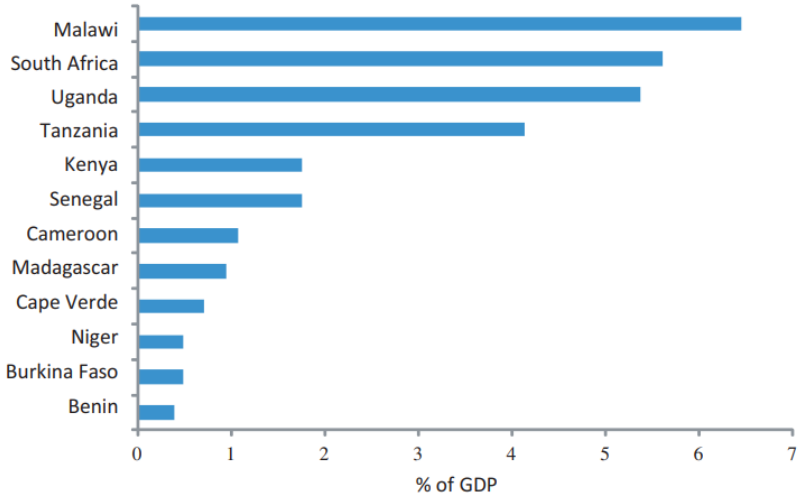
The necessity for energy as an input is not exclusive to the manufacturing sector, which uses energy and equipment to transform raw materials and other inputs into completed commodities. This covers everything from air conditioners to computers to security systems requiring constant power.

Energy, whether in the form of electricity or fuels, is critical for even the most basic to the most technologically advanced manufacturing operations. Full and productive employment, as well as good work for all, are development goals that are intertwined with energy. However, energy sources for machines and finance schemes to acquire access to energy-using equipment are often left off the agenda, even though many nations have active programs to increase employment through worker training and other skill-building activities.

The possibility of escaping poverty at the personal, community, and national levels is directly related to the availability of good employment opportunities. It's been found that many jobs, especially those that pay the least, can be dangerous or even deadly. Injuries sustained on the job can have a devastating effect on a family's finances. This is because of the many variables outside their control that might affect their income (food and fuel price increases, access to affordable housing, and increases in education or health service fees) (food and fuel price increases, access to affordable housing, and increases in education or health service fees). Sustainable energy alternatives can boost employment prospects, enhance working conditions, and guarantee good employment for entire communities. The availability of energy services for value-added operations in the industry, services, government, and social sectors directly affects this access (Modi et al., 2006; UN-Energy, 2005). (Modi et al., 2006; UN-Energy, 2005).

Employment in both the official and informal sectors and worker productivity in value-added processes are positively correlated with access to cleaner energy sources like electricity. More readily available cleaner energy also facilitates the shift from agricultural to industrial economies since such energy is essential for producing goods.

Figure 6: Proportion of GDP lost due to unreliable power supply in 2007



It is likely to be more difficult to generate productive work and revenue in nations or regions within nations where access to electricity is limited or unreliable, as this will inhibit the ability to generate productive employment and income. To counter this, the accessibility, affordability, and dependability of energy services all play a role in fostering economic expansion, manufacturing, and high-quality employment opportunities.

For instance, in sub-Saharan Africa, where the energy supply is sometimes inconsistent, the issue of job security is a big one, particularly for people working in the service sector. Electrical failures are responsible for a yearly loss of production equal to three full months' worth of goods and services (IEA, 2010a). The economy and the labor market suffer from this protracted inaction. In addition, businesses that experience power outages lose an average of 6.1% of their revenue due to the downtime caused by the outages (IEA, 2010a).

It is anticipated that unstable energy supplies will significantly impact the rate of economic growth and overall productivity at the macroeconomic level.

The percentage of a country's gross domestic product (GDP) that is lost owing to an inconsistent supply of energy is depicted in Figure 6.

The availability of modern energy sources that are also cost-effective is an essential component in the fight against poverty through the development of new jobs.

Agriculture, as well as the Energy Sector Rice, corn, millet, and wheat, are some examples of the staple grains that provide the majority of the caloric intake for the world's most impoverished people. Yet, factors such as the cost of energy services, their availability, and their dependability all have a role in determining whether or not economic growth, manufacturing, and high-quality employment are fostered. It is likely to be more challenging to generate productive work and revenue in nations or regions within nations where access to electricity is limited or unreliable, as this will inhibit the ability to generate productive employment and income.

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To this day, many farmers in sub-Saharan Africa still irrigate their small plots of land by lifting buckets, which is a method that is cumbersome, time-consuming, and requires much manual labor. Consequently, small-scale irrigation systems are typically installed by farmers on their own, with little assistance from the government, to satisfy the requirements of their families and the markets in their immediate vicinity. This is particularly crucial for females to keep in mind.

Even if large-scale water projects in several African countries have yet to meet expectations, small-scale irrigation utilizing treadle pumps has succeeded in several countries. Studies conducted in Kenya, Niger, Zambia, and Zimbabwe suggest that farmers may be able to improve crop quality, boost yields, and minimize the amount of labor required. Changing from buckets to treadle pumps powered by renewable energy is one way to accomplish this goal. Farmers, particularly women, might benefit from the use of treadle pumps because these tools are not only straightforward but also quite inexpensive. In addition, the development of treadle

pumps has enabled less fortunate farmers in rural areas, particularly women, to increase their incomes by selling the surplus food they produce on the neighborhood market.

Another significant area in which more viable energy sources could assist in the fight against hunger is the reduction of losses that occur after the harvest. To keep up with food production, there needs to be an increase in the number of farms, warehouses, and trucks. Moreover, there is a need to increase the number of preservation techniques that can keep perishable goods fresh for longer. A problem also exists in the form of pests, illnesses, and other factors that reduce both the quality and quantity of the food products that are gathered.

After harvest, the FAO estimates that 15–50% of food grains are lost in countries that are considered to be developing (FAO, 2009). According to Farm Journal, the postharvest loss of fruits and vegetables (including tomatoes, bananas, and citrus fruit) and sweet potatoes and plantains can reach up to fifty percent (Radio International, 2006a). It is estimated that between 20 and 50 percent of the fish collected in Africa are lost during fishing (Farm Radio International 2006b).

The substantial postharvest losses create double the amount of suffering for the poor:

1. There is less food available that is high in nutrients, making poor people more likely to suffer from malnutrition.
2. The amount of money lost after the harvest is roughly equivalent to what could have been earned. This results in a lower amount of sales money for the impoverished. 4 A piece of agricultural irrigation equipment propelled by human footfalls is known as a treadle pump.
3. A reduction in household income reduces any potential buffer against increases in the cost of food.

After being harvested, fruits and vegetables have a higher risk of going to waste than they would if there were a variety of energy sources that were affordable and beneficial to the environment. A critical technology closely connected to the provision of energy services is delivery. This refers to the timely transporting of harvested items to markets and processing plants. That makes it more difficult for low-income people to purchase food of a higher quality. While traveling through remote areas with difficult terrain, using motorized mobility can provide a number of substantial challenges. Using kinetic energy and mechanical ropeways are two examples of other technologies that are also relatively inexpensive for such locations.

According to Bates et al. (2009), ropeways have reduced the time it takes to transport agricultural products from three to four hours to just five minutes in some areas of Nepal.

The transformation of fresh fruits and vegetables into foods with a longer shelf life is an example of one type of food processing. It is essential for small-scale rural farmers living in poverty to have access to cooking and drying energy to transform perishable fruits and vegetables into shelf-stable or marketable food products with a longer shelf life. This will give the products a longer shelf life (solar drying). Both access to customers and income will rise as a result. It is important to remember that the contemporary industrial food processing that transforms raw ingredients into completed commodities such as canned meals needs the use of nonrenewable resources such as power and steam. The process in question is referred to as "food processing."

Remember that nonrenewable resources such as electricity and steam are required for contemporary industrial food processing that converts raw ingredients into completed items such as canned goods. This is because the energy demands of this process are so great. Most developing countries' most advanced food processing enterprises can be found in the country's major cities because rural areas have more limited access to modern energy sources. This is because the vast majority of agricultural production takes place in rural areas. Although it has, in some instances, led to a decline in local employment, agricultural production on an industrial scale has contributed to an increase in the amount of food produced overall. The internationalization of significant grain markets such as rice, soya, wheat, and others raises the possibility that consumers in one nation may benefit from energy inputs in another country due to international commerce. From the production of fertilizer to the harvesting and distribution of crops, each of these operations requires an input of energy. It may be possible to manufacture energy-efficient technologies rapidly and locally, and they will require low operational costs. These innovations are crucial for increasing crop yields and reducing postharvest losses. For instance, food security can be enhanced by utilizing pico and micro hydro for shaft power to process agricultural products and incrementally increase the value of those items over time. In addition, rural communities in poor countries have the potential to boost their agricultural productivity by increasing their use of efficient, low-cost hand tools and equipment drawn by animals.

Increasing the number of people who have access to renewable energy sources is one of the most essential things that can be done to end extreme hunger. This can be accomplished by increasing crop yields while simultaneously reducing the amount of wasted food.

Growth and the Energy Industry The Millennium Development Goals (MDGs) are intended to serve as both a starting point for additional projects and a standard against which to measure progress made in the fight against poverty until 2015. It is the only means by which the majority of the Millennium Development Goals may be accomplished (MDGs). The availability of contemporary energy sources is essential to the eradication of poverty, the increase of economic activity, the creation of new employment possibilities, and the improvement of social services. Access to electricity and improved cooking methods, while extremely important, represent only a very small part of the overall policy goal of reducing poverty. It is essential for households living on a low budget to have access to electricity and fuels that are healthier for cooking. Nonetheless, more needs to be done to assist them in breaking out of the cycle of poverty.

Energy, fuel, mechanical power, and the different services that they give are essential components in the fight against poverty, the improvement of living conditions, the expansion of social participation, and the expansion of economic growth. Sadly, the countries that are the most economically depressed and underdeveloped are frequently the ones with the least access to dependable modern energy sources. Individuals who do not have access to electricity are forced to rely on conventional biomass for heating; this heating method is most commonly used for cooking in Africa and South Asia. Consequently, all of the countries in sub-Saharan Africa, except South Africa, are ranked in the bottom half of the IEA's Energy Development Index (EDI).

There is no room for debate regarding the significance of energy to the expansion of the economy. But, there is much discussion about the best way to move forward, which must involve breaking away from the patterns that aren't sustainably utilized by developed nations. To move forward, it is vital to have awareness of the connections between the provision of energy and social, economic, and human advancement. These ties define and, more often than not, constrain the possible routes for persons living in poverty who are attempting to escape their poverty trap. They will decide the potentials and constraints of essential questions about the long-

term viability of development. The elimination of poverty will require several critical first steps, the most important of which are the creation of a development model that prioritizes the wants and requirements of people and the investigation of methods for providing the necessary energy services.

There are more than one and a half billion people around the world who do not have access to modern energy. (IEA, 2010a). Most of these individuals can be found in Africa and South Asia. Approximately three billion people meet their primary energy requirements by burning solid fuels such as coal and traditional biomass. About two and a half billion people cook their food using less efficient and more archaic (UNDP & WHO, 2009; IEA, 2010a). In addition, each day, millions of people, most of whom are mothers and children who are too young to work, engage in back-breaking manual labor to obtain water and grind the food they eat. This requires transporting fuel and water and executing grinding and pounding chores repetitively, tasks that a pump and mill might handle more effectively.

Barnes et al. (2010) discovered that when low-income people had more access to energy sources that were both cleaner and more affordable, they were able to improve their economic standing, as well as their health and education.

People's low socioeconomic level is significantly contributed to by spending a disproportionate amount of their valuable resources on energy sources that are both harmful and inefficient. These energy sources include dry cell batteries, primitive and weak kerosene lights, and charcoal stoves. Consequently, many people are ensnared in a vicious cycle of poverty, low salaries, and an inability to improve their living circumstances.

The ability to increase living standards, time budgets, money-generating prospects, agricultural productivity, and economic output is positively impacted by the requirement for contemporary energy sources available at reasonable prices. The low agricultural and economic output and the absence of feasible options for making a living are the root causes of malnutrition, low incomes, and a small surplus of available funds. This is the root cause of the perpetuation of poverty. So, they cannot pay for alternative energy sources that are either cleaner or more efficient (often neither the fuels nor the equipment). In this sense, the absence of affordable and environmentally friendly energy sources is directly connected to the issue of poverty. The production of more jobs, increased trade, and activities that bring value to the family unit can all benefit from a reliable supply of electricity or cleaner fuels.

Provide people with low incomes the opportunity to put aside the modest sums of money they have left over to have access to better education and health services, as well as better sustenance and better housing for their families. As a result, they are gradually pulling themselves out of poverty (UNDP, 2006).

The production of heat, illumination, and motion are three fundamentally important human activities dependent on energy (such as water pumps and transportation). Energy services, including healthcare, education, and communication improvements, are crucial to commercial activity, industrial production, trade, and public service provision. High rates of infant mortality, illiteracy, and total fertility are just some of the indices of poverty that may be connected to inadequate energy services. Many individuals in underdeveloped countries need access to consistent energy sources, so they migrate to cities for better livelihoods. Growing economies and higher living standards have long been assumed to need more energy consumption.

Further research is needed to determine whether or not a rise in energy consumption aids in the pursuit of economic progress (Asuradu Sarkodie and John Adams, 2020). Energy consumption remains strongly linked to economic expansion in developing countries. But, affluent countries are perilously close to decoupling energy use from economic growth (through structural reforms and increases in energy efficiency).

There is a clear correlation between the need for more affordable and cleaner fuels or electricity to drive engines, mills, and pumps in place of human labor and the inability to access mechanical power in many rural areas of developing countries. This includes the ability to pump water, mill grain, and perform other household tasks. Access to mechanical power for water pumping, milling, and other home duties is difficult because there are few economical and readily available mechanical solutions. In many circumstances, the lack of mechanical power damages entire regions since the distances between energy sources and cleaner fuels make it hard for even the poorest households to purchase them. Because of this, the region-wide lack of mechanical power will only worsen (UN-Energy, 2005; UNDP, 2005). Pumps, mills, and engines are all examples of machines that convert energy carriers into mechanical power to make up for the absence of mechanical power that contributes to the energy balance in a home. When thinking about the home's energy usage for other operations like cooking and heating, similar problems arise.

2.2 Empirical Literature

We will examine literature pertinent to the research's aim and objective during this session. The researcher examined fifty (50) research publications to obtain a more in-depth understanding of the subject matter, with twenty-five of those publications focusing on the problem of corruption and the remaining twenty-five focusing on the problem of energy poverty. The researcher came upon the following pertinent publication, which is rather interesting.

2.2.1 Corruption

Narain Sinha 2022, in his publication titled "Corruption and economic development: an econometric perspective on regional variations," which is considered an economical approach to corruption, examines the sources of corruption using data on cross-sections of nations that were in various stages of economic expansion in the years 2003 and 2013. In addition to that, he investigated if the causes of corruption varied depending on location. Via the utilization of the corruption perception index, he concluded that major factors in both years included economic growth, the size of the public sector, and human development. There are statistically significant variations in the causes of corruption across different regions. At the regional level, expansion's impact on corruption may be far more significant. Similarly, the public sector is a key part of the economy in many nations in the Asia-Pacific region, the European Union, and the United States. Literacy is widespread throughout the world except in the Middle East. The findings have significant implications for economic policy, particularly for countries with low incomes and high corruption rates.

Pabitra Kumar Jena and Ashmita Kesar analyzed the impacts of political stability, trade openness, and corruption on economic progress in the BRICS countries from 2002 to 2018. They presented their findings in a study published in 2022. Their research findings demonstrate that economic growth can be accelerated by maintaining political stability and an open trading environment. Despite this, the fact that corruption has been shown to offer long-term benefits for economic development lends support to the argument that the two ideas have a link structured like an inverted U. But, as a result, it impedes the progression of the economy. The findings of this research offer a novel perspective on the connection between graft and economic growth. The conclusion of their study was a set of policy

recommendations aimed at reducing instances of corruption and boosting economic expansion in the BRICS nations.

Oke, Margaret Adebimpe, and Onaolapo, Oluwatamilore Akin conducted research into the impact that corruption has on the economic growth of Nigeria in the year 2022. The investigators began their inquiry by focusing on the historical background and performing a conceptual analysis of corruption in Nigeria. In addition, research was done to uncover the causes, consequences, and evolving nature of corruption in Nigeria. The final part of their research consisted of an investigation on the connection between the graft and the progress of Nigeria's economy. This study provides a quantitative assessment of the influence of corruption on Nigeria's economic growth and the causal relationship between corruption and economic expansion. They used annual data that ranged from 1988 all the way up until 2018. In addition, the research findings suggest that corruption has a substantial and unfavorable influence on the economy's growth over the long and short terms.

Chandan Sharma and Ritesh Kumar Mishra (2022) reexamined the relationship between natural resources, corruption, and economic growth using a more extensive dataset for a panel of countries. Their findings were similar to the previous findings of the previous study. Using the use of a newly designed panel quantile estimator, their study took into consideration the possibility of endogeneity as well as asymmetric effects. In addition, they investigate the impact of corruption on natural resources and how it contributes to the expansion of the economy. The findings indicated, in general, that different income levels are affected by resources in various ways. This is because the sign and amount of the implications that environmental assets have on the economy's growth differ across income quantiles. The concept of a "resource curse" aligns with the findings obtained when a nation's resource wealth is measured by the amount of fuel exported, and the amount of oil and gas rented out. Despite this, the "resource" is the even though. According to the conclusions of their investigation, corruption plays a big part in deciding the degree to which natural resources impact the rate of development. In several different situations, it has successfully turned the disadvantages of natural resources into advantages in countries with low to middle incomes.

Teuta Xhindi and Ira Gjika1 conducted research for a report published in August 2022 and examined the correlation between graft and economic expansion in

Western Balkan republics over the previous twenty years. Their study was unique compared to earlier surveys that had been carried out in the same area since it used the ARDL model and the data spanned a different time period. The application model has demonstrated an inverse association between corrupt practices and the economy's growth.

In the context of Pakistan, Muhammad Zeeshan et al. (2022) looked into the connections that exist between corrupt government, unstable politics, the exploitation of natural resources, and the growth of the economy. The data collection covering the years 1996-2018 used both linear and non-linear ARDL. Both approaches gave similar results when applied to Pakistan's situation. In addition, the findings of their study demonstrated that natural resources contribute positively to GDP immediately and over the longer term. On the other hand, the GDP suffers when there is political instability.

On the other hand, corruption might temporarily increase GDP but ultimately leads to a decline in that measure. On the other hand, their inconsistent findings imply that a rise in corruption leads to a reduction in GDP over the long term. On the other hand, a decrease in corrupt practices leads to an increase in GDP. The results of their investigation lend further support to the findings presented before. This document proposes measures to ameliorate rent-seeking and patronage acts to control the apparent political uncertainty, corruption, and abundant untapped natural resources. Precisely, these problems can be controlled by controlling rent-seeking and patronage acts. This is since making the environment in the country more open and honest will assist to the expansion of the economy and the nation's general well-being.

Siham Matallah researched corruption's effects on economic diversification in eleven oil-rich MENA nations from 1996 to 2019. This research was published in 2019. In addition, Canada, Norway, and Malaysia, three countries that have successfully diversified their economies, all use the Arellano-Bond difference GMM estimator, which considers features unique to each nation. Higher degrees of diversification in oil-exporting MENA nations have been found to be connected with lower levels of corruption control and higher oil rents. Her research showed that Middle East and North African countries that exported oil profited economically from economic diversification when corruption and oil rents were effectively managed. The study also discovered that the control of corruption ratings of MENA

oil exporters was substituted with those of Canada, which resulted in higher diversification rates by 0.53 percentage points. The rate at which the control of the corruption gap is reduced is directly linked to the rate at which the rate of economic diversification among MENA oil exporters increases. She also made the observation that countries who are not members of the GCC, such as Canada, need to put in far more work than GCC countries to attain the same level of success in combatting corruption. Before attaining extensive economic diversification, most nations not members of the GCC will need to address the underlying instability problem in their countries.

According to Padhan et al. (2022), corruption may have the ability to retard the expansion of both India's national and domestic economies. They also investigated the extent to which foreign capital's entrance influences economic growth in the near term and over the long run following the globalization of markets. They used sophisticated econometric models, including autoregressive distributed lag (ARDL) and Bayer-Hanks models (B-H). According to their findings, sustained economic growth is related to the presence of incoming foreign capital, levels of corruption, the state of the trade balance, and the amount of money the government spends on consumption. Since the inception of economic reforms in India in the late 1990s, the addition of an open economy (i.e., foreign capital inflows and trade balance) has had a minor impact on domestic income growth.

In contrast, closed economy factors such as government expenditures continue to be a potential contribution to the household and national growth in development. In addition, their research revealed that rising corruption has constantly threatened the Indian economy. Thus, preventing and addressing corruption has become a pressing concern for any developing nation hoping to sustain its economic expansion.

Low access to energy may contribute to other indicators of poverty, such as high infant mortality, illiteracy, and total fertility. Many people in developing nations move to urban areas in search of greater economic opportunities because they lack reliable access to energy. It has long been considered that increased energy consumption is necessary for expanding economies and better living conditions. An increase in energy consumption may help in the quest for economic advancement, but more study is needed to confirm this (Asuradu Sarkodie and John Adams, 2020). Growth in developing economies continues to be closely tied to increases in energy

consumption. But, prosperous nations are in danger of severing the link between economic expansion and their energy use (through structural reforms and increases in energy efficiency).

The inability to use mechanical power in favor of human work is strongly correlated with the lack of access to affordable and cleaner fuels or electricity in many rural parts of developing countries. This involves being able to operate a water pump, mill grain, and carry out several other domestic activities. There aren't many cheap and readily available mechanical solutions for pumping water, milling grain, and other common household tasks. Because of the great distances that separate energy sources and cleaner fuels, even the poorest households often suffer because of the lack of mechanical power. This will only make matters worse for the region's already dire shortage of mechanical power (UN-Energy, 2005; UNDP, 2005). Machines such as pumps, mills, and engines are used to make up for the lack of mechanical power that contributes to a home's energy balance by converting energy carriers into mechanical power. Similar issues appear when considering the energy required for domestic tasks like cooking and heating.

Firman Firman and Fathan Munim (2022) investigated the connection between graft and FDI. Economic development, FDI, population, and the corruption perception index (CPI) were all considered in an analysis of Indonesia, Malaysia, Singapore, the Philippines, and Thailand. However, only the human development index showed a significant relationship with and a statistically significant effect on economic growth in the first model. According to their second model, although the human development index and FDI have no meaningful influence on these countries' economic growth, however, corruption perception index does.

Hayet Kaddachi and Naceur Ben Zina's 2022 book, The Effects of Corruption on Economic Development in Tunisia: An Applied Regression Discontinuity Design, examines this topic. This research examined how corruption has affected the growth of Tunisia's economy throughout its history. Using time series data and empirical investigation, relationships were found. The information required for this inquiry was obtained from the World Development Indicators (WDI) database (2019). They utilized ADF, Zivot, and Andrews tests to determine whether or not the variables exhibited stationarity. As a result of the unusual ranking of integration levels, ARDL was suggested as a tool for researching the connections between causes and effects. Estimates indicate that corruption is both a deterrent to and a barrier to private

investment in the short and long terms. The indirect effects that corruption has on government expenditures are detrimental, although they are rather tiny and only temporary.

Ade Al-study Nimra's from 2022 examines financial corruption's impact on Jordan's economic performance. Using time series data, this study investigated how the effects of financial corruption might play out on Jordan's economic performance between the years 1990 and 2020. The results show that a higher CPI correlates with better GDP growth, HDI scores, trade liberalization, population expansion, and FDI. The CR influences population growth and the Human Development Index positively, but it has a negative effect on economic growth, trade openness, and FDI.

The research conducted by Bilal Ahmed Abbasi and his colleagues (2021) investigates corruption's effects on Pakistan's economy. This study looked into the various economic factors that contribute to and are affected by corruption in Pakistan. On the other hand, this study uses data from 1987 to 2017 to experimentally assess these consequences. The number of people in Pakistan who can read and write, the growth of the GDP, and the integration of the economy all serve to increase the problem of corruption, while inflation works to alleviate the problem.

Ijaz Uddin and Khalil Ur Rahman will publish their findings in 2022 under the title Evidence from Developing Countries on the Impact of Corruption, Unemployment, and Inflation on Economic Growth. This empirical study looked at the relationship between corruption, unemployment, and inflation in 79 different developing nations between the years of 2002 and 2018. According to the PUT estimations, all variables have been integrated in a mixed-order fashion. According to estimations provided by PMG, FMOLS, and DOLS, the rate of inflation, the efficiency of governance, and the prevalence of the rule of law all have a considerable impact on GDP per capita. On the other hand, factors such as political stability, unemployment, and corruption all harm it.

Ramisha Aqeel, Muhammad Maaz Zahid, & Marium Ejaz (2022). The influence of corruption on economic growth can be positive or negative, depending on whether it speeds up or slows down progress. According to these facts, corruption is a factor that inhibits economic progress. On the other hand, this research used panel data for 45 nations spanning from 1996 to 2020 to determine the different directions that corruption went in OECD and growing Asian economies. The effect that

globalization and increases in human capital have had on the economic growth of these countries is another topic that is investigated. This work develops an expanded version of the Solow Growth Model by applying the panel ARDL technique. Both regions are plagued by rampant corruption, which hurts economic growth, but human capital has a beneficial effect. In the case of economic globalization, it is believed that the effects are favorable in OECD nations but have less impact on Asia's emerging economies. This is because OECD nations have more advanced economies.

Ogidan, Precious Oluwanifesimi, (2021) assess the Consequences of Corruption on Progress and Growth in the Nigerian Economy (1970-2019). The study utilizes secondary time series data from the Central Bank of Nigeria (CBN) Statistical Bulletin and World Development Indicators (WDI). According to the data, economic corruption and economic growth are highly correlated, but institutional corruption and economic growth are significantly negatively correlated. To effectively combat corruption in Nigeria, the research recommends that the government boost the number of anti-corruption authorities.

Bayesian panel VAR evidence for Latin American and Scandinavian nations: assessing the effects of corruption on GDP growth, the human development index, and the natural resources sector by Dante A. Urbina et al (2021). The impact of corruption on economic expansion is the topic of this article.human development, and the availability of natural resources in Latin American and Nordic countries, drawing comparisons and making contrasts between the two regions. In the first step of the process, a Bayesian technique and the hierarchical prior developed by Gelman et al. were used to generate a panel Vector AutoRegression (VAR) model (2003). A panel error correction VAR model and an asymmetric VAR model are also being explored as potential replacements for the current paradigm. The findings point to certain relevant contrasts, including, there is support for the "sand the wheels" notion in Bolivia, Chile, and Colombia, as well as the "grease the wheels" hypothesis, while there is support for the theory that "corruption has no effect on growth" in Brazil and Peru. But, in the countries of the North, economic growth invariably reacts negatively to shocks in the level of corruption. The advancement of humanity is hampered by corruption in each of these locations.

On the other hand, corruption has a way of encouraging the growth of the natural resources business in South America. Lauw et al. (2021) conducted research

on the connection between gender inequality, corrupt business practices, and economic growth. In addition, their study investigated the relationship between discrimination against women in the workplace and the impact that bureaucratic corruption has on economic expansion. Within the context of a dynamic general equilibrium model, the technique operates under the presumption that capital accumulation is the fundamental engine of economic progress. The administration of public policy is carried out by bureaucrats who have been nominated by the government. When public officials are in a position to waste money, there is an increased risk of corruption. Bureaucrats who are found guilty and sacked can look for work elsewhere. It has been demonstrated that female administrators are less likely to engage in corrupt behavior than their male counterparts. When compared to the private sector, the public sector typically has a greater gender balance. As a result, corruption and development are mutually determinative when this is the case.

Yet, the policy that seeks to boost the number of women working in public sector jobs has the potential to cut down on corruption while simultaneously fostering economic growth. Using panel cointegration and error correction models between 2002 and 2016, Chang-QingSon, hun-PingChang, and QiangGong explored the long-term association between corruption, economic growth, and financial development in 142 different nations throughout the world. To arrive at a more accurate conclusion, the researchers took the samples from their study and split them up into subsamples for industrialized nations and developing nations. The findings indicate a long-term co-integration relationship between GDP, COR, and BM in the total sample and in the subsamples of rising nations. Moreover, estimates from the panel FMOLS for both the full sample and the subsample of emerging countries suggest that corruption has a negative effect on financial development whereas economic growth has a positive impact. In addition to finding a causal link between corruption and financial development, the VECM also found a long-term causal link between economic growth and financial development. On the other side, wealthy countries are not subject to penalties. In developing countries, there is a link between economic growth and financial development; yet, eliminating corruption is a roadblock to financial development.

The impact of corruption on Nigeria's economic development was the subject of a study by Okenna Nwabueze, which looked at how corruption hinders the development of most African states using Nigeria as an example. The unit root test,

co-integration test, and the ordinary least square (OLS) approach were all used in the study. The findings of this study show that corruption has a negative effect on the expansion of economic development. Additionally, because of the enormous financial costs associated with this, expansion will either be slowed down or halted.

The Effect of Corruption on Economic Development in Mediterranean Countries: Panel Data Evidence is a 2018 study by Hicham Bousalham that used panel regression as an econometric method to examine the effect that corruption had on economic growth in Mediterranean countries between the years of 1998 and 2007. The research sample of 160 observations was subjected to individual effects models, such as the random and fixed effects models, and various tests were run to ascertain which model was most appropriate. The study used a simple model that included per capita GDP as a measure of economic development and the corruption perception index as an independent variable. The data were analyzed using the model. Individual effects models were created and used once the model included several macroeconomic control elements. The results show that corruption hinders the economic development of the chosen Mediterranean nations.

Sakib B. Amin and Farzana Alamgir (2018). In the article headed "Impact of Corruption on Socioeconomic Development," evidence from South Asia is offered to show how corruption hinders an economy's ability to develop both economically and socially. using data gathered from a sample of South Asian nations, including Bangladesh, India, Pakistan, and Sri Lanka, between 1995 and 2015. The study's conclusions show an inverse association between socioeconomic growth and levels of corruption in the South Asian region. This claim is supported by the panel cointegration method and the Vector Error Correction (VEC) model.

By Ahmad Tisman Pasha, Adeel Akhtar, and Ahmad Waleed, The Impact of Bribery and Kickbacks on Economic Development in SAARC Countries was published in 2017. This study looks at the relationship between corruption incidents and rates of economic growth between 1995 and 2014. This corrects econometric mistakes that were found in the preceding study. This study's goal is to examine how corruption affected GDP growth rates between 1995 and 2014 while also outlining the econometric constraints of previous research. Regression analysis is used in this study to look at the correlations between the four independent variables and each of the five SAARC countries (Corruption, Foreign Direct Investment, Government Expenditure, and population Growth). Endogenous development models are used to

look at how the various components are related to one another. For instance, the Economic Freedom of the World Index shows that the degree of corruption in SARRC countries significantly impacts the growth of their GDP (EFI). By G. d'Agostinoa, J.P. Dunneb, and L. Pieronic, "Corruption and Growth in Africa." Throughout this investigation, an endogenous growth model is expanded to include a variety of governmental expenses. This model includes corruption as a variable that, depending on the kind of expense taken into account, may have a variety of potential impacts. The results show how corrupt practices interact with the hardship of military service by increasing indirect costs, offering more proof that corrupt practices and excessive military spending have detrimental effects.

2.2.2 Energy Poverty

In 2022, Moegi Igawa and Shunsuke Managi will publish an economic analysis of energy poverty and wealth inequality across 37 countries. We created a three-level hierarchical model to examine the relationship between economic growth, energy poverty, and national income disparities. They came to the conclusion that as a country's economy grows, so do the accessibility and dependability of energy poverty for that country's typical households. Yet, the affordability of energy poverty is greatest in countries with low economic growth and widening income disparities. They indicate a quickening of the economy's expansion and a widening of the income disparity despite being consistent with the findings of other studies. The single most significant factor contributing to the connection between low household income and energy insecurity is the high cost of electricity. A specific example is [Case in point]

By Krishna Reddy Chittedi and Chandrashekar Raghutla, evidence from the BRICS countries explores the connection between economic growth and energy poverty (2022). The impact of access to electricity on GDP growth was examined over the time period from 1990 to 2018 in five different developing countries. The availability of electricity has greatly aided the acceleration of economic expansion in five distinct rising nations, according to long-run elasticities. Also, the results of panel causality tests show that there is a short-term, one-way relationship between economic growth and access to power. This connection is purely beneficial. Despite this, the study examines each economy's short- and long-term elasticities. These actual numbers for each country show how strongly access to electricity affects

economic development. Sulea Abdulmalik, Muhammad-Kabir Salihuac, M. Yusufab, and Ibrahim Kekere. This study examined the relationships among newborn mortality rates, differences in educational attainment, and lack of energy in 33 different African nations. This study used panel cointegration, causality, and entirely modified ordinary least squares as real-world evidence types (FMOLS). The results of the study show a connection between inadequate energy funding and neonatal premature death as well as between inadequate energy funding and educational disparities. The results also show a connection between inadequate access to financial resources for energy and educational gap and a causal link between inadequate access to power and children dying young. The FMOLS survey found a high and unfavorable correlation between not attending school, dying as a newborn, and not having enough money to cover one's energy demands. Government involvement may make it easier for households to acquire power, hurting infant and child mortality and narrowing the educational opportunity gap between rural and urban poor.

Energy Scarcity and Economic Vulnerability: Evidence from Poor and Middle-Income Countries, a study by Canh Phuc Nguyen and Su Dinh Thanh (2022). Using panel Granger causality and the two-step system comprehensive approach of moments estimation on a system equation with two variables, this study made several significant discoveries. These techniques enabled the researchers to reach some firm results, such as the following: It has been established that there are connections between the causes of economic precarity and a lack of access to affordable energy. Economic instability is more likely to be caused by energy shortages than the other way around. Most of the 47 low- and lower-income countries and 27 upper-middle-income countries may show the association. According to the research, there is a link between the world's unstable monetary systems and a lack of access to electricity. Decision-makers must move quickly to address the problem of energy poverty.

Farhad Taghizadeh-Hesary, Muhammad Shahbaz, and Muhammad Mohsina (2022): Despite the region's growing economy, a pervasive lack of energy security needs to be addressed. This study set out to determine how people's access to moderately priced power in Latin American nations is affected by erratic financial market conditions. Econometrics, principal component analysis, and the entropy technique were used to achieve this. Energy poverty levels in 17.54 percent of Latin

American nations are below one, meaning that 17.45 percent of their populations need to use energy-saving techniques to their full potential. Also, the data demonstrate a link between low economic development across all quantiles and increased energy deprivation. No matter the quantile, this is the case.

Jun Zhao, Muhammad Shahbaz, and Kangyin Dong (2022): How can fostering green growth in China help to eradicate energy poverty? the aim or reason for developing technological capacity. The possible impact of energy poverty on green growth in China was the subject of an empirical study using a balanced panel dataset spanning the years 2004 to 2017 and including 30 provinces. Before analyzing how changes in the accessibility of new technologies affect the relationship between energy poverty and green growth, the research first constructed a system of indicators for assessing a comprehensive index of green growth in China. The research's findings support the following three hypotheses: (1) Green growth in China is increasing, as shown by an increasing annual index; (2) Energy poverty eradication and rising technological innovation can effectively promote the nation's green growth; (3) Energy poverty and technological innovation interact positively to affect green growth; and (4) Energy poverty interacts positively with green growth (4).

China's need for more readily available energy has an impact on agricultural output. Hongxu Shia, Hao Xu, Wei Gao, Jinhao Zhang, and MingChang, 2022. The shifting effects of energy poverty (EP) on agricultural technology efficiency are examined in this study using a system-generalized technique of moments applied to data from 30 Chinese regions between 2002 and 2019. (ATE). The results imply that EP could be able to drastically lower ATE levels. Also, a review of the data's heterogeneity revealed that an increase in ATE counteracts EP's unfavorable impacts. The many benefits that come with the industrial organization are also becoming more and more clear. Furthermore, due to the climate in the area, agricultural production in northern China is particularly susceptible to EP. The principal mechanism by which EP negatively affects ATE, according to the results of an examination into a number of distinct channels, is non-agricultural activities. Since it adds to the body of research that already exists and shows how the impact of EP can be lessened on ATE, this article has significant policy implications.

Analyzing the global trend that lower-income people have less access to energy sources. Muhammad Salman, Donglan Zha, and Guimei Wang will be in 2022. This study found that between 2002 and 2018, energy poverty existed in 146 countries

around the world. A multidimensional energy poverty index was created using Grey Relational Analysis and Sequential Relational Analysis (MEPI). based on thirteen elements spread throughout three planes of energy (affordability, cleanability, and availability). The research examined the parallels and divergences across several characteristics of energy poverty using a model of convergence created by Phillips and Sul (PS). A mean MEPI was calculated for a group of 33 advanced OECD countries in the study. Additionally, it looks for ways that the 113 least developed nations could escape energy deprivation. The rates of energy poverty in developed nations and those in developing nations were very different from one another. Yet, since 2008, energy poverty has steadily decreased in emerging countries. Africa, South Asia, and Central Asia continue to have the lowest per capita energy availability worldwide. The PS test revealed the formation of six distinct clubs or groupings of countries that were going in various paths toward stable states with an energy deficit. The average convergence rate for emerging nations was 0.575%. These results underline how crucial it is to address the structural problems that exist in both industrialized and developing countries' energy infrastructures through energy policy efforts that take into account things like race, gender, age, physical impairment, and socioeconomic level. Energy poverty and educational achievement: new evidence from a group of developing nations

Polemis, Apergis, and Soursou 2022). In this study, the relationship between education and energy poverty was experimentally studied using the human capital theory as a lens. In order to do this, 30 emerging economies were sampled between 2001 and 2016 and the relevant cross-sectional dependence and endogeneity corrections were made using GMM estimators. The results of the empirical investigation established beyond a shadow of a doubt that low levels of education greatly worsen energy poverty. Additionally, regardless of the approach employed to assess energy deprivation, the results are consistent, which has significant implications for both policy and governance. Does the degree of income inequality affect the impact that electricity has on African civil wars?, Bruno (Emmanuel Ongo Nkoa, Honoré Tekam Oumbé, Georges Ngnouwal Eloundou, and Thierry Asngar Mamadou, 2022). This essay concentrated on how access to power contributes to civil strife throughout Africa. The transition variable in a panel data model calculated using several regressions from 1990 to 2017 was income inequality. The 1990s to 2017 were covered by the model. Generalized least squares, fixed effects, random

effects, and the Driscoll-Kraay approach were among these techniques. The most crucial determinant in deciding whether or not African governments will go to war with one another, regardless of all other circumstances, is the availability of electricity. On the other hand, depending on whether a location is urban or rural, its impacts are not constant.

What connection exists between West Africa's economic performance and availability to electricity? is a study by Fofana N'Zué and Badar Iqbal that will be published in 2021. This research investigated the relationship between economic performance and energy access. Using data from 1990 to 2016, the study was conducted across fourteen different ECOWAS member states. An ARDL setup and the Pool Mean Group estimator were used to determine the immediate and long-term effects of access to power on growth. The monetary system, language standards, and cultural standards of the various regions were examined. The results show that the variables are integrated together. When the sample is divided up to take into account changes in currency, language, and geography, it shows out that having access to electricity does not significantly affect economic growth. The World Bank's research led to the discovery of this. Access to electricity promotes economic growth over the long term, but this benefit is not immediately apparent. Long-term economic health is directly impacted by the availability of energy.

This was done by Toluwalope Ogunro and Luqman Afolabi (2018). A basic questionnaire was utilized to gather information for this study on the dwelling components of homes as well as the traits of both transient visitors and long-term occupants. The information was gathered in 2018. In order to gather information about biomarkers, a biomarker questionnaire was also given to adult males, females, and children. The logistic model estimate method was ultimately employed to ascertain how Nigeria's socioeconomic variables impact access to power. To reach conclusions, this was done. The results of this study indicate that a wide range of variables affect how simple it is to access power in Nigeria, particularly in rural areas. Nonetheless, the majority of people who live in rural areas still require access to the electrical grid. Most importantly, research has found that people are more likely to use their own portable generators in homes without access to an electrical power supply. Also, empirical data showed that a person's income and level of education both increased the likelihood that they would have access to power in Nigeria. These variables included the political will to link rural areas to the national

grid, the creation of extra infrastructure in these underdeveloped areas, and a few other elements.

In 2021, Chandrashekar Raghutla and Krishna Reddy Chittedi will publish their research on the relationship between energy poverty and BRICS economies' economic growth. This study used panel modeling to analyze the association between access to electricity and economic growth in five developing countries between 1990 and 2018. The study's time frame ranged from 1990 to 2018. The long-run elasticities show that the five emerging countries under study economies have significantly expanded due to the availability of electricity. Also, the results of panel causality tests show a short-term, one-way relationship between economic growth and access to power. This connection is purely beneficial. Despite this, the study examines each economy's short- and long-term elasticities. These actual numbers for each country show how strongly access to electricity affects economic development. The empirical findings support the conclusion that governments should take significant steps to ensure that their citizens can access electricity to support economic growth in their countries. Evidence of inadequate energy access, poor health, and poorer educational levels in underdeveloped nations

Vinay Mishra, Admasu, Rajabrata Banerjee, and Asfaw Maruta. Between 1990 and 2017, this study examined the impact of inadequate energy sources on health and education in fifty different developing nations. Experiments were conducted to ascertain whether or not the impact on development is dependent on factors like poverty and income per capita. An overall energy development index was produced. The results of numerous scientific research show a correlation between increased levels of health and education and a decreased rate of energy poverty. Despite this, they discovered that availability to power had a much greater influence on development than actual usage of the power.

Also, the results of the threshold regression show that the energy development index has a greater influence on life expectancy rates in nations and regions with higher rates of poverty. On the other hand, infant mortality rates are considerably impacted by the energy development index in countries with either a low poverty headcount ratio or a high income per capita. The study's conclusions show that poverty and per capita income have no threshold effect on educational attainment. These discoveries, however, have important implications for policymakers in poor countries since they underscore the absence of access to power in those nations. Poverty has continued to

be a major obstacle to making considerable economic growth, and poverty has a large negative impact on these countries' health outcomes. Effect of Electricity Availability on Labor Market Results in Uganda, Kenya, Tanzania, Djoumessi, Awodumi, Adeosun, and Ahabyoona, 2021. This study looked into whether access to power at home and effective labor market results in Uganda were related or unrelated. Nonetheless, a total of 28,035 households were randomly assigned to one of two categories: treatment (n = 8,925) or control (n = 19,110) using the quasi-experimental approach. The findings show that having access to power significantly increases earnings while lowering the amount of time worked. Using the Kernel Matching (KM), Nearest-Neighbor Matching (NNM), and Radius Matching (RM) processes, respectively, resulted in increases of 155%, 124%, and 155% in the average wage of residences with access to electricity. Also, the mean employment duration for families with access to electricity decreased by 1.34 percent, 2.01 percent, and 2.5 percent, respectively, as a result of the use of the KM, NNM, and RM strategies.

Nsabimana et al. (2021) assert that the lack of energy access, adverse development outcomes, and the switch to renewable energy sources are all interrelated. This study set out to find out how variables like energy insecurity and the switch to green energy affect different facets of advancement. It lays out the dynamic relationship between energy poverty, the switch to renewable sources, and the impacts of this change on development in terms of methodology.

Income, education, life expectancy, employment, and mobile phone subscription are only few of the many socioeconomic variables that were affected by energy poverty, also known as renewable energy. The negative effects of energy poverty on the various development outcomes evaluated are mitigated, but not eliminated, by switching to ecologically benign kinds of energy. The researchers also discovered that there is a chance that energy prices will rise during transitions to renewable energy sources. What they found was that this possibility is likely to last for a long time with regards to many development targets.

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Yet, evidence from a PVAR regression model suggests that higher incomes positively affect labor force participation. It has long been understood that rising energy use is correlated with economic growth. On the other hand, research shows that an increase in the size of the economy leads to an increase in the size of the labor force. A linear relationship between GDP and energy consumption bolsters the expansion hypothesis. The BRICS countries are also making strides toward meeting their energy needs. Many additional forecasting methods, such as FMOLS, DOLS, and PVAR, all point to a convoluted connection between inflation and economic expansion. The PVAR calculations lend credence to a causal relationship between growth and inflation by showing that faster growth is linked to lower inflation. The research indicates that the countries represented on the panel do not experience energy poverty. But, the BRICS countries need to increase their energy consumption and employment rates if they want to stimulate economic growth. Yet, switching to renewable energy sources is necessary if they want to lessen the quantity of air pollution caused by the burning of fossil fuels.

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is disproved, as the countries' social welfare may drop dramatically. The importance of a sustainable energy source is emphasized, and recommendations for future policy changes are provided based on the study's findings. The results show that electricity consumption poverty is the second largest contributor to energy poverty, after poverty caused by high energy costs. In addition, places with lesser energy efficiency need access to modern electricity.

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Asad Amin, Yaping Liu, Jie Yu, and Jie Luo; Abbas Ali Chandio, Samma Faiz Rasool, and Ji Luo; Shah Zaman; To what extent does access to energy limit economic development? This study uses panel data from seven South Asian nations to analyze the relationship between energy poverty, labor market participation, schooling, income inequality, price stability, and GDP growth. Using panel data, we examine the region of South Asia. Panel data were obtained from 1995-2017, and an autoregressive distributed lag model was used to check for long-term cointegration (ARDL). Penalized quantile regression was utilized to get our estimations. Energy insecurity was found to have a substantial long-term correlation with unemployment, education, income, inflation, and economic growth. Economic growth is negatively impacted in both the short and long term by low access to affordable energy, as estimated by ARDL.

On the other hand, the findings provide useful information for economic, social, and environmental decision-makers. The authors of this paper advocate for funding plans for a green and low-carbon economy. Nonetheless, the public and private sectors need to adopt technology that is kind to the environment and efficient in its use of energy to regulate the process of ecological deterioration better and to stimulate

economic progress. There is empirical evidence, using a threshold model, that links the use of renewable energy sources to GDP growth.

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Authors Ahdi Noomen Ajmia and Roula Ingles-Lotz conducted a panel study to learn how biomass energy use correlates with GDP expansion in OECD countries (2020). Between 1980 and 2013, researchers examined the connection between GDP growth and biomass energy consumption in 26 OECD countries. This study looked at various countries, including Australia, Canada, Chile, Denmark, Finland, Iceland, Norway, New Zealand, Norway, Sweden, and Switzerland. The research of the connection used analyses like the panel unit root analysis, panel cointegration analysis, the dynamic OLS analysis, the completely modified OLS analysis, and the panel VECM Granger causality. Results show a long-term equilibrium between the variables, lending credence to the feedback hypothesis. According to the analysis, OECD countries might do more to promote economic growth by investing in extending their biomass energy infrastructure. A policy suggestion was presented in this regard.

An empirical study by Oziengbe Aigheyisi titled "An Energy Deficit and Economic Growth in Nigeria" examines the effects of Nigeria's energy problem on the country's economic growth. The annual time series data from 1990-2017 were analyzed using the S-estimation of the robust least squares estimator. The study concluded that low levels of electricity availability hinder economic growth by reducing productivity. Both foreign direct investment and employment levels contribute significantly to a

nation's growth. Nonetheless, it was established that FDI inflows, trade openness, and currency devaluation severely hampered economic growth. This exposed how (poorly) ready the country was for the uncertainty brought on by globalization. The study concluded that GDP growth accelerated as renewable energy sources were used more widely. The research also showed how using renewable energy sources would benefit the economy. Therefore, this study recommends, based on the evidence, increasing rural and urban electrification, decreasing electricity prices, developing and implementing policies and programs to encourage domestic investment, expanding the workforce, enforcing import controls, promoting exports, preventing an excessive depreciation of the domestic currency, and implementing appropriate free trade agreements.

Energy poverty and economic development in India: evidence from household energy consumption data collected by Rajesh H. Acharya and Anver (2019). This study analyzed the trend of the association between inadequate access to electricity and weak economic growth in India over a ten-year period. A Multidimensional Energy Poverty Indicator (MEPI) and a development indicator were created at the district level based on data obtained from individual households. Although there is much variance between states and districts, existing research suggests that limited access to energy resources is pervasive across India. Nonetheless, with a few outliers (both more developed and less developed regions), energy poverty has decreased over the years over the entirety of India.

Furthermore, the research shows that there is a negative relationship between economic expansion and energy scarcity, the latter of which has grown considerably more severe throughout the course of the research period. An individual's level of education is more important than their income in terms of alleviating energy poverty. The study's results suggest a link between India's poor infrastructure and the country's slow economic growth and modernization. Rural parts of India are more likely to experience energy poverty than the country's urban centers.

Researchers at the University of Maryland showed a significant correlation between the availability of electricity and the output per worker in developing countries. Colleagues of Samsul Alama and himself. In this research, we analyzed how this access affected productivity in poor countries. We analyzed its effects on areas including GDP growth, new capital formation, FDI, and financial innovation. 56 countries on the ascent were examined using the panel cointegration tests

developed by Pedroni (2004) and Westerlund and Edgerton (2005). (2008). Even after accounting for regressors, the results showed a long-run equilibrium relationship between worker productivity in developing countries and access to electricity. These two crucial elements are shown to have a short-run bidirectional causal link by the results of a heterogeneous panel non-causality test conducted by Dumitrescu and Hurlin (2012).

Table 1. Summary of empirical Literature

Author's Info	**Place of Study**	**Research objective**	**Time of Study**	**Methodology**	**Brief Results**
Narain Sinha, 2022	Asia-Pacific, European Union, and American countries	To investigate regional differences in the causes of corruption.	2022	Cross-section data analysis	There are statistically significant regional variations in Corruption's effect on growth.
Pabitra Kumar Jena and Ashmita Kesar, 2022	BRICS countries	To estimate the effect of corruption, political stability and openness on economic growth.	2022	ARDL	The findings of this research provide fresh insight into the negative link between corruption and economic development.
Oke, Margaret Adebimpe, and Onaolapo, Oluwatamilore, 2022	Nigeria	To examine the historical context and conceptual analysis of Corruption in Nigeria	2022	ARDL	The ARDL bound test results reveal that corruption significantly and negatively affects

Chandan Sharma and Ritesh Kumar Mishra, 2022	Asian Counties	Reexamined the relationship between natural resources, Corruption, and economic growth using a more extended dataset for a panel of countries.	2022	GMM	economic development over the long and short terms. Corruption has a negative impact on economic growth
Energy poverty					
Moegi Igawa and Shunsuke Managi	Across 37 countries in Asia and Africa.	To analyze the interplay between national income inequality, economic growth, and energy poverty.	2022	ARDL	Found that the affordability of energy poverty is the worst in countries with moderate economic growth and more income inequality.
Reddy Chittedi and Chandrasheka r Raghutla (2022)	BRICS countries	To study the access to electricity for its impact on GDP development in five developing nations from 1990 to 2018.	2022	ARDL	Electricity availability has considerably promoted economic growth in five developing countries, as measured by long-run

					elasticities.
Ibrahim Kekere, Sulea Abdulmalik, M. Yusufab, and Muhammad-Kabir Salihuac	33 African countries	To examine how lack of energy, infant mortality, and differences in education affect each other in 33 African countries	2022	FMOLS	The result shows a one-way link between not having enough energy and the death of children, as well as between not having enough money for energy and educational inequality.
Fofana N'Zué and Badar Iqbal	West Africa	To investigate the relationship between energy access and economic performance.	2021	ARDL	Access to electricity has a good effect on economic growth in the long run but not in the near run. Access to energy has a long-term relationship with economic performance.

CHAPTER III

Theories of Economic Development

In this chapter, we look at some of the most well-known theories concerning the growth of economies. These theories outline various approaches that can be used to make social advancement. There are a significant number of explanations, arguments, and claims that are made due to the complexity and breadth of the issues surrounding economic development (World Bank, 2000). To begin, the chapter explores some of the first ideas concerning economic growth and development. The following section of this chapter delves into four fundamental schools of classical thought: models of structural change, models of global dependency, models of neoclassical counterrevolution, and models of linear stages of growth. Each model examines a different aspect of how societies develop over time. After that, the most contemporary theories and hypotheses on economic expansion are dissected, such as the new growth theory and the theory of coordination failure.

3.1 Objectives concerning Economic Growth

Increase in the country's Gross Domestic Product

Improving a nation's standard of living should be the central focus of economic expansion. Until the 1970s, the rate of expansion of the economy was a reliable indicator of other measures of development (Todaro & Smith, 2009). As a result, GDP can be substituted for GNP1 as a measurement of gross national output when analyzing the economy's health. The gross national product is typically expressed in terms of a standard currency, the US dollar, and a per-capita measure to make it easier to make international comparisons and account for variations in a population (Jaffee, 1998). For comparing the economic well-being of different nations, the World Bank now uses gross national income (GNI) per capita rather than gross national product (GNP) per capita. According to the World Bank, the total value contributed by all domestic producers, any product taxes, net primary income received during the same year, and any subsidies that are not added to the output valuation constitutes a country's gross national income (GNI) (employee remuneration and property income from abroad).

The World Bank continues to base many influential economic metrics on GDP (World Bank 2011). The indicator, on the other hand, gauges development and success only primarily on material wealth. There is little evidence to suggest that

those on welfare have profited from improvements such as more accessible access to healthcare, schools, or homes due to these policies. The research conducted in the 1950s and 1960s reveals that an increase in a nation's GDP does not necessarily improve the population's living standards. Because economic growth was the only indicator that genuinely counted in the development process, most governments only focused on fostering economic expansion (Todaro & Smith, 2003). Environmental concerns were put on the back burner while concerns about growth were prioritized. People frequently let the quality of their lives to deteriorate, overlooked the significant income disparities that existed between social groups, geographic locations, and genders, and accepted poverty at a higher rate than it should have been accepted (Basu, 2000, p. 64). Most economists and policymakers in poor countries have recently accepted a new economic perspective on development. This view acknowledges that income growth is just one of many aspects contributing to development.

Income Development Economists, Alarmed by the Plight of Millions of People Living Below the Poverty Line in the 1970s, Shifted Their Attention to Quality of Life Development economists, alarmed by the plight of millions of people living below the poverty line in the 1970s, shifted their attention from income to the quality of life of the poor The majority of the populations in many developing countries have not yet seen an improvement in their standard of life, even though many developing countries have witnessed tremendous growth in their GDP per capita. One of the development goals is to boost per capita income despite growing concerns about poverty, inequality, and unemployment. If this is the case, then Seers (1969) is accurate in stating that there needs to be a change in how development goals are articulated. Throughout this period, the goal of development was not to rely primarily on economic expansion; instead, it was to lower poverty, inequality, and unemployment (Seers, 1979). Economists realized in the 1990s that the quality of a person's life, not their country of origin, is the best determinant of whether or not they are from a developing nation. The fact that individuals in underdeveloped nations are forced to face the everyday reality of disease, malnutrition, and death at an early age has caused many people's perspectives on development to shift. Stiglitz (1998) was instrumental, along with other development experts from around the world, in shifting the development goals set by governments in developing nations to broader ones. These new goals included a more equitable income distribution,

environmental improvements, health care, and educational opportunities. According to the World Bank's Development Report (1991), page 4, "to increase the quality of life," it is necessary to take a broader view on development goals. In the most impoverished nations of the globe, higher salaries are typically required for a higher standard of living, but in most cases, more is needed. Byproducts of this movement include the improvement of education, health and nutrition, the decrease of poverty, the preservation of natural systems, equitable access to economic possibilities, individual liberation, and the enrichment of cultural traditions. The writings of Sen (1985, 1992, and 1999) were crucial in helping to formulate the most all-encompassing definition of development goals. According to Sen (1985), the objective of development is to increase human capacities, which he defines as "a person's flexibility in terms of the choice of functioning, given his features (conversion of traits into functioning), and his command over commodities." (Sen, 1985, p. 13). An increase in income is required, but more is needed to bring up the living level. His strategy turns the focus of economic development away from maximizing GDP growth and toward increasing people's quality of life, which is one of the primary goals of economic development. As a result of these modifications to the structure of the goals for development, new composite indices for measuring people's overall quality of life had to be created. These indexes need to consider both monetary and non-monetary factors to provide an accurate picture of the amount of progress that has been made. Indicators of both standard of living and quality of life have historically placed an emphasis on a number of different domains, including health, education, the state of the environment, and material prosperity, to name just a few (Berenger & Verdier-Chouchane, 2007). The United Nations Development Programme (UNDP) has published the Human Development Index (HDI) annually since 1990. The purpose of this index is to provide a single statistic for assessing progress in terms of longevity, literacy, and wealth. The work done by Sen (1985) lays the groundwork for the Human Development Index (HDI) (Elkan, 1995).

Sustainable Development

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Authors Ahdi Noomen Ajmia and Roula Ingles-Lotz conducted a panel study to learn how biomass energy use correlates with GDP expansion in OECD countries

(2020). Between 1980 and 2013, researchers examined the connection between GDP growth and biomass energy consumption in 26 OECD countries. This study looked at various countries, including Australia, Canada, Chile, Denmark, Finland, Iceland, Norway, New Zealand, Norway, Sweden, and Switzerland. The connection research used analyses like the panel unit root analysis, panel cointegration analysis, the dynamic OLS analysis, the completely modified OLS analysis, and the panel VECM Granger causality. Results show a long-term equilibrium between the variables, lending credence to the feedback hypothesis. According to the analysis, OECD countries might do more to promote economic growth by investing in extending their biomass energy infrastructure. A policy suggestion was presented in this regard.

An empirical study by Oziengbe Aigheyisi titled "An Energy Deficit and Economic Growth in Nigeria" examines the effects of Nigeria's energy problem on the country's economic growth. The annual time series data from 1990-2017 were analyzed using the S-estimation of the robust least squares estimator. The study concluded that low levels of electricity availability hinder economic growth by reducing productivity. Both foreign direct investment and employment levels contribute significantly to a nation's growth. Nonetheless, it was established that FDI inflows, trade openness, and currency devaluation all severely hampered economic growth. This exposed how (poorly) ready the country was for the uncertainty brought on by globalization. The study concluded that GDP growth accelerated as renewable energy sources were used more widely. The research also showed how using renewable energy sources would benefit the economy. Therefore, this study recommends, based on the evidence, increasing rural and urban electrification, decreasing electricity prices, developing and implementing policies and programs to encourage domestic investment, expanding the workforce, enforcing import controls, promoting exports, preventing an excessive depreciation of the domestic currency, and implementing appropriate free trade agreements.

Energy poverty and economic development in India: evidence from household energy consumption data collected by Rajesh H. Acharya and Anver C. Sadath. [Insert citation here] (2019). This study analyzed the trend of the association between inadequate access to electricity and weak economic growth in India over a ten-year period. A Multidimensional Energy Poverty Indicator (MEPI) and a development indicator were created at the district level based on data obtained from individual households. Although there is much variance between states and districts, existing

research suggests that limited access to energy resources is pervasive across India. Nonetheless, with a few outliers (both more developed and less developed regions), energy poverty has decreased throughout India.

Furthermore, the research shows that there is a negative relationship between economics, considering the population growthch has grown considerably more severe throughout the course of the research period. An individual's level of education is more important than income in alleviating energy poverty. The study's results suggest a link between India's poor infrastructure and slow economic growth and modernization. Rural parts of India are more likely to experience energy poverty than the country's urban centers.

Researchers at the University of Maryland showed a significant correlation between the availability of electricity and the output per worker in developing countries. Colleagues of Samsul Alama and himself. This research analyzed how this access affected productivity in poor countries. We analyzed its effects on GDP growth, new capital formation, FDI, and financial innovation. 56 countries on the ascent were examined using the panel cointegration tests developed by Pedroni (2004) and Westerlund and Edgerton (2005). (2008). Even after accounting for regressors, the results showed a long-run equilibrium relationship between worker productivity in developing countries and access to electricity. These two crucial elements are shown to have a short-run bidirectional causal link by the results of a heterogeneous panel non-causality test conducted by Dumitrescu and Hurlin (2012).

This concept is also represented in Keynes' prognosis of the "euthanasia of the rentier" in his five long-term prospects for capitalism, which can be found in his General Theory (1936, pp. 375–6). It is expressed in Schumpeter's literature (1934) as the concept that the profitability of innovations tends to decrease with the time, which results in the economy's return to the circumstances known as "circular flow" when new inventions are not introduced. Even though each of these schools of economic thought begins from a fundamentally different foundation, this is one of the most striking and enduring parallels that can be discovered among the major economic schools. (For more information on the history of the concept of a declining profit rate, see Tucker) (1960). A Few Thoughts About Accumulation Taking into Account a Situation from the Real World, By utilizing a streamlined model adapted from Kaldor (1956) and Pasinetti, the fundamental aspects of the traditional argument regarding the accumulation process may be seen graphically represented

(1960). The Ricardian concept of a capitalist agricultural economy that produces a single commodity, in this case corn, serves as the conceptual underpinning for this model. The productivity of land varies, and as a consequence, more effort is required in proportion to less productive land; when the cultivation margin expands due to capital accumulation and higher employment on the land, the average and the marginal output of labor decreases. It is feasible that the borders of the system will expand along either the reaches of the attainable territory or the interiors of those reaches. In addition, the notion that productivity can be found in industries other than agriculture is irrelevant to the subject at hand. The average profit rate for the entire economy can be defined by the profit rate in agriculture, as well as the conditions under which "basics" are produced (cf. Sraffa, 1960; Pasinetti, 1977). It is self-evident that a system with a high number of manufactured goods cannot be defined as having "less fertile soil," and this is true regardless of the rate of profit (Sraffa, 1960).

A simple model of an economy centered on maize demonstrates that there is still a need for this problem to occur. We make a conscious decision to simplify the complexities of Malthusian population dynamics. Because this is likely the aspect of the conventional perspective that presents the most significant amount of difficulty, we shall return to this subject in the following discussion. In the meantime, similar to Lewis (1954), it is considered that the supply of labor is fully elastic when it is set to a traditionally established real pay rate that is equal to "subsistence" at a certain specific rate. The connection between the labor put in and the final outcome should look something like this:

$$Y = F(L)$$

$$F(0) \geq 0$$

$$F' > w* > 0 \; F'' < 0 \; (1)$$

as it complies with the rule of diminishing returns and permits a surplus product to exist above the subsistence wage rate w*. Total capital K is made up solely of wages W (the "wage fund") paid out at the start of the production cycle to secure the services of workers.

Thus

$$K = W = wL \; (2)$$

Here, we simplify matters by ignoring capital's role as inputs to fixed capital and as seed stock. Rent R goes to landlords, profits P to business owners, and the wage fund is replenished at the end of the year.

$$Y = R + P + W \quad (3)$$

Land rent is calculated by subtracting the average product of labor from the marginal product of labor at the current employment level, given the amount of cultivation at any given period.

$$R = \left(\frac{F(L)}{L} - F' \right) \qquad (4)$$

Profit emerges as the residual

$$P = (F' - w*)L \quad (5)$$

It follows that the rate of profit r is determined from

$$r = \frac{P}{W} = \frac{F'}{W*} - 1 \quad (6)$$

In this model, the dynamics of the salary fund stand in for the accumulation process. Capital is accumulated when the number of people being paid rises in tandem with the number of people being employed. As wasteful landlords eat up their share of the surplus, the only way the wage fund can grow is through the investment of capitalists' incomes. When business owners reinvest all of their earnings, the result is economic growth.

$\Delta W = ap \;\; 0 < a < 1 \qquad (7)$

The proportion need not stay the same. Ricardo's theory that [capitalists'] motive for accumulation will wane with every drop in profit and completely disappear when their profits are so low as to not adequately compensate them for the trouble and risk that they must inevitably bear in employing their capital productively suggests that it might instead change depending on the rate of profit (Works, I, p. 122). If that's the case, then we've got

$$a = a(r) \quad a' > 0$$
$$a(r*) = 0 \quad (8)$$

where r* is the lowest rate of return required to make investors happy. Accumulation Rate of Capital is g = ΔW/W, and from (6), (7), and (8), it follows that

$$g = a(r).r \qquad (9)$$

As a direct consequence of this, the accumulation rate has an unbroken chain of dependence on the profit rate. The variation in the profit rate that occurs when accumulation proceeds are realized can be inferred from the following: (6). Because of this, wealthy individuals must give a more significant percentage of the surplus to landlords. In this way, they provide the landlord class control of the investable surplus of the economy, which means they lose that control. The process by which the economy moves closer and closer to reaching its ultimate stationarity is primarily driven by the distributional struggle between landlords and capitalists. The declining fertility of the soil is an impassable barrier that must be overcome during the process. The need for more essential materials like land typically halts this procedure. The classical model is an example of constrained growth in this regard. The same result would be achieved by increasing rent for any scarce resource. But, this realization is also the result of capitalists' never-ending efforts to increase the size of their capital. The basic dynamic process that characterized this chaotic phase in the history of capitalist accumulation is often assumed to be settling into a stable equilibrium in the scholarly literature (cf. Pasinetti, 1960; Samuelson, 1978).

Hicks and Hollander (1977) and Gordon (1978) were the first to express doubts about the convergence hypothesis (1983). After disputes brought up by Casarosa (1978), Caravale and Tosato (1980), and Caravale (1983), the problematic nature of the convergence process became more apparent (1985). Complexity is substantially increased in Ricardian systems because population growth and distributional change are intrinsically linked. Bhaduri and Harris (1986) use a model similar to the one just described to investigate the underlying dynamics of the Ricardian system as the interaction of distribution and accumulation predominates it. Day (1983) demonstrated that simply defining the dynamics of a population can be sufficient to create extraordinarily unpredictable or chaotic motions. They show that rather than a smooth convergence to a stationary state, the model can generate highly complex and "chaotic" motions. Furthermore, it has been demonstrated that the only thing that matters for the probability that such behavior will occur is the initial configuration of parameters. As a direct result of this finding, the idea that the Ricardian system must inexorably converge to a stationary state is challenged.

The Malthusian View of Population Expansion Conventional research often considers the Malthusian Law of Population Increase and its impact on population

dynamics. More precisely, this law requires an increase in the population equal to the excess of a country's income above its basic needs. This feedback loop was designed to keep wages stable during expansion while attracting enough workers to meet demand. But, this premise is, at most, a highly improbable starting point for describing the course of capitalist expansion. Imagine for a second that demographic and biological forces alone determined the availability of labor for capitalism. It is unlikely that significant accumulation rates could be sustained for a long time under these conditions if they could ever begin.

Meanwhile, if Accumulation continues to expand significantly, it will inevitably lead to paying raises, decreased profitability, and, eventually, the system's demise. Hence, the accumulation would have no chance of starting in such a system. Changing labor supply is fundamentally unpredictable, so it would always be in peril even if it succeeded.

Wage increases have the potential to eat away at profits, which are essential to accumulation, at any time. Marx had severe reservations regarding this part of the traditional analysis (Capital, I, pp. 637–9). He sought to replace it with an accumulation-internal concept explaining how Accumulation might sustainably produce new forms of labor to satisfy its demands. This idea would be refined to take the place of the former one. In this case, the "law of the relative excess population," another name for the reserve army of labor concept, was put into action (Capital, I, ch. 25, sections 3 and 4).

Workers were laid off because of mechanization and structural changes in the production process, which resulted in the "recycling" of labor. The formation of the reserve army was the direct effect of this relocation. More potential sources of work are being used to support the accumulation process, in addition to the current labor pool that is being used. There are only a few examples of more participation in the labor force among already employed people, labor migration, less emphasis on homework, and other non-capitalist means of production. The eradication of pre-capitalist modes of production is another example. The redistribution of financial resources may serve a similar function. These sources have been given differing amounts of weight at various times and places throughout history. There appears to be a great deal of wiggle room in the labor supply and, by extension, accumulation, which is true even when population increases is disregarded. It's now common knowledge that there will be more people to work with as the population grows. It

was given a particular purpose in the Malthusian theory, although this view has since been discredited.

The estimates of economic growth generated by classical economics are sometimes deemed "pessimistic," as a conclusion. Although it is sometimes said that they are responsible for economics' label as a "boring subject," a thorough examination of their analysis method and its relevance to the present day reveals that they have much to teach us. A sophisticated conceptual framework is a sign of an in-depth understanding of the critical features of capitalism as an economic system, the causes of its expansionary impulse, and the obstacles or limits to its expansion that result from such an examination. Nonetheless, the inherent limitations of an agrarian economy shaped their viewpoints. The rising cost of producing agricultural items in such an economy is a barrier to growth because of the restricted amount of land and declining land productivity. In their analysis, they overstated the extent to which technological progress was a dominant and enduring factor in altering the circumstances of industrial and agricultural productivity. Even if they were already aware of the positive effects of international trade and foreign investment, they should have incorporated these factors into their systematic growth theory. As classical economists failed to explain the capitalist accumulation process satisfactorily, Marx was forced to devise his own. Marx was also required to expose some of the classical method's glaring flaws. Efforts are still being made to address the issues, but progress has been slow thus far. One of the most puzzling and difficult questions in economic theory is the reasoning behind the growth of capitalist economies.

3.2 The Solow-Swan Growth Model, or Exogenous Growth Model

The Solow model, often known as an exogenous growth model, accounts for economic expansion over the long term. This theory attempts to explain long-term economic growth by examining the role that factors such as capital accumulation, population growth, and labor productivity gains play. To "establish contact with microeconomics," the model relies on a Cobb-Douglas-type aggregate production function as its core ingredient. In 1956, Robert Solow and Trevor Swan proposed the model as a successor to the Keynesian Harrod-Domar model.

A single ordinary differential equation describes the Solow-Swan model's nonlinear dynamics. The rise in individual wealth is represented mathematically by

this model. The Solow-Swan model was a solid foundation for numerous additional extensions because of several appealing mathematical features. The Ramsey-Cass-Koopmans model, developed by David Cass and Tjalling Koopmans in 1965, is an example. This was achieved by endogenizing [clarification needed] the saving rate and taking into account the work of consumer optimization expert Frank Ramsey.

The Solow-Swan model differs from the original Harrod-Domar model from 1946 in that it does not treat capital as the only determinant of economic growth (as long as sufficient labor exists to use all capital). Working separately in 1956, Solow and Swan made essential contributions by creating elementary models of economic growth. The data that Solow utilized regarding the growth of the US economy fit well with his model (A Complete Study of the Labor Market, Interest Rates, and Financial Markets) (Solow, Robert M. 1956). Solow received the economics Nobel Prize in 1987. Economists still employ Solow's sources-of-growth accounting to disentangle the contributions of new technologies, financial resources, and human labor to GDP growth. According to research conducted by Haines et al. (2006), the Solow model is widely utilized and recognized as a leading economic theory. The report claims that total factor productivity (TFP) results can lead to endless advances in a nation's standard of living Eric Frey (2017)

Long-term repercussions

According to the standard Solow model, economies reach a steady state equilibrium and technical progress is the only way to sustain economic growth beyond that point. Savings rate shifts and population growth have negligible long-term effects on the economy (i.e., in the absolute value of real income per capita). Solow's model predicts that developing nations can accelerate the pace at which their economies grow, allowing them to catch up to wealthier countries eventually.

The spread of knowledge is a gradual process. Real income disparities would narrow if global capital flows were redistributed more efficiently. This is because developing countries are expected to provide a better rate of return on investment. (presuming low-income nations have not yet attained a stable state)

Baumol found substantial empirical evidence for a link between a country's starting level of wealth and its subsequent pace of long-term economic growth (1870–1979). DeLong disagreed with Baumol's findings because of the possible substantial measurement errors in measuring real GDP per capita in 1870 and the

non-random selection of nations utilized in the study (Baumol, William J. (1986)). According to DeLong, there is not much data to support the convergence hypothesis, and he argues that Baumol's conclusions are biased because of the non-random selection of countries.

Assumptions

As time passes, the rate of return on financial investments in capital tends to decrease in a stagnant economy, which is the core premise behind the Solow-Swan growth model. This is because, assuming a constant supply of labor, the impact of adding a new unit of capital on production will always be less than the impact of adding a new unit of labor.

The amount of new capital generated can only replace current money lost due to depreciation past a certain point, according to the law of diminishing returns, assuming for simplicity that there have been no technical improvements or expansion in the labor force. Assuming no further increases in technological advancement or the number of working-age individuals, economic growth looks to have stalled.

Even though it complicates things, assuming non-zero labor growth rates makes much sense. The expansion rate will decrease in the near future due to diminishing returns. The economy will eventually settle into a fixed growth rate "quite stable" (no economic growth per capita). With the non-zero technical advancement, a new equilibrium is achieved when the amount of work needed to create one output unit in one working hour remains constant. Considering "affective labor," this is quite close to the scenario when the number of workers increases by more than zero. But in this case, the constant increase in output per person may be traced back to technical progress (the rate of productivity growth).

There are variations in how production impacts society.

An unexpected change in output growth is called a Solow residual in the Solow-Swan model. This step follows the elimination of capital accumulation's impact on the scenario. A time period's growth in total factor productivity (TFP) can be tracked using this method. While technological progress is often cited as the primary cause of increased total factor productivity, continuous increase in the efficacy with which production factors are combined also counts. Enhanced commercial or governmental management practices are implicitly considered when calculating real factor productivity growth. Although total factor productivity (TFP)

growth is an exogenous variable in the model, it cannot be independently assessed in isolation from the impact of capital accumulation on growth.

Variations in formulation occur when the model's productivity assumptions or units of measurement are changed.

3.3 Theories of organic and environmental expansion

The endogenous growth theory proponents argue that internal variables, as opposed to external ones, propel economic development. That is accurate. Knowledge, innovation, and human capital are given particular weight in endogenous growth theory (Romer and Peter M. Romer, 1994). This model highlights the benefits of a knowledge-based economy in terms of externalities and spillover effects. The endogenous growth theory asserts that government intervention is crucial to the long-term success of an economy. For instance, funding for R&D and training initiatives might help endogenous growth models that incorporate additional incentives to innovate.

3.4.1 Models

Some growth theorists raised their voices around the middle of the 1980s to dispute the conventional wisdom that external forces are the primary determinant of long-run growth. They favored a model that considered the main forces in economic growth without resorting to any exogenous variables (unexplained technical progress). Previous studies by Kenneth Arrow (1962), Hirofumi Uzawa (1965), and Miguel Sidrauski are cited extensively throughout this article (1967). Models created by Paul Romer (1986), Robert Lucas (1988), Sergio Rebelo (1991), and Ortigueira and Santos (1997) assumed that growth was produced by a never-ending monetary injection into human capital, rather than by technological progress. This resulted in a multiplier effect that invigorated the economy and helped counteract the effects of the law of diminishing returns. "(Barro, R.J., 2004)

Assuming a constant saving rate due to exogenous variables and providing a continuous saving rate due to endogenous factors, the AK model is the simplest endogenous model. It uses a single factor to model technological development over time (usually A). According to this paradigm, increasing production volumes has no negative consequences. Many lines of reasoning have been put out in support of this perspective. They include the multiplicative effects of technological progress and the

multiplicative effects of capital investment on the economy. Yet, the endogenous growth hypothesis is supported by simulation results in which individuals make optimal decisions about consumption and saving. These simulations show how prioritizing R&D with the most available funds leads to technical progress. Growth theory was expanded upon by Romer (1986, 1990), Aghion and Howitt (1992), Grossman and Helpman (1993), and others (1993). The model was created by Romer (1991). Economist Vladimir Pokrovskii of Russia is widely regarded as the creator of the quantity theory of endogenous productivity growth. The theory may reproduce historical economic development rates without resorting to arbitrary assumptions since it assigns the change to the dynamics of three components, one of which is the technological qualities of production equipment. The theory allows for this since it assigns development to the dynamics of three factors.

Understanding the Endogenous Growth Hypothesis

The endogenous growth hypothesis provided a new way of thinking about the factors contributing to economic growth. When it was proposed that a country's wealth over time is determined more by internal factors—such as human capital, creativity, and investment capital—than by external, uncontrollable forces, neoclassical economics was tested.

Endogenous growth occurs when the economy's fundamental conditions are favorable. Most economists agree that increased rates of innovation and spending on human capital are primary causes of rising productivity. As a result, they push for government and corporate support of creativity by providing individuals and corporations with tools like funding for R&D and IP protection (IP).

Investments in technology and people produce sound knock-on effects that improve earnings in a knowledge-based economy. Knowledge-based industries such as telecommunications, software, and other high-tech fields have an outsized impact in the area as a direct result.

The endogenous growth theory is based on the following postulates:

- Government policies can boost economic expansion by heightening market competition and encouraging product and process innovation.
- Investments in capital, such as those made in infrastructure, schools, hospitals, and phone companies, can increase profits over time.
- The government provides a sizeable share of the money used for R&D. The business sector.

- The safe protection of property rights and patents is the only way to meet the goal of providing incentives for firms and entrepreneurs to invest in research and development.
- Human capital investment is vital for economic development.
- Public policy should encourage entrepreneurship since it contributes to the formation of new businesses, which generates new employment possibilities, new channels for technological advancement, and new sources of money.

3.4 Reasons for Corruption and Energy Poverty

A person will engage in corrupt action if the expected benefit exceeds the sum of the punishment times the likelihood of being caught.

Others have sought to introduce the variable of "morality" or "integrity" to explain why high degrees of monopoly, discretion, and lack of openness may not necessarily result in corruption. Specifically, the "mentality problem" is what the "intrinsic feature" of the moral sphere means. On the other hand, extrinsic variables relate to those beyond a person's control, such as financial hardship, inadequate pay, unsafe working environments, and unnecessarily complicated processes. As a result, many lose hope and start looking for "alternative" ways to fix their problems.

The following are some of the many possible causes of corruption, as identified by respondents to a survey performed in 2017.

High levels of in-group favoritism, racial divisions, poverty, political instability, weak property rights, contagion from corrupt neighboring countries, low levels of education, extravagant family lifestyles, and a lack of democracy are all to blame.

It has been noted that when countries with high corruption levels are compared to countries with low corruption levels, those with high corruption levels tend to be those with large socioeconomic gaps. In contrast, those with low corruption levels tend to be those with more equitable societies.

CHAPTER IV
METHODOLOGY

4.0 Methodology

This section provides specifics of the methodology applied to this study, including the population or sample that was investigated, the procedures followed to gather and analyze data, and how the findings were evaluated.

4.1 The Plan for the Research

This investigation took a quantitative approach in terms of its methodological approach. The presentation and examination of numerical data are given much weight in quantitative research methodologies. It uses the logical method, in which beliefs are subjected to scrutiny, with empiricist and positivist ideas serving as influences, as mentioned by (Bryman, and Alan, 2012).

This method of inquiry is widely used in the natural, applied, formal, and social sciences because it promotes the objective, analytical study of observed occurrences with the intention of testing and comprehending linkages. This is accomplished through a wide variety of quantitative methods and procedures, which reflects the tactic's widespread application as a strategy across various academic fields—following the findings of investigations (Babbie, Earl R. (Lisa M. 2008).

The goal of quantitative research is to develop and apply statistical formulae, concepts, and hypotheses that are specific to a phenomenon. The measuring approach bridges the gap between empirical observation and the mathematical articulation of quantitative relationships, making it central to quantitative research. This chasm exists due to the incompatibility between empirical observation and the mathematical articulation of quantitative relationships.

When we talk about "quantitative data," we refer to a wide range of numerical information like statistics, percentages, and raw numbers. To draw a valid conclusion that can be generalized to the total population, the researcher applies statistical concepts to the data (Lisa M. 2008). Qualitative research, on the other hand, goes far further into the experiences of certain groups to establish themes unique to the group being investigated through textual, narrative, or visual data. This is what the results of a 2011 study say. Corrine and Glesne.

4.2 Investigational Scope

Africa is the primary area of interest for the research. Africa, the second largest and most populous continent, is the second largest continent. The continent is over 30,3 million km2 when all the islands are added (11.7 million sq mi). This amounts to about 20% of Earth's landmass or 6% of its surface area. World Population Prospects 2022, released in 1999 by Sayre and April Pulley, projects that by 2021, the region's 1.4 billion residents will make up about 18% of the world's total population. In 2012, Africa had the youngest population on Earth, with a median age of 19.7 (Swanson, Ana 2015). This was nearly ten years younger than the global median age of 30. The following reflects these results: (Janneh, Abdoulie, 2012). Despite the continent's wealth in natural resources, Africa has the lowest per capita GDP and is only second in total wealth to Oceania. Geography, climate, tribalism, colonialism, the Cold War, neocolonialism, a lack of democracy, and corruption are among the factors that academics have highlighted as causes. Some more possibilities include the following. Africa is a crucial economic market because of its large and young population and recent economic progress, although wealth is dispersed across the continent.

The Atlantic Ocean to the west, the Indian Ocean to the southeast, and the Mediterranean Sea to the north form the continent's encompassing oceanic borders. Madagascar is only one of many island nations that make up this continent. The international community recognizes 54 sovereign nations, eight territories, and two de facto independent entities. Algeria's landmass surpasses any other African nation, yet Nigeria's population is higher. The African Union's (AU) capital is Addis Abeba, founded due to cooperation among African countries.

Africa has more plant and animal species than any other continent, and its megafauna diversity is unparalleled. This is because Africa was the continent least impacted by the disappearance of large animals during the Pleistocene Epoch. Desertification, deforestation, water scarcity, and pollution are just some environmental problems that Africa has to deal with. The effects of climate change in Africa are expected to make these long-standing environmental concerns considerably harder to resolve.

Ancient Egyptian and Carthaginian civilizations began in what is now North Africa. Africa is home to an extensive and diverse population that speaks a great variety of languages due to the continent's long and dramatic history, which includes

various civilizations, migrations, and trade routes. During the last 400 years, American culture has absorbed that of Europe. This distinct African diaspora population in the Americas may be traced back to the beginning of the trans-Atlantic slave trade in the 16th century. The term "African diaspora" describes these dispersed communities. European forces dominated almost all of Africa in the second half of the nineteenth century and the early twentieth century, leaving only the governments of Ethiopia and Liberia unconquered (2019, Samuel Fury). Africa's decolonization in the decades following WWII laid the groundwork for most of the continent's current administrations.

4.2.1 Economics

South Africa and the countries of North Africa stand out from the rest of the continent's underdeveloped economies with their diverse sets of manufacturing infrastructures. Despite the abundance of natural resources, over 60% of the continent's population still relies on agriculture as their primary source of income. Despite its natural resource wealth, Africa remains the world's poorest and least developed region (bar Antarctica). This is due to several factors, such as governments that are corrupt and have violated the rights of their citizens in horrendous ways, central planning efforts that have failed, widespread illiteracy, low levels of self-esteem, a dearth of access to foreign capital, the legacy of colonialism, slavery, and the Cold War, frequent tribal and military conflict, and a lack of foreign investment. But the nominal GDP of the United States, China, Japan, Germany, the United Kingdom, and India is more than that of any other country (Richard,1985). Twenty-four countries ranked lowest in the United Nations Human Development Report for 2003 (151st to 175th) were located there.

Poverty, illiteracy, starvation, improper hygiene practices, and poor health all significantly negatively impact large segments of the African population. While 86% of the population in India lived on less than $2.50 (PPP) a day in 2005, 81% of those in Sub-Saharan Africa did. The World Bank revised its global poverty predictions in August 2008, raising the poverty threshold to $1.25 per day (from $1.00). The prior poverty threshold was $1.00; therefore, this was an increase.

In Sub-Saharan Africa, where half the population lived on less than $1.25 a day in 1981 (200 million people), 58% of the population did so in 1996, and 50% of the population did so in 2005, there has been the least amount of progress toward

alleviating poverty. (380 million) Quite a few individuals. There has been a rise in the number of people living in poverty in some parts of the world as the standard of living of the average person in sub-Saharan Africa has declined since 1973 when they were only making 70 cents a day. It has been linked in some research to the unsuccessful implementation of economic liberalization initiatives pushed by multinational firms and governments abroad, but it appears that most of the blame lies with domestic government policymakers. Put another way, the poverty rate in Sub-Saharan Africa is far higher than in any other part of the world.

4.3 Sample Size and Population Statistics

As was said previously, the 53 countries that makeup Africa are the primary focus of this investigation. This research aims to illuminate the structural obstacles that African nations must overcome to achieve economic prosperity. Researchers have hypothesized the presence of two primary barriers to economic growth based on the results of their analysis. In this case, the absence of access to cheap forms of energy. This motivates the study's examination of the link between corruption and African economies' growth from 2012 to 2020, as well as the link between economic development and power shortages from the turn of the millennium to the present day.

This study estimated the correlation between economic growth and corruption across a sample of 20 countries in Africa (Botswana, Rwanda, Mauritius, South Africa, Ghana, Togo, Kenya, Namibia, Burkina Faso, Ethiopia, Tanzania, Cote d' Ivoire, Angola, Mali, Cameroon, Madagascar, Mozambique, Zimbabwe, and the Congo Republic). Due to a need for more information in several African republics, this was essential.

To further investigate the connection between energy poverty and economic growth, the researcher reviewed data from 39 separate African states. The following nations are being considered for inclusion in the study: Algeria, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cote d' Ivor, Congo Republic, Djibouti, Egypt, Equatorial Guinea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, N.

4.4 Tools and Resources for Information Collection

To estimate the connection between economic development, corruption, and energy poverty in Africa, researchers used a wide range of resources like computers,

tablets, mobile phones, and libraries to get the necessary data. New information was a boon for several World Bank databases, including the Data Bank, Our world in data, and the Corruption Perceptions Index.

Titled "World Development Indicators," this publication is the World Bank's premier tally of global progress data (WDI). Some of the World Development Indicators (WDI) indicators contain time series that goes back more than 50 years, giving users access to a wealth of historical data on 217 economies. Official sources provide the data for these metrics, which include regional, national, and global estimates. The database provides users with historical and current data on the growth rate. Poverty, healthcare, population, GDP, international trade, and the environment are only a few of the many areas of study covered by the World Development Indicators (WDI). Check out the Global Development Indicators website to better understand development indicators, data collection methods, and visualization options. In this way, site users can make better-informed choices based on the data provided.

The Corruption Perceptions Index (CPI) ranks countries "based on expert judgments and public opinion polls of perceived levels of corruption in the public sector." Corruption is defined as "the abuse of power for private advantage," and the CPI has been published annually by Transparency International since 1995. Online academic journal Our World in Data (OWID) tackles pressing global problems like poverty, disease, famine, climate change, violence, existential threats, and inequity. In 2010, OWID was established. Max Roser is a development economist and a social historian. He established the Global Change Data Lab in Cardiff, Wales, as a non-profit in the United Kingdom. Oxford is now home to the investigation's headquarters, which the organization created.

4.5 Data

To fairly assess the relationship between energy poverty and economic development, as well as the relationship between corruption and economic progress, this study collected two separate data sets. In this research, we looked into the links between the two.

To begin estimating the connection between economic development and corruption, this study analyzed annualized panel data from 2012 to 2020 for twenty African countries (Botswana, Rwanda, Mauritius, South Africa, Ghana, Togo,

Kenya, Namibia, Burkina Faso, Ethiopia, Tanzania, Cote d'Ivoire, Angola, Mali, Cameroon, Madagascar, Mozambique, Zimbabwe, and the Congo Republic). Panel data give access to such a huge sample size, making it possible to arrive at accurate and objective findings across all variables. Botswana is one of these countries. In addition, the World Bank's data repository is mined for secondary information used in this analysis.

Corruption prevention (CORR), national spending on consumer goods (GCE), public education expenditures (GEE), annual price increases (INF), and tax collections (GEE) were the independent variables used for comparison (TAX). It is standard practice to show a connection between these elements and economic development and degrees of corruption. The annual growth rate of gross domestic product (GDP growth) is used here as a surrogate for economic growth.

Second, this research makes use of annual panel data from 39 African countries (including Algeria, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cote d'Ivoire, Congo Republic, Djibouti, Egypt, Equatorial Guinea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Nigeria, Niger, The growth in GDP per capita expressed as an annual percentage is the dependent variable. The independent variables include things like the percentage of the population that has access to electricity (AE), the percentage of the population that has experienced annual population growth (Pop), the percentage of the population that has experienced annual inflation in consumer prices (Inf), and the percentage of the people that has experienced a decrease in life expectancy (Lex) (Lexp). Variables.

The first estimation uses data from 29 countries across Africa, while the second uses data from 39 states. The variables were chosen to be used as surrogates for the annual growth in GDP (GDP growth). The independent variables were the rate of corruption suppression (CORR), the rate of inflation in consumer prices (annual percent), the rate of tax revenue collection as a share of GDP, and the rate of government spending on education as a share of GDP (TAX). The second estimation uses the control variables of electricity access (as a percentage of the population) (AE), population growth (as a percentage) (Pop), inflation (as a percentage) (Inf), and life expectancy (LE) (Lexp).

Determinant Factor

Twenty distinct African states are being studied, and their GDPgr yearly growth rates between 2012 and 2020 are the dependent variable.

GDP growth rates for any given year can be estimated in 2015 US dollars by ignoring fluctuations in the value of the home currency. Gross domestic product (GDP) is the market value of all final goods and services produced within a country, including taxes on those goods and services but excluding government subsidies. Natural resource depletion and quality decrease, as well as the deterioration of manmade assets, are ignored. Changes in the population's ability to produce goods or earn money drive the expansion or contraction of the economy. Gross domestic product, actual gross domestic product, and real gross domestic product at the country level are the three key growth measures included in the 2008 United Nations System of National Accounts (2008 SNA). All economic activity, including that of people, governments, and businesses, is what makes up GDP. This sum is expressed using regular pricing. Gross domestic product (GDP) is a measure of economic output that accounts for the contribution of both home and foreign markets.
The World Bank's database included information on GDP growth rates.

Corruption

Corruption was extracted from the transparency index and analyzed further because it was a variable of interest.

Nations are rated according to their self-reported levels of corruption in the public sector based on polls of both experts and members of the general public. Corrupt practices are defined as "the misappropriation of entrusted power for personal profit" by the Corruption Perceptions Index. The index has been compiled annually by Transparency International since 1995.

A large number of researchers have used this indicator of corruption in their studies. Two other measures of corruption, overly strict regulation, and black market activity, were shown to have a "very strong association" with the Corruption Perceptions Index in a 2002 study.

To encourage governments to combat corruption, the annual Corruption Perceptions Index (CPI) is released as a robust advocacy tool. It also helps a lot in getting the word out there about corruption. Since the CPI 2012 is an aggregate index

that relies on key questions from several data sources to collect the perspectives of firms and industry experts, 2012 data was used for this study.

As a percentage of GDP (formerly known as GCE), government final consumption expenditure (previously known as general government consumption) includes all current government expenditures for items and services (including compensation of employees). National defense and security expenditures are also mostly accounted for, with the exception of military expenditures, which are included in the total for government capital creation.

Gross exports (exports minus imports) and net accretion of valuables (exports minus imports) make up the expenditure side of GDP, whereas gross capital formation (private and public investment in fixed assets, inventory fluctuations, and net accretion of valuables) makes up the investment side (GDP). The price quoted to the buyer reflects these expenditures and any net taxes specific to purchased items.

As a result of governments' preference for increased output and the fact that product information is easier to get than information on expenditures, many countries predominantly utilize a manufacturing-based technique to estimate their GDP. In addition, some countries estimates of their national expenditures leave some crucial details. Instead, they utilize their gross domestic product (estimated with manufacturing methods) as the benchmark against which a variety of critical metrics are measured.

Information on government expenditure priorities and totals was culled from the World Bank's national accounts database.

Inflation measured by the year-over-year change in consumer prices

Inflation rates are often calculated using the Consumer Price Index (CPI). The annual percentage increase in the cost of a set of goods and services that are acquired on a regular basis is calculated using this metric. Because of this, using the Laspeyres formula has become standard practice.

Revenue from taxes (as a share of GDP)

The government is responsible for "tax revenue," which is the distribution of money to the people. This is why most payments to social security, as well as fines and penalties, are excluded from the required contributions. When tax money is collected incorrectly and must be refunded to taxpayers or adjusted in some other way, a revenue loss occurs.

Supply of electrical energy

The share of the total population that can always count on having access to electricity. Our understanding of electrification rates and trends is gleaned from a wide range of resources, including government studies, surveys, and international data sets as well as the private sector. The International Energy Agency, the International Renewable Energy Agency, the United Nations Statistics Division, the World Bank, and the World Health Organization all used data from the World Bank's Global Electrification Database to compile this report (WHO).

Annual percentage of population growth

The global population is on the rise, adding millions of new people every year. All people living in a given area, regardless of citizenship or legal status, are counted toward the de facto population estimate. The population is calculated based on this criteria. Calculating the percentage increase in population from the middle of Year t-1 to the middle of Year t-2 yields an exponential representation of the annual growth rate in Population in Year t. The total population is included in these numbers. The major data source for this demographic research is the United Nations Population Division (as of July 1). This research relied on a variety of sources, including the United Nations Statistics Division's Population Predictions for the World in 2019 Revision, national statistics offices' census reports and other data, the European Union's Eurostat, and the United States' Census Bureau (different years). Estimated and Mean Lifespan at Birth (years)An infant's life expectancy at birth is the number of years they are projected to live if present mortality rates continue uninterrupted throughout their lives. This figure can change depending on a variety of factors, including whether or not the infant is male or female. The original setting for it: 1. The Department of Population at the United Nations. Predictions of the World's Population for the Year 2019 Sources such as the (2) Census reports and other statistical publications from national statistical offices, (3) Eurostat: Demographic Statistics, and (4) United Nations Statistical Division are utilized in the process of either updating or calculating male and female life expectancy at birth. Statistics and Demography Programmed, Secretariat of the Pacific Community Records of Births and Deaths, Various Years International Database, United States Census Bureau Records of Births and Deaths, Various Years

4.6 Methodologies for Analyzing Data

In order to conduct an analysis of the data obtained from a wide range of sources, the research project in question makes use of a piece of statistical software called E-Views. E-Views is a cutting-edge econometric, statistical, and forecasting tool that features powerful analytical capabilities wrapped up in a user interface that is highly modifiable and easy to use. In the realm of research, E-Views can be used for a wide variety of purposes, including the efficient and simple management of data, the execution of econometric and statistical analysis, the creation of forecasts or model simulations, and the generation of graphs and tables of publication-quality.

In order to conduct an analysis of the data that was gathered, the following steps were carried out using the E-Views software.

Statistics that are descriptive: Doing descriptive statistics in order to gain an understanding of the pattern of behavior exhibited by the data is essential before moving on to an analysis of any particular set of data. These data are useful for: testing that is both parametric and nonparametric conducting essential research both quantitative and qualitative

Determine whether or not the sample has a normal distribution.

Determines whether there are any data points that are considered to be outliers.

Displays the many metrics of dispersion, including range (the difference between the highest and lowest value), variance (the extent to which the values fluctuate), and standard deviation (the distance from the mean), amongst others.

Provides an indication of the normalcy parameters:

1. kurtosis (measures the degree of sharpness)

a. Mesokurtic: a normal distribution with a kurtosis equal to 3, often known as a "meso" distribution.

b. Leptokurtic: a positive kind of kurtosis (also known as a peaked curve) that is characterized by values that are higher.

The platykurtic distribution has a negative kurtosis, which results in a flatter curve and a greater number of significant low values.

2. Skewness (measures the degree of asymmetry)

a. Normal skewness: a distribution that is symmetrical around the mean and has a skewness value of zero.

b. A positive skewness describes a distribution in which the right tail is longer and values are higher.

c. A negative skewness is characterized by a long left tail and a considerable increase in the number of low values.

$$f(x) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{\frac{(x-\mu)^2}{2\sigma^2}}$$

Normality test: You need to, as the phrase says, conduct a normality test in order to determine whether or not your data conform to the normal distribution. A normal distribution is a term used to refer to the statistical distribution that is most commonly associated with the concept of normalcy. This distribution, which is also sometimes referred to as the Gaussian distribution or a bell-shaped curve, can also be conceived of as a bell curve. The bell-shaped curve is another name for the Gaussian distribution. If you have a mean and a standard deviation for your data, then you have what is known as a normal distribution, which is a symmetrical continuous distribution. If you do not have a mean and a standard deviation for your data, then you do not have a normal distribution. The equation for it is as follows:

This check determines whether or not the data is sufficiently typical to enable the confident use of your statistical approach. Typicality is defined as the degree to which the data is representative of the whole. The ability of a statistical tool to withstand violations of its normality assumption is what determines whether or not it can be utilized when data does not adhere to the normal distribution. To restate, the normality test is not very sensitive to relatively minor departures from the normality that is supposed to be present. The term "null hypothesis" refers to the presumption that your data do not exhibit any abnormalities in distribution (Ho). If you don't believe that your data is representative of the general population, you can also refer to this as your null hypothesis (H0). Following the completion of any statistical normality test, the p-value will be what you consult in order to determine whether or not to reject the null hypothesis.

Test of the Unit Root: A test of the unit root can be performed to see if a time series is stationary. Non-stationarity can be created by the presence of unit roots, while stationarity occurs when the distribution of a time series remains unchanged as time passes. Non-stationarity is the condition in which a change in time does have an effect on the distribution form of a time series. The statistical power of these kinds of tests is typically below average at best. The fact that there is no one test that can be

singled out as being especially effective helps explain why there are so many different kinds of tests. The following are examples of evaluations that were utilized throughout this investigation: A statistical method that relies on linear regression, the Dickey Fuller Test is also occasionally referred to by its alternate name, the Dickey Pantula Test. The Augmented Dickey-Fuller (ADF) test is one that can be utilized in situations when there is a concern for serial correlation. The ADF can easily handle larger and more sophisticated models without any issues. One of its flaws is that it has a Type I error rate that is higher than average. The Phillips-Perron (PP) Test is a version of the Dickey Fuller test that is used to correct for autocorrelation and heteroscedasticity in the mistakes. This test was developed by Phillips Perron.

Padroni cointegration test The fully modified ordinary least square (FMOLS) and the dynamic ordinary least square (DOMLS) are utilized in order to investigate the cointegration coefficients. Pedroni's panel cointegration test is utilized in order to determine whether or not there is a long-term correlation (DOLS).

The procedure that is generalized for moments (GMM)

The generalized method of moments (GMM) is a statistical methodology that can be utilized for this purpose. It can be used to estimate the model's unknown parameters by integrating the information found in population moment conditions with the economic data that has been observed. After we have determined those values, we will be able to employ inference to further investigate the primary question. We will soon see that GMM is a perfect fit for the data that we are collecting from our economic models, and we will be able to witness this in the near future.

The inconsistent ordering of findings produced by the unit root test was the impetus behind the implementation of this method. The generalized method of moments, sometimes known as the GMM, is a technique for developing estimators that is analogous to maximum likelihood (ML). GMM allows us the greatest degree of adaptability in terms of identification. Any collection of data moments can be used to uniquely identify GMM estimations; all that is required is that there be at least as many moments as there are parameters to estimate in the collection. (And it's clear that each of the parameters has its own unique characteristics.)

The data set used in this investigation is fairly extensive, and in situations when there is a great deal of information available, the method of is most likely to provide the most accurate results. For the GMM, it is only necessary to make a few minimal assumptions about the DGP. We are able to model the DGP using GMM without

having to define the distributions of the error terms. This is typically considered to be a strength due to the fact that the vast majority of faults are never discovered and the vast majority of models are only approximations of the real DGP.

The method of moments, often known as GMM, has been generalized so that it may take into account a greater number of moment conditions and parameters. The GMM is superior to the MM in terms of its efficiency as a result of these additional moment criteria. When there are more instantaneous circumstances than parameters, it has been suggested that the estimator is overidentifying the value. Even when the estimator has an excessive amount of information, GMM is still able to combine moment conditions efficiently.

Any statistic that offers a broad perspective on the data might be regarded as a "data moment," as this term is sometimes used. A single data point up to the sample mean could be included within a data instant. The parameters of a model- or data-generating process can be determined with the help of GMM. This is done so that the model moments are as near to the data moments as possible. As instances of the more generic GMM estimation approach, we can consider linear least squares estimation, nonlinear least squares estimation, generalized least squares estimation, and instrumental variables estimation.

4.7 Methods

As was mentioned earlier, this thesis aims to investigate the impact of corruption on economic growth and assess the connection between energy poverty and economic growth in Africa. In addition, the investigation will look at corruption's influence on economic development. As a result, the study developed two separate models to evaluate the aforementioned connections between variables.

The linear function model will be discussed further in the following paragraphs as we move on to the first estimation.

$GDPgr = f(CORR, GCE, GEE, INF, TAX)$- (1)

Where GDPgr stands for the annual growth of the Gross Domestic Product, CORR stands for the measure of corruption, GCE stands for expenditures made by the government on its final consumption, GEE stands for expenditures made by the government on education, and INF stands for the rate of inflation.

The statistical expression of the employed GMM model is given below:

$$GDPgr_{it} = \delta_0 + \delta_1 CORR_{it} + \delta_2 GCE_{it} + \delta_3 GEE_{it} + \delta_4 INF_{it} + \delta_5 TAX_{it} + \varepsilon_{it} - (2)$$

The GMM model used in this study is reflected by the statistical representation in the preceding equation (2). GDPgr is the dependent variable in the above equation, while CORR, GCE, GEE, INF, and TAX are explanatory variables. δ_0 To δ_5 represent the coefficients and parameters of the models, whereas ε_{it} represents the error term.

For the second estimation, an economic model was first constructed, followed by an econometric model, which estimates the error of the model as well

$GDPgr = f(AE, Pop, Inf, Lexp)$ – (3)

Where GDPgr stands for the annual growth of the Gross Domestic Product, AE stands for the Access to Electricity (% of the population), Pop stands for population growth (annual %), Inf stands for Inflation, consumer prices (annual %), and Lexp stands for Life expectancy. From the economic model, the below econometric model was constructed to estimate the model's error.

$GDPgr_{it} = \beta_0 + \beta_1 AE_{it} + \beta_2 Pop_{it} + \beta_3 Inf_{it} + \beta_4 Lexp_{it} + \varepsilon_{it}$- (4)

The statistical representation in the preceding equation (4) represents the GMM model specified in the present investigation. GDPgr is the dependent variable in the above equation, while AE, Pop, Inf, and Lexp are explanatory variables. β_0 To β_4 represent the coefficients and parameters of the models, whereas ε_{it} represents the error term.

The dynamic generalized method of moments (GMM) model is the most appropriate approach to provide reliable findings. This is because the characteristics of the data, the size of the sample, and the length of time during which the study has been conducted all point to the GMM model being the most appropriate choice.

The number of countries represented in our panel data, twenty, is greater than the time span we are investigating (9). The GMM model is the best method if the amount of time available needs to be increased concerning the number of countries or topics being researched. Several authors have utilized this model, including but not limited to Anderson and Hsiao, Holtz-Eakin, Blundell, and Bond, amongst others.

First-difference GMM (GMM-DIF) models were developed by Anderson and Hsiao (1982), Holtz-Eakin et al. (1988), Arellano and Bover (1995), and Blundell et al. (1991). Arellano and Bover (1995) also developed a systems GMM model established by Anderson and Hsiao (1995). (1991). (1998). First-difference GMM, in contrast to systems GMM, which uses orthogonal deviations to eliminate the variables' average of all future data, rectifies the model's endogeneity difficulties by differencing the regressors and eliminating fixed effects (Arellano and Bond 1991).

(Arellano and Bond 1991). [Citation needed] Together with Bond, Amador (1991). In addition to Blundell and Bond (1998), Arellano (1995) and Bover (1995) Systems GMM is typically preferred over first-difference GMM because it minimizes the amount of data that is lost and allows panel data to either be balanced or imbalanced. First-difference As was said before, GMM encourages an imbalance in data sets that already have an imbalance.

1. The Generalized Method of Moments (GMM) model is chosen over the usual least-squares technique because it eliminates the risks of heteroskedasticity, autocorrelation, and normalcy (Fraj et al., 2018). Panel data modeling can be complex due to heteroskedasticity, autocorrelation, and normalcy, all of which can result in incorrect inferences from the data.

This comparative research investigation uses both systems and first-difference generalized estimating equations. In addition to this, diagnostic tests may also include the Arellano and Bond test of serial correlation as well as the J-statistic. Before the dynamic GMM model is applied, the descriptive statistics and unit roots of the variables are analyzed with the help of the Dickey-Fuller and Phillips-Perron tests (1988). The unit root test can determine the proper order in which the variables are integrated into the model. To identify whether the variables have long-term relationship, the Pedroni cointegration test will analyze whether or not the variables have a long-term relationship.

CHAPTER V
FINDINGS AND DISCUSSION

5.1 Results and Discussion

This chapter presents a summary of the conclusions that can be taken from the data that was obtained.

This research focuses on two nexuses: the nexus of corruption and Economic development, and the nexus of Energy Poor and Economic development. Both of these nexuses are intertwined. As a consequence of this, the findings of this research have been split up into two distinct sections.

5.1.1 A preliminary assessment of the correlation between bribery and economic growth

This research uses a variety of tests to evaluate the nature of this link, and the following are the results of those tests:

Descriptive statistics

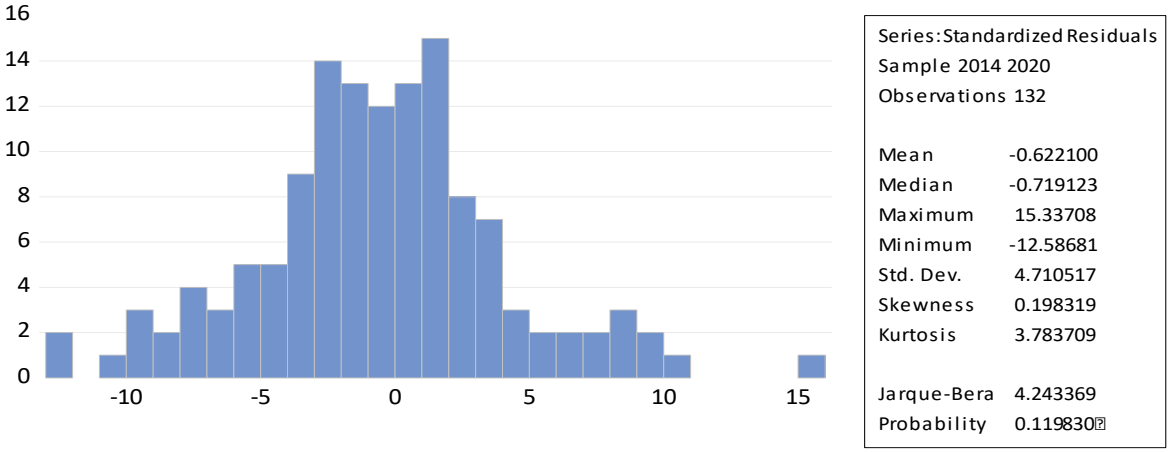
The outcomes of the descriptive statistics analysis that was carried out on the indicators that were the subject of the research are shown in Table 1 further down. All 20 African countries' annual growth in Gross Domestic Product (GPDgr) was observed over a nine-year period, and the average was 3.60 percent; the median was 4.29 percent; the maximum was 16.67 percent; the minimum was -14.89 percent; the standard deviation was 4.38 percent; and the skewness was -1.09 percent; and the kurtosis was 5.42 percent. The values for the mean, median, maximum, lowest, standard deviation, skewness, and kurtosis for corruption are respectively 35.65, 32.50, 65.00, 15.00, 11.84, and 2.46. In addition, the numbers for corruption's kurtosis are 2.46. Inflation has a mean value of 9.47, a median value of 3.55, a maximum value of 557.20, a standard deviation value of -3.23, and skewness and kurtosis values of 45.52 and 10.69 respectively. The values for kurtosis are 123.22. The mean, median, maximum, minimum, standard deviation, skewness, and kurtosis values for tax revenue as a percentage of GDP in 20 African countries are 15.27, 13.63, 34.62, 6.66, 6.09, 1.24, and 3.98, respectively. These values represent the mean, median, maximum, and minimum values. The mean, median, maximum, and minimum values for tax revenue as a percentage of GDP in 20 African countries are 15.27, 13.63, 34.62, and 6.66 respectively. The standard deviation, skewness, and kurtosis values are also as follows: In addition, the mean, median, maximum,

minimum, standard deviation, skewness, and kurtosis of the government's final consumption expenditure are 15.58, 14.82, 35.35, 6.63, 5.74, 0.93, and 3.61, respectively. These values are presented in the table below. The following table lays down these values for your perusal. The highest value of government spending on education as a percentage of GDP was 10.65, while the lowest value was 1.78. The mean value of government expenditures on education as a percentage of GDP is 4.63, while the median value is 4.42. In addition, the standard deviation of these data comes in at 1.69, the skewness value is 1.05, and the kurtosis value is 4.11. Within the scope of this study, there are a total of 180 observations for each variable (see Table 1).

Table 1: Descriptive statistics

	GDPGR	CORR	INF	TAX_GDP	GEC	GEEGDP
Mean	3.603542	35.65000	9.470438	15.27155	15.58012	4.628718
Median	4.289569	32.50000	3.550760	13.63348	14.82266	4.427080
Maximum	16.66543	65.00000	557.2018	34.62869	35.35077	10.65203
Minimum	-14.89469	15.00000	-3.233389	6.661741	6.635067	1.776940
Std. Dev.	4.380708	11.83994	45.52189	6.098272	5.740849	1.699922
Skewness	-1.090539	0.630029	10.69938	1.235973	0.925423	1.056987
Kurtosis	5.426033	2.468317	123.2202	3.978553	3.607679	4.116589

Figure 7. Normality Test



Histogram residuals are generally not dispersed when the p-value is less than or equal to 0.05 percent but are normally distributed when the p-value is higher than or equal to 0.05 percent, as determined by the Jarque-Bera test for normality. Consequently, based on the result of the normality test and the fact that the probability of the Jarque-Bera statistics is obviously larger than 0.05, the preceding graph demonstrates that the residuals have a normal distribution.

Table 2: ADF and PP results unit root test

ADF					**PP**			
	INTERCEPT		INTERCEPT & TREND		INTERCEPT		INTERCEPT & TREND	
VARIABLE	LEVEL	1ST DIFFERENCE	LEVEL	1ST DIFFERENCE	LEVEL	1ST DIFFERENCE	LEVEL	1ST DIFF
GDPgr	0.694	0.0054	0.138	0.0515	0.957	0.0038	0.623	0.0136
Corr	0.753	0.0187	0.552	0.0260	0.438	0.0000	0.384	0.0000
GEC	0.116	0.0440	0.316	0.9141	0.643	0.0000	0.001	0.0000
GEEgdp	0.117	0.0058	0.249	0.1313	0.030	0.0000	0.000	0.0000
Inf	0.027	0.0000	0.084	0.0540	0.000	0.0000	0.000	0.0000
TAxgdp	0.546	0.0000	0.003	0.0001	0.029	0.0000	0.000	0.0000

Unit root tests using ADF and PP were used to look at the integration order of the researched variables, and the results are shown in Table 2. Using the ADF and PP

unit root test methods, Granger claims that they are the most accurate (1986). Table 2 shows that the annual rise in GDP is not level-stable; however, it is level-stable based on ADF and PP unit root findings at the first difference. The ADF and the PP both imply that corruption is not stationary, although it does become stationary after the first difference. At first difference, General Government Final Consumption Expenditures, as shown in Table 2, do not remain constant compared to those reported by the ADF. It is conventional at first glance, but PP agrees with the ADF that it is not stationary. The first difference, according to ADF, is not a steady state of government spending on education; it is only at the level and first difference, according to the PP. Based on these two indicators, inflation remains steady at its present rate and initial difference. To summarize, tax as a percentage of GDP does not remain static at level but remains static at the first difference, whereas current inflation is stable at all conventional levels for both level and first difference, according to ADF.

Table 3: Pedroni cointegration test

	Statistic	Prob.	W. Statistic	Prob.
Panel v-Statistic	-0.768212	0.7788	-0.851042	0.8026
Panel rho-Statistic	2.869403	0.9979	3.367680	0.9996
Panel PP-Statistic	-7.966975	0.0000	-5.057505	0.0000
Panel ADF-Statistic	-6.457657	0.0000	-3.459447	0.0003

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	5.142902	1.0000
Group PP-Statistic	-7.445318	0.0000
Group ADF-Statistic	-4.266258	0.0000

The cointegration test is an essential test that must be carried out in order to analyze the long-term relationship that exists between the different variables in economic modeling (Granger, 1986; Engle & Granger, 1987). In this particular investigation, the Pedroni cointegration test was utilized, as demonstrated in Table 3. The group T-statistic for ADF and the group PP t-statistic for PP are both considerable at all conventional significance levels, which allows us to test the null hypothesis that there is no cointegration between the two variables. The group rho-statistic, panel v-statistics, and panel rho-statistics all indicate that the null hypothesis of no

cointegration is valid, which lends support to the fact that there is no cointegration and supports the null hypothesis. Yet, the overwhelming evidence from PP statistics and ADF statistics for groups and panels alike demonstrates that the variables are cointegrated with one another. As a consequence of this, there is a long-term balance between the yearly increase of GDP, public spending on final consumption, inflation, the proportion of GDP that taxes account for, and the amount of money spent by the government on education.

Table 4. Difference GMM.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDPGR(-1)	0.527922	0.133893	3.942851	0.0009
CORR	-0.995677	0.409791	-2.429718	0.0252
INF	-0.010978	0.012565	-0.873714	0.3932
TAX_GDP	-0.915088	0.168523	-5.430036	0.0000
GEC	-0.482835	0.148771	-3.245499	0.0043
GEEGDP	3.137244	0.828437	3.786945	0.0012

Table 5. Orthogonal GMM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDPGR(-1)	0.517636	0.107448	4.817541	0.0001
CORR	-0.709948	0.263762	-2.691622	0.0144
INF	-0.016327	0.003484	-4.686721	0.0002
TAX_GDP	-0.680909	0.207563	-3.280489	0.0039
GEC	-0.373621	0.099028	-3.772874	0.0013
GEEGDP	2.086162	0.887134	2.351574	0.0296

The outcomes of the panel's GMM and the subsequent discussion

Tables 4 and 5 illustrate the findings that were obtained from applying the dynamic panel GMM model. First difference In addition, orthogonal deviations were taken into consideration. GDP yearly growth is the dependent variable in this model; the other variables (corruption, inflation, government expenditure as a proportion of GDP, tax revenue as a percentage of GDP, and final government consumption

expenditure) are independent factors or explanations for the relationship between GDP yearly growth and those variables. The model's instrument is invariably determined to be the difference between the previous and current GDPgr values.

There is a substantial association between the dependent variables and the other explanatory variables, according to both estimation techniques (first difference and orthogonal deviations), with the exception of Inflation, which, according to the first difference, is not significant at any conventional levels, whereas, according to the orthogonal deviations, it is significant at the 5% conventional level.

As a result, the researcher comes to the conclusion that the model used to describe the investigation that was sought fits all of the selected variables the best.

It has been hypothesized that GDP (-1) has a positive association with the annual increase in Gross Domestic Product. This connection has a coefficient of 0.53 and 0.52 respectively, based on the two different estimations that were performed on it. This indicates that the yearly growth of Gross Domestic Product would increase by 0.53 percentage points and 0.52 percentage points, respectively, if GDPgr (-1) increased by 1 percent.

According to the two estimations, corruption has a negative affect on annual GDP growth that is approximately equivalent to -0.99 and -0.71 percentage points, respectively. It is absolutely necessary to keep in mind that the level of corruption might be ranked anywhere from 0 to 100. As a consequence of this, the findings suggest that an increase of one unit in corruption will result in a reduction of 0.99 percent and 0.71 percentage points, respectively, in annual GDP growth.

Moreover, Tables 4 and 5 demonstrate that there is an inverse relationship between inflation and the annual growth in Gross Domestic Product. A clear communication of the link can be achieved by indicating a coefficient of around -0.01 and -0.02 correspondingly. According to these findings, a one-unit increase in inflation is equivalent to a reduction of approximately 0.1 percentage point and 0.2 percentage point, respectively, in annual growth of the Gross Domestic Product.

According to the estimate provided by the GMM dynamic panel, there is an inverse relationship between taxes paid as a proportion of GDP and the annual growth in gross domestic product. Tables 4 and 5 reveal coefficients that are close to -0.92 and -0.68 respectively. This indicates that an increase of 1 percent in the level of Tax as a percentage of GDP results in a reduction of approximately 0.92 and 0.68 percentage points, respectively, in the annual growth of Gross Domestic Product.

In addition, the data shown in Tables 4 and 5 demonstrate that the annual increase of Gross Domestic Product for the countries and year under consideration was negatively impacted by about -0.48 and -0.37 due to the impact of Government Consumption Expenditures. Hence, it is indicated that the annual growth of Gross Domestic Product will decrease by 0.48 and 0.37 percentage points, respectively, for every increase in Final Government Consumption Expenses.

The researcher found that there was a positive association between the yearly increase in the Gross Domestic Product and the proportion of the GDP that the government spent on education. This correlation is illustrated in Tables 4 and 5 of the research report. To be more specific, the estimated link between the dependent variable and the explanatory variable is 3.14, and the difference between those two numbers is 2.09. Therefore, the researcher came to the conclusion that an increase in the percentage that the government spent on education led to an increase in the annual growth rate of gross domestic product of 3.14 percent and 2.09 percentage points.

5.2 Estimation of the nexus of Energy Poverty and Economic development

This estimation covers the period of 20yrs and runs for thirty-nine African nations. Below are the results for the test that was carried out.

Table 6: Unit Root

	ADF				**PP**			
	Intercept		Trend		Intercept		Trend	
Variables	Level	1st Diff	Level	1st Diff	Level	1st Diff	Level	1st Diff
LnGDPc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AE	0.98	0.00	0.01	0.00	0.31	0.00	0.00	0.00
Inf	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lexp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pop	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

To examine the integration order of the researched variables, unit root tests utilizing ADF and PP were carried out, and the outcomes are presented in table 6. According to both the ADF and PP, the Gross Domestic Product per capita level has been unchanged for some time now, and this holds true for the first difference as well. On the other hand, Access to Electricity does not remain static at level, but it does remain static at first difference, as stated by ADF and PP. According to the findings of the unit root test conducted on inflation, both ADF and PP discovered that it was stable at level and first difference. This was the conclusion reached by both methods.

Table 6 reveals that there has been no change in the average life expectancy that has been reported by either the ADF or the PP. It has been demonstrated beyond a reasonable doubt that population growth is stationary both at the level and at the first difference, as was reported by ADF and PP.

Table 7: Padroni Residual Co-integration test

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	1.340967	0.0900	0.744922	0.2282
Panel rho-Statistic	2.456154	0.9930	2.292294	0.9891
Panel PP-Statistic	-3.146279	0.0008	-3.734542	0.0001
Panel ADF-Statistic	-5.207454	0.0000	-3.431878	0.0003

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	4.108469	1.0000
Group PP-Statistic	-3.912948	0.0000
Group ADF-Statistic	-4.816939	0.0000

The researcher employs the padroni residual co-integration test in order to investigate the nature of the long-term connection that exists between the variables under investigation. Table 7 presents the findings that come from this investigation.

The group T-statistic for ADF and the group PP t-statistic for PP are both considerable at all conventional significance levels, which allows us to test the null hypothesis that there is no cointegration between the two variables. The group rho-statistic, panel v-statistics, and panel rho-statistics all indicate that the null hypothesis of no cointegration is valid, which lends support to the fact that there is no cointegration and supports the null hypothesis. Yet, the overwhelming evidence from PP statistics and ADF statistics for groups and panels alike demonstrates that the variables are cointegrated with one another. As a consequence of this, there is a long-term balance between the yearly increase of GDP, public spending on final

consumption, inflation, the proportion of GDP that taxes account for, and the amount of money spent by the government on education.

The outcomes of the panel's GMM and the subsequent discussion

Tables 8 include the results obtained using the dynamic panel GMM model. First difference GMM. The annual growth of GDP is the dependent variable in this model. The other variables—access to electricity, population growth, inflation, and life expectancy—are independent factors that explain the relationship between the dependent and the other variables. The initial lag of GDPgr is always utilized as the model's instrument. This happens automatically.

The method of estimate indicates that there is a significant link between the variables being explained (the dependent variables) and the other factors (the explanatory variables). As a result, the researcher comes to the conclusion that the model used to describe the investigation that was sought fits all of the selected variables the best.

It is stated that there is a positive association between LNGDP (-1) and annual increase in Gross Domestic Product. This association is estimated to have a coefficient of 0.94, according to the findings of the study. That is to say, the annual growth of Gross Domestic Product would increase by 0.94 percentage points if GDPgr (-1) increased by 1 percent.

Access to electricity is estimated to have a favorable influence on the annual growth of GDP by around 0.001383, according to the estimate. According to the findings, an increase of one percentage point in the population's overall access to electricity will result in a 0.001383 percent increase in annual GDP growth.

According to the estimate provided by the GMM dynamic panel, there is an inverse relationship between inflation and the annual growth in Gross Domestic Product. Table 8 reveals coefficients of -0.003128, which indicates that a 1 percent increase in the level of inflation causes a reduction of about 0.003128 percentage points in the annual growth of Gross Domestic Product.

According to what is displayed in Tables 8, the researcher found that there is an inverse relationship between the annual growth in Gross Domestic Product and the increase in life expectancy. To be more specific, the estimated value of the link between the factors being explained and the dependent variable is -0.010648. Thus, the researcher arrives at the conclusion that an increase of one unit in life expectancy

will result in a loss of 0.010648 percentage points in the annual growth of gross domestic product.

Table 8 demonstrates unequivocally that there is a positive connection between rising numbers of people living in a given area and rising levels of annual gross domestic product. pointing to a coefficient that is around 0.016954. This suggests that an increase in inflation of one percentage point will result in an increase of 0.016954 percentage points in the annual growth of the Gross Domestic Product.

Table 8: GMM Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGDPC(-1)	0.944475	0.007912	119.3739	0.0000
AE	0.001383	0.000634	2.180519	0.0295
INF	-0.003128	0.000121	-25.95483	0.0000
LEXP	-0.010648	0.001785	-5.963990	0.0000
POP	0.016954	0.003353	5.056499	0.0000

Effects Specification

Cross-section fixed (first differences)

Mean dependent var	0.050149	S.D. dependent var	0.138270
S.E. of regression	0.170312	Sum squared resid	21.31952
J-statistic	38.62980	Instrument rank	39
Prob(J-statistic)	0.268323		

CHAPTER VI
DISCUSSION

6.0 Discussion

This thesis attempted to investigate the reasons behind Africa's low level of development. According to the findings of this study, corruption and a lack of access to affordable energy are two factors that contribute to the continent's slow economic growth. This analysis used explanatory variables to test the relationships between economic development and corruption and energy poverty and economic development. These relationships were tested using separate estimations to establish the relationships between economic development and corruption and energy poverty and economic development.

6.1 Economic Growth and the Influence of Corruption

This study analyzes Gross Domestic Product per capita, the Corruption Perception Index, Inflation, Tax income as a percentage of Gross Domestic Product, Government final consumption spending, and population growth to estimate the relationship between economic development and corruption. According to this, the findings imply that corruption poses a significant barrier to the economy's growth.

The accumulation of evidence over time demonstrates that corruption in any sphere is harmful. It is essential to underline the fact that the growth of every country is contingent on the efficiency of every industry and market in that country's economy. If what you say is accurate, then the only thing corruption in these areas leaves behind is a stagnant economy. According to a report by the International Monetary Fund, there is a reason for optimism regarding the correlation between corrupt practices and levels of poverty (IMF). When corruption is present, people in an economy or community suffer a general decline in their standard of living. According to the findings of a study that was conducted in 2019 by Amber Hsiao, Verena Vogt, and Wilm Quentin on corruption in the health sector: One study investigated how people's access to healthcare in sub-Saharan Africa was impacted by corruption; the findings suggested that corruption was a substantial barrier to progress toward universal health coverage across the continent. As a growing number of nations adopt laws to guarantee that their inhabitants have access to cheap medical treatment, it will be necessary in the foreseeable future to raise financing for healthcare. In conjunction with anticipated increases in health spending, which are

required in many countries to achieve universal health coverage (UHC), extraordinary measures must be taken to prevent corruption. Only by quantifying and keeping an eye on corrupt practices in the health industry will it be possible to attain universal health care coverage (UHC). O Onwujekwe, P Agwu, C Orjiakor, C Mbachu (2018), LC Rispel, P De Jager, S Fonn, (2016), P Agbenorku - Journal of Medicine and Medical Sciences, (2012), and many other studies found a negative relationship between corruption and the adequate provision of health services, which is a factor of economic development. These findings are confirmative of this founding.

In their study titled "corruption and Economic growth," Chandan Sharma and Arup Mitra use corruption, government consumption of national resources, capital investment, environment, and regular quality as explanatory variables. Their goal is to estimate the degree to which there is a correlation between the two. Their research lends credence to the hypothesis that there is a detrimental connection between economic growth and corrupt practices.

Similarly, Mathew Ekundayo Rotimi, Ojo Joseph Iseolorunkanmi, Gift Grace Rotimi, and Mishelle Doorsamy (2021) provide empirical evidence demonstrating a long-term association between economic development and corruption that is detrimental. This finding lends credence to this argument while demonstrating that the idea that corrupt practices can contribute to economic growth is false. The authors conclude that corruption retards economic growth and that a continuous increase in corruption would have a detrimental influence on growth rates even when they are at an equilibrium state. This conclusion validates the argument because it is consistent with the theory stated before and previous research conducted on the effects of corruption on economic expansion. In addition, they recommended instituting a strict anti-corruption program with no room for error to stimulate the economy.

In recent times, researchers Elefthenus Spyromitros and Minas Panagiotidis (2022) have completed a study found: According to the findings of empirical research into the influence that corruption has on the growth of GDP in developing countries, corruption significantly impedes economic development (the effect of sand on the wheel). This substantiates the result of this thesis, which coincides with the forecast of the theory of the political economy of emerging countries that was created over the last few decades.

According to the findings, there is an inverse relationship between corruption and price increases. Fahim A.Al-Marhubi researched the relationship between graft and inflation (2000). It was found that there is a positive correlation between corruption and inflation through the utilization of other corruption indicators. According to the evidence provided, there is a link between high levels of corruption and rising prices. Even when we consider other possible reasons for inflation, such as the central bank's independence, the administration's consistency, and the presence of other structural elements, we still find that this link holds true. This study offers some empirical evidence to support the argument that was made in the previous sentence. The findings showed that corrupt practices stifled economic growth and advancement. As corruption causes prices to rise faster, we can only draw the logical conclusion that economic development is retarded as a direct result of inflation. Inflation is the term used to describe the general increase in prices.

There is a significant body of evidence supporting this contention. But to name a few examples: M Ibrahim, OA Aluko, XV Vo, 2022; DV Dinh, 2020; V Mishchenko, S Naumenkova, 2018; M Sahnoun, C Abdennadher, 2019; RJ Barro, 2013; F Mamo, 2012; E Erbaykal, HA Okuyan, 2008. According to the claims made in this thesis, there is significant evidence to suggest that inflation impedes the economy's growth. According to the findings of this investigation, there is a detrimental connection between taxation as a percentage of gross domestic product and economic growth. Moving forward, it is critical to understand that a tax-to-GDP ratio is the proportion of a nation's total tax revenue to its gross domestic product (GDP).

According to this estimate, a rise in tax rates will harm economic growth. If a more significant tax is levied on companies or firms, this will increase the price of the product or service that those companies or firms provide, decreasing consumption and hindering economic growth. When people in positions of an authority responsible for collecting taxes illegally raise those levies on businesses for their own personal gain, corruption serves as the process's cartilage. According to research by Chugunov, M. Pasichnyi, and V. Koroviy in 2021, an increase in the tax burden placed on consumption causes inflation to rise more quickly. Earlier versions of this concept stated that inflation hinders economic growth. From this information, it is reasonable to conclude that a rise in taxation slows economic growth, which agrees with this thesis's empirical result. The amount of money recently spent by the various

parts of the government on areas such as military, education, and public safety is referred to as "government final consumption expenditure" (GFCE), denoted by the acronym.

Because this service is either provided at no cost to the end-user or at charges that are so low that they barely cover a portion of the costs, the government is considered to be the product's ultimate consumer. Within national accounting, a cost price is ascribed to governmental output because the value of what the government produces cannot be decided solely by market forces. To get the GFCE, we must first determine the value of the government's output (such as the statistics publications produced by the ABS) and then subtract the amount of money made from the sale of that output. The outcomes of this thesis's empirical investigation point to a negative association between total government spending on final consumption (as a percentage of GDP) and GDP. Many empirical studies have been conducted, and the results have produced inconsistent conclusions regarding the impact of government spending on economic growth. Some scholars concluded that the relationship between GDP growth and governmental spending was complicated. This research indicated a negative link between the two observed variables, which aligns with the findings of other studies, such as Adaramola and O Dada, 2020. (Final Government consumption and economic development).

If there is no correlation between population increase and the rise of GDP per capita, then higher economic growth rates should be anticipated. The conclusion that only increasing GDP per capita may lead to increased economic well-being, which Piketty (2014) reached, would still be correct. Yet, if the growth in population influences the growth in per capita production, then, depending on the nature of the effects that population growth has on GDP, higher population growth rates could either speed up or slow down the expansion of the economy. This research concluded that population increase and GDP growth are favorably associated since the investigation discovered a positive association between the two variables. Several studies, including T Nyoni and WG Bonga's 2017 study, S Ali, A Ali, and A Amin's 2013 study, and R Maijama'a, KS Musa and M Yakubu's 2019 study, lend credence to the idea that there is a positive correlation between rising populations and expanding economies.

6.2 The lack of access to affordable energy and economic growth

This study estimates the association between energy poverty and economic development by using per capita GDP, per capita access to electricity, per capita growth, per capita inflation, and per capita life expectancy.

The empirical data provide credence to the thesis that more convenient access to sources of energy contributes to increased economic activity. Research has shown that electricity is an essential component in the manufacturing process for businesses. Because electricity is difficult to replace with other components of the manufacturing process, its absence could result in decreased output. Second, the government relies on energy to deliver vital services such as healthcare and public education to the general people. Finally, using electricity can help you save time, improve your communication, and spend more money on your children's education, all of which add to your family's general pleasure and well-being. Using PVAR, FMOLS, and DOLS analysis in BRICS countries, Nihat Doanalp, Baki Ozsolak, and Alper Aslan, 2021 confirmed the result found by this thesis that there exists a positive relationship between access to electricity and Economic development. This is because energy is required to power sectors of the economy that account for growth. This thesis found a positive relationship between access to electricity and Economic development. Greater access to power helps eliminate the problem of energy poverty. The discovery of a positive link with economic growth suggests that a widening energy gap is inhibiting economic expansion.

CHAPTER VI
CONCLUSIONS AND RECOMMENDATIONS

7.1 The Last Thoughts

GMM can be used to identify the parameters of a model or data-generating process. This ensures that the model moments closely match the data moments. Consider linear least squares estimation, nonlinear least squares estimation, extended least squares estimation, and instrumental variables estimation as specific applications of the more general GMM estimation strategy. A significant amount of research has been conducted, theoretically and empirically, on the adverse effects of corruption on the expansion of an economy. Literature suggests that corruption is bad for economic growth and development, leads to a drop in investment, and results in the waste of resources.

Moreover, corruption is said to be responsible for the loss of resources. Corruption impedes healthy competition between individuals and institutions, resulting in unequal economic, political, and social systems. On the other hand, contrary to popular belief, a few experts contend that corrupt behaviors may benefit economies that have inadequate institutional structures. Inefficient governments in nations without a well-developed tax system may resort to seigniorage to make up for lost tax revenue due to corruption in the government, which theoretically leads to increased inflation. This is especially true in countries where corruption is widespread. Emission contributes to inflation, leading to a rise in the total amount of money in circulation. In addition, bribery payments add an additional cost to the already expensive prices. The ineffective distribution of public and private finances is another negative consequence of corruption, which reduces economic activity. Like many others before, this study concludes that corruption stifles economic growth.

There is a correlation between electricity consumption and the gross domestic product, even if access to the grid certainly isn't enough to stimulate economic growth. Because access to energy is critical to the process of economic growth, the United Nations has begun a mission to ensure, by the year 2030, the availability of energy technologies that are both affordable and environmentally friendly. Africa still needs to catch up to the rest of the world regarding technology. It is unduly dependent on traditional, solid biomass for heating and cooking, which could be more efficient and polluting. The constant use of this outmoded piece of equipment

has been connected to an increase in illnesses such as pneumonia and chronic obstructive pulmonary disease (COPD), both of which are caused by polluted air in the indoor environment. By conducting an empirical study into the connection between electricity availability and GDP growth, this research contributes to the ongoing discussion on a global scale that has been taking place. The findings indicated that having access to dependable sources of energy contributed positively to economic expansion in sub-Saharan Africa. The inquiry's findings provided conclusive evidence that such a climate exists.

7.2 Recommendations

Preventing public sector corruption

The rule of law, proper administration of public affairs and public property, and honesty, transparency, and accountability are all included in Article 5 of the United Nations Convention Against Corruption as factors that contribute to a corruption-free public sector. Articles 7 and 8 of the UNCAC mandate that states create asset declaration systems, implement merit-based systems for hiring and promoting government employees, increase transparency in the funding of political parties, eliminate opportunities for conflicts of interest, and disseminate codes of conduct for public servants. Expanding stakeholder participation and practicing open government are two examples of further anti-corruption strategies that are advocated for by the United Nations Convention against Corruption. Articles 10 and 13 of the Convention strongly advocate for these actions. The next section goes deeper into these and related anti-corruption approaches for the public sector.

Codes of conduct

Anti-corruption campaigns and techniques frequently begin with the prohibition of certain actions. Standards for public officials include codes of behavior and ethics, legal prohibitions against corruption, and criminal and civil punishments aimed at both the public and private sectors. These requirements must always be met (Williams-Elegbe, 2012). To enhance professional requirements for the appropriate, unbiased, dignified, and acceptable execution of public tasks and personal standards, the UNCAC mandates that such codes be used (Article 8). (integrity, honesty, and accountability). Codes spell forth the standards that public employees should uphold and the procedures that can be used to hold them

accountable for their decisions and actions. Several initiatives of regional and international organizations recognize and support the adoption of codes of conduct in addition to the United Nations Code of Conduct Accreditation Commission (UNCAC). For instance, the International Code of Ethics for Public Authorities was adopted by the United Nations General Assembly in 1996.

Rewards and incentives, both monetary and otherwise

To combat corruption, every country should implement a basic framework in the public sector that recognizes and punishes ethical behavior. The system should take external issues into consideration, such as fair pay, merit-based advancement, and appointment. U.S. Agency for International Development-funded studies show that a lower wage for public personnel is not always correlated with corruption (USAID, 2017). Nonetheless, there are cases in which higher levels of compensation and promotions provided on the basis of merit are connected with a decreased risk of taking unlawful payments. Keeping morale high is crucial for the success of anti-corruption initiatives. People who don't take pride in their profession are more likely to tolerate unethical conduct (Kwon 2014). There is evidence from studies that more severe penalties for corrupt behavior can help reduce corruption in the public sector. Many nations have enacted anti-corruption legislation, and violations of these laws typically result in monetary penalties (Fisman and Miguel, 2007; Hasty, 2005).

Accessibility

These rules must be followed by any business that wants to bid on government contracts (OECD, 2016). Increasing competition in public procurement and enticing participation from small and medium-sized firms requires ensuring complete accessibility (SMEs). Easier access can be achieved by simplifying the bid technique, lowering the barrier of entry into public procurement, and speeding up the bidding process. The public procurement procedure suffers from too much red tape and must be simplified. Rules that mandate awarding a certain percentage of government contracts to small and medium-sized enterprises, women-owned businesses, minority-owned businesses, and other target groups are mutually beneficial.

Human resources management

Public sector corruption prevention is aided by rules and regulations governing the public sector workforce, including recruiting, firing, promotion, advancement, professionalization, and education. The establishment of new corrupt relationships and the operation of existing corrupt linkages are thought to be impeded by high staff turnover rates in positions ideal for bribery, for example. It is possible that private sector actors' incentives to engage in corrupt actions will reduce even further if there is no certainty that a corrupt partner will continue in a specific role once rotation has taken place. Human resource management also uses merit-based hiring as a means of combating corruption. According to Article 7 of the UNCAC, the principles of openness, honesty, and efficiency must underpin the public sector's human resource management framework. This involves making sure government servants have access to opportunities for lifelong learning, are paid fairly, and have safe and healthy workplaces, as well as implementing objective criteria for hiring, firing, promotion, and retirement. Rotation, like other anti-corruption programs, must balance competing goals, such as the development of institutional knowledge and the maintenance of public service commitment.

Citizen and stakeholder engagement

For the public sector to be held accountable for its actions, including procurement, anti-corruption authorities, private sector organizations, end-users, civil society members, academia, the media, and the general public must all play a role (OECD, 2016). In this respect, community involvement, especially in the purchasing process, is essential (Heroles, 2012; Landell-Mills, 2013). Several nations' legislatures have passed laws mandating public involvement in procurement. In nations like Mongolia and Mexico, citizens' involvement is required before the government will grant a contract (Parafina, 2015). With this method, Mexico was able to reduce the price of government contracts (De Simone and Shah, 2012). The tenth and final module in E4J University's Anti-Corruption Module Series dives deeper into the importance of public participation in the fight against corruption.

Open government and e-government

In order to meet their commitments under the United Nations Convention on the Rights of the Child, nations are required by Article 10 to develop reporting and

information access systems. To improve government efficiency, transparency, and public engagement, several countries have implemented electronic government (e-government) services that make use of information and communication technology (ICT) in government operations and procedures (United Nations, 2016). Public service delivery, citizen-government trust, and efforts to reform the public sector can all benefit from technological advancements (OECD, 2005a). Because of its ability to raise transparency, make public tenders more accessible, and streamline administrative processes, ICT is actively employed to strengthen integrity, notably in public procurement and public financial management. In the realm of government contracts, this is especially true (United Nations, 2016). Also, there may be less face-to-face interaction between procurement officials and firms due to the use of ICT. And by sharing more data, inconsistencies and unethical activities like bid-rigging schemes can be spotted more easily. In addition to enhancing internal anti-corruption controls and the detection of integrity violations, the creation of audit trails through digitalization in procurement procedures can aid investigators during the inquiry process (OECD, 2016).

As of September 2019, 71 national and municipal governments worldwide had endorsed the Open Data Charter. Nevertheless, only a minority of these signatories were located in non-Western countries (see the current list of countries). There were also 49 organizations from the corporate and non-profit sectors that backed the Open Data Charter. According to the Open Data Charter, every publicly available government data must meet six criteria. Data must be open by default, understandable, timely, readily available and usable, comparable, and interoperable to adhere to these criteria (following international data standards).

The data should be used to promote inclusive growth and innovation, as well as higher levels of government and public engagement. Ukraine is another another government to commit to the Open Data Charter. To make public procurement records and information accessible to civil society, Ukraine launched an online and open data system in 2015 called ProZorro. As a direct result of adopting ProZorro, the government has been shown to be able to save millions of euros while also receiving 50% more bids on contracts. As stated on page 4 of the 2018 edition of the Open Data Charter. All public bids for contracts worth more than a certain threshold value must be published in the Official Journal of the European Union (OJEU) Supplement, per Directive 2014/24/EU issued by the European Union (see chapter 3,

section II: Publication and Transparency and summary). These kind of regulatory restraints, along with initiatives to build open information platforms, are crucial for fighting corruption successfully.

Training programs and tools developed by the Open Data for Development Programme (OD4D) are available to help governments provide guidance and expertise for open data initiatives. One example of a resource that shows how open data can be used to combat corruption is the OD4D Anti-Corruption Open Up Guide. One government that makes use of the Open Data for Democracy platform is the Georgian government, which maintains the public information database Georgia Opendata.ge. Information about all of Georgia's public agencies, including budgets, bonuses, and employee pay, is available here. By doing so, the Georgian government's public expenditures are more easily understood and analyzed by the general public and non-governmental organizations (NGOs).

Handle a Conflict of Interest

As of the month of September 2019, 71 national and municipal governments worldwide had endorsed the Open Data Charter. Nevertheless, only a minority of these signatories were located in non-Western countries (see the current list of countries). There were also 49 organizations from the corporate and non-profit sectors that backed the Open Data Charter. According to the Open Data Charter, every publicly available government data must meet six criteria. Data must be open by default, understandable, timely, readily available and usable, comparable, and interoperable to adhere to these criteria (following international data standards).

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Compliance-friendly environment

In the public sector, a culture of compliance with anti-corruption legislation and policies is often fostered through nudges and training programs. By defining "nudging" as "any feature of the choice architecture that modifies people's behavior in a predictable way without restricting their options or fundamentally altering their economic incentives," Thaler and Sunstein (2008) brought the concept of "nudging" to the forefront, leading to its widespread adoption. To qualify as a "nudge," an intervention must be easy to administer and inexpensive. Pushes are not orders. Fruit will nudge if it is displayed at eye level. Dietary restrictions are ineffective.

In order to influence behavior without resorting to coercion, it is helpful to provide easy alternatives at the time of decision making, when people are most receptive to them. The nudge theory states that when offered a choice, most people will go with whatever is already set as the default.

When applied to the problem of corruption, the concept of "ambient accountability" develops nudge theory. This is accomplished by incorporating "feedback interfaces, urban screens, and architectural interventions" into "physical space and the built environment to empower people, help them understand/assert their rights, and stop corruption exactly where it matters - ideas, inspiration, evidence from stickers, murals, and billboards to" (Zinnbauer, 2012). The purpose of anti-corruption and ethics training is to provide public officials with the knowledge they need to make morally sound decisions under pressure. The whole public sector engages in this, and

many niche markets do as well (for example, public procurement) (OECD, 2007a). The eleventh, thirteenth, and fourteenth modules of the E4J University Module Series on Integrity and Ethics provide a more comprehensive introduction to the administration of integrity and ethics than their predecessors.

Monitoring and oversight

The three primary components of monitoring are audits, transparency measures that provide the information necessary to hold the public sector accountable, and monitoring by civil society organizations. Audits of public hospitals in Argentina, say Di Tella and Schargrodsky (2003), reduced the cost of medical supplies by 15%. Municipal corruption in Puerto Rico was found to decrease by 67% once audits were implemented (Bobonis, Fuertes, & Schwartz, 2016). The outcomes of a risk assessment of the procurement environment determine the nature and extent of control, for example over the procurement process. If they are "coherent, and include effective and clear methods for reacting to credible accusations of violations of laws and regulations, and allows reporting to the proper authorities without fear of retaliation," control measures can be used as instruments for risk management (OECD, 2016).

Both accountability and monitoring are required (the four-eyes principle)

The "four-eyes concept" mandates that certain government actions or decisions be reviewed and approved by at least two people before they may be implemented. On the reasoning that two people are harder to bribe than one, the "four-eyes principle" establishes a system of accountability and monitoring (Bodenschatz and Irlenbusch, 2019). Yet, in persistently corrupt environments, this may not hold true (Williams-Elegbe, 2018).

Private Sector Anti-Corruption and Bribery Initiative

More and more stringent regulation places pressure on businesses to increase their level of standard compliance. At the same time, businesses need to put their own values first and seek to foster an ethical workplace culture. Employees, investors, customers, and community members all look to firms to uphold higher standards of honesty and decency than are mandated by law alone. A sole focus on laws and regulations is insufficient to fulfill these corporate ethical responsibilities. To go beyond basic compliance and attempt to develop a culture of integrity, an

ethics and compliance program should include internal, external, and collective measures. This is necessary due to the fact that basic compliance will not bring about the desired results from the program.

From a strictly legal to a more behaviorally focused perspective

Because of the proliferation of anti-corruption laws around the world, businesses have been compelled to institute ethics and compliance systems with the capacity to identify and prevent unethical practices within their organizations. Financially speaking, it is in a company's best advantage to fight corruption because of the harm it may do to the market as a whole and to individual companies. The company's culture and operational standards also need to be updated (Sullivan and others, 2013; UNODC, 2013a).

Implementing legal compliance procedures that are wholly reliant on standards defined by the corporation has historically been the most effective technique for combating corruption in the private sector. The threat of legal or civil repercussions is a driving force behind these processes. A number of states and international organizations have issued guidelines that corporations could find useful when crafting anti-corruption compliance processes and ethics efforts. The UN Office on Drugs and Crime, for instance, has released both a comprehensive anti-corruption ethics and compliance program and a related rulebook (in cooperation with OECD and the World Bank). ISO 37001 has been accepted by the International Organization for Standardization as a standard for anti-bribery management (ISO).

However, early compliance programs were flawed because companies tended to focus on processes rather than looking at how these processes affected ethical and behavioral concerns within the company. This included things like implementing codes of conduct and establishing internal rules and procedures. This reduced the efficiency of preexisting compliance programs. According to (Hodges & Steinholtz, 2017). This meant that the flawed business models used by these companies were unaffected by the actions taken. There was no impact from compliance measures on the company's culture because of the perception that they were unrelated to the core business. The result was a rise in unethical practices adopted by the vast majority of businesses. When corruption grew pervasive, it was clear that it was not the work of a few rogue employees but rather a symptom of deeper problems inside the corporate

culture. There was a shift in emphasis, as a result, to make sure this culture was in accordance with anti-corruption initiatives.

To counteract this movement, conventional economics and the concept of rational choice are being used in legal approaches to corporate responsibility. Finding the sweet spot between rooting out bad behavior and punishing its perpetrators was thought to be the most efficient technique of discouraging it. But in reality, exclusively depending on deterrence is not only costly, but also ineffective from a social and economic perspective. Using rewards and penalties to motivate people to change their behavior is useless and costly, according to studies in the fields of psychology and behavioral science. Time and money must be committed, and new systems must be developed, in order to implement these changes and ensure their success. Also, a monitoring system is required. A distrustful culture can develop when a company's anti-corruption compliance and ethics programs emphasize punishment rather than education and training. Pervasive surveillance has the potential to destroy a company's culture forever. Disengagement and suspicion among workers might result from a lack of trust in management, which could prevent them from reporting policy violations.

To successfully eradicate a culture of wrongdoing within an organization, top-level management must make it crystal clear that they do not approve of or condone unethical behavior, and that those who engage in corrupt practices will be punished after a thorough investigation and analysis of the causes of the problem. The expression "tone from the top" is commonly used when discussing this in a scientific or academic setting. Communicating a zero-tolerance policy for corruption requires a nuanced approach that combines both strong deterrents and words meant to convince workers that they would be held to rigorous standards.

Combating and avoiding corruption in the public sector

Investigations and analyses of root causes contribute to the establishment of a "just culture," in which justice is acknowledged and individuals are given the opportunity to learn from their errors before any form of retributive action is performed. Those involved in such a scenario would be able to analyze the matter, determine the root of the problem (maybe the targets established by top management are unrealistic), and ultimately find a solution if they did not assign blame and take punitive action.

When it comes to raising ethical awareness, increasing the likelihood that employees will report violations, and reducing the potential for harm that may result from such violations, it is increasingly recognized that behavioral change approaches based on value-based programs are more effective than legal compliance approaches. This is the case in a growing number of cases. The idea behind value-based programs is that employees actively participate in and internalize the company's pro- or anti-social ideals. This idea forms the basis of value-based programs. Workers are more likely to comply with corporate standards even when they aren't being watched if the underlying principles of the organization emphasize the importance of helping others. It is essential for value-based programs to include fair treatment of employees, acknowledgment for doing the right thing, reparation for unintentional injustice, and punishments for dishonest or unlawful conduct (Trevio et al., 2006). Developing a Values Pledge is the subsequent step in implementing this strategy. This is a vow made by every employee in the company to develop a culture that is deeply ingrained in the fundamental concepts that guide the organization and to ensure that all business choices are made in compliance with these guiding ideals. One such group is the UK Values Alliance, which is an organization with the mission of creating a Values Pledge in the United Kingdom by rallying residents and businesses together under a common cause.

Value-based models are not only as effective as, if not more effective than, traditional coercion-based models, but they are also significantly more effective in promoting voluntary compliance with the rules and reducing the difficulties and costs associated with developing and maintaining efficient surveillance procedures, which are required for sanction-based models.

In light of discoveries from the field of behavioral ethics, the anti-corruption ethics and compliance programs that have been made possible as a result of Langevoort's study make it easier to implement such programs (2017). Langevoort's research demonstrates that commonly held beliefs about what it takes to succeed in business, such as group loyalty, competitiveness, and risk appetite, may be covert conduits for unethical conduct. This is in addition to the obvious need to align recompense schemes and promotion practices with ethical values.

Compliance and ethical training programs for anti-corruption organizations

Beyond the obvious need to align compensation schemes and promotion practices with ethical values, the research conducted by Langevoort demonstrates that commonly held beliefs about what it takes to be successful in business, such as group loyalty, competitiveness, and risk appetite, may be covert conduits for unethical behavior. This is in addition to the need to align compensation schemes and promotion practices with ethical values. Risk assessments are used as the foundation for internal measuring systems in order to make the most efficient use of the available resources. The values are ingrained in the day-to-day operations, and personnel are given training as well as access to resources that will aid them in negotiating hard and unclear situations. In addition to a robust internal control system, there is also more than one way to disclose concerns, such as through the use of the whistleblower policy. The ethics and compliance program for fighting corruption is seen as a process that should be continuously evaluated and improved upon. Use of free educational tools such as the video-based e-learning tool developed jointly by UNODC and the United Nations Global Compact is possible for the purpose of providing continual education (which is the focus of the pre-class exercise in this Module). It is absolutely necessary for all levels of management to be involved in the process of developing an ethical culture and putting in place an efficient anti-corruption ethics and compliance program (UNODC, 2013b). It is imperative that recordkeeping and internal controls be implemented into the monitoring systems throughout the design phase of the program.

Policies that prevent corruption, minimize specific corruption risks, and resolve instances of infringement are an essential component of effective programs. In addition to that, they set established mechanisms for reporting instances of corruption.

For larger firms to participate, the program needs to involve their commercial partners, subsidiaries, and intermediaries. Employee training, as well as promoting and encouraging ethical behavior and compliance, are all vital to the successful implementation of the change. Inspection and analysis of the software ought to be performed at regular intervals. Occasionally, the efficiency of the measures that are currently in place must also have its efficacy upgraded. Bigger companies are strongly encouraged to extend their anti-corruption efforts to third parties and to exchange best practices. One way to do so would be to take part in anti-corruption

collective action initiatives, which will be discussed in further detail in the following paragraphs.

In addition to concentrating on developing their own moral culture, businesses need to communicate with the partners and networks of suppliers with whom they do business. Intermediaries are frequently the weakest link in the chain, and public perception frequently focuses not just on the supplier but also on the businesses that hired them. Companies should develop a proactive strategy to strengthen the integrity and ethics of their supply chains, in addition to complying with national and international regulations, as part of their corporate responsibility and sustainable business practices. This strategy should be developed in addition to complying with national and international regulations.

Corporations can also contribute to collective action by taking part in operational assemblies or by connecting themselves to programs such as the United Nations Global Compact. When unethical behavior is widespread, companies may resort to collective action in an effort to alter the existing order of things. They might, for instance, be able to convince authorities to take action or establish standards that are pertinent to the industry. In the following paragraphs, we will go into further detail on this kind of coordinated effort.

It may be essential to take a variety of techniques in order to build an effective ethical culture in a company; this may be the case depending on the size of the company, its legal standing, or the complexity of its operations. Even while there is no one model that fits all businesses, the core ideas may be applied successfully by both large and small companies, including new ventures (OECD, UNODC and World Bank, 2013). Given that the CEO of a large company is unable to meet with all of the employees in person, one way to convey the tone from the top could be to post a video message on the company's website or send out a postcard with a note from a management representative. Both of these options are viable options. In the context of a small, owner-operated company, it may be possible to underline the significance of honesty as a core company value by having one-on-one conversations with employees. A multinational corporation, on the other hand, may need to consider the most effective way to express its values in various contexts and pay attention to the various country regulations to which its employees will be subject. Whereas a small business or start-up may not require an elaborate code of ethics (though this may change as the business grows), a multinational corporation may

need to consider these things. In order to determine which course of action will be most effective, the multinational corporation needs to determine the possibility of unethical behavior occurring in each of its many different operational areas. A multinational corporation is frequently put in situations where it must deal with issues that are culturally or geographically significant. Should there be a single guideline that applies to all of the countries in which the organization operates, or should there be a number of different standards that take into consideration the myriad of possible scenarios? The most elegant solution would be to have a global code that provides high-level guidance on the company's values, supported by country guidelines that permit some flexibility without conflicting with global values or applicable law. This law may be that of a different jurisdiction depending on where a multinational company operates, such as the United Kingdom's Bribery Act or the United States' Foreign Corrupt Practices Act (FCPA), which are both examples of applicable laws.

The report from the UNODC The book "A Practical Guide to an Anti-Corruption Ethics and Compliance Plan for Companies" teaches companies how to improve their integrity standards and comply with anti-corruption regulations. The primary concerns addressed by this Handbook are those that an individual The report from the UNODC Companies can learn how to uphold better standards of honesty from the book, A Practical Guide to an Anti-Corruption Ethics and Compliance Plan for Businesses. This Handbook focuses on fundamental concerns that need to be addressed by all organizations, notably the opportunities and challenges that are unique to small and medium-sized businesses. It is grounded in the United Nations Convention Against Corruption as well as other international and regional accords that instruct businesses on how to uphold stronger integrity standards and behave as responsible corporate citizens.

Additional international initiatives that provide guidance on business ethics include the G20/OECD Principles of Corporate Governance, the G20's Business 20 (B20), the OECD CleanGovBiz Initiative, the United Nations Global Compact, the Alliance for Integrity, Transparency International's Business Principles on Countering Bribery, and the World Economic Forum's Partnering Against Corruption Initiative (PACI)..

Several different organizations have collaborated to produce guiding principles with the intention of encouraging exemplary behavior. Mexicans Against Corruption and

Impunity (Mexicans Against Corruption and Impunity), a non-profit organization whose mission is to protect the rule of law by condemning, prosecuting, and eradicating systemic corruption and impunity in the public and private sectors, has produced a code of conduct. The code of conduct can be found on their website. This code serves as a guide for organizations as they establish and implement their own codes of conduct, and it can be used as a framework (Mexicans Against Corruption and Impunity, 2019). Every organization has a responsibility to address the difficulties and opportunities that are faced by small and medium-sized businesses. It does this by drawing from the United Nations Convention against Corruption as well as other international and regional agreements that provide firms with guidance on how to uphold greater integrity standards and behave as responsible corporate citizens.

Additional international initiatives that offer guidance on business ethics include the United Nations Global Compact, the Alliance for Integrity, Transparency International's Business Principles on Countering Bribery, the G20/OECD Principles of Corporate Governance, the G20's Business 20 (B20), and the OECD CleanGovBiz Initiative.

A great number of organizations have embraced guiding principles in order to encourage exceptional behavior. Mexicans Against Corruption and Impunity (Mexicans Against Corruption and Impunity), a non-profit organization whose mission is to defend the rule of law and condemn, prosecute, and eradicate systemic corruption and impunity in the public and private sectors, has published its code of conduct. [Citation needed] [Citation needed] [Citation needed] [Citation needed] [Citation needed] [Citation needed Companies who are interested in designing and implementing their very own codes of conduct can use this code as a reference and guidance (Mexicans Against Corruption and Impunity, 2019).

Risk management techniques to combating private sector corruption

Corruption is a threat that faces any organization, regardless of whether or not they have safeguards against it. Thus, ethics and compliance systems should contain ways for identifying and minimizing corruption-related risks that may hamper business performance. These methods should be included in ethics and compliance systems. Compliance requirements for businesses are becoming increasingly reliant on various risk management systems. Process of identifying and

prioritizing (assessing) risks in order to develop a suitable plan for addressing them., followed by the plan's implementation while monitoring the changing environment and remaining adaptable to meet new challenges. In general, corruption risk mitigation is viewed as the process of identifying and prioritizing (assessing) risks in order to develop a suitable plan for addressing them.

Numerous corruption hazards exist. Internal risks, such as inadequate reporting channels, competing motivations, and a lack of policies and procedures are just some of the internal risks that an organization faces. External risks, such as nation, industry, and operation type, are also a factor. Many aspects of a company, such as its size, structure, geographical variables, business strategy, or internal activities, each present a unique challenge when it comes to the potential for bribery and corruption. It is important to consider the size of the company because doing so helps define the right methods and metrics. The extent to which an organization has the financial, human, and other resources necessary is directly proportionate to its capacity to conduct anti-corruption compliance and ethical programs. For instance, a lack of resources makes risk assessments particularly challenging for small and medium-sized businesses (SMEs), who need to establish a balance between cost-effectiveness and properly managing fears about corruption. But, this should not be an excuse to let a lack of resources get in the way of fostering an ethical culture.

Evaluations of the potential for corruption are essential not only for the purpose of distributing assets to the areas where they will have the most impact, but also for the purposes of enhancing transparency, promoting confidence, and cutting down on corruption. Before a company to effectively recognize and combat corruption, it must first have a solid understanding of how and where it takes root in the organization. This understanding makes it easier to identify and put into action efficient solutions that are aimed at resolving actual problems within an organization's processes and structures, as opposed to merely imagined roadblocks. These solutions are aimed at resolving actual problems within an organization. Managers could have a general perspective on the problem of corruption, but they might not be aware of the specific mechanisms that put their company in jeopardy of being corrupted.

In recent years, a number of international organizations have created methods and instruments to assist the business sector in recognizing and addressing concerns of corruption. This assistance has been provided by a number of international

organizations. Risk assessment tools have been developed by several organizations, including the United Nations Global Compact, the Committee of Sponsoring Organizations of the Treadway Commission (COSO), the Regional Anti-Corruption Initiative (RAI), and Transparency International.

The vast majority of the aforementioned documents are in accordance with the Principles and Guidelines of Risk Management as outlined in ISO 31000. Management of corruption risks through design, deployment, and ongoing maintenance of systems. This framework outlines a standard method for managing risks, which includes three stages: identifying the risk, conducting an analysis of the risk, and performing an evaluation of the risk. The PowerPoint presentations that are included in the Additional teaching materials section of this Module provide an explanation of this tactic.

Assessments of the risk of corruption facing a corporation ought to place an emphasis on internal and external concerns, such as the risk posed by corporate culture. With the discovery of specific corruption routes, additional controls and checks may be put into place in order to stop the spread of the vulnerabilities they exploit. Risk assessments need to be performed not only on a regular basis but also anytime there is a substantial change in the company's business activities. This is necessary in order to establish a compliance system that is both effective and economical.

Business partner's due diligence

Companies will occasionally delegate certain operations to third parties such as agents, consultants, distributors, subcontractors, re-sellers, foreign subsidiaries, business partners in joint ventures, and, more generally, to anyone who has the authority to act on the company's behalf or whose actions can provide the company with long-term benefits. These third parties may include agents, consultants, distributors, subcontractors, re-sellers, and foreign subsidiaries. On the other hand, working with outside parties considerably raises the risk of corruption. According to data provided by the OECD (2014), the use of intermediary payments was involved in 75 percent of all foreign bribery enforcement cases carried out between 1999 and 2014. As a result of the pervasive use of middlemen to channel bribes, the international community has insisted that corporations perform due diligence when

doing business with third parties in an effort to increase the accountability of corporations.

The idea that everyone who presents a risk or hazard is responsible for taking the appropriate precautions to protect others from injury gives rise to the need to keep an eye on the actions of third parties. Before organizations can begin to address the dangers posed by third parties, they must first map their global third parties and have an understanding of the goals of each commercial partnership. With the help of this information, organizations are better able to organize their contacts with third parties into a risk matrix and put into action the appropriate strategies to control the risks that have been identified. In most cases, the use of due diligence procedures results in a reduction in the number of business partners and a rationalization of business processes, both of which are beneficial to the company.

The adoption of contractual safeguards such as audit and termination rights, as well as the provision of anti-bribery training to third parties, are examples of risk-mitigation strategies. Other risk-mitigation strategies include obtaining the admission and commitment of business partners to comply with the law and the organization's code of conduct. The reputations of possible business partners are checked against databases that include sanctioned individuals, blacklisted individuals, politically exposed persons (PEPs), and bad reports from local media outlets as part of the process of doing due diligence. If it turns out that the third party is on any of these lists, the company will be able to conduct a more in-depth inquiry. The United Kingdom chapter of Transparency International conducts an assessment of the current state of third-party due diligence.

Measures used to reduce the risk posed by third parties, like those taken to reduce the risk posed by employees, can take a variety of forms. Corporations may choose to steer clear of potential business partners who have been linked to unethical behavior. In the case that a third party violates the regulations, a monitoring and sanctions strategy will highlight the selection of business partners and the corporation's legal defenses in order to highlight the importance of both. On the other side, a value-based strategy tries to engage with partners that share similar values and support them in developing the needed corporate culture to combat corruption. This is accomplished through the provision of assistance in the form of advice and assistance. This distinction is especially important in circumstances in which local business partners may be required to pay bribes in order to provide their customers

with the products and services they have requested. If local agents are coerced into working with large corporations, they can feel compelled to lie about the actions they are involved in. It is possible for local agents and large firms to work together in a more open and honest manner in order to reduce instances of corruption in a certain economic process.

Energy Poverty

This thesis investigates the effect that energy poverty has on the expansion of the economy and provides remedies that will help to protect those who are most vulnerable while reducing the susceptibility of cities to shifts in the price of fossil fuels. In this piece, we outline ten potential actions that urban areas can take over the course of the next five years to reduce their reliance on fossil fuels, as well as to lift themselves out of energy poverty.

Target support at residents who are vulnerable to energy poverty.

Create a plan to combat the issue of fuel poverty on a longer time scale, similar to the one that London has put in place. It would be helpful for low-income families if the costs of social housing and municipal taxes were lowered. Help low-income families that are already familiar with local aid providers enroll in national programs that may be pertinent to their situation. Cities that own their own utilities have the ability to enact policies similar to the one that Barcelona has adopted, which prohibits the disconnection of service to individuals with low incomes while simultaneously giving short-term aid with bills and other forms of financial hardship. In the event that this cannot be accomplished, you should advocate for and collaborate with private utilities and national governments to develop equivalent safeguards, and you should also push for the decentralization of decision-making in order to expand the scope of your efforts to include those who are most at risk.

Retrofit public buildings and social housing, and transition them to renewable energy.

By hastening the intentions of municipalities to decarbonize publicly owned buildings through retrofits and the generation or acquisition of local renewable energy, energy costs can be reduced and local retrofit markets can be stimulated. You might put the money you save on your energy bills toward helping low-income families reduce their energy consumption by contributing to programs that provide assistance in this area. In order to accomplish this objective, Seoul has established

the Energy Welfare Public-Private Partnership Programme. This program allows funds that are saved by public and academic institutions to be used to finance improvements in energy efficiency that are made in private residences as well as educational endeavors. 3 It is essential that in the construction of new public buildings as well as social or affordable housing projects, efforts be made to reduce the amount of energy used and ensure that these structures are powered by renewable energy sources. One such endeavor is currently being carried out in Milan in the form of a zero-carbon communal housing project.

Make sure that reliable energy advice is available to all of the people.

Assist individuals who are at risk of sliding into energy poverty by educating them on easy and inexpensive measures to enhance their energy efficiency as well as the resources available to them to alleviate their situation. In order to include advise into frontline services such as health and social care, it is necessary to bring together partners and community organizations in order to strengthen advisory services such as London's Cost of Living center and target individuals or communities who are at risk.

With various programs, excessive energy use can be reduced.

It is possible to alleviate the strain on energy markets and cut prices by encouraging demand-side actions. Demand-side measures include limiting the temperature inside buildings and maintaining heating and cooling equipment, for example. If the typical temperature inside buildings in Europe was reduced from above 22 degrees Celsius to 18 degrees Celsius, the amount of gas used would decrease by 10 billion cubic meters each degree, resulting in cost savings for everyone. 5 Begin with the buildings of the government, and then persuade corporations and wealthy areas to do the same. This will protect the most disadvantaged by preventing them from cutting back on their own energy demands. For example, office buildings in Amsterdam are lowering their base temperatures by three degrees Celsius, which will result in a fifteen percent reduction in the amount of gas that is consumed. In addition, the city is working closely with local companies to ensure that any superfluous lights are turned off whenever the building is vacant. 6 Additionally, make an effort to pass progressive energy tariffs, which would incentivize energy savings that are greater than a certain level and offer cost-effective alternatives for essential items.

Retrofit the ‘leakiest’ commercial and residential buildings as quickly as possible.

It is important to encourage ambitious retrofit initiatives, as well as techniques that reduce both initial costs and long-term financial burdens, as well as aid for disadvantaged people living in low-performing buildings. Make it simple for renters to file complaints, and if your city has the capacity to do so, compel that landlords make any necessary repairs to the rental units they own or manage. Make it a requirement that the commercial buildings that use the most energy give the highest priority to retrofits and equipment upgrades, and investigate ways to legally control emissions, such as through the use of air quality powers. More details can be found at the following website: Guidelines for the Establishment of Existing Building Energy Efficiency Standards

Increase the adoption of clean heating technologies that are also cheap in order to phase out the use of fossil fuels.

If the local government has the capacity to do so, they should institute a ban on the installation of gas boilers in newly constructed dwellings as well as in properties that have had their heating systems modified as soon as is practically possible. By utilizing the information provided by heat maps, the installation of heat pumps and district energy linkages can be sped up. In addition to a more robust heat pump supply chain and installation capacity, early scrappage measures to speed the replacement of heat pumps through natural causes will be required.

Decentralized electricity and demand-side flexibility both have unrealized potential that should be released.

If government agencies were to provide short-term grants covering 20% of the installation costs of renewables, the rate of investment might potentially be increased by a factor of two. 8 Accelerating the spread of decentralized energy can be accomplished by the implementation of policies and programs such as solar mandates on newly constructed and renovated buildings as well as financial incentives. Ensure that persons living on low incomes are able to take advantage of these cost advantages by providing free or low-cost installation options as well as community energy programs. In a similar vein, develop plans to increase demand-side flexibility by implementing intelligent control systems, storage solutions, and the incorporation of intelligent electric-vehicle charging in order to bring down the peak levels of energy consumption in urban areas.

Decrease the need for oil by providing urban transportation alternatives that are both economical and environmentally responsible.

We should prioritize public transit, as well as facilities for pedestrians and cyclists, rather than private automobiles, buses, and trucks. It is imperative that, in order to bring public transportation service back up to their full pre-pandemic levels, fares be reduced or frozen, particularly for people with limited financial resources. The book "How to Drive a Modal Shift: From Private Cars to Public Transit, Walking, and Cycling" provides additional information on how to bring about these societal shifts in your community. You can find extra general information about lowering oil usage by reading this paper by the International Energy Agency. It contains ten proposals for reducing our reliance on petroleum.

Encourage prompt investment in the establishment of environmentally responsible jobs.

There is no competition for energy efficiency retrofits when it comes to reducing the effects of climate change and shielding residents from rising electricity rates. For instance, by the year 2030, approximately 600,000 employment opportunities could be created in Italian cities alone by implementing deep efficiency and electrification projects in existing buildings, with an additional 274,000 employment opportunities being generated by retrofitting and electrifying new buildings.

Take action as a group and combine your efforts to effectively address the crisis.

It is of the utmost importance to collaborate with other municipalities, partners, and national governments to determine the extent to which energy poverty is pervasive and fossil fuels are relied upon, to determine the most critical responses, and to establish platforms for collective action. Some examples of these platforms include the shared purchase of renewable materials such as heat pumps and solar photovoltaic panels. Cities should make use of their ability as convening organizations in order to bring together civil society organizations, corporations, unions, and regional governments to advance fair energy policies. In addition, these organizations need to make it clear to both national and international governments what steps need to be taken in order to quicken the pace of their operations. See our articles on generating demand for large-scale renewable energy generation, encouraging climate action through municipal diplomacy, and cooperating with neighboring cities on planning, procurement, and more for further ideas and exemplary examples. These articles may be found on our website

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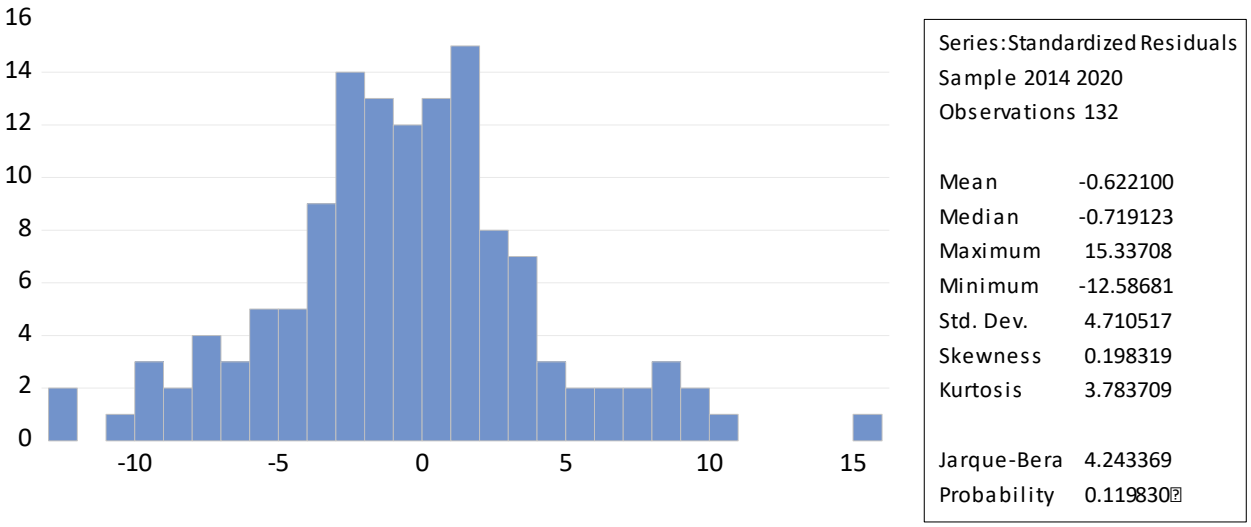
APPENDIX

Descriptive statistics

	GDPGR	CORR	INF	TAX_GDP	GEC	GEEGDP
Mean	3.603542	35.65000	9.470438	15.27155	15.58012	4.628718
Median	4.289569	32.50000	3.550760	13.63348	14.82266	4.427080
Maximum	16.66543	65.00000	557.2018	34.62869	35.35077	10.65203
Minimum	-14.89469	15.00000	-3.233389	6.661741	6.635067	1.776940
Std. Dev.	4.380708	11.83994	45.52189	6.098272	5.740849	1.699922
Skewness	-1.090539	0.630029	10.69938	1.235973	0.925423	1.056987
Kurtosis	5.426033	2.468317	123.2202	3.978553	3.607679	4.116589

Normality Test



Pedroni cointegration test

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	-0.768212	0.7788	-0.851042	0.8026
Panel rho-Statistic	2.869403	0.9979	3.367680	0.9996
Panel PP-Statistic	-7.966975	0.0000	-5.057505	0.0000
Panel ADF-Statistic	-6.457657	0.0000	-3.459447	0.0003

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	5.142902	1.0000
Group PP-Statistic	-7.445318	0.0000
Group ADF-Statistic	-4.266258	0.0000

Panel unit root test: Summary

Series: AE

Date: 01/30/23 Time: 11:54

Sample: 2000 2020

Exogenous variables: Individual effects

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	1.09147	0.8625	39	741
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	7.26137	1.0000	39	741
ADF - Fisher Chi-square	52.1934	0.9892	39	741
PP - Fisher Chi-square	83.4072	0.3169	39	780

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(AE)

Date: 01/30/23 Time: 11:57

Sample: 2000 2020

Exogenous variables: Individual effects

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-13.4620	0.0000	39	702
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-18.7127	0.0000	39	702
ADF - Fisher Chi-square	452.848	0.0000	39	702
PP - Fisher Chi-square	2201.86	0.0000	39	741

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

First difference GMM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDPGR(-1)	0.527922	0.133893	3.942851	0.0009
CORR	-0.995677	0.409791	-2.429718	0.0252
INF	-0.010978	0.012565	-0.873714	0.3932
TAX_GDP	-0.915088	0.168523	-5.430036	0.0000
GEC	-0.482835	0.148771	-3.245499	0.0043
GEEGDP	3.137244	0.828437	3.786945	0.0012

Table 5: orthogonal deviations GMM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDPGR(-1)	0.517636	0.107448	4.817541	0.0001
CORR	-0.709948	0.263762	-2.691622	0.0144
INF	-0.016327	0.003484	-4.686721	0.0002
TAX_GDP	-0.680909	0.207563	-3.280489	0.0039
GEC	-0.373621	0.099028	-3.772874	0.0013
GEEGDP	2.086162	0.887134	2.351574	0.0296

Padroni Residual Co-integration test

Table 6

Pedroni Residual Cointegration Test

eries: LNGDPC AE INF LEXP POP

Date: 11/02/22 Time: 22:47

Sample: 2000 2020

Included observations: 819

Cross-sections included: 39

Null Hypothesis: No cointegration

Trend assumption: Deterministic intercept and trend

User-specified lag length: 1

User-specified bandwidth: 1 and Bartlett kernel

Alternative hypothesis: common AR coefs. (within-dimension)

			Weighted	
	Statistic	Prob.	Statistic	Prob.
Panel v-Statistic	1.340967	0.0900	0.744922	0.2282
Panel rho-Statistic	2.456154	0.9930	2.292294	0.9891
Panel PP-Statistic	-3.146279	0.0008	-3.734542	0.0001
Panel ADF-Statistic	-5.207454	0.0000	-3.431878	0.0003

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	4.108469	1.0000
Group PP-Statistic	-3.912948	0.0000
Group ADF-Statistic	-4.816939	0.0000

Dependent Variable: LNGDPC

Method: Panel Generalized Method of Moments

Transformation: First Differences

Date: 10/10/22 Time: 11:50

Sample (adjusted): 2002 2020

Periods included: 19

Cross-sections included: 39

Total panel (unbalanced) observations: 740

White period instrument weighting matrix

White period standard errors & covariance (d.f. corrected)

Instrument specification: @DYN(LNGDPC,-2) AE INF LEXP POP

Constant added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGDPC(-1)	0.944475	0.007912	119.3739	0.0000
AE	0.001383	0.000634	2.180519	0.0295
INF	-0.003128	0.000121	-25.95483	0.0000
LEXP	-0.010648	0.001785	-5.963990	0.0000
POP	0.016954	0.003353	5.056499	0.0000

Effects Specification

Cross-section fixed (first differences)

Mean dependent var	0.050149	S.D. dependent var	0.138270
S.E. of regression	0.170312	Sum squared resid	21.31952
J-statistic	38.62980	Instrument rank	39
Prob(J-statistic)	0.268323		

Panel unit root test: Summary

Series: AE

Date: 01/30/23 Time: 12:00

Sample: 2000 2020

Exogenous variables: Individual effects, individual linear trends

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.16040	0.0000	39	741
Breitung t-stat	0.00956	0.5038	39	702
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.12881	0.0166	39	741
ADF - Fisher Chi-square	110.488	0.0091	39	741
PP - Fisher Chi-square	395.535	0.0000	39	780

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(AE)

Date: 01/30/23 Time: 12:01

Sample: 2000 2020

Exogenous variables: Individual effects, individual linear trends

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-11.0411	0.0000	39	702
Breitung t-stat	-11.7954	0.0000	39	663
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-17.0447	0.0000	39	702
ADF - Fisher Chi-square	385.670	0.0000	39	702
PP - Fisher Chi-square	726.820	0.0000	39	741

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: INF

Date: 01/30/23 Time: 12:02

Sample: 2000 2020

Exogenous variables: Individual effects

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.06611	0.0000	39	741
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-8.27184	0.0000	39	741
ADF - Fisher Chi-square	228.592	0.0000	39	741
PP - Fisher Chi-square	323.090	0.0000	39	780

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(INF)

Date: 01/30/23 Time: 12:02

Sample: 2000 2020

Exogenous variables: Individual effects

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-23.0127	0.0000	39	702
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-23.8555	0.0000	39	702
ADF - Fisher Chi-square	593.275	0.0000	39	702
PP - Fisher Chi-square	3072.45	0.0000	39	741

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: INF

Date: 01/30/23 Time: 12:06

Sample: 2000 2020

Exogenous variables: Individual effects, individual linear trends

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.33339	0.0000	39	741
Breitung t-stat	-4.02410	0.0000	39	702
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-7.34489	0.0000	39	741
ADF - Fisher Chi-square	201.368	0.0000	39	741
PP - Fisher Chi-square	449.536	0.0000	39	780

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: LEXP

Date: 01/30/23 Time: 12:08

Sample: 2000 2020

Exogenous variables: Individual effects

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-32.7995	0.0000	39	741
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-39.9757	0.0000	39	741
ADF - Fisher Chi-square	2562.18	0.0000	39	741
PP - Fisher Chi-square	216.993	0.0000	39	780

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(LEXP)

Date: 01/30/23 Time: 12:08

Sample: 2000 2020

Exogenous variables: Individual effects

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-29.1616	0.0000	39	702
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-26.8146	0.0000	39	702
ADF - Fisher Chi-square	926.265	0.0000	39	702
PP - Fisher Chi-square	91.5895	0.1393	39	741

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: LEXP

Date: 01/30/23 Time: 12:09

Sample: 2000 2020

Exogenous variables: Individual effects, individual linear trends

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-39.3990	0.0000	39	741
Breitung t-stat	9.04591	1.0000	39	702
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-57.3503	0.0000	39	741
ADF - Fisher Chi-square	593.473	0.0000	39	741
PP - Fisher Chi-square	68.9954	0.7570	39	780

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(LEXP)

Date: 01/30/23 Time: 12:10

Sample: 2000 2020

Exogenous variables: Individual effects, individual linear trends

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-29.8245	0.0000	39	702
Breitung t-stat	1.16874	0.8787	39	663
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-28.3040	0.0000	39	702
ADF - Fisher Chi-square	538.141	0.0000	39	702
PP - Fisher Chi-square	121.481	0.0012	39	741

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: GDPC

Date: 01/30/23 Time: 12:13

Sample: 2000 2020

Exogenous variables: Individual effects

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.55750	0.0000	39	740
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.07606	0.4697	39	740
ADF - Fisher Chi-square	75.5366	0.5580	39	740
PP - Fisher Chi-square	84.5518	0.2865	39	779

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(GDPC)

Date: 01/30/23 Time: 12:18

Sample: 2000 2020

Exogenous variables: Individual effects

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-11.7797	0.0000	39	701
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-10.2947	0.0000	39	701
ADF - Fisher Chi-square	250.839	0.0000	39	701
PP - Fisher Chi-square	397.002	0.0000	39	740

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: GDPC

Date: 01/30/23 Time: 12:20

Sample: 2000 2020

Exogenous variables: Individual effects, individual linear trends

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-1.16277	0.1225	39	740
Breitung t-stat	3.09664	0.9990	39	701
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	3.21039	0.9993	39	740
ADF - Fisher Chi-square	44.6600	0.9991	39	740
PP - Fisher Chi-square	41.0096	0.9998	39	779

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(GDPC)

Date: 01/30/23 Time: 12:21

Sample: 2000 2020

Exogenous variables: Individual effects, individual linear trends

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-13.9777	0.0000	39	701
Breitung t-stat	-4.29001	0.0000	39	662
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-9.92361	0.0000	39	701
ADF - Fisher Chi-square	238.251	0.0000	39	701
PP - Fisher Chi-square	440.975	0.0000	39	740

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: POP

Date: 01/30/23 Time: 12:24

Sample: 2000 2020

Exogenous variables: Individual effects

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-15.1253	0.0000	39	741
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-18.3246	0.0000	39	741
ADF - Fisher Chi-square	484.716	0.0000	39	741
PP - Fisher Chi-square	162.722	0.0000	39	780

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(POP)

Date: 01/30/23 Time: 12:25

Sample: 2000 2020

Exogenous variables: Individual effects

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-15.2988	0.0000	39	702
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-16.1652	0.0000	39	702
ADF - Fisher Chi-square	447.981	0.0000	39	702
PP - Fisher Chi-square	396.781	0.0000	39	741

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Nexus of Corruption, Energy Poverty and Economic Development: The African perspective

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SCIENTIFIC RESEARCH ETHICS COMMITTEE

21.11.2022

Dear Sampson Obediah George, Jr.

Your project **"Accentuating impediments to economic development- nexus of corruption, energy poverty, and economic development"** 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