CHAPTER NINE

INFRASTRUCTURE AND SUSTAINABLE DEVELOPMENT GOALS (SDGs) IN NIGERIA

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Introduction

By Building on the foundation laid and substantial progress achieved under the Millennium Development Goals (MDGs), the response of the international community to the grand challenge of sustainable development was codified in the 2030 Agenda for Sustainable Development that was adopted by the 193 Member States of the United Nations at the UN Sustainable Development Summit in September 2015 (Mansell, Philbin & Konstantinou, 2020; Sakanko & David, 2018). The UN General Assembly (UN-GA) agreed on the seventeen Sustainable Development Goals (SDGs), also known as the 'Global Goals, which officially came into force on January 1, 2016 (Davies, Nwankwo, Olofinnade & Michaels, 2019). The SDGs underline the shared commitments of all countries to mobilize efforts geared towards eliminating poverty, fighting inequality, ensuring that all people enjoy peace and prosperity, and reducing climate change over 15 years while ensuring that no one is left behind (Xiao, D'Angelo & Lê, 2020).

Like all other UN Member States, Nigeria 2015 signed the SDGs treaty, emphasizing its commitment to working towards realizing the Global Goals (Mansell & Philbin, 2020). Seven years into the global commitment to deliver meaningful SDG action, it is evident that Nigeria, like most developing countries, is falling behind on its local and global ambitions. In particular, despite Nigeria's enormous resources and potential for sustainable growth and development, her SDG index score—a measure that tracks country performance towards achieving all 17 SDGs—in 2021 is at the lowest at 48.93, outperforming only Liberia, Somalia, Chad, South Sudan, and Central African Republic (CAR). Moreover, statistics illustrate that about 40.1 percent of the population (equivalent to about 82.9 million of the population, excluding the war-torn Borno state) are living in absolute poverty in 2019, up from about 30.3 percent in 2010, while the inequality rate stood at 35.13 percent in 2019 (National Bureau of Statistics [NBS], 2020).

Poverty and inequality in the country are so chronic that it has become a catalyst for terrorism, violence, conflicts, displacement of large populations, environmental degradation, illness due to malnourishment, spread and endemic of diseases, such as HIV/AIDS, multi-drug resistant tuberculosis, malaria and vaccine-preventable childhood diseases (Sakanko & David, 2018; World Bank, 2021). In addition, the country is also characterized by the absence, or inadequacy, of basic infrastructures such as power (about 50 percent of the

population do not have access to grid electricity), paved roads, and railways, lack of access to basic healthcare and clean energy for cooking, the highest number of out of school children in the world, poor water supply and sanitation, high unemployment rate, and inadequate access to credit facilities, among other precarious development indicators which abounds and has continued to bedevil the country (David, Sakanko & Ladan, 2019; World Bank, 2021).

Meanwhile, recent debates on promoting sustainable growth and development, poverty reduction, and improved standard of living in low- and middle-income countries have centered on the need to promote large scale expenditure on infrastructure (Davies et al., 2019; Xiao et al., 2020). The emphasis on infrastructure as the panacea for sustainable growth and development is, perhaps, premised on the large-scale investment in infrastructure, which arguably contributed to the East Asian economic miracle (Kalu, Onuigbo, Imoagwu & Njemanze, 2021). For instance, the provision of basic infrastructures such as roads, schools, and markets can help reduce unemployment and illiteracy, which leads to higher income and better nutrition. Infrastructural facilities ranging from transport – related infrastructure to power – generation, water and sanitation networks are crucial for development. It provides the "services that enable society to function and economies to thrive" (The Economist Intelligence Unit, 2019). Needless to say that this thus put infrastructure at the very heart of domestic and global efforts to achieve the SDGs (Thacker, Adshead, Morgan, Crosskey, Bajpai, Ceppi, Hall & O'Regan, 2018).

Infrastructure is critical to all the sustainable development objectives encapsulated in UN Agenda 2030 for Sustainable Development, from eliminating poverty and reducing inequality to inclusive economic growth, quality education, health, and digital development (Cordell & Li, 2021). Particularly, while the 17 SDGs aim to address a wide range of global issues, including those related to poverty, inequality, education, health, water and sanitation, climate, energy, environmental degradation, prosperity, and peace and justice, three of the goals are directly related to infrastructure – water, sanitation, and hygiene (SDG 6), energy (SDG 7), and infrastructure and industrialization (SDG 9) (Xiao et al., 2020). Moreover, a surface-level assessment of the Agenda's 17 SDGs illustrates that the projected influx of investment in infrastructure has a large potential to embrace the 169 cross-cutting development targets of the SDGs, with approximately half of SDG financing needs for lower- and lower-middle-income countries are estimated to originate from investments in sustainable infrastructure (Adshead, Thacker, Fuldauer & Hall, 2019; Franks, Lessmann, Jakob, Steckel & Edenhofer, 2018). Also, the 'big five' networked infrastructure sectors of energy, transport, water (including wastewater and flood protection), solid waste, and digital communications are estimated to directly or indirectly

influence about 72 percent of SDGs targets (Thacker et al., 2019). This influence increases with the inclusion of non-networked infrastructures such as schools, hospitals, and community centers (Thacker et al., 2018).

Against this background, this chapter assesses the role of infrastructure in attaining the UN Global Goals in the context of Nigeria. It is imperative to state that the focus of this chapter is on three key infrastructure sectors—transport, energy (electricity), and water and sanitation—where information is available and quantifiable targets can be defined. A conceptual overview of infrastructure, SDGs, and their linkage is the starting point of discussion in this chapter. The link between efficient infrastructure (in terms of access and quality) and the realization of the Global Goals in the context of Nigeria is then extensively discussed. Lastly, pragmatic recommendations are then featured as they are crucial in facilitating the country's achievement of the Infrastructure and Sustainable Development Goals (ISDGs).

Conceptual Clarifications

Infrastructure

Infrastructure may refer to "the basic services without which primary, secondary and tertiary types of products and activities cannot function" (Hirschman, 1958) or the "physical framework of facilities through which goods and services are provided to the public" (Mawoli, 2021). These include public facilities such as roads, rails, ports, gas pipelines, water, telecommunication networks, and energy transmission networks which the private and public sectors leverage to provide goods and services for public consumption (Baskakwa & Malafeev, 2017). Infrastructure can be categorized as either hard or soft or economic or social. Typically, economic infrastructure, for instance, includes utilities (electricity, gas and water, telecommunications, sanitation, sewerage, and solid waste disposal), public works (water catchments in dams, irrigation, and roads), and other transport sub-sectors (railways, roads, seaports, airports, and urban transport systems), while social infrastructure encompasses services such as health, education, and recreation, having both direct and indirect effect on the quality of life (Kalu et al., 2021).

Sustainable Development Goals (SDGs)

According to Mohammed (2013), sustainable development refers to "the ability to preserve the state's existing resources for collective use of citizens while conscious efforts are made to conserve the resources for the future generations." Nevertheless, the most cohesive definition of the concept of sustainable development was given in the United Nations' 1987 Brundtland Commission report, which described it as "development that meets the needs of the present

without compromising the ability of future generations to meet their own needs" (Brundtland, 1987).

Over the past decades, the concept of sustainable development has become an increasingly central theme of nation-states and their citizens (Thacker et al., 2018). However, the most significant demonstration of high-level international commitments to sustainable development on the part of governments, international organizations, businesses, and civil society was in 2015, when all governments ratified the UN's seventeen SDGs, which are designed to be a blueprint for achieving a better and more sustainable future for all and intended to be achieved by 2030 (Aguene, 2021; Mansell & Philbin, 2020; Mansell et al., 2020; Thacker et al., 2018; Xiao et al., 2020). The 17 'Global Goals' have 169 targets and 244 indicators (each has between 5 to 20 targets) (Adshead et al., 2019). Also, each of these targets has one, two, or three indicators to measure the progress towards reaching the targets. There are 232 approved indicators to measure SDG performance (Aguene, 2021).

The SDGs are the successor to, and improvement on, the MDGs, which ran between 2000 and 2015 (Sakanko & David, 2018). However, while the SDGs build on the earlier MDGs by focusing on similar issues, they differ from the MDGs because it requires the implementation of all countries in the world – both developed and developing alike. Moreover, unlike the MDGs, the SDGs are focused on monitoring, evaluation, and accountability – across society, not just at a national level, which is why the link must be made from the 'bottom-to-top,' meaning from the delivery of project-level impacts that can then be assessed against the national and global targets and indicators (Mansell & Philbin, 2020).

Infrastructure and SDGs

The link between infrastructure and sustainable growth and development is well documented in the economic literature (Ariyo & Jerome, 2004; Cellini & Torrisi, 2013; Gbadebo & Olalusi, 2015; Sojoodi, Zonuzi & Nasim, 2012). Evidenced by the East Asian economic miracle, recent debates on promoting sustainable growth and development, poverty reduction, and improved living standards in low- and middle-income countries have centered on promoting large-scale expenditure on infrastructure (Mawoli, 2021). This is premised on the argument that infrastructures such as roads, electricity, water, bridges, telecommunication, railway systems, airports, hospital, housing, stadia, parks, and seaports, amongst others, are critical to the functioning of every economy and contribute to sustainable growth and development, and the alleviation of poverty (Gbadebo & Olalusi, 2015). Infrastructure is critical to sustained growth and development by increasing productivity and providing amenities that enhance the quality of life and standard of living, whereas its

shortage, depletion, failure, or collapse usually affect the socio-economic well-being of a state or nation adversely (Davies et al., 2019).

Moreover, Ariyo and Jerome (2004) argued that investment in infrastructure tend to induce or contribute to sustainable growth and development by reducing transaction costs and facilitating trade flows within and across border, enabling economic actors (individuals, firms, and governments) to respond to new types of demand in different places, lowering the costs of inputs or making existing businesses more profitable, creating employment, including in public works (both as social protection and as a counter-cyclical policy in times of recession, enhancing human capital, by improving access to schools and health centers, and improving environmental conditions, which is significantly linked to improving livelihoods, better health and reduced vulnerability of the poor.

Infrastructure is important for development from transport systems to power-generation facilities and water and sanitation networks. It provides the "services that enable society to function and economies to thrive" (The Economist Intelligence Unit, 2019). Needless to say that this thus put infrastructure at the very heart of domestic and global efforts to achieve the SDGs (Davies et al., 2019; Kalu et al., 2021; Xiao et al., 2020). Infrastructure is critical to all the sustainable development objectives encapsulated in UN Agenda 2030 for Sustainable Development, from eliminating poverty and reducing inequality to inclusive economic growth, quality education, health, and digital development (Cordell & Li, 2021). Moreover, encompassing everything from health and education for all to access to clean water and sanitation and energy, most of the SDGs imply improvements in infrastructure (The Economist Intelligence Unit, 2019).

Indeed, while the 17 SDGs aim to address a wide range of global issues, including those related to poverty, inequality, education, health, water and sanitation, climate, energy, environmental degradation, prosperity, and peace and justice. Three of the goals (water, sanitation, and hygiene) are directly related to infrastructure (SDG 6), energy (SDG 7), and infrastructure and industrialization (SDG 9) (Davies et al., 2019; Xiao et al., 2020). In addition, a surface-level assessment of the Agenda's 17 SDGs illustrates that the projected influx of investment in infrastructure has a large potential to embrace the 169 cross-cutting development targets of the SDGs, with approximately half of SDG financing needs for lower- and lower-middle-income countries are estimated to originate from investments in sustainable infrastructure (Adshead et al., 2019; Franks et al., 2018). Also, the 'big five' networked infrastructure sectors of energy, transport, water (including wastewater and flood protection), solid waste, and digital communications are estimated to directly or indirectly influence about 72 percent of SDGs targets (Thacker et al., 2019). This influence

increases with the inclusion of non-networked infrastructures such as schools, hospitals, and community centers (Thacker et al., 2018). It is not surprising that the challenges of achieving SDGs are larger for developing countries with poor quality of infrastructure (including transportation, electricity, water and sanitation, et cetera) than in advanced and emerging market economies where the presence of quality infrastructure is not a significant issue (Xiao et al., 2020).

Moreover, infrastructure plays a significant role in the three dimensions of the SDGs – the economy, the environment, and society. Regarding the economy, the infrastructure dividends range from job creation during construction and maintenance to the ability of infrastructure to generate and/or induce inclusive economic growth. In terms of the social dimension of SDGs, the presence of efficient infrastructure (in terms of access and quality) benefits the society since it delivers services (such as power supplies, healthcare services, and sewerage networks) that are essential for sustainable development. Besides, whether by providing transport infrastructures that facilitate the participation of women in rural areas in the workforce or the health care facilities, clean water, and sanitation that reduce maternal mortality, infrastructure also advances gender equality. Lastly, in protecting the environment, infrastructures play significant roles in conserving natural resources and reducing the impact of climate change. For instance, clean energy generation plants play important roles in reducing the dependence on fossil fuels. At the same time, mass transit systems contribute to the reduction in pollution and the generation of greenhouse gases by taking cars off roads (The Economist Intelligence Unit, 2019).

Infrastructure and SDGs in Nigeria

The capacity of Nigeria to achieve the SDGs before the end of 2030 is being challenged, as statistics show aggravation of poverty, hunger, and inequality, high level of insecurity, low industrialization and poor economic growth performance, lack of basic health facilities, power supply, water and quality education, amongst other precarious developmental indices in the country. Whereas it was reported that the country made progress in certain areas, particularly with regards to the improvement in maternal and child mortality rates from 11.77%% in 2019 to 11.38% in 2021, increased access to electricity from 55.4% in 2019 to 55.6%, and enhanced participation of women in governance, evidence suggests that these improvements were counterbalanced elsewhere by rising food insecurity, deterioration of the material environment and persistent and pervasive inequality rate occasioned by the prevalence of corruption and widespread insecurity across the country (Aguene, 2020; World Bank, 2021). The COVID-19 pandemic also played a significant role in eroding whatever gain that may have been achieved in the recent past (Fagbemi, 2021). In

fact, in 2021, Nigeria's SDG index score was among the lowest globally at 48.93, outperforming only Liberia, Somalia, Chad, South Sudan, and CAR, ranking the 160th out of the 165 countries and territories assessed.

Given that quality infrastructure is really at the center of the actualization of the SDGs, it is apparent that investment in economic and social infrastructures is important in promoting the realization of the SDGs in Nigeria (Davies et al., 2019). Indeed, over time, Nigeria has made significant strides toward improving much of its infrastructure. Compared to many African counterparts, the country has relatively advanced road, energy, rail, and information and communications technology (ICT) networks that cover extensive areas of the country's territory (Foster & Pushak, 2011). However, despite the arguments in favour of infrastructural development as the panacea for Nigeria's sustainable growth and development, the country has continued to be characterized by a marked absence of efficient infrastructure (both in terms of access and quality) across sectors, notably transport (roads, seaports, airports, rail), energy (electricity), water and waste management, communication, and housing (Mawoli, 2021).

With regards to road infrastructure sub-sector of transport infrastructure, for instance, statistics illustrate that over 60 percent of roads in the country are either in bad condition, unpaved or inaccessible, adversely affecting national connectivity and economic activities (Akinwale, 2010). More so, evidenced by the nation's poor rural accessibility, the country's agricultural and rural development has been seriously threatened (Fagbemi, 2021). Having one of the most extensive national rail networks in Africa, second only to South Africa in length, it is ordinarily expected that the railway should serve as an alternative for passenger traffic and freight movements in the face of the inadequacy of road networks (World Bank, 2021). But due to deficient performance and erratic service, it has passenger and freight traffic has been on a long term decline, accounting for less than one percent of land transport in the country, due in part to neglect, the vandalization of rail lines, lack of maintenance of existing rail transport infrastructures, inadequate investment in rail transport, and a recent but scary development, insecurity (Akinwale, 2010; Cordell & Li, 2021). President Buhari's administration's recent revival of rail transport through significant investment in rail infrastructures was unable to overturn the long-term neglect of the sector. Despite the burgeoning domestic air transport sector, the nation's poor air transport safety record is the reason for further concern, while the performance of the country's major ports has remained poor by any standards (Foster & Pushak, 2011).

In addition, in terms of the energy sector, specifically electricity, figures suggest that only about 55 percent of the population, mainly in urban areas, have access to electricity, coupled with the fact that the country's electricity

consumption per capita is one of the lowest in Sub-Saharan Africa (Akinwale, 2010; Bazilian et al., 2012). Moreover, insufficient generation capacity and lack of investment in the power sector imply that the country has met only about half of its power demand (Gberevbie, Joshua, Excellence-Oluye & Oyeyemi, 2017). This, in turn, has resulted in an extremely unreliable supply even after the deregulation of the power sector. The economic impacts of Nigeria's power deficit are at least substantial. Due to the epileptic nature of electricity supply in the country, over 20 percent of the value of sales of firms is reportedly lost to electricity outages, resulting in more than 80 percent of firms in the country owning backstop generators, usually diesel fuelled, which provide over 60 percent of their electricity needs (World Bank, 2021). Besides, social costs of poor electricity can be conservatively estimated at 3.7 percent of the gross domestic product (GDP), a level significantly higher than that found in other African countries (Foster & Pushak, 2011).

According to the World Bank (2021), the water and sanitation sector's developmental problem is less visible and disturbing compared to other services. Although access to safely managed water and sanitation has improved significantly over the years, it is far from adequate, especially in rural areas. For instance, in 2020, figures suggest that only about 21 percent and 30.5 percent of the total population have access to safely managed water services and safely managed sanitation services, respectively. Statistics indicate that over 29 percent of the rural population still practice open defecation. Despite high levels of agricultural activity, irrigation infrastructure development has also remained low relative to the nation's potential (Aguene, 2020).

It is, therefore, not surprising that the country has not only performed poorly across developmental indices but also ranked low in terms of its performance in achieving all 17 SDGs (Gberevbie et al., 2017). Interestingly, in Nigeria's SDGs National Voluntary Review (NVR), the nation's huge infrastructural deficit is one of the major impediments to realizing the SDGs in Nigeria. It is reported that infrastructural investment worth almost US$14.2 billion per year over the next decade, or about 12 percent of GDP, would be required to address Nigeria's infrastructural challenges (Kalu et al., 2021). Several factors have been attributed to the infrastructural gap in the country. This includes the prevalence of corruption, lack of political will, and the absence of adequate funding due to dwindling oil revenue – the mainstay of the nation's economy and government's income (Gbadebo & Olalusi, 2015). In fact, despite the huge infrastructural deficit in the country, the continuous existence of very few infrastructures in the country has also been significantly threatened by the absence of legislation on the maintenance of public infrastructure and maintenance policies, poor leadership, vandalization, corruption, users'

indiscipline and ignorance, and shortage of maintenance equipment and spare parts, amongst others (Mawoli, 2021; Tijani et al., 2016).

Looking Ahead

Indeed, infrastructure has a critical role in achieving the Agenda 2030 for Sustainable Development. However, the absence of efficient infrastructure (both in terms of access and quality) has impaired the nation's attainment of some of these SDGs. Therefore, it is plausible to indicate the need for the country to urgently satisfy its infrastructure needs and expand its infrastructure assets in key areas to catch up with developed countries in other parts of the world, thereby enabling the realization of the 2030 Agenda for Sustainable Development. To achieve this, the country must significantly increase its quality infrastructure spending. Since the investment needed to improve infrastructure in key areas targeting SDG achievement are sizeable, the successful implementation of the SDGs agenda requires strong national ownership to mainstream the SDGs strategy into a national development plan, prioritization of investment in infrastructure, and budget processes. In turn, it requires careful planning of financing options, galvanizing private sector involvement, managing the associated risks, and improving public investment governance and efficiency.

The prioritization of investment in infrastructure will require the governments to increase the capital/developmental spending relative to recurrent expenditure while improving the revenue. While the improvement in government revenue may be significantly limited by the dwindling oil revenue, which accounts for over 70 percent of the government's income, the nation's infrastructural deficit could be addressed through external and internal borrowing and partnership with the private sector, matched with adequate planning, high level of transparency, accountability, and maintenance during the project cycle. In addition, without concrete interventions from the international community, the quality infrastructure gap in the country will hinder the country's realization of the UN 2030 Agenda for Sustainable Development and constrain the nation's economic prosperity. Despite the substantial challenges of Nigeria's infrastructure to the attainment of the SDGs, given the strength and potential of the nation's economy, it is obvious that they are not insurmountable

Conclusion

Promoting sustainable growth and development, poverty reduction, and improved living standards in low- and middle-income countries called for the need to promote large-scale expenditure on infrastructure. Infrastructure plays a critical role in achieving the Sustainable Development Goals. However, the absence or lack of access to quality and efficient infrastructure has impaired the

prospect of SDG attainment in Nations like Nigeria. Therefore, it is plausible to indicate the need for the country to urgently satisfy its infrastructure needs and expand its infrastructure assets in key areas to match up with other members countries, thereby enabling the realization of the 2030 Agenda for Sustainable Development. It become imperative for the country to increase its spending on quality infrastructure, built strong national ownership to mainstream the SDGs, prioritization of investment in infrastructure and budget processes.

The government needs to harnessing innovative finance. The government budgets maybe insufficient to finance the infrastructures, therefore, finding new ways to tap into global capital markets, encourage more private sector investment in the sector and establishing public private partnership to ensure flow of finance to execute capital infrastructure. Managing infrastructure and recognizing its importance must be adopted in all sector of the economy. This is because infrastructure assets may need to be in place for time period for present and future asset. Implementation of the institutionalization measures to combat corruption to improve transparency. This is because corruption is one of the biggest sustainable development obstacles. In addition to ensuring that everyone has access to basic needs, governments must ensure that women and people with disabilities have equal access to productive resources such as grants, education and training, and employment opportunities. Educating young unemployed Nigerians, women, and persons with disabilities, and providing free education and healthcare, are keys to improving the educational and healthcare systems in Nigeria. The government must address the wide spread insecurity in the country to sstrengthening subsistence and small-scale Agriculture and pave wave for economic growth and development.

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