Clean Water and Sanitation in Nigeria: A Path to SDG 6

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Abstract

This paper delves into the pressing challenges and crucial actions required to advance Sustainable Development Goal 6 (SDG 6) on clean water and sanitation in Nigeria. The nation grapples with a scarcity of safe water sources and inadequate sanitation facilities, particularly impacting rural and underserved communities. To achieve SDG 6, concerted efforts are vital, necessitating enhancements in water treatment technologies, infrastructure development, community engagement, and policy frameworks. Education and awareness campaigns are also crucial for fostering responsible water usage and proper sanitation practices. Sustainable financing mechanisms and climate-resilient strategies should be integrated to ensure lasting progress. Collaborative endeavours involving governments, non-governmental organizations, private sectors, and communities are imperative. This study emphasizes the urgent need for comprehensive and interdependent actions, underlining the criticality of local commitment and international cooperation to achieve SDG 6 and secure a future with equitable access to clean water and improved sanitation across Nigeria.

Keywords: *Clean water, Sanitation, Nigeria, Water treatment, Community engagement, Wastewater management*

1.0. Introduction:

The African continent, known as the world's second driest, grapples with a considerable challenge in managing its water resources. It constitutes 9% of the world's renewable water but supports 15% of the global population (UNEP, 2020). This scarcity is further intensified by inadequate water and wastewater treatment, particularly amidst rapid population growth and urbanization (UNEP, 2011). Despite the urgent necessity to enhance water quality and treatment, initiatives are falling behind demographic shifts and economic development. This escalates water consumption and pollution, significantly impacting human health and the environment (Pickering and Davis, 2012). The United Nations' Millennium Development Goals emphasize the vital role of water and wastewater treatment in achieving socioeconomic objectives across Africa. This reflects the integral part of safe water access in poverty eradication, education, gender equality, child mortality reduction, maternal health improvement, disease control, and environmental sustainability (Schnoor, 2011).

Ensuring access to safe drinking water and sanitation is a global imperative, especially in rural areas of developing nations. Sub-Saharan Africa, however, trails in achieving Sustainable Development Goal 5, facing challenges in meeting the targets for clean water accessibility and sanitation (UNICEF, 2012). Limited data on water quality and scarce empirical studies hinder the formulation of sound policies to tackle this pressing issue. Inadequate access to clean water and sanitation adversely affects health, socioeconomic development, and poverty eradication. Addressing this necessitates evidence-based policy actions, focusing on specific, country-specific studies for effective water quality management. Policymakers, NGOs, and individual users play pivotal roles in ensuring sustained access to safe water (Opio. 2012).

Safe drinking water and sanitation in Nigeria cannot be emphasized enough. Access to safe drinking water and proper sanitation is fundamental for improved health, economic growth, education, and development. However, Nigeria faces hurdles in ensuring water quality due to poor sanitation facilities, inadequate water treatment, unequal water usage, and deficient governance and monitoring structures. These challenges underscore the urgent need for comprehensive water management programs and strategies to ensure the availability of safe drinking water across the continent (Lalani, 2013).

2.0. Objective

The objective of the study is to provide comprehensive insights and recommendations addressing the Sustainable Development Goal 6 (SDG 6) on Clean Water and Sanitation in Nigeria. The study will delve into the context of water and sanitation, analyzing accessibility, cleanliness, and sanitation measures across urban and rural areas. It aims to identify strategies to improve water quality and sanitation, emphasizing inclusive approaches, government roles, alternative solutions, and sustainable practices. The study seeks to offer a holistic perspective and actionable recommendations to promote sustainable development, ensuring clean water and adequate sanitation for all citizens in Nigeria.

3.0. Methodology

In terms of methodology, this research adopts a document research approach. The data sources used are primarily secondary and gathered through a thorough review of pertinent journals, articles, books, relevant publications, reports from international organizations, and relevant national policy documents on sustainable development goal 5 – clean water and sanitation.

4.0. Results

Nigeria, the largest African nation with an approaching population of nearly 200 million, has experienced remarkable economic growth, quadrupling its GDP between 2005 and 2015. However, this growth has yet to translate adequately into poverty reduction or the provision of essential amenities such as water, sanitation, and hygiene (WASH), which struggle to keep up with the expanding population (WaterAid, 2018). The challenges lie in insufficient capability, funding, institutional structures, and national policies, hindering effective and sustainable delivery of these fundamental services. Overcoming these hurdles demands solid political leadership and concrete actions to enhance sector investments, implement institutional reforms, and address human resource deficits (WaterAid, 2018).

The 2019 National Outcome Routine Mapping of Water, Sanitation, and Hygiene Service Levels (WASH-NORM) reveals pressing challenges a significant portion of Nigeria's population faces. Around 30% lack access to clean water (approximately 60 million people), 84% lack nearby handwashing facilities with soap (around 167 million), and 56% lack decent toilets (around 112 million), emphasizing the urgent need for comprehensive interventions to enhance their quality of life (WaterAid, 2018). Moreover, 23% practice open defecation, amounting to approximately 46 million Nigerians, underscoring the necessity for a nationwide commitment to initiatives like the Clean Nigeria campaign (UNICEF, 2021).

Basic drinking water services have slightly improved, reaching 75% of the population, but the lack of proper sanitation and handwashing facilities persists, contributing to a significant health crisis. The insufficiency of WASH services is a primary cause of diarrheal morbidity and mortality, leading to at least 70,000 deaths in children under five annually (Federal Ministry of

Water Resources, National Bureau of Statistics, and UNICEF, 2020). Addressing these issues is crucial for the overall well-being and health of the Nigerian population.

5.0. Discussion

Nigeria's score/rating in relation to accessibility to drinking water and sanitation

Table 1.0 presents the Environmental Performance Index (EPI) scores and rankings for various countries, specifically focusing on the "Sanitation and Drinking Water" issue category. The primary objective of this category is to evaluate how effectively countries safeguard human health by addressing environmental risks associated with unsafe drinking water and inadequate sanitation (EPI, 2020).

The ranking of each country is determined based on its EPI score, where a higher score signifies superior environmental performance concerning access to safe drinking water and appropriate sanitation. The rankings range from 1 to 179, with 1 being the most favorable rank achievable. Meanwhile, the EPI score has a scale of 0 to 100, where a score of 100 indicates the highest attainable level of environmental performance (EPI, 2020).

For instance, Finland, Iceland, and the Netherlands have the highest EPI scores of 100, indicating their excellent performance in safeguarding human health regarding drinking water and sanitation. On the other hand, Nigeria ranks 177th with an EPI score of 4.9, suggesting significant room for improvement in ensuring safe drinking water and sanitation for its population. The "10-year change" column indicates how each country's EPI score has changed over the past decade, reflecting trends and progress in this particular issue category.

Table 1.0: Environmental performance index for sanitation and drinking water (Source: EPI, 2020).

Country	**Rank**	**EPI Score**	**10 Year Change**
Finland	1	100	0.3
Netherlands	1	100	-
Sweden	10	98.5	1.9
Belgium	20	93.6	3.6
Bosnia and Herzegovina	50	61.4	3.2
Morocco	107	40.8	8.9
Benin	158	13.4	4.1
Nigeria	177	4.9	4.9
Chad	179	-	-

Means/mechanisms by which specific communities can get access to clean water

The table 2.0 examined the percentage of people using drinking water from an improved source accessible on premises, available when needed and free from faecal and priority chemical contamination. Improved water sources include piped water, boreholes or tube wells, protected dug wells, protected springs, and packaged or delivered water.

Table 2.0: Nigeria Clean Water Access (Macrotrends, 2023)

Year	Population with Access to Clean Water (%)	Change (%)
2020	21.67%	+0.35%
2019	21.32%	+0.36%
2018	20.96%	+0.36%
2017	20.60%	+0.37

Access to clean water is fundamentally vital for the health and prosperity of communities, and several approaches can guarantee such accessibility. Initially, communities should be connected to safe water sources such as wells, boreholes, or shielded springs, providing pure water for drinking and household purposes (Healing Waters Media, 2021). Water treatment techniques like chlorination or filtration can further purify contaminated water, making it safe for consumption. This can be achieved through treatment facilities established by the community or at the household level. Additionally, establishing and maintaining water infrastructure, including pipelines and distribution networks, are crucial for ensuring a steady provision of fresh water to communities. Equally critical is educating the community on proper water storage, hygiene, and sanitation practices to uphold clean water quality and prevent pollution (Healing Waters Media, 2021). Government backing is a pivotal approach, necessitating the prioritization of pure water accessibility, substantial investments in infrastructure, and fair distribution policies. Furthermore, non-governmental organizations (NGOs) play a significant role by initiating clean water initiatives in underserved communities, offering vital funding and expertise to enhance access to clean water.

In northern Nigeria (Arid locations), what depth should be dug before clean water is accessible?

In diverse regions of Africa, the profundity of wells is pivotal in ensuring consistent access to water. A prominent instance is Sokoto State, Nigeria, where the depths of wells exhibit significant variation contingent on geological circumstances, intended utilization, and the local water table levels. Shallow wells, usually less than 30 meters (around 100 feet) in depth, are widespread in urban and rural locales. Conversely, greater depth boreholes surpassing 100

meters (about 330 feet) or more are frequently drilled to access deeper aquifers and mitigate the obstacles posed by water table levels (Winfield, 2022).

Throughout Africa's arid zones, groundwater utilisation via wells and boreholes holds immense significance due to prevalent water insufficiency. The profundities of these water sources fluctuate depending on geological aspects, hydrological factors, topography, and the particular purpose of the well. Shallow manually dug wells, with depths ranging from a few meters to approximately 30 meters (around 10 to 100 feet), are prevalent, particularly in rural vicinities. In more arid regions, boreholes become indispensable, reaching depths from 30 meters to several hundred meters (over 300 meters or approximately 1000 feet). Deep boreholes exceeding 100 meters (around 330 feet) are drilled in exceedingly arid zones to access substantial groundwater reservoirs (Winfield, 2022). Comprehending the geology and hydrological circumstances of particular arid zones is fundamental in ascertaining the suitable well profundity, guaranteeing a sustainable approach to accessing uncontaminated water. (Winfield, 2022).

Instances of diverse well and borehole types across African nations highlight the range of strategies employed to tackle water accessibility hurdles. In rural villages of Niger, hand-dug shallow wells, varying from a few meters to approximately 30 meters (10 to 100 feet) in depth, serve as vital sources of groundwater for local communities (Idris et al., 2015). In more parched areas like Turkana County in Kenya, boreholes are instrumental, delving into deeper aquifers at depths ranging from 30 meters to several hundred meters (over 300 meters or approximately 1000 feet), a response guided by geological factors. This approach ensures a dependable water supply in arid landscapes. Similarly, in exceedingly arid sections of Somalia, such as Puntland, deep boreholes exceeding 100 meters (approximately 330 feet) are drilled to access groundwater reservoirs, offering a lifeline to communities grappling with acute water scarcity. These

examples underscore the varied depths of wells and boreholes tailored to unique water accessibility challenges, taking into account the specific local geography and climate (Idris et al., 2015).

Can communities access tools and resources to get water from below the earth's surface?

Certain Communities possess the fundamental instruments and means to reach subterranean water sources, but the pressing necessity lies in securing pure and secure water for developing communities. However, obtaining this water demands investments in accessing groundwater, a move that profoundly impacts the lives of community members (The Water Project, 2019).

Numerous communities in progressing areas confront notable financial restrictions that hinder their capacity to invest in critical drilling apparatus, materials, and proficient personnel for successful water initiatives. The costs affiliated with drilling, encasement, and constructing a reliable water system consistently exceed their financial means. Moreover, extracting water from profound layers of the earth necessitates specialized drilling apparatus and machinery, assets often lacking due to financial restraints within communities. Consequently, efficiently accessing deeper aquifers remains a challenge. Additionally, drilling to substantial depths mandates specialized technical insight and expertise, especially in understanding geological conditions and hydrology, pivotal components for triumphant drilling. Unfortunately, several communities lack individuals with the needed expertise and training to perform these endeavours safely and proficiently. To accomplish a water project that is trustworthy, expedient, and secure, a comprehensive comprehension of geological composition, hydrological dynamics, and well construction methodologies stands as imperative. Collaboration with entities or experts

guarantees that projects are devised and executed in adherence to these standards, affording communities a sustainable and dependable water supply (The Water Project, 2019).

External aid and alliances with entities or experts in the field emerge as pivotal in surmounting financial constraints, gaining access to specialized equipment, and leveraging technical expertise. Through collaboration with seasoned entities, communities can effectively carry out water projects, guaranteeing dependability, ease, and safety in obtaining clean water from below the earth's surface. This collaboration bridges the divide between the community's water requirements and the technical prerequisites to acquire it proficiently (The Water Project, 2019).

How can water be cleaned and usable for drinking, cooking and other domestic purposes?

The surface of our planet is predominantly covered by water, constituting roughly 71% of the overall expanse. However, about 96.54% of an extensive share is oceanic water, making it unfit for consumption due to its elevated salinity. Merely a diminutive fraction, approximately 1.42%, represents indispensable freshwater vital for sustaining life. Astonishingly, less than 1% of this freshwater is readily obtainable, underscoring the pressing necessity for judicious management of this rare commodity (Samarasiri, 2015).

Water purification encompasses two pivotal classifications: potable water refinement and sewage treatment. Potable water refinement involves gathering water from primary origins, such as rivers, and refining it to align with quality benchmarks for safe human ingestion. Conversely, sewage treatment entails cleansing industrial effluents before their discharge into diverse surroundings, ensuring conformity with distinct quality criteria to avert environmental transgressions. Water purification technologies are multifaceted and cater to varied objectives, mandating thorough scrutiny of untreated water's constituents and physical attributes. The

assessment encompasses inorganic and minor inorganic compounds, natural and artificial organic compounds, as well as assorted microorganisms, in addition to considerations of physical properties like turbidity, particles, hue, taste, and scent. The designation and advancement of appropriate water purification techniques hinge on these distinct attributes, encompassing procedures such as filtration, coagulation, flocculation, adsorption, disinfection, and more. The selection of the approach is steered by elements like water quality benchmarks and specific requisites of industries or household consumers, contributing to the ongoing progression of water purification as a crucial realm addressing the escalating demand for hygienic and conveniently accessible water, notably in regions contending with water paucity (Samarasiri, 2015).

What is the role and responsibility of government in providing clean water to its citizens?

Inadequate sanitation and contaminated water sources often culminate in compromised water quality and poor health. National governments should institute the following measures to ensure the suitability of water for human consumption:

Establish robust rural sanitation and drinking water monitoring programs to uphold water quality. This approach aims to ensure that all water sources are devoid of human, industrial, or agricultural pollutants. Wells should be strategically located, far from potential sources of pollution like sewage systems, pit latrines, and flood-prone areas. Clear potable water standards need to be set, and water from new wells must adhere to them before it can be deemed safe for consumption. Water testing results indicate contamination by faecal coliform colonies exceeding 1 per 100 ml of water. The national program should encompass regulations mandating water purification before consumption, commonly achieved through chlorination and shock chlorination (Oram, 2012a, 2012b).

Implement educational initiatives promoting prudent water and sanitation management practices, emphasising proper hygiene in handling water containers and storage facilities. These educational programs should be tailored to engage diverse learning styles. Training sessions should underscore the interrelation between drinking water and well-being, demonstrate through testing whether the water in local homes is tainted, educate villagers on preventing contamination of drinking water sources, and elucidate how boiled or treated water can be recontaminated during handling and storage. Furthermore, they should elucidate techniques to render water safe for drinking (Klink, 2007). The public should also be informed that all water sources, including bore wells, can be contaminated with disease-causing microorganisms due to poor sanitation practices.

Involve communities in devising, installing, and managing bore well drinking water delivery systems and sanitation programs. Drinking water and sanitation technology employed in rural communities of Nigeria should be uncomplicated, reliable, cost-effective, and easy to maintain (PACN, 2010).

What are the alternatives to the provision and availability of water to the citizens of Nigeria?

Substitute water provisioning methods encompass alternate water sources like rainwater, grey water (non-industrial wastewater generated from domestic activities), and reclaimed water (previously treated wastewater devoid of solids and specific impurities). These alternative water origins can be amassed and processed locally, amenable to organization at various levels, including decentralized setups. These systems are operational in rural regions and burgeoning urban centres, notably in nations like Australia, Spain, and select states in the United States.

However, their application in urban settings is implicitly curtailed across most OECD nations (OECD, 2009).

A burgeoning array of applications exemplifies the implementation of alternate water systems in urban locales within developed economies. Experiments with such systems are on the rise in established European nations, where cities are equipped with centralized infrastructure for water supply and wastewater collection and treatment. For instance, in BedZED (U.K.), renewable water sources (rainwater, reclaimed water) cater to 18% of the daily water consumption. Wastewater undergoes treatment in a "Living Machine" (Green Water Treatment Plant), where biological and ultraviolet light treatments render the water compliant for toilet flushing and gardening (OECD, 2009).

The merits of alternative water origins include favourable environmental externalities, diminished energy consumption, and the possibility of tapping into fresh funding sources. Conversely, drawbacks encompass health concerns tied to potable reuse, applicability quandaries when central infrastructure is established, and inadequate supervision and regulatory frameworks. Alternate water systems can prove cost-effective in certain scenarios. Hence, policy challenges can be mitigated by forging technology-neutral enabling structures that address concerns regarding public engagement, transparency, accountability, and obligations. These frameworks would ensure the viable deployment of alternative water systems, assisting in tackling water supply challenges faced by OECD countries where central infrastructure is already entrenched (OECD, 2009).

What is the level of cleanliness of all of Nigeria's states and local governments?

In 2022, the number of Nigerians residing in unsanitary conditions increased to 176.3 million, up from the 172 million reported in 2021. Akwa Ibom stood out for its high level of cleanliness, achieving a score of 80%. Conversely, Kogi and Zamfara had the lowest scores at 9% and 10%, indicating a relatively poor level of cleanliness. Clean Up Nigeria (CUN) urged citizens to prioritize robust personal hygiene, follow good sanitation practices, and ensure proper waste disposal in designated areas (CUN, 2020).

During a press briefing in Abuja, Clean-Up Nigeria presented findings from the National Technical Study Group (NTSG) for the 2021 State/Cities Cleanliness Performance Rating. The ratings were determined through physical verification (30%) and satellite imagery data (70%), considering several performance indicators. These indicators included Streets/Roads Cleanliness (30%), Vegetation/Drain Control (15%), Waste Management Services (30%), Public Opinion Poll (POP) (10%), and Knowledge, Attitude, and Practice (KAP) of hygiene and sanitation within the population (15%) (CUN, 2020).

This data was summarized from the monitoring and evaluation report of the 2020 CUN national technical study group, focusing on the nation's cleanliness index ratings for states across the federation (CUN, 2020).

Table 3.0: Summary of monitoring and evaluation report of the 2020 CUN national technical study group on the nation's cleanliness index ratings for states of the federation (CUN, 2020)

S / N	STATES	TOTAL PERCENTAGE OF SCORES (%) 100 %
1	Akwa Ibom	80%
2	Ebonyi	44%
3	Lagos	41%
4	Bauchi	29%
5	FCT	29%
6	Cross River	24%
7	Rivers	22%
8	Plateau	21%
9	Niger	20%
10	Ekiti	20%
11	Oyo	20%
12	Ogun	19%
13	Delta	19%
14	Benue	19%
15	Enugu	18%
16	Anambrat	18%
17	Edo	18%
18	Kaduna .	17%
19	Imo	16%
20	Borno	16%
21	Sokoto	15%
22	Gombe	15%
23	Adamawa	14%
24	Kwara	14%
25	Bayelsa	14%
26	Katsina	13%
27	Ondo	13%
28	Taraba	13%
29	Jigawa	13%
30	Yobe	12%
31	Nasarawa	12%
32	Abia	11%

33	Kano	11%
34	Osun	11%
35	Kebbi	10%
36	Zamfara	10%
37	Kogi	9%

Table 4.0: Summary of monitoring and evaluation report of the 2020 CUN national technical study group on the nation's cleanliness index ratings for towns/cities in Nigeria (CUN, 2020)

S / N	STATES CAPITAL / CITTY	TOTAL PERCENTAGE OF SCORES (%) 100 %
1	Abuja	68%
2	Uyo	63%
3	Ikeja	44%
4	Abakaliki	39%
5	Calabar	36%
6	Bauchi	32%
7	Ibadan	29%
8	Kaduna	28%
9	Port Harcourt	27%
10	Minna	27%
11	Jos	26%
12	Abeokuta	24%
13	Umuahia	21%
14	Akure	21%
15	Ilorin	20%
16	Akwa	20%
17	Sokoto	20%
18	Jalingo	19%
19	Damaturu	19%
20	Enugu	17%
21	Gusau	17%
22	Markudi	17%
23	Dutse	17%
24	Benin City	16%
25	Oshogbo	16%
26	Ado - Ekiti	15%
27	Owerri	15%
27	Owerri	15%
28	Yenagoa	14%
29	Lafia	14%
30	Kano	14%
31	Asaba	14%

32	Yola	13%
33	Katsinal	12%
34	Gombe	12%
35	Beiri - Kebbi	12%
36	Lokoja	11%

What are the proven means of sanitation for the various states in Nigeria?

In Nigeria, guaranteeing appropriate sanitation methods is critical for the public's well-being and the environment. A comprehensive strategy is necessary to tackle the obstacles and advocate for cleanliness throughout diverse regions. The foremost crucial factor is granting entry to safe and hygienic toilet facilities to discourage open defecation and hazardous waste disposal. Sufficient sanitation facilities are pivotal in lessening the transmission of diseases resulting from poor sanitation. Moreover, ensuring a secure water supply is imperative; this entails treating water to preserve its purity and ensuring its availability through correct distribution networks. Pure drinking water is fundamental to good health and cleanliness (Dajufo, 2016).

Efficient management and treatment of wastewater represent another pivotal element. Forming systems to adequately treat and dispose of sewage and wastewater aids in averting water pollution shielding water reservoirs from impurities. Simultaneously, proper Control of solid waste is vital. Methods like waste gathering, recycling, composting, and appropriate disposal can drastically reduce environmental pollution. Promoting hygiene is equally crucial, encompassing public campaigns to enlighten communities about appropriate hygiene practices such as regular hand washing, ensuring food safety, and sustaining personal cleanliness (Dajufo, 2016).

Overseeing disease-transmitting carriers like mosquitoes and flies via effective waste control and insecticide utilization is part of the all-encompassing approach. Additionally, overseeing healthcare waste to preclude infections and uphold public health is critical. Community engagement and education are pivotal in ensuring the triumph of sanitation initiatives. Involving communities and providing instruction regarding the importance of proper sanitation and hygiene practices nurtures a sense of obligation and dedication. Moreover, institutional and

policy encouragement is vital; imposing and executing policies and regulations at diverse government tiers promotes appropriate sanitation, hygiene, and environmental sustainability. Lastly, embracing innovative technologies, like environmentally friendly restrooms and intelligent waste management systems, can revolutionize sanitation techniques, further advancing public health and sustainability endeavours across the varied states of Nigeria (Dajufo, 2016).

Can recycling and other modern means of sanitation help in Nigeria?

Nigeria grapples with a pressing waste management challenge due to rapid population growth and urbanization, resulting in pollution and adverse public health impacts. Effective waste management strategies, particularly contemporary sanitation and recycling, hold the key to mitigating this crisis and fostering a cleaner, healthier environment (Environmental Biotechnology, 2003). Modern sanitation methods encompass efficient gathering, treatment, and reuse systems for wastewater and appropriate solid waste disposal techniques. By integrating these strategies, sanitation throughout the country can be significantly improved.

Adopting modern sanitation techniques offers a transformative potential in addressing the sanitation crisis in Nigeria. Improved wastewater treatment can substantially reduce water contamination, leading to a decrease in waterborne diseases. Additionally, appropriate solid waste disposal methods like recycling, composting, and incineration can relieve landfill pressure and provide efficient waste management solutions. Recycling, in particular, stands out for its ability to convert waste materials into reusable resources, contributing to a sustainable environment (George and Frank, 2002).

Furthermore, integrating recycling practices into waste management addresses environmental concerns and holds significant economic benefits. Recycling initiatives can boost employment opportunities, stimulate entrepreneurial activities, and drive innovation in waste reduction strategies and resource recovery. By embracing recycling and modern sanitation, Nigeria can pave the way for sustainable waste management, improving public health, environmental conservation, and economic growth (Odoh and Emmanuel, 2021). These practices represent vital components of a comprehensive approach to tackling Nigeria's waste management challenges, setting the stage for a sustainable future.

What is the relationship between urban cleanliness and government sanitation efforts in each state in Nigeria?

Urban cleanliness in Nigeria is fundamentally intertwined with governmental policies and initiatives implemented at the state level. Each state's government sets regulations concerning waste management, sanitation standards, pollution control, and urban planning, which are pivotal in maintaining clean urban areas. States like Akwa Ibom and Lagos, with well-defined and effectively enforced policies, generally experience cleaner urban environments. Additionally, investment in critical infrastructure, such as waste management systems, efficient drainage, and sewage facilities, plays a crucial role in urban cleanliness. States that prioritize and uphold robust infrastructure witness a positive impact on the overall cleanliness of their urban areas (Ezeudu, 2020).

The level of enforcement of sanitation laws is a significant determinant of urban cleanliness in Nigeria. States with active enforcement mechanisms and penalties for violations, such as littering and illegal dumping, observe a higher level of compliance, leading to cleaner urban spaces.

Stringent enforcement drives behavioural changes and promotes responsible waste disposal practices. Public compliance is vital and can be fostered through awareness campaigns and education about proper waste management. States that actively engage their communities in these initiatives generally maintain cleaner urban environments (USAID, 2023).

Socioeconomic conditions within a state play a pivotal role in determining the focus and funding allocated to sanitation efforts, ultimately impacting urban cleanliness. States with stronger economies may dedicate more resources to sanitation initiatives, while economically challenged states may face limitations. Furthermore, the efficiency and dedication of local governance and leadership are key factors influencing urban cleanliness. States benefit from proactive local governments that effectively implement sanitation policies and ensure cleanliness, indicating that leadership committed to the cause drives sustainable sanitation efforts within urban areas (Ezeudu, 2020).

How can Nigeria and its constituent states truly achieve this SDG?

Firstly, the country should reinforce its policy and legislative frameworks, bolstering water management, sanitation, and hygiene regulations. Implementing laws that encourage responsible water usage, pollution reduction, and proper waste disposal is crucial. Moreover, substantial investment in sustainable water and sanitation infrastructure, especially in underserved regions, is essential to enhance efficiency and accessibility. This includes building wastewater treatment facilities and efficient waste management systems to curb pollution and protect water sources.

Education and community engagement form a vital aspect of SDG 6 attainment. Public awareness campaigns should educate communities on the significance of clean water, proper sanitation, and hygiene practices. Additionally, integrating hygiene and sanitation education into

the school curriculum will instil a culture of cleanliness and responsible water usage from a young age. Community involvement in planning, implementing, and monitoring water and sanitation initiatives is critical to ensure these projects cater to local needs and endure in the long run. Encouraging community-led sanitation programs fosters better hygiene practices and efficient waste management.

Sustainable financing and climate resilience must also be at the forefront of strategies. Mobilizing funds from diverse sources like public budgets, international aid, private sector investment, and community contributions is essential to ensure a sustained financial base for water and sanitation projects. Establishing water tariffs and user fees can fund operations, maintenance, and future investments. Furthermore, adapting to climate change impacts through climate-resilient infrastructure and practices is paramount. Integrating climate adaptation strategies into water and sanitation planning and management helps address the environmental challenges that impede progress towards SDG 6.

6.0. Conclusion

In confronting the grave water quality and sanitation challenges across Nigeria, urgent actions are imperative to advance towards SDG 6, focusing on clean water and sanitation. Efforts must revolve around enhancing water and wastewater treatment technologies, making them suitable by considering the lack of appropriate infrastructure and the region's unique characteristics. This transformation necessitates collaboration from all stakeholders, encompassing governments, non-governmental organizations, private sectors and the communities. Notably, while external aid is crucial, the internal efforts of a country's government are paramount for achieving safe water and sanitation and fostering a healthy ecosystem. Furthermore, addressing the critical issue of access

to safe drinking water in rural Nigeria demands a holistic approach involving the engagement of rural populations, education on proper water handling, and regular monitoring of water systems to ensure purity. Lastly, there is a need for data collection and an evolving database to guide targeted interventions based on variables predicting water quality and sanitation levels, reinforcing the essential linkage between socioeconomic progress, water quality and sanitation improvement. These insights underscore the urgent and interdependent actions required to advance clean water and sanitation efforts in Nigeria, underscoring the criticality of internal resolve and international collaboration for lasting impact.

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