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Balancing Economic Development and Environmental Protection in South Africa: Navigating Challenges Post-COVID-19 for Sustainable Growth

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Abstract

The COVID-19 pandemic exacerbated the economic recession and household affordability crisis, leaving families without sufficient income to afford basic needs and services such as electricity. When COVID-19 reached South Africa, the economy had experienced two consecutive quarters of a recession and an increased unemployment rate. Furthermore, raising household electrical costs exacerbated the situation, prompting individuals to return to traditional low-cost energy generation methods such as burning fossil fuels. Traditional energy generation methods may address immediate energy needs but often pose environmental and health risks. This study explored balancing economic development and environmental protection in South Africa, particularly in the post-COVID-19 era. The socio-economic context of the country, characterised by a high level of inequality, unemployment, and heavy reliance on coal power stations, complicates balancing economic development and environmental protection. South Africa should embrace a green economy. This means that the country should shift from focusing solely on economic growth to focusing on inclusive growth, prioritising both economic growth and environmental protection for sustainable development. These insights are pivotal in balancing economic development and environmental protection. This study investigated the challenges and opportunities associated with sustainable growth. It employed a qualitative research methodology. The findings of the study are relevant to

policymakers, furnishing important recommendations for informed decision-making.

Keywords: *COVID-19 pandemic, Economic development, Environmental protection, Green economy, Household affordability crisis, Sustainable growth.*

1. Introduction

The first positive case of contagious COVID-19 was recorded in South Africa on 1 March 2020 by the National Institute for Communicable Diseases (Modisenyane et al., 2022:366). In an effort to curb the spread of COVID-19, the president of the Republic of South Africa, Cyril Ramaphosa, declared a state of National Disaster. He imposed stringent lockdowns and restrictions on the movement of people and transportation of goods (Government Gazette no. 43096). Many businesses, particularly those not providing essential services, had to close (Stiegler & Bouchard, 2020:696). Some companies had to close forever, while others had to retrench employees (Baboolal-Frank, 2021:1). The COVID-19 pandemic, therefore, deepened the economic crisis as the unemployment rate increased sharply. People lacked income or financial resources to participate in activities that would have improved their families' economic well-being and quality of life (Gumata, 2022). When the COVID-19 pandemic reached South Africa, the economy had experienced two consecutive quarters of recession and downgrading (Habiyaemye, 2021:5). The economic downturn amplified financial constraints, particularly affecting disadvantaged communities (Lakemann & Tafese, 2020:9). Simultaneously, the increase in household electrical costs placed an additional burden on vulnerable communities (Ismail & Wood, 2023:1). Household electrical costs increased by 18.7% in 2023/24 after approval by the National Energy Regulator of South Africa (Nersa) (Tariffs and Charges – distribution). The impact of COVID-19 and escalating household electrical costs disproportionately affected disadvantaged communities. Often, these communities already grapple with financial constraints and face heightened economic burdens. Consequently, these disadvantaged communities resorted to traditional low-cost energy generation methods, posing health risks and contributing to air pollution, particularly in confined living spaces (Shupler et al., 2021: 1-2). Heavy reliance on traditional energy generation methods exacerbates health issues such as respiratory diseases and the pollution of the environment (Ayejoto et al., 2023:78). Conversely, illegal connections to Eskom power lines

increase (Eskom, 2021). This practice, born out of necessity, reflects the inability to afford electricity and, in some cases, lack of access to electricity among disadvantaged communities. According to Xivambu, Eskom loses close to R22 billion a year due to illegal connections. Mbanjwa et al. argue that illegal connections cause a significant risk to communities and result in power companies' revenue losses (Luvhengo, 2023).

Addressing this crisis would align with the national goals of uplifting the historically disadvantaged, achieving sustainable development, and fostering economic resilience and sustainable energy access (National Developmental Plan, 2030). South Africa needs a paradigm shift in attitudes from focusing solely on economic growth to focusing on inclusive economic growth that prioritises both economic growth and environmental sustainability. Inclusive economic growth or green economy, as a model of sustainable development, looks at the long-term consequences of resource depletion and environmental degradation (United Nations Environmental Programme, 2011). A green economy advocates a balanced and harmonious relationship between economic development, social well-being, and environmental protection. Therefore, embracing a green economy in South Africa entails a departure from the conventional growth model that often overlooks the long-term consequences of resource depletion and environmental degradation.

2. Literature Review

The impact of the COVID-19 pandemic on economic development and environmental protection has garnered significant attention both during and after the pandemic. This is primarily due to the global crisis and the need to enhance the environment through a green economy, which involves eradicating poverty and addressing environmental issues and social disparities (Chitiga-Mabugu et al., 2022). Yang et al. (2022) conducted an empirical study to investigate if China can achieve a "win-win" situation by reducing environmental pollution while maintaining economic success. They concluded that China is achieving a "win-win" situation as the economy grows while environmental protection improves. Attaining a "win-win" situation for environmental protection and economic growth necessitates fulfilling the imperatives of economic development while minimising adverse impacts on the environment (Yang et al., 2022:15-17). The fundamental objective of a "win-win" approach is to devise strategies and policies that enable robust economic growth without compromising the quality of the environment. This paradigm shift involves adopting sustainable growth strategies, harnessing eco-friendly

technologies, and promoting responsible resource management (Yang et al., 2022:17). To attain a state where a nation's environment and economy demonstrate resilience and equity, the government must commit to Sustainable Development Goals. An illustration of this commitment is found in China, where the government has set and progressively achieved ambitious goals to enhance environmental standards. Specifically, China mandated that 93% of urban water supplies meet the "drinking water" standard by 2020 (Mahai, 2021). China recognises the importance of addressing issues such as air and water quality in tandem with economic growth (Hao, 2018). This proactive stance underscores the interconnectedness of environmental protection and sustainable economic development.

As societal, economic, and environmental conditions differ, Yang's study lacks contextual relevance for the South African economy. China is the world's second-largest economy, with rapid industrialisation and urbanisation driving remarkable economic growth (Meng, 2018). South Africa is grappling with the legacies of apartheid, which contributes to socio-economic disparities (Tshishonga, 2019). Balancing economic and environmental protection in marginalised communities in South Africa requires the government to empower communities through basic services such as free electricity. It also requires economic opportunities to uplift community members. The government should invest in renewable energy solutions such as wind and solar power generation. Renewable energy generation can play an important role in uplifting disadvantaged and vulnerable communities by addressing energy poverty, fostering economic development, and promoting environmental sustainability. The government of South Africa faces financial constraints, particularly in municipalities responsible for service delivery. Therefore, implementing renewable energy generators in disadvantaged and vulnerable communities requires the involvement of communities and collaboration between the government, private sector, and non-profit organisations (NGOs) to raise financial resources.

Wang et al. (2022) conducted an empirical, analytical study on the relationship between fossil energy consumption and economic development in BRICS countries. They discovered that coal and gas consumption enhances economic development. However, after a certain limit has been reached, further increases in coal and gas consumption negatively impact economic development (Wang et al., 2022). South Africa has historically relied heavily on coal for power generation. Its reliance on coal has both advantageous and disadvantageous consequences that warrant consideration. Using coal power stations has undeniable positive

impacts. It fosters job creation and provides electricity to South Africa. Through coal mining, processing, and related sectors, contributions are made to local economic development, and millions of people are employed in this sector. According to Cole et al. (2023), Eskom emerges as a pivotal force in South Africa's economy, functioning as a primary electricity provider and a source of economic stimulus through its operations and substantial capital expenditure (Cole, 2023). The intricate interplay between environmental protection and economic development in the post-COVID-19 era necessitates a nuanced approach to ensuring sustainable growth. The challenge lies in balancing economic development with environmental protection, especially after the COVID-19 pandemic. The pandemic has brought about a heightened awareness of the vulnerabilities in global systems and has underscored the importance of building resilience in the face of future challenges. In navigating the post-COVID-19 landscape, disadvantaged and vulnerable communities grapple with the challenge of balancing economic growth, energy security, and environmental sustainability. The study conducted by Omolade and Mbonigaba (2019) explored the intersection between poverty alleviation efforts and the transition to a green economy in South Africa. The study highlighted the challenges and opportunities of pursuing inclusive growth while promoting sustainability. Omolade and Mbonigaba argue that there is a need for policies and strategies prioritising both poverty reduction and environmental protection. Borel-Saladin and Turok (2013:212) posit that the core assumption of the green economy concept is the inseparability of environmental progress from economic and development advancement. This perspective highlights that sustainable growth and environmental protection are interdependent and rejects the notion that environmental concerns must be sacrificed for economic growth. By integrating environmental considerations into economic policies and developmental strategies, the green economy framework can strive for synergistic outcomes where the quality of the environment is protected. At the same time, socio-economic progress is being made, and the economy is growing. Balancing economic growth, energy security, and environmental sustainability requires strategic solutions such as implementing renewable energy to mitigate disparities from rising household electrical costs and increased unemployment. Renewable energy sources such as wind and solar power provide a cost-effective alternative to traditional fossil fuels. Investing in renewable energy infrastructure can reduce dependency on traditional fossil fuels such as coal-generated electricity. In South Africa, there is a need for government support in the form of subsidies, grants, and incentives for renewable energy projects specifically targeting

disadvantaged communities. The government should also partner with NGOs, the private sector, and local communities to mobilise resources and expertise for renewable energy projects in disadvantaged communities. Renewable energy sources can alleviate prevalent issues such as illegal connections to Eskom cables due to increased household electrical costs. These illegal connections are often fuelled by the inability to afford electricity (Moshoeu, 2017). Integrating renewable energy sources makes electricity costs more affordable, addressing marginalised communities' economic and social challenges. This transition can mitigate the criminal aspects of electricity connections and ensure that most disadvantaged communities can access more affordable and sustainable energy solutions. In the view of Wang et al. (2022), coal and gas consumptions are necessary for the economic development of a country, but countries should, before reaching a stage where consumption pollutes the environment, transition to cleaner energy generation. The study emphasises the need to balance fossil fuel energy consumption, environmental protection, and economic development. Some of Eskom's power stations reached their end-of-life before the government transitioned to cleaner energy generation. With South Africa having limited power stations to provide people with electricity, the closure of power stations results in increasing hours of load-shedding. Many South Africans live in poverty, and load-shedding contributes to the increasing number of people relying on fossil fuels for energy generation.

Chang et al. (2017) analysed the causal link between coal consumption and economic growth in BRICS countries. They concluded that there is no causality between coal consumption and economic growth and that environmental policies to reduce coal-generated electricity will not affect economic growth. On the contrary, the primary source of energy generation in South Africa is coal, and since the establishment of coal power stations, the economy has been growing. However, economic growth is slowed by load-shedding. Consequently, South Africa's economic growth depends on electricity availability. The study stands against the view of Chang et al. (2017) and believes there is a causal link between coal consumption and economic growth in South Africa as part of BRICS. Additionally, the study conducted by Lenoke (2017) on the impact of load-shedding on the economic growth of South Africa concluded that there is a positive relationship between electricity consumption and economic growth in South Africa. Therefore, South Africa must provide electricity for economic growth, which means the continued burning of coal for electricity generation. It is unavoidable that fossil fuel energy generation in South Africa will continue without alternative, cleaner energy sources. With

the high rate of unemployment and increasing poverty rate in South Africa, the government should be involved in utilising available resources to mitigate poverty and inequality brought about by the COVID-19 pandemic.

Makaringe and Khobai (2018) conducted a study to examine the relationship between unemployment and economic growth. They concluded that unemployment and economic growth have an inverse relationship. If unemployment continues to increase, it will negatively affect economic growth because the majority of unemployed might be unable to participate in economic activities that contribute to economic growth. A scarcity of financial resources, including income, acts as a barrier, preventing people from fulfilling basic needs like access to electricity. This financial constraint affects immediate living conditions and challenges the balancing of economic growth and environmental protection. In many cases, limited finances lead to a reliance on traditional, often environmentally detrimental, energy sources. The study sees the promotion and implementation of renewable energy source initiatives as factors that can play an important role in breaking this cycle, ensuring that economic growth is inclusive and environmentally sustainable, thereby fostering a more resilient and equitable society.

Akinbami et al. (2021) conducted a study on the state of renewable energy development in South Africa. They noted a rising demand for energy, resulting in existing power-generating plants being overwhelmed. Akinbami et al. (2021) argue that the government and policymakers must carefully balance the economic and environmental aspects associated with decreasing the number of power stations by decommissioning them. In the study conducted by Lenoke (2017), an argument is advanced that South Africa, a developing and middle-class country, relies on electricity consumption for productivity. Therefore, if the government fails to provide electricity, productivity and economic growth will be negatively affected (Lenoke, 2017:56). In summarising the study, Akinbami et al. (2021) conclude that South Africa's primary source of energy generation is coal, which is cheap but harmful to the environment. The existing power generating plants are at capacity because of an increasing population, poor maintenance, and the government's failure to build alternative sustainable energy generation plants. Even though energy supply is significant for productivity, it can also be significant in economic growth.

According to Huang and Tian (2021), the poor tend to increase their consumption in carbon-intensive energy categories as they move to the middle class. Fossil fuels such as wood and coal are used on a massive scale by the poor to advance their lives and move to the middle class. Moving to

the middle class may assist people to participate in activities that improve their economic well-being and quality of life. Income can be generated through informal trading, such as cooking on the street. In developing countries such as South Africa, carbon emissions cannot be avoided because burning coal, wood, and oil remains the main energy generator. According to Steinberger and Roberts (2010), high human development can be achieved at moderate energy and carbon levels; increasing energy and carbon past this level does not necessarily contribute to higher living standards. Steinberger and Roberts (2010) believe that economic development as part of advancing living standards can be achieved even when resorting to moderate energy and carbon emission levels. Their stance suggests that a more sustainable approach to development can prioritise efficiency and conservation of resources.

3. Post-COVID-19 Economic Landscape in South Africa

Due to COVID-19, economic activities worldwide contracted, and South Africa was no exception. Like several other countries, South Africa enforced stringent lockdown measures to mitigate the transmission of the virus. Although essential for the public's well-being, these actions had significant ramifications for the economy. Businesses in several industries closed down, and others experienced operating limitations, significantly decreasing production and consumer expenditure. During the COVID-19 pandemic, nations worldwide faced challenges managing the virus's impact on international trade and transportation. As a significant participant in international trade, South Africa experienced the same repercussions. Manufacturing activities slowed down due to delays in the shipping of items, scarcity of raw materials, and logistical issues. This impacted domestic production and impeded the country's capacity to export commodities, resulting in decreased revenue.

The economic vulnerabilities that already existed in South Africa worsened the recessionary trends (Maswana, 2009:1). Before the pandemic, South Africa was confronted with economic difficulties such as increasing unemployment rates and sluggish economic expansion (Devilliers et al., 2020: 798). The pandemic served as an amplifying lens, revealing and worsening these problems. The labour market experienced a decline due to industries, constrained by financial limitations, resorting to layoffs and decreased working hours (Daniels et al., 2021:7). The researcher argues that the decrease in household income can result in many socio-economic problems such as heightened poverty, restricted energy accessibility, and a probable increase in illegal connections to Eskom. The government of

South Africa implemented measures such as the Social Relief Distress (SRD) to respond to this economic crisis (Mazenda et al., 2022). This social relief initiative was designed to mitigate the difficulties experienced by disadvantaged and vulnerable people. Nevertheless, the efficacy of these interventions is limited due to fiscal constraints and pre-existing economic vulnerabilities.

Striking a balance between economic development and environmental protection can become difficult after a recession. The government frequently confronts the predicament of prioritising immediate economic recovery at the expense of long-term sustainability. South Africa is constructing the Kusile Power Station, which is expected to be one of the world's largest coal-fired power plants. While the project aims to address the energy crisis and stimulate economic growth by creating employment, its reliance on coal as a primary fuel source raises significant environmental concerns. The researcher argues that the urgency to stimulate economic growth in South Africa and create jobs results in choices that prioritise economic benefits over the long-term effect of coal power stations on the environment. Section 24 of the Constitution of the Republic of South Africa, 1996 and section 2(2) of the National Environmental Management Act 107 of 1998 (NEMA) place an obligation on the state and/or environmental management organs to prioritise people and their needs and serve their physical, psychological, developmental, cultural, and social interests equitably. South Africa faces challenges in meeting its energy demand, leading to load-shedding that disrupts industrial and economic activities. Building the Kusile Power Plant can provide a reliable solution to address this energy deficit, ensuring uninterrupted electricity supply in South Africa. This directly aligns with the state's obligation to serve its citizens' developmental and social interests, as stipulated in section 24 of the Constitution and section 2(2) of NEMA. The research argues that while coal-fired power stations may have a negative environmental impact, they serve as a transitional solution while South Africa invests in cleaner energy alternatives. Given the urgency to address the energy and employment crisis, coal-fired power stations can be justified as a measure to stabilise the energy sector and support economic growth. Post-COVID-19 conditions present an opportunity for South Africa to reassess its economic framework and give importance to resilience and inclusivity. Adopting sustainable development techniques, such as incorporating green economy principles and implementing eco-friendly infrastructure projects, can safeguard the environment, generate employment opportunities, and foster economic expansion.

4. Household Affordability Crisis and Energy Consumption Patterns

The economic slowdown caused by the pandemic has driven individuals and families to reassess their spending patterns, resulting in an increased awareness of utility expenses, particularly that of electricity (Zakeri, 2022). Increasing electricity expenses, frequently worsened by financial pressures on energy supplies, have forced households to reevaluate and modify their energy consumption patterns. The pandemic-induced economic difficulties have prompted households to place greater importance on implementing cost-reduction strategies (Chen & Chen, 2021:2501). Consequently, people are more inclined to embrace energy-efficient behaviours such as minimising needless power consumption, purchasing energy-efficient appliances, and investigating alternative and sustainable energy options. However, individuals in rural areas and disadvantaged groups rely on natural resources such as wood for energy generation (Kaygusuz, 2011:940). This is a practical solution to the economic necessity of decreasing household expenses.

The correlation between economic difficulties and changing energy consumption habits emphasises the necessity for policymakers to consider socio-economic circumstances while developing energy regulations. The government should acknowledge and tackle the issues faced by households experiencing financial difficulties by implementing energy policies that are inclusive, affordable, and considerate of the economic constraints caused by the pandemic. Policies aimed at enhancing energy accessibility, providing financial assistance to low-income households, and encouraging the adoption of energy-efficient technologies can alleviate the adverse effects of escalating electricity expenses on disadvantaged communities.

5. Traditional vs Sustainable Energy Sources: Implications for Environmental Protection

Traditional, low-cost energy generation methods tend to become more prevalent due to economic difficulties, particularly in disadvantaged communities experiencing financial limitations or aiming to meet urgent energy demands (Kabeyi & Olanrewaju, 2022). These methods include burning fossil fuels like coal, paraffin, and wood for energy generation (Glushkov et al., 2021:3,17). Although these sources may be economically appealing because of their minimal expenses, they have significant environmental and health implications (Omer, 2009; Lelieveld et al., 2019). Burning fossil fuels emits greenhouse gases into the atmosphere, including carbon dioxide and other harmful substances. This contributes to air

pollution and public health risks (Perera, 2017; Perera, 2018). Air pollution can worsen global environmental problems, decrease air quality, and contribute to water pollution. Amid economic constraints, prioritising low-cost energy solutions in the short term may result in more dependence on fossil fuels and increased environmental deterioration, impeding the advancement towards sustainable and cleaner energy sources. The impact of COVID-19 and increasing household electricity costs, which resulted in economic hardship, may lead to environmental harm, potentially impacting those relying on agriculture without advanced technologies to protect crops.

The health implications of traditional, low-cost energy generation methods are substantial. Emissions from burning fossil fuels can result in respiratory ailments, cardiovascular disorders, and other health complications (Swilling et al., 2016:662). These negative impacts are especially prominent in communities close to industries that emit harmful gases, such as the Mpumalanga Highveld (Laisani & Jegede, 2019). Furthermore, the dependence on fossil fuels for cooking and heating, prevalent in economically disadvantaged areas, might contribute to indoor air pollution (Mondal & Chakraborty, 2015). Utilising solid fossil fuels such as wood and coal emits pollutants that, when breathed in for a prolonged period, can result in respiratory infections and chronic illnesses, with a greater impact on disadvantaged communities (Torres-Duques et al., 2008). Although the immediate economic advantages of traditional and low-cost energy generation methods are apparent, it is important to consider the long-term economic compromises. The costs relating to health, including medical treatment and reduced productivity, that result from exposure to air pollution and environmental damage can significantly strain healthcare systems and impede economic progress.

Policymakers should balance immediate economic requirements and enduring environmental and health factors. Allocating resources towards cleaner and more sustainable energy solutions, such as solar and wind, to tackle environmental and public health issues can foster economic expansion by generating employment opportunities and promoting the emergence of new industries. Furthermore, implementing policies advocating energy efficiency, environmental protection, and responsible resource management can help establish a more sustainable energy landscape. Collaboration among government, businesses, and communities is important for identifying solutions that harmonise economic objectives with environmental and health concerns.

6. Inequality, Unemployment, and Coal Power: Complexities in South Africa's Socio-economic Landscape

South Africa has historically faced economic inequalities, a direct result of the apartheid past (Wilson, 2011). Although many areas of inequality have been addressed, a significant disparity in wealth remains. A high level of income inequality undermines social cohesiveness and hinders the fair allocation of the advantages of economic development. To balance economic development and environmental protection, it is necessary to tackle the fundamental social disparities to provide a more equitable distribution of burdens and benefits.

South Africa faces the challenges of a high unemployment rate, particularly among the youth (Kanjere & Choenyane, 2021). The problem is worsened by economic downturns, such as those caused by the COVID-19 pandemic and recessions (Hunt et al., 2021:7; Jacobs et al., 2020). When job creation becomes a priority for economic recovery, there is a strong temptation to prioritise companies that offer immediate employment, even if they have a greater environmental impact. Section 29 of NEMA protects individuals who refuse to perform work, believing that their actions could lead to severe and imminent environmental harm. This section, by granting immunity from dismissal or harassment, encourages individuals to act as responsible stewards of the environment without fear of personal consequences. This temptation can be avoided if the government strengthens and enforces environmental regulations to ensure that companies adhere to strict environmental standards, regardless of their employment potential. The government should also consider introducing tax breaks as incentives for companies that prioritise environmental sustainability. This offer can encourage companies to adopt eco-friendly practices while still creating employment opportunities.

The heavy reliance on coal power in South Africa poses a substantial obstacle to achieving environmental sustainability (Swilling et al., 2016:661). Although coal plays a vital role as an energy source, it is a significant contributor to the release of greenhouse gases and air pollution. Adopting better energy sources is essential for addressing climate change and minimising environmental harm. Nevertheless, such transformation is complicated due to the current infrastructure, economic factors, and possible employment reductions in the coal industry. Engaging in strategic planning, implementing gradual changes, and allocating resources towards developing alternative renewable energy sources are necessary to maintain the fragile balance. Policymakers should carefully consider immediate economic needs in light of long-term environmental objectives, frequently

managing competing interests. To effectively create policies that tackle socio-economic inequalities while encouraging sustainable behaviours, it is crucial to thoroughly comprehend the specific circumstances and conditions within the local environment. The importance of inclusivity in the decision-making process cannot be overstated, as it guarantees the inclusion of varied voices and prevents underprivileged communities from bearing an unfair weight regarding environmental affairs (Phiri et al., 2022).

Despite these challenges, South Africa has the potential to reshape its socio-economic landscape while simultaneously promoting environmental protection and economic growth. Allocating resources towards education and skills development can enable individuals, especially those from disadvantaged communities, to actively engage in the growing green economy. Green infrastructure projects, such as programmes focused on renewable energy, can generate employment opportunities and foster economic expansion while mitigating environmental harm at the same time. International cooperation and monetary assistance are crucial in facilitating South Africa's transitions. Access to financing for sustainable development initiatives, the transfer of technology, and the enhancement of capabilities can support a seamless transition towards a more environmentally sustainable and economically inclusive model.

7. Challenges and Opportunities for Sustainable Growth

Like many nations, South Africa faces many challenges and opportunities in its pursuit of sustainable growth, particularly in the aftermath of the COVID-19 pandemic (Amir & Khan, 2022). The intricacies of the post-COVID-19 pandemic emphasise the necessity for a delicate balance between economic development and the protection of the environment. This study identified several challenges and opportunities for sustainable growth, namely economic recession, unemployment, resource dependence, environmental degradation, infrastructure deficits, and adaptation to new realities.

(a) Economic recession and unemployment

The COVID-19 pandemic triggered a severe economic recession in South Africa, intensifying unemployment issues (Hart et al., 2022). The implementation of lockdown measures, disruptions in global supply chains, and a decrease in consumer expenditure resulted in the closure and downsizing of businesses, hence exacerbating the unemployment situation in South Africa (Ali et al., 2022). The economic downturn has intensified

pre-existing socio-economic difficulties such as unemployment. Adopting a deliberate change in favour of sustainable employment strategies is crucial to tackling unemployment in the post-COVID-19 era. Although it is important to focus on regaining lost jobs, there is a chance to envision and reformulate the work market in ways that promote enduring environmental and social sustainability. This entails generating new employment opportunities in industries that align with green technologies, renewable energy, and other sustainable practices.

The post-COVID-19 era provides a chance to invest in green jobs that support economic recovery and align with environmental protection, promoting sustainable growth. Sectors such as renewable energy and energy efficiency provide opportunities for generating employment. These sectors create jobs and support South Africa's dedication to decreasing carbon emissions and transitioning to a more environmentally friendly economy. Some traditional industries may resist change due to their economic interdependencies and concerns about short-term profitability (Hansen & Hill, 1991). Achieving a balance between the short-term demands of economic recovery and the enduring objective of environmental protection necessitates careful planning, policy implementation, and collaboration between the government, business sectors, and NGOs.

Policy integration plays an important role in addressing and surmounting these issues. Therefore, it is essential for the government to formulate and execute policies that provide incentives for adopting sustainable practices. It should also establish a conducive environment for generating green jobs. This may entail the implementation of tax incentives, subsidies for sustainable businesses, and the construction of a regulatory framework that promotes environmentally friendly practices. Another crucial tactic is to allocate expenditures specifically towards green infrastructure initiatives. This includes initiatives pertaining to renewable energy and sustainable urban planning. These projects can aid in environmental protection and job creation through the development, upkeep, and functioning of eco-friendly infrastructure. With the employment market increasingly focusing on sustainability, it is essential to prioritise the investment in skills development. Training programmes and educational activities should prioritise the necessary skills for emerging environmentally friendly sectors. This guarantees the presence of a proficient labour force capable of making valuable contributions to and prospering in a sustainable economy.

Therefore, involving the public in transitioning to a sustainable job market is important. Promoting knowledge about the advantages of green

employment, advocating for consumer decisions that promote sustainability, and cultivating a sense of environmental accountability can generate a market for environmentally friendly goods and services.

(b) Resource dependence and environmental degradation

The South African economy traditionally relies on extracting natural resources through mining, agriculture, and forestry (Steinberg, 2019). Coal-fired power stations significantly contributed to economic expansion but have also been linked to environmental consequences such as air, water, and soil pollution (Habib & Khan, 2021:442; Malherbe, 1950). The economic structure of South Africa requires the extraction of natural resources such as coal. The government should, however, develop a strategy to minimise environmental consequences through carbon capture and storage. It should support the development and deployment of carbon capture and storage technologies, which capture carbon dioxide emitted by coal-fired power plants and store it underground or utilise it for enhancing oil recovery. The government should direct money towards environmental protection and restorative initiatives to counterbalance the adverse environmental effects caused by resource extraction. Expanding the economy beyond industries that heavily rely on natural resources is important. Allocating funds towards technology, service, and other sectors that rely on knowledge can decrease the dependence on resource extractions and promote long-term economic development.

(c) Infrastructure deficits and adaptation to new realities

The COVID-19 pandemic exposed vulnerabilities in infrastructure, impeding the capacity to adjust to emerging economic conditions (Scholz et al., 2022). Enhancing infrastructure to facilitate sustainable practice and prepare for future issues is important. The advent of the COVID-19 pandemic revealed vulnerabilities in South Africa's infrastructure, exacerbating the difficulties in adjusting to emerging economic conditions. Insufficient healthcare infrastructure impeded the country's capacity to manage and contain the virus's transmission effectively, hence hampering the response to a public health crisis (Sarkar et al., 2020). Furthermore, interruptions in transportation and supply chains highlighted weaknesses in the overall infrastructure system, hindering the operations of multiple industries (Chakwizira, 2022). In the post-COVID-19 era, economic adaptability necessitates the ability to withstand and recover from unpredictable circumstances. Businesses require resilient and adaptable

infrastructure to manage disruptions effectively, be it caused by pandemics, climate-related incidents, or other unforeseen causes. A lack of modern or adequate infrastructure impedes any ability to quickly adapt to economic changes, potentially worsening the effects of future disruptions.

Upgrading infrastructure is important for several reasons, especially when considering the need to balance economic growth and environmental protection. Modern and robust infrastructure can improve South Africa's capacity to adjust to new economic circumstances. This encompasses digital infrastructure for telecommuting, streamlined logistics networks, and healthcare facilities ready to manage public health crises. By allocating resources towards adaptive infrastructure, South Africa can establish a robust, resilient basis for forthcoming disturbances and uncertainties. Furthermore, upgrading infrastructure presents a chance to incorporate sustainability into the core of economic development. Sustainable infrastructure includes utilising environmentally friendly materials, energy-efficient technologies, and robust designs for climate change. This not only diminishes the environmental footprint but also corresponds with global efforts for economic recovery. Lastly, enhancing infrastructure can act as a potent catalyst for economic revitalisation. Establishing renewable energy initiatives and digital infrastructure generates job opportunities, infusing dynamism into the economy while promoting sustainability goals.

8. Conclusion and Recommendations

In conclusion, COVID-19 and increasing household electrical costs have disproportionately impacted vulnerable communities in South Africa. Communities facing the economic downturn, increasing unemployment, and rising living costs have turned to traditional energy production techniques, posing health risks and contributing to air pollution. The prevalence of illegal electricity connections further exacerbates the situation, causing significant financial losses to Eskom. To uplift the conditions of vulnerable communities, it is important to implement immediate measures such as subsidies, grants, and incentives for renewable energy generation. Addressing this situation can help to reduce immediate challenges, foster economic resilience, and promote sustainable energy availability for a more equitable future.

The intricate relationship between environmental protection, economic growth, and economic development necessitates a subtle and refined strategy, especially in the post-COVID-19 era. Although studies such as Yang et al. (2022) in China provide valuable ideas on how to achieve a "win-win" outcome, the unique context of South Africa,

characterised by social, economic, and historical challenges, requires a customised approach. Balancing the use of fossil fuels, particularly coal, and implementing inclusive environmental sustainability are important. The aim is to overcome financial limitations and ensure that economic growth is inclusive, environmentally sustainable, and resilient in response to global challenges and needs.

As discussed in this study, South Africa's challenges require a nuanced approach. The transition towards a green economy entails integrating economic growth and environmental protection in policies, development of skills, and active public participation. The need for a strategic balance between economic growth and environmental protection arises due to the reliance on natural resources and the deterioration of the environment. Infrastructure deficits highlight the necessity for adaptive infrastructure that promotes both economic resilience and environmental protection. South Africa can overcome these obstacles through comprehensive strategies that would achieve inclusive, resilient, environmentally conscious long-term development.

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