



Bad Gains: Effects of Fossil Fuel Energy on Africa

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

Article Information

DOI: 10.9734/JENRR/2020/v6i330170

Editor(s):

(1) Dr. Mohammed Aslam Husain, Rajkiya Engineering College, Ambedkar Nagar, India.

Reviewers:

(1) P. Ravichandra Ganesh, Dr. M.G.R. Educational and Research Institute, India.

(2) Betül Gürünlü, Gebze Technical University, Turkey.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/62078>

Received 20 August 2020

Accepted 24 October 2020

Published 18 November 2020

Original Research Article

ABSTRACT

Energy is indispensable to global economic development and human development. Through the course of history, different energy sources have been used to fuel economic growth and better human life. The fossil economy fuelled unprecedented economic growth that was not possible with previous energy epochs. The development brought about by fossil fuels has not been beneficial for all and this paper argues that fossil fuel energy sources; specifically oil and gas have had more of negative political and socio-cultural implications for Africa. Using secondary data sources from books, articles and reports, the study finds out that oil resources have helped in sustaining dictatorships and socioeconomic hardship in oil producing countries in Africa.

Keywords: Africa; energy; energy transition; fossil fuels.

1. INTRODUCTION

Over time, human beings have come to rely on ever-increasing quantities of energy to meet their rising numbers and to better their living standards [1]. The dependence of modern society on the use of energy resources is very high and energy has even been dubbed the

lifeblood of technological and economic development [2]. From organic to fossil fuels as an energy source, the reasons for shifts from one energy source to another are complex and the changes to new carriers were slow with older forms of energy use coexisting alongside new ones [1]. The current global energy system is dominated by fossil fuels and suffers from

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environmental problems caused by increasing greenhouse gas emissions, air pollution at local and regional level as well as energy security issues. The unsustainability of our current energy system necessitates and urgent transition to a cleaner and safer energy system [3]. The need for the next energy transition is widely apparent as current energy systems are simply unsustainable on all accounts of social, economic and environmental criteria [4]. With the future of energy systems being one of the core policy problems facing industrial countries [5], understanding past energy transitions is core to charting a way forward. As a solution to these issues a transformation of the global energy system is commonly proposed, including a transition from the current situation to an energy system based on renewable energy resources.

Over time, energy research has dealt more with technological issues at the expense of other relevant components like the social and behavioural aspects [6]. It should be recalled that new technological innovations today often face challenges of societal acceptance and adoption [7,8]. Most historical energy transitions were necessitate by demand forces in the economy and as a result did not stem from concrete policy considerations like we have the current agenda today for a renewable energy transition. While the shift to a cleaner system is being championed globally, it becomes very important to understand the impacts past transitions have had on society as they can be political, economic and social, in order to chart a better and well organised energy transition agenda today [9]. In this paper, fossil fuel energy sources; specifically oil and gas, having more of negative sociocultural and political implications for Africa, are argued.

1.1 Energy Trends and Fossil Fuels in Africa

Energy is the life wire of the global economy. As populations expand, living standards improve and consumption increases, global energy demand is expected to rise by 28% by 2070. Over time, energy and natural resources have been considered as both sources of economic chances and concerns for socioeconomic and environmental sustainability [10]. Ample evidence show that economic growth, expressed in the form of real GDP growth is directly related to increased energy consumption and escalated usage of natural resources in general. The US economy is a good example, where, from 1949

to 2009, the correlation between GDP growth and energy consumption growth was equal to 0.934 [11]. Brown, Burnside, Davidson, DeLong, Dunn, Hamilton et al. used a 24-year-long period (1980–2003) to analyse data for 220 nations and established a strong correlation between the per capita energy use and the per capita GDP [12]. An explanation for this phenomenon is the augmentation of human labour with capital. Most capital goods currently used are somehow dependent on various inputs of energy to be usable in the production process [11]. Fossil fuels facilitated the advent of the Industrial Revolution and the subsequent continuing economic growth till today. With scarcity of fossil sources being envisaged, Stern notes that as the scarcity of energy grows, a strong constraint on the growth of the economy can be experienced [13]. However, the abundance of energy has a much reduced effect on economic growth. Energy is so important to economic growth to the point where Hamilton notes that 80% of recessions experienced since 1970 in the US have a close connection to oil price shocks [14].

Fossil fuels are rock-like, gas, or liquid resources that are burned to generate power. They include coal, natural gas, and oil, and are used as an energy source in the electricity and transportation sectors. They are considered fossil fuels because they were formed from the fossilized, buried remains of plants and animals that lived millions of years ago. Because of their origins, fossil fuels have a high carbon content. Besides fossil fuels, other fuel sources have been used by humans. Burke identifies main energy epochs (energy regimes) in human history. These two regimes are the age of solar energy (a renewable resource) from 10,000 B.C.E. to 1800 C.E., and the age of fossil fuels (a non renewable resource) from 1800 C.E. to the present. The fossil fuel economy liberated humanity from the constraints imposed upon it by previous energy sources and opened up the road for built-in growth [15].

Of all energy sources today, oil and gas plays a very vital role in the global economy. It is a key source for revenue and growth for several developing and developed countries rich in hydrocarbons and the entire global economy of today runs on fossil fuels. The production chain begins with burning oil and gas, ends with it, and still depends on the same oil and gas to move commodities along the chain from one location to another [16]. The global economy today as we know it today would not exist if there was no oil

and gas. In recent years, there have been increasing concerns over the environmental consequences of burning enormous volumes of oil and questions as to the capacity of fossil fuel reserves to service meet the ever-growing global demand for goods and services [17]. Within the oil industry, Africa remains a major player in the production and exportation of oil worldwide and more reserves have been discovered over the years with an estimated 100 billion barrels of oil awaiting offshore discovery [18]. According to 2020 statistics, Africa contains about 7.5% of global oil reserves [19]. Almost every country in Africa is engaged with petroleum exploration and/or production.

The potential for undiscovered oil and gas reserves in many parts of Africa is particularly strong given the lack of previous exploration activity. Regions such as the Gulf of Guinea, Congo basin, and offshore East Africa are attractive to the oil and gas industry due to the excellent record of exploration activity in recent years. During the commodity boom of 2003–2014, many new discoveries were made in the continent's two largest traditional oil and gas producers, Angola and Nigeria. Several new reserves are being found in countries including Central African Republic, Chad, Cote d'Ivoire, Ghana, Senegal, Liberia, Sierra Leone, Mozambique, Uganda, Kenya, Togo, Tanzania, and Sao Tome and Principe. A general sense of '*Africa rising*' took hold during this period and as a result of these oil discoveries, the continent has become a major site for competition between various national and international oil companies from across the globe [20]. The lack of skills development continues to be a problem in Africa, and it is becoming a global challenge in the oil & gas industry overall [21]. Africa's resource-rich countries continue to be highly dependent on natural resource exports for both foreign exchange and revenue generation. Most of African oil and gas resources are exported to generate huge revenues in their raw state. The oil and gas sector has been a good source of revenue generation for African countries but has not been free of challenges including corruption, weak regulatory frameworks, tax requirements, financing costs and foreign currency volatility [22,23].

However, the history of oil extraction on the African continent presupposes that it has not turned out to yield anticipated developmental outcomes [24]. Sachs and Warner hold that the tendency for resource-rich countries to

experience low economic growth remains a conceptual puzzle [25] and is often characterised as the *resource curse* [26].

2. METHODOLOGY

Energy transitions have often been conceived and planned from a technological perspective and events driven by economic demand. A review of articles and books would be used to ascertain the effects the fuel sources had on Africa. In achieving this goal, the main fossil fuel sources concerned with shall be coal and oil. Understanding how these energy sources have impacted Africa is indispensable to systematically planning for any future transitions and address any possible problems.

3. RESULTS AND DISCUSSION

3.1 Political and Socioeconomic Implications of Transition to Fossils

Energy epochs have often been regarded as milestones in technological innovations and human development. Over time, the tendency to appraise these transitions in a positive light often sheds less shadow on other socioeconomic cultural effects they have had. Energy sources have actually played a very important role in monitoring human population growth. While petroleum resources have largely been criticised from an environmental aspect, it is also important for a political and socioeconomic analysis of petroleum resource in Africa.

3.1.1 Petroleum and conflicts in Africa

The transitions from one energy form to another engendered possibilities which overcame multiple barriers. However, the barriers it overcame are being enjoyed more by industrialised economies. The case has not been same for most African countries endowed with petroleum resources as it has led to and sustained wars. The natural resource curse is a major challenge plaguing African countries [27]. Natural resources are wealth to a nation and can be used to foster rapid economic development if well managed and revenue properly accounted for. The case for Africa has however been very different as petroleum resources have been major reasons for civil wars in Africa. Looking at Cameroon for example, the 2017 Anglophone crisis led to on-going civil war in the country with one of the major underlying argument for the



Fig. 1. Map showing petroleum exploration and production in Africa

Source: Designed by author with statistic from US IEA website
<https://www.eia.gov/beta/international/data/browser/>

fight being the separatist believe that all petroleum resources in the country are from the English speaking region but their region benefits nothing from this conflict [28,29,30]. The Cameroon – Nigeria Bakassi crisis was largely caused by the struggle to control the oil wealth in the Peninsula [31]. In Libya, the overthrow of Gaddafi left a power vacuum that had to be filled. Being a state with weak institutions, peaceful transition failed and this led to rival militias fighting for state power. Gaining state power requires resources and oil of one of the commodities Libya has in ample supply and is causing war to fester in this African state [32,33].

According to Reuters, “oil has been at the core of unrest that followed Gaddafi’s overthrow, a slow-burn conflict with periodic flare-ups of intense fighting.....Factions have used oil facilities as

bargaining chips to press financial and political demands. Fields and ports in Libya’s east were blocked between 2013 and 2016” [34]. Most western powers have staked their interests in either the faction of general Haftar of the Government of National accord. With the global economy dependent on petroleum products, whatever needs to be done to keep oil flowing must be done. With the oil fields in General Haftar’s control in April 2019, the US President openly showed support for him in disregard of the UN – Backed Government of National Accord in Tripoli [35]. The factionalisation of this conflict is because of the oil wealth which has become a curse for Libyan people as the need to keep the refineries running takes precedence. This Civil, war like many others in the continent, have been fuelled and sustained for years by petroleum resources. The Niger Delta conflict in Nigeria has been a conflict over equitable distribution of

benefits from oil by the population of the Niger Delta region of Nigeria [36,37,38]. Evidence by acts ranging from sabotaging of oil pipelines to kidnapping of oil company personnel for ransom between 2005 – 2009, the Nigerian government has effectively curbed militancy in the region but is yet to fully meet its obligations to provide basic amenities like potable water to this region.

Many oil rich countries have low levels of democratic practice and high levels of corruption. In Africa, like in most countries endowed, petroleum resources are managed as national wealth and controlled by the government. In a multitude of resource rich countries like Tordo, notes, national oil companies control approximately 90% of the world's oil and gas reserves and 75% of global production [39]. In countries like Algeria, the entire petroleum chain has no foreign oil company as a player with the National Oil Company SONATRAC being the largest employer in the country. Despite this national ownership of petroleum reserves, international oil companies and even oil-poor emerging countries such as China often gain access to petroleum reserves in Africa (south of the Sahara) through non transparent deals. Foreign investments can be used as leverage to improve democratic practices. But it has often been the case that in most African oil producing countries, sanctions are rarely implemented to promote democracy or to curtail conflicts. States like the *Darfur Four* (Algeria, Pakistan, China and Russia) with major oil investments in Sudan opposed the U.N. Security Council's plans for arms and oil embargoes on Sudan during the Second Sudanese Civil War [40]. Since petroleum resources generate huge revenues for state government, it is likely for these states to tax their citizens less. This in turn generates lower demands for accountability from government by citizens and weak institutions [27,41]. Majority of the petroleum producing and exporting states in Africa, according to the Economist Intelligence Unit ranking, are classified as dictatorships [42]. These states may have some conventional institutions of democracy but with meagre significance, infringements and abuses of civil liberties are common occurrences, elections are not free and fair, the media is often state-owned or controlled by groups associated with the ruling regime, the judiciary is not independent, and there are omnipresent censorship and suppression of governmental criticism. States like these have limited political space, with nepotism in revenue management being a norm [42].

3.1.2 Economic and social consequences of oil producing resources

Other impacts of the oil and gas industry include increased cost of rent, basic foodstuffs, and a generally high cost of living in oil producing communities. This is mostly a result of migration and population growth, as economic migrants seek new opportunities. In-migration can also be associated with higher levels of crime and prostitution. In Cameroon, for example, the Bakola/Bagyei pygmies of the Kribi area had their hunting means of subsistence affected by the Chad-Cameroon pipeline construction. This pipeline project traversed their lands and destroyed medicinal plants, game areas and fishing grounds. High levels of income inequality often exist in such states. While most of the workers in the oil refineries and rigs are extremely wealthy, other member of the community wallow in poverty. Limited government presence exists with little access to socio and health amenities for the poor. The influx of workers and their poor housing conditions on oil projects is associated with an increase in health issues and population pressure to an increase in transmittable diseases such as AIDS and other sexually transmitted infections. Temporary living along the Chad-Cameroon pipeline led to the rise in prostitution and the manifestation of HIV/AIDS in nearby localities [43]. Health challenges abound in oil producing areas. Increasing concern about fossils being harmful to the environment through Co₂ emissions needs to also capture the fact that wastes from these plants increasingly poison water and food sources for local dwellers. Gas flaring lets toxic pollutants like sulfur dioxide into the atmosphere, which can lead to environmental problems like acid rain and also leads to increase in greenhouse gases contributing to climate change [44]. The impacts of flaring also extend to human health issues and low crop yields [45]. Pollution from oil spills has been a very huge problem for African countries. Damage to large ecosystems for both human and animal habitation has been recorded in Africa resulting from poor disposal of refining waste and oil leaks. Human communities and marine habits in Niger Delta region of Nigeria have been largely affected by this pollution as many farmers have lost their farm lands, fishing grounds and drinking water sources because of huge spills covering and destroying land, surface and underground water through seepage. A 12 year long court case of Shell's pollution is on the way in a Dutch Court as 4 Nigerian farmers keep seeking justice

[46]. The recent oil spill of the coast of Mauritius has affected internationally recognized biodiversity hotspots. It is believed that the whole ecosystem is at risk if proper cleaning is done [47]. Events like this though rare have huge impacts on both humans, animals and the environment.

Another issue to consider is the inequality associated with energy transitions. In the 19th and early 20th centuries, as the oil and gas energy sources and technologies were introduced, major proportions of populations were left without access to these new energy sources. The high costs of petroleum products in most African countries have made access to modern modes of transportation difficult. With the exceptions of countries north of the Sahara, other petroleum producing countries in Africa have high fuel prices and this makes it difficult for citizens to afford using cars. Access to clean energies like LPG for cooking is also difficult as it is expensive and this leaves residents to resort to using polluting petroleum products like Kerosene which lead to health hazards [48].

Growing cost of living is another well-known problem faced in oil producing areas. The exploration, production, and development of oil pushes out both fishers and farmers away from their land. Prices of land and housing have increased dramatically to the point that many are unable to cope with the escalating costs of housing and rise in evictions. Landowners continue to sell or rent their land to the highest bidders, including foreign expatriates. This has made it difficult for residents to get accommodation while some have been evicted for oil companies and their workers [49]. This fosters the migration of locals from their ancestral lands and sources of livelihood. This severance of ties for people from their lands is like literal death.

The process of oil extraction promotes gender inequalities and social fragmentation in communities [50]. Ablo, through research, identifies a strong practice of discrimination in the recruitment and employment of workers in Ghana's oil sector on the basis of ethnicity and gender in Ghana's oil sector. This shows that the entrenchment of economies into oil based directly promotes gender bias. In a system filled with nepotism, drilling licences are given to friends just like contracts for the recruitment of offshore personnel by recruiting agencies. There are few women working on the rigs, who are

mostly employed as cooks and utility personnel (housekeeping and dishwashing) [51].

4. CONCLUSION

Energy is essential for economic growth and is a driver for good and quality life. Fossil fuels have powered the global economy for over a century and have fostered unprecedented economic growth and development. While this has largely been the case for developed and industrialised economies, the oil and gas energy source has had more of negative impacts on African countries endowed with the resource. Being national resources and managed by public parastatals, it becomes important to carry out research and find out if privatisation of these resources can help provide more benefits to citizens. Even though the role of the oil and gas sector for promoting development in African states has its controversies, more countries are moving to common extraction of their oil and gas discoveries and the Coronavirus pandemic effects on oil prices has also affected producing states [52]. Diversification of these economies is very important and the addition of value to these resources before export is encouraged.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/62078>