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Water Governance: Challenges and Prospects for the Implementation of Sustainable Development Goal Six in Nigeria

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Abstract

The primary objective of this study is to review all Nigerian National Water and Sanitation Policies implemented since 1993. The aim is to assess their performance, efficiency, and alignment with the targets set forth in UN Sustainable Development Goal 6 (SDG 6). This review provides a contextual understanding of the challenges and opportunities for implementing SDG 6 in Nigeria. We conducted a critical appraisal and qualitative analysis of the 2016 Nigerian National Water Resources Policy, the most recently published policy, in relation to the targets of SDG 6. Our findings indicate that seven out of the eight SDG 6 targets are addressed in the policy. These include safe drinking water, sanitation and hygiene, pollution reduction, water-use efficiency, trans-boundary cooperation, and protection of water-related ecosystems. However, the policy falls short in involving local communities in water and sanitation management, which is the eighth requirement of SDG 6. Specifically, only 28 states have a dedicated Rural Water Supply and Sanitation Agency (RUWASSA), and few local government areas have Water Supply and Sanitation Hygiene Departments (WASH) as required by SDG 6. Our assessment of the policy's implementation and practices is based on secondary data sources, notably from the United Nations, World Health Organization, and National Bureau of Statistics. We argue that by developing effective implementation strategies that involve local communities, the 2016 National Water Resources Policy can significantly contribute to achieving sustainable water and sanitation management for all Nigerians by 2030.

Keywords: SDG, Water Sanitation, Hygiene, Nigeria, Content Analysis.

Introduction

In September 2015, at the 70th UN General Assembly, the Sustainable Development Goals (SDGs), officially titled "Transforming our world: the 2030 Agenda for Sustainable Development," were unanimously adopted by all 193 member states (Lee et al., 2016; Sachs et al., 2015; Hák et al., 2016). Sustainable development encompasses the interrelated goals of economic growth, social progress, and environmental sustainability (Duran et al., 2015; Biermann et al., 2017). Finding a harmonious balance among these three dimensions of sustainable development presents a significant challenge. Economic growth should be pursued in a manner that is socially equitable and environmentally responsible (Bobylev et al., 2015). This approach contributes to building more resilient economies by fostering

effective production systems, minimizing resource depletion, environmental degradation, and reducing greenhouse gas emissions (Bobylev et al., 2015; Biermann et al., 2017). Institutions and governance play pivotal roles in shaping these three dimensions of sustainable development (Seidler & Bawa, 2016). An enabling governance environment and well-functioning institutions provide the responsible, legal, and constitutional frameworks that are essential for fostering productive activities and enhancing sustainable development outcomes (Seidler & Bawa, 2016).

Nigeria faces significant developmental challenges exacerbated by a rapidly growing population and declining oil revenues, which have traditionally been a cornerstone of its economy (Oleribe & Taylor-Robinson, 2016). To effectively meet the Sustainable Development Goals (SDGs), Nigeria must prioritize its goals and allocate resources accordingly. Improving the quality and standards of national statistics requires increased investment in independent and impartial statistical capacities. The country's failure to achieve its SDG targets can be attributed to various factors, including poor project execution, corruption such as racketeering and contract inflation, and other contractual violations. Furthermore, inadequate data tracking capabilities make monitoring and implementation of the SDGs particularly challenging (Oleribe & Taylor-Robinson, 2016). Funding the SDGs presents a formidable challenge in Nigeria (Abel et al., 2016). For instance, the growth rate of water supply and sewage services is lagging behind the increasing water demand in both urban and rural areas (Okeke, 2015). This gap is driven by urbanization, industrial growth, and significant levels of unaccounted-for water due to leakage, wastage, and unauthorized connections (Okeke, 2015). Addressing these issues will require concerted efforts and investments in infrastructure and governance to ensure sustainable water management and meet the SDG targets.

While Nigeria grapples with challenges in water availability per person due to uneven distribution of resources, its water management issues are not unique (Ezabasilli, 2014). Many water delivery systems suffer from severe deterioration and inefficient use of existing capacities due to poor maintenance, inadequate policy frameworks, and insufficient funding. For example, 46% of water systems in Nigeria are inoperable, leaving 57 million people without access to safe drinking water, and 130 million without improved sanitation services (WHO/UNICEF Joint Monitoring Programme Report, 2016). These pressing issues have influenced policy formulation in Nigeria, drawing insights from various conferences, conventions, and meetings, as well as aligning with the Millennium Development Goals (MDGs), Sustainable Development Goals (SDGs), New Partnership for Africa's Development (NEPAD) objectives, and resolutions from these events (Federal Ministry of Water Resources, 2016).

The National Water Supply and Sanitation Policy in Nigeria prioritizes affordable and sustainable access to adequate drinking water and sanitation for all citizens. It advocates for a cost-sharing arrangement between the government and beneficiaries to achieve this goal. However, implementing this strategy presents challenges in balancing low rates for

the economically disadvantaged while ensuring high levels of cost recovery (Okeke, 2015). This study aims to assess the implementation of Sustainable Development Goal 6 (SDG 6), which focuses on ensuring availability and sustainable management of water and sanitation for all, within the context of Nigeria's National Water Policy.

Methodology

Study Area

Nigeria, a nation in West Africa, is bordered to the north by the Chad Republic, to the south by the Atlantic Ocean, to the west by the Benin Republic, and to the east by Cameroon. The total area of Nigeria is 924,000 square kilometres or 356,667 square miles. Nigeria is the most populous country in Africa and the sixth most populous country in the world, according to estimates. The Federal Capital Territory and 36 States make up the nation of Nigeria. There are 250 different ethnic groups represented in the 774 Local Government Areas that make up the States (Adewole, 2014).

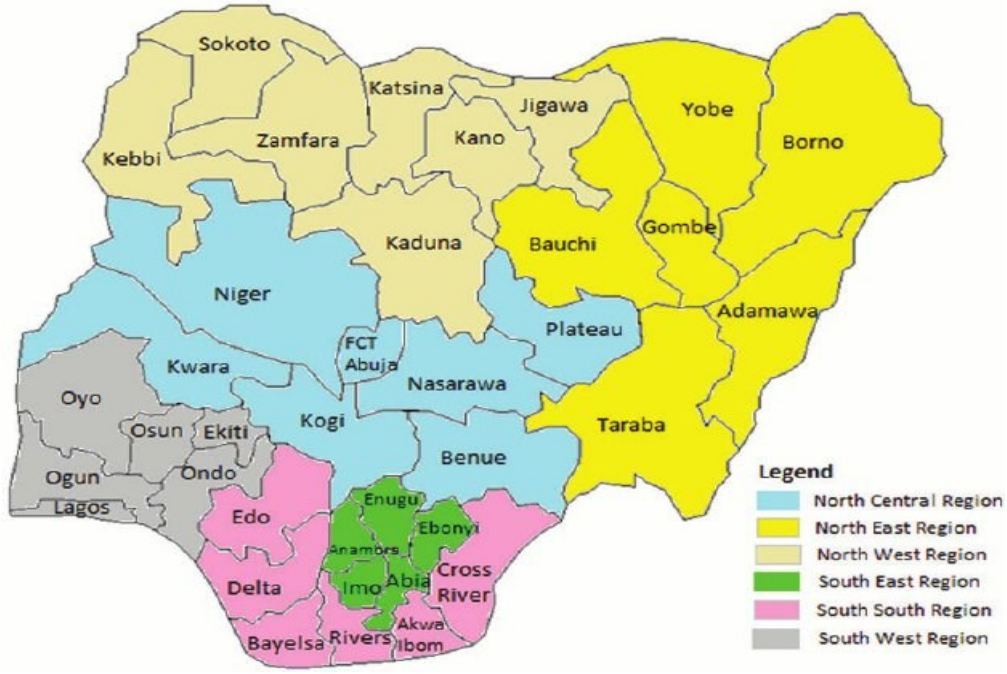

Fig 1: Map of Nigeria indicating different regions (Source: Gayawan et al., 2014).

Methods

In this study, secondary data were mainly obtained from the 2016 National Water Resources Policy to evaluate its contributions towards achieving Sustainable Development Goal 6 (SDG 6), which focuses on ensuring sustainable and sanitary water supply. Additionally, water and sanitation policies from 1993 to 2023 were identified and analyzed. The 2016 National Water Resources Policy, being the most recent, underwent a comprehensive appraisal using Content Analysis. Content Analysis involves examining both the manifest and latent content of communicated material, such as policy documents,

through classification, tabulation, and evaluation of key symbols and themes to determine its meaning and potential impact (Drisko & Maschi, 2016). This approach was employed to assess the policy's overall goals, principles, and objectives in the context of SDG 6 implementation in Nigeria.

In addition, SDG 6 was analysed alike, to know the goal indicators and targets. Consequently, the efficacy, challenges, and prospect of this policy were identified. The 2016 Water Resources Policy was further appraised to know if the targets of SDG 6 are captured in its content. Previous reports (from the National Bureau of Statistics, United Nations, World Health Organization, etc.) and their statistical information were identified to know the level of practices and implementation of Nigeria regarding the following indicators of SDG 6:

- The percentage of people who use drinking water systems that are safely maintained.
- The proportion of people who use sanitation services that are safely managed and have access to soap and water for hand washing.
- % of wastewater that has been safely treated.
- The proportion of bodies of water with good water quality.
- The percentage that water use efficiency has changed throughout time.
- Freshwater withdrawal as a percentage of the resources that are still available in freshwater.
- Level of application of integrated water resources management (IWRM) (0-100).
- Area of the trans-boundary basin having a functional agreement for cooperative water use is still under discussion.
- The percentage of change in the size of ecosystems connected to water throughout time.
- The amount of Official Development Assistance for water and sanitation that is included in a government-coordinated expenditure plan.
- The proportion of local administrative units that have policies and procedures for community engagement in water and sanitation management that have been established and are in effect.

Results and Discussion

Nigerian National Water Policies (1993 – 2023)

This section examines the evolving trends in Nigeria's national policy framework for water resource management, focusing on the underlying motivations for policy design, efforts in knowledge capacity building, and adherence to new principles and approaches. Six key policies directly influence water supply provision and management in the country, and they are:

i. The 1993 Water Resources Decree number 101

According to Decree No. 101 of 1993, which came into effect on August 23, 1993, the Federal Government of Nigeria is authorized to use and manage all surface and groundwater resources. Additionally, it has jurisdiction over any watercourse that spans more than one state, including its banks and beds. The decree aims to promote the planning, development, and utilization of Nigeria's water resources. It also coordinates initiatives that may impact the quantity, quality, distribution, and management of water. The decree emphasizes the use of appropriate standards and techniques for water use and protection, as well as providing technical assistance and support for water supply rehabilitation. In summary, Decree 101 of 1993 serves as a legislative framework that aims to ensure the optimal management, development, and utilization of Nigeria's water resources, along with addressing related issues.

Following the implementation of Decree No. 101 of 1993, water supply services provided by government agencies continued to be subpar. Financial losses were incurred, and provisions related to fees for groundwater abstraction were not effectively enforced. Large corporations were able to consume significant water resources without proper compensation. In response to these challenges, the Rural Water Supply and Sanitation Policy of 2000 was enacted. This policy was developed to address the shortcomings identified after the implementation of Decree 101 of 1993 and aimed to improve water supply and sanitation services, particularly in rural areas.

ii. Water Supply and Sanitation Policy 2000

The National Policy on the Environment, formulated prior to the Federal Government's National Water Supply and Sanitation Policy in 2000, did not incorporate the latter. The 2000 Water Supply and Sanitation Policy establishes standards and objectives for improving water supply across urban, semi-urban, and rural areas. This policy seeks to institutionalize multi-sectoral and integrated water resources management approaches. It aims to support equitable resource allocation, national utilization, and conservation, as well as ecosystem protection. Key objectives of the policy include ensuring sufficient supply of portable water for all needs; developing technical and managerial capacities and institutions to support and sustain integrated water resources development; strengthening the regulatory framework to protect water resources from pollution and overexploitation; promoting bilateral and multilateral cooperation for the rational and fair development and utilization of trans-boundary water resources. By addressing these objectives, the policy aims to enhance water supply and sanitation services while ensuring sustainable management of water resources in Nigeria.

iii. National Water Policy 2004

The Water Resources Policy of Nigeria outlines the government's ideology, goals, and plans for managing the country's freshwater and potentially marine water resources. This policy

builds upon previous initiatives and legislative frameworks, including the National Water Resources Master Plan studies conducted in 1984 and 1993, the enactment of Water Resources Decree 101 (Water Act 100) in 1993, and the Water Resources Management Sector Reform Programme initiated in 1999. In 2004, Nigeria introduced its first draft Water Resources Policy, which was grounded in the principles of Integrated Water Resource Management (IWRM). IWRM serves as the foundational ethos and guiding principles for this policy, aiming to ensure holistic and sustainable management of water resources across the country.

iv. National Water Resources Policy 2016

The Federal Ministry of Water Resources completed the 2016 National Water Resources Policy in July 2016, which was subsequently adopted by the Federal Executive Council (FEC) on September 28, 2016. This updated policy serves as a revision of the 2004 National Water Policy, incorporating the sector's latest advancements. The 2016 policy integrates findings from the evaluation of the 1993 Water Resources Master Plan and incorporates insights from the most recent Water Resources Master Plan established in 2013. By doing so, it aims to address current challenges and align with contemporary water management strategies and goals in Nigeria.

However, the fundamental tenet of this strategy is the understanding that water is essential to sustainable socio-economic development since it directly affects population health, environmental preservation, and the attainment of global development goals. To that effect, this policy has two major principal goals of this policy which are:

i. Protecting and enhancing the quality of the nation's water resources;
ii. Promoting the wise and efficient management and use of water.

Table 1: The Nigeria National Water Policies and their Years of Promulgation

Policy	Year of promulgation
1. Water Resources Decree number 101	1993
2. Water Supply and Sanitation Policy	2000
3. National Water Policy	2004
4. National Water Resources Policy	2016

Source: Content survey, 2023.

Challenges Facing the Water Resources Sector in Nigeria

The following are the challenges of the Water Resources Sector in Nigeria, as highlighted in the 2016 Water Resources Policy:

i. Water resources and demand are not equally distributed, which makes it necessary to build dams and convey water to the places that require it.
ii. Insufficient availability to viable water resources to meet the water demand for industry and home use (due to economic growth). These are exhibited by poor availability to clean and drinking water in urban, small-town, and rural areas; by low

levels of irrigation agriculture; by inadequately utilising hydropower potentials; and by a restricted inland fishery.

iii. Deteriorating water quality due to widespread contamination, particularly the careless disposal of hazardous materials brought on by poor pollution and mining control.
iv. The development of water resources has been fragmented and poorly coordinated because of poor catchment management.
v. Roles and responsibilities at the Federal and State levels of government, as well as between numerous ministries, departments, and organisations, are unclear.
vi. Poor mobilisation, application, and coordination of finances for water supply development (including international donor coordination). This frequently causes waste, inefficiency, and duplication of effort in the creation and administration of water infrastructure across the nation.
vii. Poor data management and collection for water resources. This results in subpar project planning and design.
viii. Limited groundwater availability in places covered by crystalline rocks, which make up a significant portion of the country, while thorough research and documentation are yet in their infancy for the more productive sedimentary regions.
ix. Ineffective or non-existent groundwater resource monitoring and management; supply, irrigation, husbandry, horticulture, and other uses against dwindling financial resources.
x. Inefficient government subsidies on the provision water services.
xi. Extreme weather events brought on by climate change, such as protracted droughts, greater flooding, widespread erosion, and racial tensions; a vicious cycle of unreliable projects that deliver services that fail to satisfy customer needs and for which customers are unwilling to pay.

Inadequate or ineffective management of water resource infrastructure, including dams, reservoirs, waterworks, irrigation structures, and navigable waterways, which results in financial losses and unreliable service delivery. Nigeria's water sector has faced numerous difficulties over the years, including uneven distribution of water resources, difficulty accessing usable water resources, degradation of watersheds, pollution of watercourses, lack of coordination in the development of water resources, ineffective government subsidies for the provision of water services, and poor management of water resources, among others.

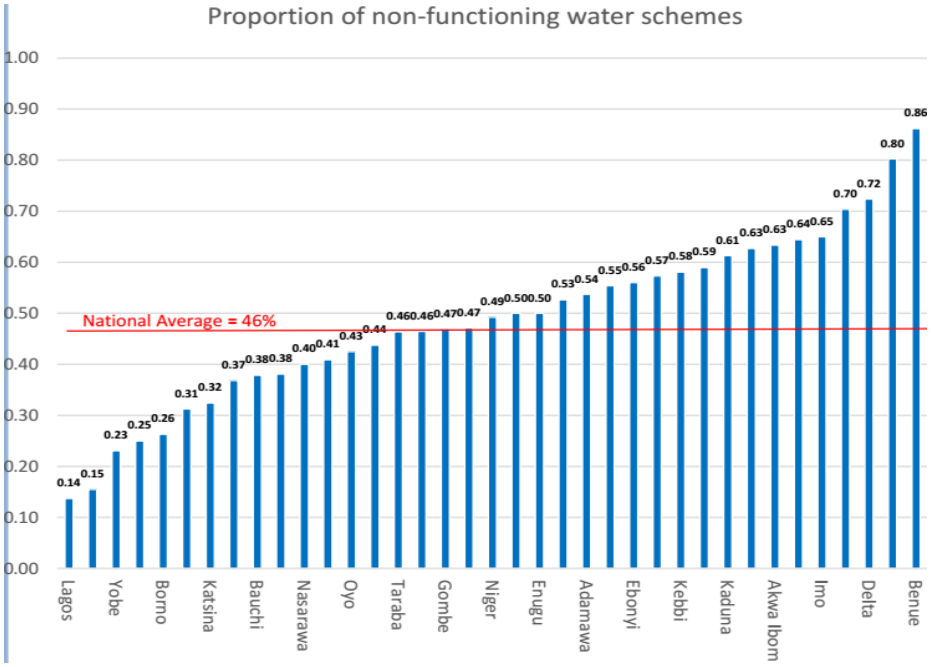

Figure 2: Proportion of Non-Functioning Water Schemes (**Source:** Federal Ministry of Water Resources, 2016).

The above figure depicts the proportion of non-functioning water schemes in 20 States of Nigeria, with a national average of 46%. This, by no small means, contributed to the failure of the Water Sector.

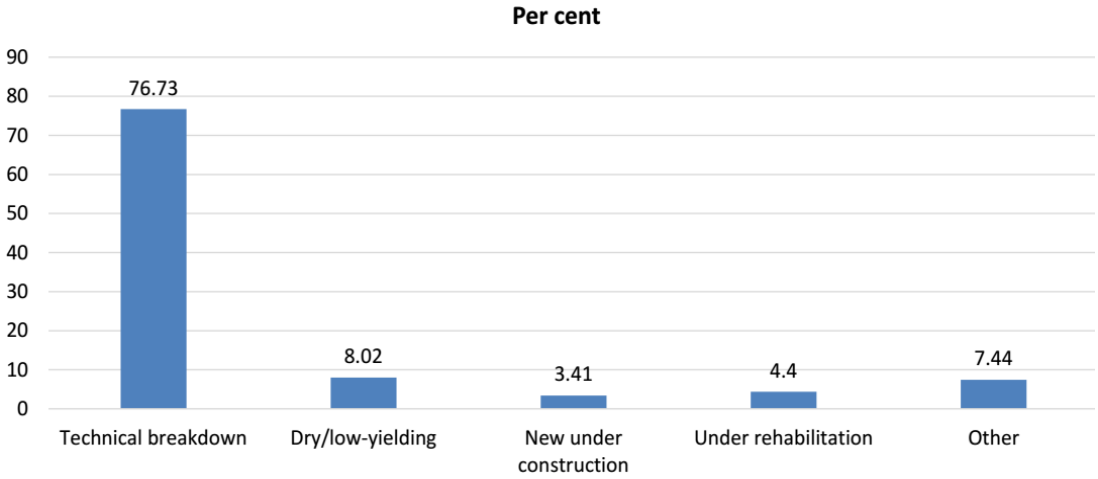

Figure 4: Reasons for the Failure of Nigeria Water Sector (**Source:** Federal Ministry of Water Resources, 2016).

From the figure above, it can be deduced that the Nigeria Water Sector failed, owing to a high level of technical breakdown, regarding distribution and delivery (76.73%); low water resources yield (8.02%); new projects under construction (3.41%); projects under rehabilitation (4.4%); and others (7.44%).

2016 National Water Policy Appraisal in Line with the Targets of SDG Six

This section aims to evaluate the 2016 National Water Resources Policy in the context of Sustainable Development Goal 6 (SDG 6). The evaluation will assess whether the policy aligns with the targets outlined in SDG 6, examine the proposed strategies for its implementation, and gauge Nigeria's level of preparedness to achieve these goals.

Table 2: 2016 National Water Policy Appraisal in Line with SDG Six

Goal	Targets	Indicators	Policy	Practice/implementation	Supporting Source
SDG six	**Target 6.1** "By 2030, achieve universal and equitable access to safe and affordable drinking water for all."	"Percentage of population using safely managed drinking water services."	Captured	In Nigeria, 69% of people have access to clean water. According to this proportion, 57 million Nigerians do not have access to clean water.	WHO/UNICEF Joint Monitoring Programme report, 2015.
				In the years 2004, 2008, 2012, and 2014, respectively, 57%, 55.8%, 57.4%, and 62.2% of Nigerians had access to improved drinking water sources.	National Bureau of Statistics, 2015
	Target 6.2 "By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations"	"Percentage of population using safely managed sanitation services including a hand washing facility with soap and water."	Captured	Access to better sanitary facilities is available to 29%. According to this figure, almost 130 million Nigerians lack access to basic sanitation. In Nigeria, access to better sanitary facilities was at 32.2%, 31.2%, 29.9%, and 29% in 2004, 2008, 2012, and 2014, respectively.	WHO/UNICEF Joint Monitoring Programme report, 2015; National Bureau of Statistics, 2015.
	Target 6.3 "By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and increasing recycling and safe reuse globally"	"Percentage of wastewater safely treated."	Captured	90% of the wastewater produced is discharged into rivers and other bodies of water untreated. Only 10% of Nigeria's total wastewater production is safely processed.	UN Environment Programme (UNEP) in partnership with UN-HABITAT and UN Water, 2015.

	Target 6.4 "By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity"	"Percentage change in water use efficiency over time." "Level of water stress: freshwater withdrawal in percentage of available freshwater resources"	Captured	The value added per water used (expressed in USD/m3) in 2019 in Nigeria is $32 per metre cube. Nigerian Government failed to meet the targets of MDG on the multiplicity of water stressors. Nigeria will continue to face acute water stress till 2025. Out of a daily requirement of 540 million gallons, Lagos now has a 300 million gallon water shortfall.	FAO, 2021. Ezabasilli, 2014 Ali, 2012. Vanguard, 2014; Ibukun, 2015.
	Target 6.5 "By 2030, implement integrated water resources management at all levels, including through trans-boundary cooperation as appropriate"	"Degree of integrated water resources management (IWRM) implementation (0-100)" "Percentage of trans-boundary basin area with an operational arrangement for water cooperation."	Captured	The incapacity of the River Basin Development Agencies to undertake watershed management was due to regulative, normative, and cognitive features of institutions. Reform of the legislative system is required to enhance implementation.	Adeoti, 2019.
	Target 6.6 "By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes"	"Percentage of change in water-related ecosystems extent over time."	Captured	The extensive ecological restoration initiative for Ogoniland in the Niger Delta was ultimately initiated by the Nigerian government in June 2016. This restoration effort is based on the 2011 Environmental Assessment of the United Nations Environment Programme (UNEP).	Etemire & Muzan, 2017.

	Target 6.a "By 2030, expand international cooperation and capacity-building support to developing countries in water and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies"	"Amount of water and sanitation related Official Development Assistance that is part of a government coordinated spending plan."	Partially captured	In cooperation with UNICEF WASH and USAID, the Federal Ministry of Water Resources has intensified its policy efforts to expand the water and sanitation sector and has undertaken a number of large-scale initiatives.	UNICEF, 2017; USAID, 2017.
	Target 6.b "Support and strengthen the participation of local communities in improving water and sanitation management"	"Percentage of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management."	Not Captured	About 60 million Nigerians did not have access to basic drinking water services in 2019. There are 167 million people without access to a basic handwashing station and 80 million without proper sanitary facilities. Only half of families in rural areas have access to better sanitation, and nearly a third (29%) of houses there do not have at least basic water supply services. For the Nigeria Sustainable Urban and Rural Water Supply, Sanitation, and Hygiene Program, the World Bank has approved a credit of $700 million. This will primarily benefit local communities, giving 6 million people access to basic drinking water services and 1.4 million people access to enhanced sanitation facilities.	The World Bank, 2021.

Source: Content Survey, 2023.

Target 6.1

"By 2030, achieve universal and equitable access to safe and affordable drinking water for all."

As shown in Table 2, the provision of equitable access to safe and affordable drinking water for all, which is the first target of Sustainable Development Goal 6, is reflected in the mission statement, objectives, and guiding principles of the 2016 National Water Resources Policy (WHO/UNICEF Joint Monitoring Programme report, 2015; Federal Ministry of Water Resources, 2016).

Indicator of target 6.1 and its level of implementation

Percentage of population using safely managed drinking water services

The figure below illustrates the change in access to water supply for Nigerians from 1990 to 2015. According to the WHO/UNICEF Joint Monitoring Programme report (2015), 69% of Nigerians had access to safe water in 2015, equating to 126 million people out of the country's total population. However, an estimated 57 million Nigerians still lacked access to clean water in 2015.

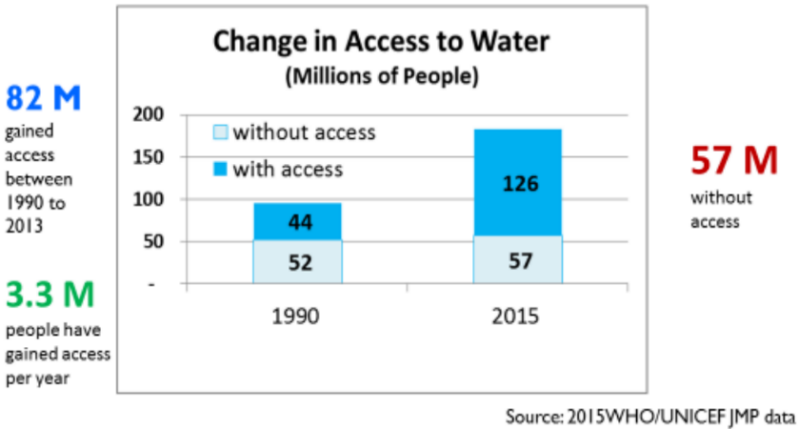

Figure 5: Change in Access to Water between 1990 and 2013.

Figure 5 illustrates the level of access to improved water in households across the 36 states of Nigeria. States with the highest percentages of individuals having access to drinking water include Abia, Imo, Jigawa, Anambra, and Osun. In urban areas, 72% of the population has access to drinking water, while in rural regions, this figure stands at 54%. Tube wells, drilled wells, and boreholes are the most common sources of water. During dry seasons, water is primarily sourced from reserves, which are typically supplied by water trucks, vendors, and surface water sources. Additionally, the sources of water can vary depending on the season (Khadijat, 2022).

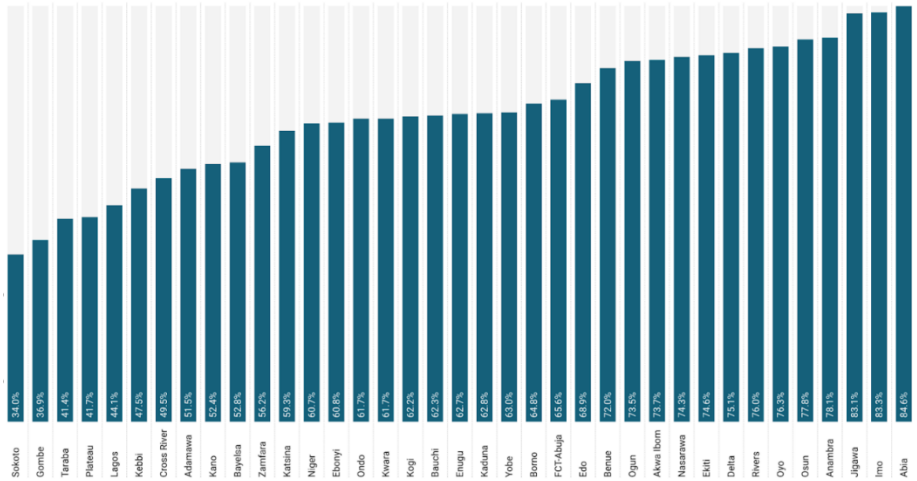

Figure 6: Access to Improved Water by State (Khadijat, 2022).

As shown in Figure 6, according to National Bureau of Statistics (NBS), 57%, 55.8%, 57.4% and 62.2% of Nigerians had access to improved drinking water source in the year 2004, 2008, 2012 and 2014, respectively (NBS, 2014).

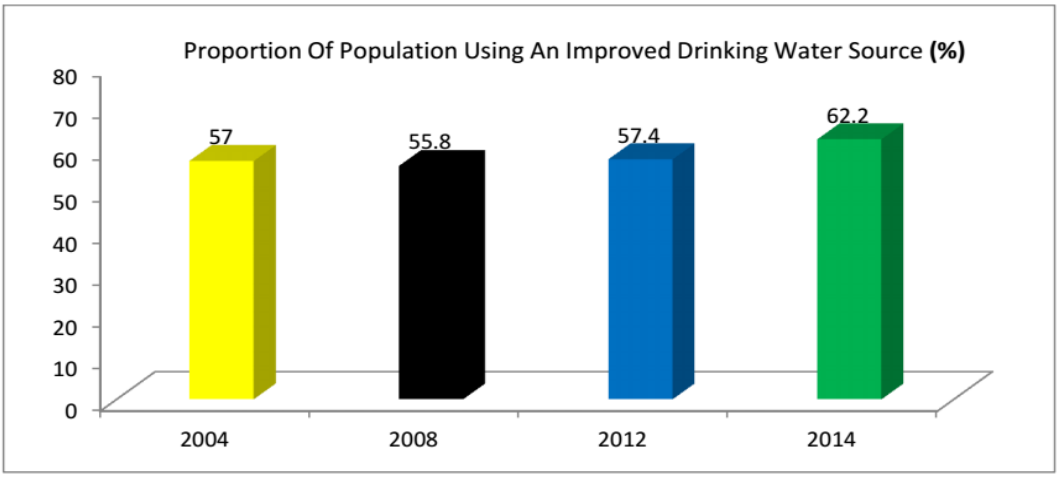

Figure 7: Percentage of Population Using an Improved Water Source (Source: National Bureau of Statistics, 2014).

Target 6.2

"By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations."

Target 6.2 was captured in the objectives, strategies, and statement eight of the policy.

Indicator of target 6.2 and its level of implementation

Percentage of population using safely managed sanitation services including a hand washing facility with soap and water.

From Figure 7, the WHO/UNICEF Joint Monitoring Programme reported in 2015 that 29% of Nigerians have access to improved sanitation services. This percentage indicates that over 130 million Nigerians are without access to basic sanitation (WHO/UNICEF Joint Monitoring Programme report, 2015). The percentage of the population using better sanitation facilities is referred to as access to improved sanitation facilities. Improved sanitation systems are likely to provide the sanitary separation of human touch and excrement. These include composting toilets, ventilated improved pit (VIP) latrines, pit latrines with slabs, and flush/pour flush (to piped sewer system, septic tank, and pit latrine).

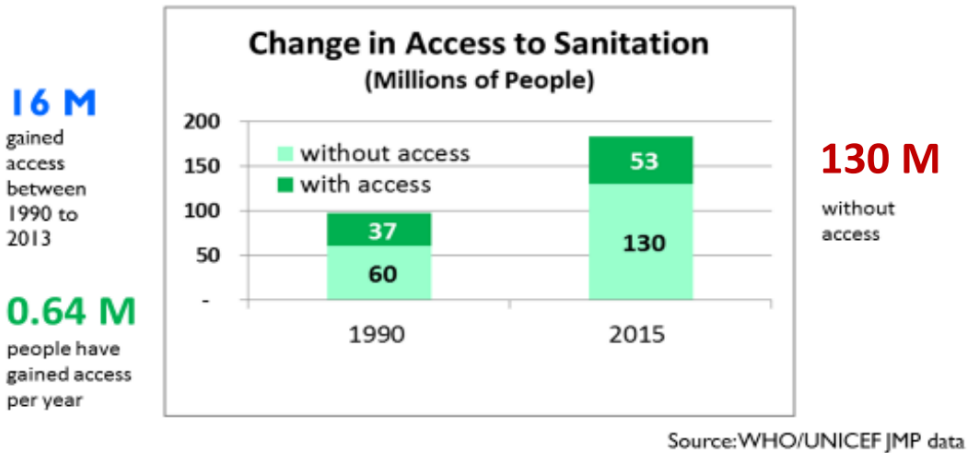

Figure 7: Change in Access to Sanitation

According to National Bureau of Statistics (2015), as shown in figure 8, 38%, 53.8%, 33.7% and 33.3% of Nigerians had access to improved sanitation facilities in the year 2004, 2008, 2012 and 2014, respectively.

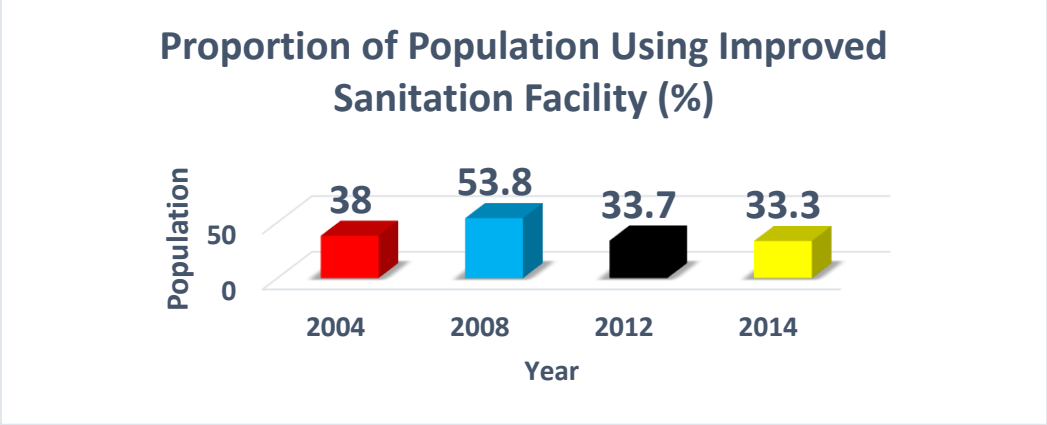

Figure 8: Proportion of Population Using Improved Sanitation Facility (Source: National Bureau of Statistics, 2015).

Target 6.3

"By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and increasing recycling and safe reuse globally."

This target is found captured in the objectives and guiding principle of the 2016 National Water Resources Policy.

Indicators of target 6.3 and their level of practices in Nigeria

(a) *Percentage of wastewater safely treated*

Ninety percent of the wastewater produced is dumped into rivers and other bodies of water untreated, according to the UN Environment Programme (UNEP), in collaboration with

UN-HABITAT and UN Water (2015). Alternatively, this suggests that only 10% of Nigeria's total wastewater production is safely treated.

Target 6.4

"By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity."

The 2016 National Water Resources Policy incorporates the goal of providing equitable access to safe and affordable drinking water for all in its guiding principle, objectives, and mission statement. This target is further emphasized in Key Policy Statement 2, which focuses on Water Resources Conservation, Protection, and Use. Water resources in Nigeria serve various primary uses, including water supply and sanitation, irrigation, freshwater aquaculture, livestock water needs, and mining. Additionally, non-consumptive socioeconomic activities such as hydropower generation, flood control, and inland navigation also rely on these water resources. According to the National Water Resources Master Plan, the consumptive water demand was estimated to be 5,933 million cubic metres per year (MCM/year) in 2010 and is projected to increase to 16,585 MCM/year by 2030. This data is presented in the table below (Federal Ministry of Water Resources, 2016).

Table 3: Consumptive Water Demand Rates for Year 2010 and Year 2030 by Sub-Sectors

Estimated National Consumption	Year 2010 (MCM/Day)	Year 2030 (MCM/Day)	Projected factor of increase in demand by 2030 against 2010
Water supply	3,047	8,852	2.9times
Irrigation	1,926	6,245	3.3 "
Aquaculture	728	1,166	1.6 "
Livestock	233	312	1.3 "
Total	**5,933**	**16,585**	**2. 8 "**

The target is to meet 100% coverage by the year 2030 and continue to sustain this level of coverage in the subsequent years.

Source: Federal Ministry of Water Resources, 2016.

The following priority order of consumptive water use will be applied when surface water resources development and allocation is planned:

- 1st priority: Minimum stream flow requirement
- 2nd priority: Municipal water supply
- 3rd priority: Irrigation water supply
- 4th priority: Other water supply, if any.

Indicator of target 6.4 and their implementation level

Percentage change in water use efficiency over time

In 2019, the value added per unit of water used in Nigeria was $32 per cubic metre (FAO, 2021). Despite this, the Nigerian Government did not meet the targets of the Millennium Development Goals (MDG) due to various water stressors (Ezebasili, 2014). It is projected that Nigeria will continue to experience acute water stress until 2025 (Ali, 2012). Lagos, one of Nigeria's major cities, faces significant water challenges. Out of a daily water requirement of 540 million gallons, Lagos experiences a shortfall of 300 million gallons (Vanguard, 2014; Ibukun, 2015).

Target 6.5

"By 2030, implement integrated water resources management at all levels, including through trans-boundary cooperation as appropriate."

This target can be found captured in the guiding principle, overall goal, and objectives of the 2016 National Water Resources Policy. This target is also adequately captured in the objectives and strategies of the Policy Statement 5 – Trans-boundary Issues.

Indicators of target 6.5 and their practices level

Percentage of trans-boundary basin area with an operational arrangement for water cooperation

Adeoti (2019) asserted that the incapacity of the River Basin Development Agencies to undertake watershed management was due to regulative, normative, and cognitive features of institutions. Reform of the legislative system is required to enhance implementation.

Target 6.6

"By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes."

Protection of water-related ecosystem is captured in the Objectives, Mission Statement and Guiding Principles of the policy:

Indicator of target 6.6 and its level of implementation

Percentage of change in water-related ecosystems extent over time

The Nigerian government launched an extensive ecological restoration initiative for Ogoniland in the Niger Delta in June 2016. This initiative was based on the 2011 Environmental Assessment conducted by the United Nations Environment Programme (Etemire and Muzan, 2022).

Target 6.a

"By 2030, expand international cooperation and capacity-building support to developing countries in water and sanitation-related activities and programmes, including water

harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies."

This target is partially captured in the Guiding Principles of the National Water Resources Policy.

Indicator of target 6.a and its level of practice

"Amount of water and sanitation related Official Development Assistance that is part of a government coordinated spending plan."

In collaboration with UNICEF WASH and USAID, the Federal Ministry of Water Resources has intensified its policy efforts to expand the water and sanitation sector in Nigeria. The ministry has undertaken several large-scale initiatives to improve access to clean water and sanitation facilities (UNICEF, 2017; USAID, 2017).

Target 6.b

"Support and strengthen the participation of local communities in improving water and sanitation management."

The 2016 National Water Resources Policy does not explicitly mention efforts by local communities to better manage their water and sewage systems. However, this responsibility seems to fall under the purview of Catchment Management Offices and Committees. These bodies, established by the Federal Government, are tasked with controlling, protecting, and regulating the use of water resources within specific hydrological areas to ensure equitable use.

2.0. Encourage community involvement in the management, control, development, conservation, and protection of water resources in its hydrological area and coordinate related activities of water users and those of other water management institutions within its hydrological area. This should include a formalised stakeholder consultative forum in each catchment to actualize the participatory approach in water management.

This can be found articulated in Chapter Four (4.6, precisely) - Catchment Management Offices and Committees.

Indicator of target 6.b and its level of practices

"Percentage of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management."

In 2019, approximately 60 million Nigerians lacked access to basic drinking water services, while 167 million people did not have access to a basic handwashing station, and 80 million lacked proper sanitary facilities. In rural areas, only half of families have access to improved sanitation, and nearly 29% of households lack basic water supply services (The World Bank, 2021). To address these challenges, the World Bank has approved a credit of $700 million for the Nigeria Sustainable Urban and Rural Water Supply, Sanitation, and Hygiene Program. This initiative aims to benefit local communities by providing 6 million people

with access to basic drinking water services and 1.4 million people with enhanced sanitation facilities (The World Bank, 2021).

Discussion and Policy Implications

Nigeria's efforts to achieve Sustainable Development Goal 6, which aims to ensure universal access to water and sanitation, face a myriad of interconnected challenges that have hindered progress for years. A major obstacle is chronic underfunding, which has led to deteriorating infrastructure and inadequate services. There is a pressing need to realign budget priorities to allocate the necessary financial resources effectively. Additionally, prudent management of allocated funds is crucial to maximize their impact at the community level. The institutional framework overseeing Nigeria's water sector is complex and lacks coordination among various government agencies at different levels. Streamlining policies and improving oversight could help alleviate bottlenecks in the system. Furthermore, there is a need to cultivate specialized expertise, which is currently in short supply, to address sector-specific challenges. In the absence of adequate expertise, fostering collaboration and knowledge exchange between different entities could help bridge capability gaps in the short term. By addressing these challenges holistically and implementing coordinated strategies, Nigeria can make significant strides towards achieving universal access to water and sanitation.

A significant challenge is the lack of comprehensive water and sanitation data in Nigeria. Quality data are essential for guiding policy, programming, and monitoring progress. Without reliable data, interventions may be misdirected and assessing progress becomes challenging. To address this issue, Nigeria could explore innovative technologies capable of generating valuable insights, even in remote areas. However, the usefulness of this information depends on its accessibility to various stakeholders, from federal officials to local leaders. Climate change exacerbates Nigeria's water challenges, with increased instances of prolonged droughts, flash floods, and other extreme weather events. This highlights the importance of developing resilient infrastructure and practices. Measures such as rainwater harvesting, efficient technologies, and other adaptive strategies can help strengthen Nigeria's resilience to climate-related shocks.

A lack of public awareness and community participation hinders sustainability efforts. Broad educational campaigns, coupled with initiatives that promote local ownership of water resources, can help address this issue. Empowering communities to take ownership can lead to grassroots solutions and collaborative management of shared resources. By focusing on key areas such as financing, governance, data collection, climate adaptation, and civic engagement, Nigeria can overcome its water challenges and move towards water security. The path forward is clear; now, it's essential to unite government, partners, and communities to turn this vision into reality.

Conclusion

In conclusion, the Nigerian Water and Sanitation Policies since 1993 have been accurately identified, along with their respective promulgation years. The Water Supply and Sanitation Policy was introduced in 2000 following the shortcomings of the 1993 Water Resources Decree No. 101. This was followed by the National Water Policy in 2004 and the 2016 National Water Resources Policy, which aims to improve water management, sanitation, and supply in line with SDG 6 targets. The 2016 policy effectively addresses six of the SDG 6 targets related to water and sanitation outcomes. However, it does not fully capture the last two targets related to the means of implementing these outcomes. While the policy is well-formulated to help Nigeria achieve the water and sanitation aspects of SDG 6, it falls short in addressing international cooperation and the involvement of local communities. Despite these limitations, the policy has the potential to meet the SDG 6 targets by 2030 if effectively implemented and governed.

It is recommended that the Nigerian Government increase the budget allocation for Water Supply and Sanitation Hygiene (WASH) and strictly adhere to the Water Resources Policy, giving greater priority to the water resources sector. The government should mandate all 36 states to establish agencies for rural water sanitation and hygiene, equipping them with adequate manpower and resources. Additionally, all levels of government should implement mechanisms for timely data collection, reliable knowledge management, and robust operation and management (O&M) practices to ensure effective data management. Furthermore, stimulating private sector participation and investment in the WASH sector is crucial for accelerating progress in Nigeria's water and sanitation goals.

Ethical Approval

The authors of this work ensured that all ethical standards were complied with throughout the duration of the work and no human or animal rights was violated.

Consent to Participate

All author (s) and co-authors who collaborated in the project have consented to participate in the work.

Consent to Publish

The permission to publish this article has been sought and obtained from all contributing authors.

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Conflict of Interest

The authors declare no conflict of interest in this research paper.

References

Abel, G. J., Barakat, B., Kc, S., & Lutz, W. (2016). Meeting the Sustainable Development Goals leads to lower world population growth. *Proceedings of the National Academy of Sciences*, *113*(50), 14294-14299.

Adeoti, O. (2019). Understanding the factors constraining the implementation of watershed management in Nigeria. *Sustainable Water Resources Management*, *5*(4), 2001-2021.

Adewole, A. (2014). Governance reform and the challenge of implementing public procurement law regime across Nigerian state and local governments. *International Journal of Public Administration and Management Research*, *2*(4), 25-32.

Ali, K. A. (2012). Development of Water Supply Infrastructure in Nigeria: Challenges and Prospects. Lecture Delivered at the Nigerian Society of Engineers October Lecture.

Biermann, F., Kanie, N., & Kim, R. E. (2017). Global governance by goal-setting: the novel approach of the UN Sustainable Development Goals. *Current Opinion in Environmental Sustainability*, *26*, 26-31.

Bobylev, S., Zubarevich, N., & Solovyeva, S. (2015). Challenges of the crisis: How to measure sustainable development?. *Voprosy Economiki*, *1*.

Choy, Y. K. (2015). 28 years into "Our Common Future": sustainable development in the post-brundtland world. *WIT Transactions on The Built Environment*, *168*, 1197-1211.

Drisko, J. W., & Maschi, T. (2016). *Content analysis*. Pocket Guide to Social Work Re.

Duran, D. C., Gogan, L. M., Artene, A., & Duran, V. (2015). The components of sustainable development-a possible approach. *Procedia Economics and Finance*, *26*, 806-811.

Etemire, U., & Muzan, M. A. (2017). Governance and regulatory strategies beyond the state: stakeholder participation and the ecological restoration of Ogoniland. *Griffith Law Review*, *26*(2), 275-298.

Ezabasilli, A. C. (2014). Water Resources Management and Strategies in Nigeria. AFREV STECH 3:1: 35-53.

FAO. (2021). Progress on Change in Water-Use Efficiency: Global Status and Acceleration Needs for SDG Indicators 6.4. 1.

Federal Government of Nigeria. (2000). Water Supply & Sanitation Interim Strategy Note November, *ii* (November).

Federal Ministry of Water Resources. (2016). NATIONAL WATER RESOURCES POLICY (2nd ed.). Nigeria.

Federal Ministry of Water Resources, Nigeria. (2016). Partnership for Expanded Water Supply, Sanitation & Hygiene (PEWASH) Program.

Fukuda-Parr, S. (2016). From the Millennium Development Goals to the Sustainable Development Goals: shifts in purpose, concept, and politics of global goal setting for development. *Gender & Development*, *24*(1), 43-52.

Gain, A. K., Giupponi, C., & Wada, Y. (2016). Measuring global water security towards sustainable development goals. *Environmental Research Letters*, *11*(12), 124015.

Gayawan, E., Arogundade, E. D., & Adebayo, S. B. (2014). Possible determinants and spatial patterns of anaemia among young children in Nigeria: a Bayesian semi-parametric modelling. *International health*, *6*(1), 35-45.

Hák, T., Janoušková, S., & Moldan, B. (2016). Sustainable Development Goals: A need for relevant indicators. *Ecological indicators*, *60*, 565-573.

Ibukun, Y. (2015). Nigeria Water Shortage Is Bigger Killer Than Boko Haram: Cities. Bloomberg.

Khadijat, K. (2022). *#ChartoftheDay: In Nigeria, Over 60 Million People do not Have Access to Drinking Water*. Accessed January 15, 2023. <https://www.dataphyte.com/latest-reports/water/chartoftheday-in-nigeria-over-60-million-people-do-not-have-access-to-drinking-water/>

Lee, B. X., Kjaerulf, F., Turner, S., Cohen, L., Donnelly, P. D., Muggah, R., ... & Gilligan, J. (2016). Transforming our world: implementing the 2030 agenda through sustainable development goal indicators. *Journal of public health policy*, *37*(1), 13-31.

Lousley, C. (2015). Narrating a global future: Our common future and the public hearings of the World Commission on Environment and Development. In *Global Ecologies and the Environmental Humanities* (pp. 263-285). Routledge.

Mugagga, F., & Nabaasa, B. B. (2016). The centrality of water resources to the realization of Sustainable Development Goals (SDG). A review of potentials and constraints on the African continent. *International Soil and Water Conservation Research*, *4*(3), 215-223.

National Bureau of Statistics (2011). "Nigerian Poverty Profile, 2010". *National Bureau of Statistics.*

National Bureau of Statistics. (2015). The Millenium Development Goals Performance. *Tracking Survey 2015 Report*.

Ohwo, O. (2016). Challenges of public water provision in Nigerian cities: a review. *Journal of Water, Sanitation and Hygiene for Development*, *6*(1), 1-12.

Okeke, R. C. (2015). Fundamentals of sustainable development in Sub-Saharan Africa: a focus on water policy in Nigeria. *International Letters of Social and Humanistic Sciences*, *65*, 143-151.

Oleribe, O. O., & Taylor-Robinson, S. D. (2016). Before sustainable development goals (SDG): why Nigeria failed to achieve the millennium development goals (MDGs). *The Pan African Medical Journal*, *24*.

Osborn, D., Cutter, A., & Ullah, F. (2015). Universal sustainable development goals. *Understanding the Transformational Challenge for Developed Countries*.

Sachs, J. D. (2015). Achieving the sustainable development goals. *Journal of International Business Ethics*, *8*(2), 53-62.

Seidler, R., & Bawa, K. S. (2016). Dimensions of sustainable development. *Religion, Culture and Sustainable Development*, *3*, 161.

The World Bank. (2021). Improving Water Supply, Sanitation and Hygiene Services in Nigeria. *The Press Release.*

UNICEF Nigeria—Media Centre—Launch of Hand Washing Campaign in Abuja. Available online: https://www.unicef.org/nigeria/media_2364.html

United Nations Economic Commission for Africa. (2015). Africa Regional Report on the Sustainable Development Goals.

UNEP and UN-Habitat Greener Cities Partnership | UN-Habitat. (2015). Retrieved 4 October 2016, from https://unhabitat.org/unep-and-un-habitat-greener-cities-partnership (Accessed January 13, 2017).

USAID Launches New Water and Sanitation Project in Nigeria. Available online: https://www.usaid.gov/nigeria/news-information/press-releases/usaid-launches-new-water-and-sanitation-project-nigeria (Accessed January 10, 2017)

Vanguard. (2014). Lagos Has 300 million Gallons of Water Deficit Per day By LCWC Boss.

WHO/UNICEF Joint Water Supply, & Sanitation Monitoring Programme. (2015). *Progress on sanitation and drinking water: 2015 update and MDG assessment*. World Health Organization.