

Research Article

Disparities in Fossil Fuel Exploration: Developing Nations Halt, Developed Nations Explore

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Abstract— Fossil fuel exploration has historically been a pivotal factor in driving industrialization and economic growth globally. However, the detrimental impact of fossil fuel emissions on climate change has resulted in heightened scrutiny and demands to halt further exploration. This perspective, however, overlooks the disproportionate burden placed on developing nations. These countries face pressure to cease exploration without receiving adequate financial support from developed nations and international financial institutions. This imbalance is further aggravated by inequities in energy access, with developing nations experiencing severe energy poverty despite having substantial fossil fuel reserves.

While affluent nations continue to explore fossil fuels to meet their energy needs, developing countries struggle to secure clean and affordable energy sources. Transitioning to renewable energy poses significant challenges for these nations, including high costs, limited technical expertise, and insufficient financing. Concurrently, wealthy nations persist in investing in fossil fuel infrastructure, undermining global efforts to combat climate change.

This study critically examines the disparities in fossil fuel exploration between industrialized and developing nations and the challenges faced by the latter in transitioning to renewable energy sources. It analyzes the environmental, political, and economic factors contributing to this disparity and explores potential solutions to facilitate a more equitable transition. Ultimately, the study underscores the importance of supporting developing countries in diversifying their energy sources and addressing energy poverty to mitigate climate change impacts and promote sustainable development.

Keywords— Fossil fuel exploration, Industrialization, Economic growth, Climate change, Emissions, Energy poverty, Developing nations

1. Introduction

Fossil fuel exploration and exploitation have traditionally been linked to the economic growth and industrialization of many countries (37). There is historical evidence that suggests fossil fuel exploration had a major role in the expansion of China's, Europe's, and America's industrial and economic dominance. But because of the climatic change brought on by these operations, fossil exploration and the emissions-causing byproducts have come under close scrutiny recently. The argument for stopping the exploration of fossil fuels is unbalanced worldwide (12). Citing the urgent need to reduce emissions and mitigate environmental degradation, particularly given the advanced impact on emerging economies, frequently comes across as unfair because wealthy developed nations and financial institutions pressure developing nations to stop exploring for fossil fuels while Western countries continue to advance in their exploration of new reserves, despite the pressure to do the same.

According to (9), the search for fossil fuels and the new push to stop it because of its effects on the environment are what

drive the development of modern economies. According to the International Energy Agency, fossil fuels will still be the world's primary source of energy until 2035, with new oil fields expected to produce 80% of the fuel. In the meantime, economic and industrial development in Sub-Saharan Africa and Asia will continue to be hampered by disparities in energy access (17).

This review paper aims to analyse the behaviour of rich countries in relation to fossil fuel exploration as well as the onerous expectations placed on poor countries to contribute negligibly to their pollution quota in order to stop fossil fuel exploration. This unbalanced narrative's historical, economic, and political components have an impact on energy gaps and shortages, particularly for developing countries where 1.2 to 1.4 billion people lack access to electricity, with a higher proportion living in sub-Saharan Africa (16). The severity of this lack of access represents the obstacles to the people's quality of life in terms of economic development brought about by energy scarcity (5). Because of fossil fuels, developed nations have been able to advance their economies

and build infrastructure over the years by profiting from fossil exploration (27).

The role of major stakeholders in fossil fuel explorations is discussed through international policies and treaties under umbrella organizations such as the United Nations Environment Programme. The goal is to balance the gaps, reduce emissions, and shape the discourse around the impact of fossil fuel exploration on both developing and developed economies. However, the extent of compliance to agreed terms remains a question.

With regard to mitigating climate change, the paper seeks to provide an understanding of the challenges associated with striking a balance between energy needs and environmental sustainability. (39) This is especially important in light of the disparate effects on developing countries' lack of resources and technical know-how of suggested transitions to renewable alternatives in the face of climate change, which are supported by fossil capitalism in the exploration and consumption paradigm.

2. Methodology

The literature compiled on the disparities in fossil fuel exploration where developing nations face halts while developed nations continue exploration was meticulously retrieved from original research articles, books, websites, and theses spanning from 2005 to 2023. This extensive search utilized various databases including Google Scholar, JSTOR, ScienceDirect, government and international reports, and online news and magazine articles. Specific keywords such as "fossil fuel exploration," "industrialization," "economic growth," "climate change," "emissions," "energy poverty," and "developing nations" were employed to ensure comprehensive information retrieval. The sources of information were meticulously referenced using Mendeley, a reference management software, ensuring accurate and organized citation of all materials used.

3. Fossil Fuel Exploration

3.1 Fossil Fuel Exploration Disparity Between the Developed and Developing Nations

Despite the agreement to phase out hydrocarbon to meet the long-standing Paris agreement on curbing climate change, over 400 oil and gas projects were approved globally in the past two years, according to Valentine and Nathalie (2023), an online columnist for phys.org. Of those projects, 57 were backed by states, and 22 were linked to oil majors like Shell, Chevron, and Total Energies. This desperate plea for further oil exploration highlights the discrepancy between developed and developing countries in the ongoing discovery of fossil fuels, as well as the gaps in production and consumption (32). The significant disparities in fossil exploration and carbon emissions prompt the question of which parties should assume greater responsibility for mitigating the impact of climate change. This inherent disparity, evident in exploration, consumption, and emissions, is deeply rooted in the global energy system's inefficiency and necessitates

policy reforms (23). When discussing industrial development, it is important to note that fossil fuel remains the main source of energy worldwide. It serves as a means of globalizing economies and is a key factor in determining a nation's economic might (9).

Nevertheless, eight of the oil-abundant economies in Africa continue to struggle with the incapacity to supply energy to two-thirds of the population (12).

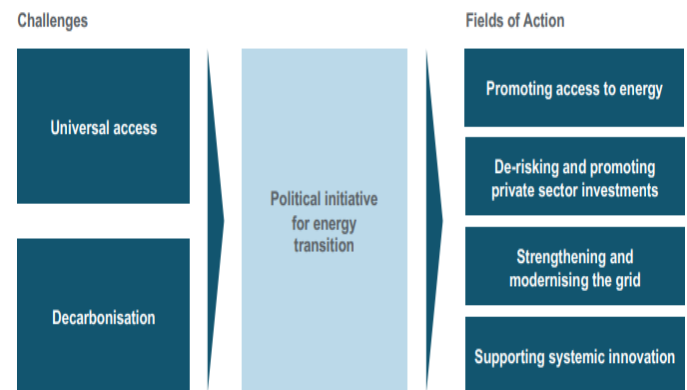


Figure 1: Challenges and field of action of Africa RE transition
Source: IRENA 2021

Figure 1 above shows that a broad concerted initiative in effectively transitioning Africa to renewable energy requires a comprehensive initiative to make universal access to electricity a right through institutionalizing a policy framework to support such transition (40). Africa has seen major setbacks in policies, arising from weak institutions and political will by the successive governments while transitioning, this weakness alters the progress of growth in all sectors. However, Africa accounted for only 2% of global renewable energy addition in the last decade a more robust commitment is required from the African government in the realization of improved energy for its people in the coming years by harnessing the potentials of the abundant natural resources of the region.

The issue of balancing policies to address the carbon emission gaps, which have been met with varying disparities, is often attributed to the lack of political influence of nations that bear the burden of climate change resulting from fossil exploration and emissions. These nations struggle to participate effectively in international decision-making processes due to their limited financial capabilities. Consequently, they face challenges in developing their energy potentials without seeking external assistance. This situation has exacerbated the problem of emission negligence, (31) leaving these nations with severe energy crises.

Developing nations bear the brunt of the consequences of carbon emissions, while three countries (China, the United States, and the EU) with only 30% of the world population consume half of the world's energy demand. When India is included, these countries represent 56% of the global population (14). The disparity in energy usage highlights the leading contributors to pollution worldwide, including China and the United States. These countries have significantly

increased their consumption and exploration of new energy reserves, driven by their carbon-intensive industries. In contrast, developing nations with an economic growth focus lack the necessary energy infrastructure and rely heavily on crude energy sources (6).

Although there is a significant difference in energy consumption between developed and developing nations, the developed nations have shown an increased interest in exploring fossil fuels due to their growing need for energy self-sufficiency. This is particularly evident in light of the energy crisis in Europe caused by the conflict between Russia and Ukraine. Many developed nations have disregarded their commitments to reduce fossil fuel exploration as a result of this crisis (37). China, Norway, and the US have significantly increased their efforts to explore fossil fuel reserves in recent years. The US, in particular, is leading in the export of liquefied natural gas (LNG), with an annual exploration volume of approximately 450 billion cubic meters (33).

3.2 Lack of Energy Despite Fossil Fuel Potentials in Developing Nations

Despite the abundant potential of renewable energy sources and fossil fuel reserves, developing nations are reported to have the highest prevalence of energy poverty worldwide (29). The challenge of energy scarcity is worsened by their insufficient infrastructure for exploration and limited financial capabilities without external assistance. Additionally, international financial institutions have recently reduced their support for fossil fuel activities as part of their emissions reduction policies (29).

Despite the fact that 1.6 billion people in developing countries are thought to be without access to clean energy, many have turned to various forms of crude energy, exacerbating environmental degradation, as a result of the difficulties in realizing the potential of energy resources, whether they be fossil fuel or renewable (17). The IEA World Energy Outlook (2004) projects a 30% increase in global population, of which 80–90% is expected to come from developing countries. This raises concerns about the energy sources required to support regional development, sustainable growth, and the millions of people who lack access to energy. Nonetheless, the IEA (11) states that the world's energy grid is heavily reliant on fossil fuels, which are expected to provide 84% of global energy needs by 2030 and command a \$1.5 trillion market share. It should come as no surprise that researcher (30) contended that a 25-year analysis of data has demonstrated that, contrary to earlier predictions that reserves of oil and gas would decline owing to consumption, there was no decline in the ratio of energy consumption to reserves between 1980 and 2007.

Africa, which comprises approximately 1.5 billion people and accounts for 25% of the global population, is among the developing nations that generate only 3.2% of the world's electricity. This highlights Africa's energy poverty (13). Africa also accounts for about 9.5% of the world's oil, 8% of its natural gas, and 4% of its coal (1), further emphasizing the disparity in the rate of development in the region. The ability

of Africa to find balance in utilizing the energy mix, including the exploration of fossil fuels, is thought to be crucial in assisting the region in making the transition to a more environmentally friendly energy future that drives the search for a solution to this energy poverty (13) and socioeconomic growth while optimizing the effects of crude energy usage on the environment.

3.3 Fossil Fuel Exploration and Expansion by Developed Nations Despite Climate Change

Despite calls from climate change campaigners to phase out fossil exploration, Norway, Canada, Australia, China, and the United States continue to explore newer reserve exploration (8).

Table 1: Fossil Fuel Reserves That Must Remain Unburned to Limit Global Temperature Rise to 2°C

Country/Region	Oil		Natural Gas		Coal	
	Billions of barrels	Percent of total reserves	Trillions of cubic feet	Percent of total reserves	Giga-tonnes	Percent of total reserves
Africa	28	26	4.4	34	30	90
Canada	40	75	0.3	24	5.4	82
China and India	9	25	2.5	53	207	77
Former Soviet Union	28	19	36	59	209	97
Central and South America	63	42	5	56	11	73
Europe	5.3	21	0.3	6	74	89
Middle East	264	38	47	61	3.4	99
OECD Pacific	2.7	46	2	51	85	95
Other developing Asia	2.8	12	2.1	22	17	60
United States	4.6	9	0.5	6	245	95
Global	449	35	100	52	887	88

Source: Mcglade and Ekin 2015

This table summarizes the percentage of fossil fuel reserves that must remain unburned to prevent global temperatures from rising above 2°C.

This refusal to back down from continual exploration contradicts the appeal to reduce the impact of climate change caused by carbon emissions, notwithstanding the future financial consequences of continued investment in fossil fuels (2). Despite climate emergencies, states and oil companies' insatiable thirst for exploration signals their desire for profit. This is because key sectors like transportation, particularly aviation and shipping, depend heavily on fossil fuels, and the lack of readily available fuel alternatives hinders efforts to realize the global cap of 1.5 degrees Celsius (8). These industries, along with other industrial advancements requiring energy for large-scale manufacturing, are still growing throughout the developed world. (21) and (35) draw attention to the complexity of developed countries' quest for energy independence, the dynamism of the fossil fuel market, and the financial gain from fossil fuel exploration, which has led to many developed countries making little to no effort to reduce further exploration. The government provides subsidies, tax incentives, and state investment to support the spread of exploration for fossil fuels due to its profitability. Wealthy developed nations even enjoy this privilege while making investments in Africa.

3.4 Capitalism's Influence on Fossil Fuel Exploration

Fossil capitalism is a combination of environmental and economic crises that has led to the continued exploration of fossil fuels in spite of the risks and their connection to climate change (36). In several cases, this exploration has led to a crisis that has escalated conflicts over perceived environmental injustice, deprivation, and corruption brought on by the natural resources, disenfranchising societies. According to (22), the restructuring of the capitalist global order is in line with the energy system's supply and demand, which is one of the causes of global power struggles, environmental degradation, and social unrest. (28) supports Muzio's theory by connecting the emergence of armed rebels with resource abundance in developing countries rich in resources but depriving their citizens of advantages. Resources are abundant in some places, according to (20) and (4). These researchers contend that corruption, misrule, and benefit deprivation are key factors that provoke conflict in developing nations, as evidenced by the conflicts that have occurred in Angola, Nigeria, Chad, and Sudan due to oil corruption. Given its position as the most powerful energy source globally, fossil fuels have become commodities of modern capitalism due to the worldwide desire for energy security among nations (24). The abundance of this rare mineral in developing countries—of which Africa is not an exception despite its 9% reserves—has brought to light historical context. Additionally, the relationship between state actors and multinational corporations always results in a loss because oil revenues remain opaque, leaving the populace in poverty both economically and energy-wise.(7) Even though international debt from backdoor loans from international banks has caused capital flight to most oil-rich nations in Africa despite their active participation in the fossil exploration business, tax evasion by multinationals using the expertise of the international banking system continues to create revenue deficits despite the number of exploration projects outside the continent (25). The discussion of corruption is a top priority in Africa. (3) This burden only falls on the impoverished whose survival depends on the soil being harmed by oil spills and who are uprooted because of social unrest leading to an uneven distribution of the meager benefits of resource endowment.

3.5 Transitioning to Renewable Energy Challenges for Developing Nations

Because developing countries are particularly vulnerable to the effects of climate change, there is an urgent need to move toward more renewable energy sources in light of the growing concerns in recent years about the impact of carbon emissions from fossil fuels (19). While switching to renewable energy is important, the energy needs of regional development don't seem to be met by the suggested switch given the financial resources needed for it, and the cost of the technology makes it unaffordable for the majority of developing countries (34). In most underdeveloped countries, including those in Africa, financing renewable energy is difficult because of severe cost and profitability limits, as the risk of such investment is high as well as low purchasing power by households in the absence of government subsidies for renewable energy components (Ka).(10) Lack of funding:

Most developing countries struggle to make capital investments because their economies are not strong enough to handle the financial obligations without outside funding from international financial institutions or the private sector. Fast-forward to 2024, The East Africa crude oil pipeline in Uganda and Tanzania is an example of a transaction wherein France, as the chief financier, agreed not to do business with any country that cannot implement the Paris Agreement, as stated by UN special representative Rachel Kyte in her 2019 address at the climate action summit on the need to decarbonize the developed nation's economies (26). Private sector financial institutions have invested \$132,32.3 billion in fossil fuel projects throughout Africa since the Paris Agreement was passed; in the context of developing countries, calling for an end to fossil fuel exploration does not equate to funding sustainable alternatives for Africa (12). On the other hand, whereas developing countries are making efforts to transition through investments in solar farms, hydropower plants, and thermal sources, developed country-based institutions are still making investments in fossil fuel infrastructure (12).

4. Discussion

The discussion surrounding the disparity in fossil fuel investment between developing and developed countries highlights a crucial global dilemma. While there is growing advocacy for halting additional fossil fuel investment in developing nations, the narrative is starkly different for wealthy countries, as evidenced by recent funding for fossil fuel exploration both in Africa and the West. This discrepancy not only perpetuates existing economic inequalities but also raises questions about the sincerity of developed nations' commitments to mitigating climate change, as outlined in international agreements such as the Paris Agreement.

Recent investments by multinational firms in East Africa exemplify the continued pursuit of fossil fuel extraction and the creation of new reserves, particularly in regions with untapped resources. (18) However, for developing countries to effectively diversify their energy portfolios and reduce reliance on fossil fuels, there must be a concerted effort to promote investment in alternative energy sources. This necessitates robust environmental governance frameworks that incentivize renewable energy development while discouraging further investment in fossil fuel infrastructure. According to recent reports, China and India will use 45% of the world's coal supply by 2030, rising from 4154 million tonnes in 2005 to 7173 million tonnes. Similarly, the demand for natural gas in North America and Europe will account for more than one-third of the gas supply, with consumption growing from 2854 billion cubic meters in 2005 to 4779 billion cubic meters in 2030. (11) this continuous energy gap will further compound the space of development in developing nations specifically in Africa with projected increased population in years to come. Drawing from a variety of studies to define what a fair transition for developing countries like Africa should entail, taking into account the CO₂ emission sheet, where sub-Saharan Africa

contributes less than 4% of global emissions, while the United States has been emitting 50% gigatons of carbon since 1856. According to (32), an increase in oil production of 16 billion barrels is anticipated in 2030, which is equivalent to two years' worth of emissions from the European Union. This poses significant challenges for countries in Africa, particularly as they grapple with rapid population growth and limited access to clean energy resources. This highlights the urgency of reevaluating global energy priorities and transitioning towards more sustainable and equitable energy systems. However, the transition to renewable energy is not without its challenges for developing countries. Barriers such as the initial cost of renewable infrastructure, lack of technical expertise, and low household purchasing power due to economic disparities must be addressed through targeted interventions and international cooperation.

5. Conclusion and Future Scope

The analysis highlights a significant disparity between developed and developing nations in the context of fossil fuel exploration and energy access. Developed countries, despite their commitments to mitigating climate change, continue to explore and invest in fossil fuel infrastructure. In contrast, developing nations, particularly in Africa, face immense pressure to halt fossil fuel exploration without receiving adequate financial and technical support to transition to renewable energy sources.

This imbalance exacerbates energy poverty in developing countries, hindering their economic and social development. Despite having substantial fossil fuel reserves, these nations struggle with inadequate infrastructure and limited financial capabilities, leading to a heavy reliance on crude energy sources that further degrade the environment. Meanwhile, developed nations' ongoing fossil fuel activities undermine global efforts to address climate change and create a hypocritical stance on international environmental policies while highlighting the need for equitable energy policies that consider the unique challenges faced by developing nations. It advocates for increased financial and technical assistance to these countries to enable a just transition to renewable energy, thereby addressing both energy poverty and environmental sustainability.

Conflict of Interest

No conflict of interest exists between the authors of this paper.

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Authors' Contributions

Both authors equally contributed to and reviewed the entire paper.

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