

The Greater Makurdi Water Works and Water Distribution Challenges in Makurdi Metropolis

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ABSTRACT

Access to safe and reliable water remains a major challenge in many rapidly urbanizing cities in sub-Saharan Africa despite substantial investments in water infrastructure. This study examines the Greater Makurdi Water Works Project and the persistent challenges of water distribution in Makurdi Metropolis, Benue State, Nigeria. Drawing on archival records, oral interviews with key stakeholders in the water sector, field observations, and relevant secondary literature, the study investigates the historical evolution of public water supply and evaluates why water scarcity continues despite the commissioning of the Greater Makurdi Water Works in 2012. The findings reveal that while successive governments expanded water distribution networks, investments in production capacity, reticulation infrastructure, maintenance, and institutional reforms were often inadequate. The study further demonstrates that aging pipelines, weak revenue collection mechanisms, poor asset management, governance inefficiencies, and inadequate funding significantly constrained the operational performance of the water utility. These challenges have resulted in intermittent water supply, increased dependence on private boreholes and water vendors, and growing inequalities in access to potable water. Situating the Makurdi experience within contemporary debates on urban water governance and public utility management, the paper argues that infrastructure expansion alone cannot guarantee improved service delivery without corresponding institutional reforms, financial sustainability, and accountability mechanisms. The study recommends integrated infrastructure rehabilitation, modernization of billing and monitoring systems, enhanced public-private collaboration, and governance reforms aimed at improving efficiency and equitable access to potable water in Makurdi metropolis.

Keywords: Urban water governance, public utility management, Greater Makurdi Water Works, potable water supply, water distribution, Makurdi metropolis, Nigeria.

INTRODUCTION

Public water supply in Makurdi metropolis- the Benue State capital in Central Nigeria was mainly undertaken by government agencies but it became glaring that public demand for potable water in the metropolis could not be met by only the government. Indeed, the steadily increasing number of private boreholes in the metropolis is indicative of the inability of government agencies in meeting the water needs of Makurdi residents. Since the colonial period when cooled steam from locomotives was used to serve the water needs of designated quarters in Makurdi several efforts have been made by the federal and state tiers of government to provide water for the residents. These efforts also included the establishment of water schemes to harness surface water sources, the establishment of a water Board to treat and distribute water as well as the drilling of boreholes. The federal government for instance, constructed earth dams and sank boreholes in the area. It is also on record that members of the federal and state legislative bodies also contributed in providing boreholes in some parts of Makurdi as part of their constituency projects. The Greater Makurdi Water Works stands out as the largest water project embarked upon by the Benue State government and despite being touted as the solution to the

persistent challenge of water scarcity in Makurdi, residents of the state capital still spend hours in search of water hence the need to examine the challenges of the project.

The problem of water scarcity in Makurdi is befuddling as the metropolis is bifurcated by the River Benue – the second largest fresh water body in Nigeria. Water can also be easily sourced from shallow wells given the marshy nature of Makurdi during the rainy season but the quality of the water is questionable and when the dry season sets in, even non – potable water becomes scarce. Makurdi is an assumed circular settlement with a radius of 20km and an area of about 800km². The town began as a riverside settlement during the pre-colonial period and metamorphosed into a labour camp site with the arrival of the rail line from Enugu between 1922 and 1924. Makurdi became the headquarters of the then Benue Province in 1927. In addition to the trading ports in the area, the construction of a bridge across the River Benue between 1928 and 1932 drew more people to Makurdi.

From a meager population of 6338 people in 1938 the settlement increased to 8772 people in 1947 (NAK/SNP, 1935-1948). In 1963, the population of Makurdi had increased to 174,719 and surged to 106,000 people in 1976 with the town becoming the capital of the newly created Benue State. The 1991 Population Census showed that the population of the town had increased to 239,889. The population later increased to 300,377 in 2006 while the projected population of the town by 2015 was pegged at 380,509 (Tser, 2013). Since evolving into a large settlement, the agencies responsible for water treatment and distribution have not lived up to their responsibility. This is even as the Benue-Plateau State and later, Benue State governments initiated policies through agencies like Benue State Public Utilities Management Board (BSPUB) and Benue State Water Board. The Benue State Government therefore inaugurated the Greater Makurdi Water Works which was touted as the solution to the problems of potable water supply in Makurdi to no avail. The aim here is to therefore examine the Greater Makurdi Water works project within the context of why the problem of public water supply has continued to linger in Makurdi metropolis.

RESEARCH METHODOLOGY

This study adopted a qualitative historical research design complemented by case-study analysis. The research relied on multiple sources of evidence, including archival documents, oral interviews, direct observations, government reports, newspaper publications, and relevant scholarly literature. The triangulation of these data sources enhanced the credibility and reliability of the findings.

Primary data were collected through semi-structured interviews conducted with officials of the Benue State Water Board, water tanker operators, public servants, and residents of Makurdi metropolis who possessed direct knowledge of water supply and distribution challenges. Interview participants were purposively selected based on their involvement in water management, policy implementation, or experience as consumers of public water services. Interviews focused on water production capacity, distribution networks, institutional performance, tariff administration, infrastructure maintenance, and challenges affecting service delivery.

Secondary data were obtained from archival materials housed in the National Archives Kaduna, Benue State Water Board records, government publications, population reports, newspaper reports, and scholarly literature on water governance and public utility management. Field observations were conducted in selected areas of Makurdi to assess the condition of water infrastructure, leakages, distribution networks, and alternative water sources utilized by residents.

Data were analyzed using thematic content analysis. Interview transcripts, documentary evidence, and observational notes were systematically coded and organized into major themes, including historical development of water infrastructure, institutional governance, infrastructure deficits, financial sustainability, distribution challenges, and alternative water supply mechanisms. Patterns emerging from multiple sources were compared and interpreted within broader theoretical discussions on urban water governance and public utility management. The use of multiple sources facilitated data triangulation and enhanced the validity of the study's conclusions.

Ethical considerations included obtaining informed consent from all interview participants, assuring anonymity where necessary, and ensuring that information provided was used strictly for academic purposes.

Public Water Supply in Makurdi before 1976

The local population in Makurdi used to rely on the use of ponds, rain, and shallow wells for drinking and other purposes during the pre-colonial period. The situation remained the same during the colonial period except that the colonizers used boiled and filtered river water. Condensed steam from locomotives became the source of water for the Europeans in and around Makurdi with the advent of the locomotive in the area. As the population increased with increasing levels of sewage contamination of water sources, the Public Water Works Department was created for the treatment and distribution of water. At independence (1960) the operations and maintenance of the Public Water Works Department remained unchanged from what it was during the colonial period. The Department still relied on the Railway Corporation for sourcing of water from the river. The distribution of water to the public still remained the responsibility of the Public Water Works Department which collected water bills out of which it paid the Railway Corporation for its services. The Nigeria Railway Corporation continued to operate at an installed capacity of 170,000 gallons per day out of which the corporation consumed 60,000 gallons daily. The remaining 110,000 gallons was supplied to government structures and the public (NAK/SNP, 1935-1948).

There was no improvement in the water treatment and distribution infrastructure in Makurdi 15 years after independence and the facility continued to operate at a capacity of 170,000 gallons per day. In 1976 however, the J. D. Gomwalk-led administration in Benue Plateau State divorced the Makurdi water works from the Nigeria Railway Corporation. This machinery which had the capacity of supplying 3,423 cubic litres per day was installed to serve the town's population of 106,000 people (NAK/SNP, 1935-1948). This supply too was grossly inadequate hence; it was restricted to the Railway Station, Railway Quarters, GRA, and Madikpo areas of the town.

Establishment of Benue State Water Board

In 1976, Benue State was created out of the defunct Benue-Plateau State and Makurdi was designated as the capital of the State. Also, there was the amendment of the statutory corporation's edict of 1974 leading to the establishment of the Benue State Water Board (BSWB) in 1976 (BSWB/HQ/S, 1998). The Benue State Water Board was vested with the task of controlling and managing all water works and groundwater in the state; establishing, managing, controlling and developing new water works for the public; ensuring the supply of adequate and potable water throughout the state at reasonable charges; and encouraging, from time to time, the conduct of research for the purpose of carrying out its functions. With the establishment and full take-off of the Benue State Water Board, existing water schemes in the state alongside newly developed ones were placed under the management of the Board. The Board was responsible for the management of the three main urban water schemes namely the Makurdi Water Works, the Katsina-Ala water scheme which already existed as a municipal water scheme during the defunct Benue Plateau State, and which was commissioned in 1993 to supply 5,400cm³ of water per day, and the Gboko water scheme, at Ameladu that was commissioned in 1993 to supply 9,450cm³ of water per day (BSWB/HQ/S, 1998).

The major achievement of the Board in Makurdi was the expansion of the water generating capacity in the town from 3,423 cubic litres to 18,000 cubic litres (BSWB/HQ/S, 1998). This project was commissioned by Colonel Abdullahi Shelleng, then military administrator of the State in 1978 ((BSWB/HQ/S, 1998). In 1978, the responsibilities of the Water Board were enlarged to include rural electrification, resulting in the birth of the Benue State Public Utilities Board, BSPUB (BSWB/HQ/S, 1998). This arrangement too did not last, as the edict was again amended in 1979 to create the Benue State Water Corporation under the leadership of Aper Aku as the first Executive Governor of Benue state.

During the administration of Aper Aku as Governor of Benue state, there was remarkable expansion in the infrastructural base of the state although this did not improve the generating capacity of the water sector. Rather government efforts relating to the water sector were more concerned with the expansion of the distribution network. In what can be termed as Aku's Old Makurdi Water works, the administration extended

water supply pipelines to industries and the residential areas it had created such as Benue Hotel, Benue Breweries and Benue Bottling Company as well as the Benue State Civil Service Secretariat (Consumer, Benue State, personal communication, June, 8, 2013). By this time, the population of the town was on a steady increase hence there was the need to open up new areas. It is also important to explain here that despite the expansion in the water reticulation system in Makurdi, many other parts of the town (such as Kanshio, Yaikyor, Welfare Quarters, part of Modern Market Area and North Bank) and its environs lacked access to potable water sources. While the administration of Aper Aku can be considered as one which made significant effort in the aspect of reticulation in the water sector in Benue state, it is important to observe that the administration rather expanded the reticulation system without improving on the production capacity. To this end, more pressure was exerted on existing water supply infrastructure in the town. However, the administration could not continue with its infrastructural development programme as the military took over power, December, 1983.

With the return of the military, an enabling edict No.7 of 1986 was enacted and the State Water Corporation was renamed the Benue State Public Utilities Board again (BSWB/HQ/S, 1998). The activities of BSPUB then were rather more concentrated in the rural parts of the state hence, no remarkable projects were undertaken in Makurdi. In January, 1991, the BSPUB was merged with the Rural/Community Development units of the defunct Ministry of Social Welfare to form the Ministry of Water Resources. The Ministry of Water Resources too was later dissolved within the same year and the Water Board re-emerged in its present form in July, 1991 with the enactment of the 1991 enabling edict (BSWB/HQ/S, 1998). The responsibilities of the Benue State Water Board were to construct, operate and maintain water works and dams for the purpose of potable water supply in order to meet the ever increasing demand for water in urban and semi-urban areas within the state. It was also to be responsible for advising, formulating and implementing policies towards efficient and effective supply of potable water in the state (BSWB/HQ/S, 1998).

The Benue State Water Board operates under the following administrative structures: Personnel/Administration, Finance and Supply, Planning/Research and Statistics, Mechanical/Electrical, Building/Civil Engineering and Water Supply. The water Board had twenty-four water supply schemes that were spread across the state and this fell under the Board's four area offices located at Makurdi, Gboko, Otukpo, and Katsina-Ala. Each of the four area offices was responsible for the water schemes covering a given geographical area of the state. In addition, the Board offered technical services to Nigeria Army School of Military Engineering (NASME) and Nigeria Air Force (NAF) Base water works all within Makurdi town. In Makurdi, the area office is located at the Makurdi Water Works, Beach Road.

After the Second Republic was terminated leading to change of leadership in Benue State, no significant development was recorded in the water sector in Makurdi until the election of Rev. Fr. Moses O. Adasu as governor of the state. One of the major contributions of Rev. Fr. Moses Adasu's administration to water treatment and distribution in Benue State generally and Makurdi in particular was the rehabilitation of the Benue State Water works through the involvement of Bi-water Company. The administration also proposed a new site for the "Second Makurdi Water Works" which Bi Water deemed as being non-feasible because the proposed site which was to be situated between the Benue State University and Benue Brewery Limited along the south bank of the River Benue was liable to flood.

During the administration of George Akume which stretched from 1999 - 2007, as Governor of Benue State, Makurdi town witnessed unprecedented expansion in terms of settlements which was most probably due to the economic stability that accompanied Nigeria's return to democratic governance. For instance, the Owner-Occupier Housing Estate was established by the administration as well as Judges Quarters as model layouts that needed water supply. To this end, considerable efforts were made by the administration to extend water supply to some parts of the town such as newly established layouts particularly the Judges Quarters. A logical consequence of this expansion as earlier mentioned was increased pressure on the existing water infrastructure in the town. This was particularly more so as all successive administrations in the state were more concerned with expanding the water supply network without commensurate effort towards the generation aspect. Consequently, the extension of water supply to these areas exacerbated the problem of shortage of potable water in the state.

Another development which had direct implications on the problem of potable water supply in Makurdi was population increase. In this regard, the population of Makurdi had increased to 300,377 in 2006 from 226, 198 in 1991 (Consumer, Benue State, personal communication, June, 8, 2013). This had implications for the existing water infrastructure in the town in the sense that the water infrastructure could not cater for the population. Based on the 2006 population census, Makurdi had a population of about 300,377 people, and as such estimates by the Water Board placed the water needs of the town at 47,000 cubic liters per day (BSWB/HQ/S, 1998). However, 18,000 cubic liters of water is released by water Board to the public per day due to the problem of reticulation. To this end, the State Government contracted Bi-water for the expansion of the water infrastructure in the town. This led to the installation of two overhead water reservoirs at Rocon Park Ankpa Quarters and the Eastern Wing of Benue State University in 2005.

The aim of these reservoirs was to aid the distribution system as the tank on Eastern Campus of Benue State University was meant to serve the Benue State University community, Judges Quarters, International Market area and Terwase Agbadu axes. The tank located at Rocon Park, Ankpa Quarters was on its part, expected to serve Ankpa Ward, Modern Market and the environs of Tionsha, Adaka and Uchen. However, the reticulation system of the Board could not support this idea as proliferation of water vendors in the town increased to underscore the problematic nature of water supply. Another reservoir was proposed for Agan. It was expected to supply water for residents of North Bank area of Makurdi but this did not materialize. Initially, the communities in North Bank area of Makurdi obtained their supply of water from Nigeria Army School of Military Engineering (NASME). However, due to frequent pipe breaks, this pumping was stopped as a result of the high cost involved in maintaining and repairing the broken pipes. It was during the tenure of Professor Yegh Abaa as the General Manager Water Board the policy mandating the Benue State Water Board to manage the water treatment and supply facilities of the NASME, Air Force Base and University of Agriculture, Makurdi was reversed. Water Board therefore withdrew from managing these water treatment plants hence it became the responsibility of the respective institutions. However, Benue State Water Board continued to offer technical services and advice relating to water treatment and supply to the institutions concerned.

The aforementioned efforts by George Akume's administration to ameliorate the problem of potable water in Makurdi did not produce the expected outcome by the consuming public. The reason for this was obvious. While the distribution network was being expanded, no efforts were made to upgrade the treatment facility hence it could not sustain the pressure arising from an expanded distribution network. It was perhaps in an attempt to surmount this challenge that the idea of Greater Makurdi Water Works was conceived by the Akume administration. The Greater Makurdi Water Works was considered as a gigantic potable water generation project that would provide a long lasting solution to the problem of potable water supply in Makurdi and its environs. Feasibility studies for the project were carried out and modalities were put in place for the project. Contract was also awarded and a site was cleared for the take-off of the Greater Makurdi Water Works which was then projected to have a daily generating capacity of 45,000 cubic liters of water. There are indications that the contract for the project worth N3 billion (Federal Information Center Report, 2012, October, 29th) was awarded to Bi-Water, British firm. However, work did not commence on the site before the administration of George Akume as Governor of the State was rounded up in 2007.

On the other hand, the then Benue State Commissioner for Water Resources, John Ngbede disclosed that the Board had approved a flat monthly water rate of N2, 000 (12.50 USD) which according to him, was quite reasonable (Consumer, Benue State, personal communication, March, 26, 2013). The commissioner therefore lamented that indigenes of the state were usually misled by opposition politicians who used promises of free water as a tool to canvass for votes. To this end, he had decried the situation where residents of the state had become overly dependent on the government to do all things for them for free. The Commissioner's argument is rather lopsided as it completely heaps blame on residents of Makurdi town in particular while absolving the government of any blame. It is only logical to consider the fact that as at 2012, the cost of providing water to residents of Makurdi could not be realistically offset by the scanty number of consumers enlisted by the Water Board and whom the Board could not effectively account for. Thus, while it is important for consumers to pay promptly for water consumed, it will be realized that this alone cannot sustain the cost of water production and

distribution hence the excuse that non-payment of water rates is responsible for the epileptic nature of potable water supply in Makurdi is rather unconvincing.

In view of the foregoing, it is quite logical to doubt the reiteration by Ngbede that if people paid their water bills, water would definitely reach their houses (Consumer, Benue State, personal communication, March, 26, 2013). The implication of this statement is that the inability of the Water Board to supply potable water to households within the town stems from the refusal of water consumers to pay for services rendered by the Board. Conversely, the inability of the board to realize revenue from water consumers is an indication of the ineffectiveness of the Board. There are indications that water consumers in Makurdi town do not see the N2, 000 flat monthly charges for water consumption as being justifiable. It is apparent that there is neither a clear system for water billing nor one that tracks revenue and grants in Makurdi from the national government. Hence, residents have no guarantee that paying the bill will result in actual service. This situation is compounded by the fact that areas that sometimes go for more than four months without a drip of water from the Board are still expected to pay this flat charge.

Going by the fact that the Water Board is ineffective in terms of consumer enumeration, it is unaware of the existence of some consumers. The Board is also ineffective with regards to its inability to prosecute even a handful of those who connected to their pipes illegally to serve as deterrence. A major consequence of this is the creation of the impression that those paying water rates are “scape goats or unintelligent”. It therefore means that the few who pay are made to shoulder the burden of others. Indeed, water consumers in Makurdi town may have fair grounds to argue upon especially if the situation is considered from a retrospective angle. During the colonial period, the water rates charged were proportional to the services which were also efficient. For instance water rates were reduced in March 1947 to reflect the shortage in public water supply as a result of a strike that was embarked upon by railway workers. It was perhaps on this basis that cases of accumulated water bills were rare during the colonial period.

The scale of existing charges as presented by the Benue State Water Board above as contained in the Consumer Information Guide, an outdated publication does not exactly reflect the water billing system in Makurdi town. There are inconsistencies between the cost of water as presented by Water Board, and what it actually costs the water vendors to get water from the same Board. It either means that the Board lacks accurate statistical data on water rates particularly in Makurdi town or it is economical with facts. Findings from the Chairman of the Water Tanker Drivers’ Union showed that until 2012, a tanker load of water used to cost N500.00. However beginning from 2012, the price was increased to N2, 500 whereas the Board’s bulletin as shown on table 3 shows as N10.00 per 1000 gallons. This was resold to consumers in the town at a price which ranged between N5000 and N8000 per tank load. By 2025 residents has to pay as much as N25, 000.00 per tanker. On the other hand, water vendors using carts for delivery purchased at the rate of N200.00 – N300.00 per cart. This was resold at a cost which varied from N200.00 to N350.00 all depending on the distance (Consumer, Benue State, personal communication, June, 8, 2013).

The question raised by the foregoing is this, if an individual can buy water from vendors for as much as N25, 000.00 per tanker or N1,000.00 for a cart containing 200 – 240 litres of water (The carts used by vendors usually convey 10 or 12 jerry cans of which hold 20litres of water each), why then is it difficult for the same person to pay a monthly water bill of N2, 000 which is by far cheaper than the cost of obtaining water from vendors? The answers to this question can be traced to the capacity of the Water Board in terms of service delivery and the attitude of the public towards public facilities. For one reason there is inconsistency in the services rendered by the Water Board and the other; public utilities and facilities are handled with contempt.

The above argument does not mean that significant revenue is not generated from water bills. The Benue State Water Board generates significant revenue from water rates as N37, 371,259.2 was generated between 2009 and 2012 while the receivable total on number of connections in same period was N45, 114,153.3. It was glaring that it would be difficult for the Water Board to sustain its operations if it is to bear responsibility for the salaries of its staff. However, the Benue State government is responsible for the payment of the salaries of the staff of the Water Board. In this regard, what the Board does with the revenue that it generates in the wake

of its increasing inability to produce and distribute adequate potable water in its coverage area remains the question.

Greater Makurdi Water Works Project

Since 1978 when the generating capacity of the Makurdi Water Works was scaled from 3,423 cubic litres to 18,000 cubic litres by the administration of Colonel Abdullahi Shelleng, successive administrations in Benue State were mainly occupied with the expansion of the water distribution network in the state (Consumer, Benue State, personal communication, June, 8, 2013).

The implication of this expansion was that it exerted more pressure on the existing water works which had to meet the demand of a population increase that was not envisaged. However, the administration of late Rev. Fr. Moses Adasu realized the need to upgrade the production capacity of the Water Works in 1992 hence it proposed a site for a new water works project which was to be located about 8 km east of the New Benue Bridge (BSWB/HQ/S, 1998). The project however, did not materialize before the short-lived administration came to an end in 1993.

When George Akume assumed office as Governor of the State in 1999, he also extended water supply to other parts of Makurdi town such as Commissioners' Quarters and Nyiman Layout. However, the fact that the existing water production facility could not cope with the expanding supply network was glaring. Thus, the Akume administration initiated the idea of a Greater Water Works in 2003. The idea was to construct a water works that was greater than the existing Makurdi Water Works. Despite claims in some quarters that the Akume administration had awarded contract for the Greater Makurdi Water Works, work did not start on the site until the administration came to an end in 2007 (Consumer, Benue State, personal communication, March, 21, 2013).

The inability of the Akume administration to provide solutions to the problem of potable water supply in Makurdi despite initiating the Greater Makurdi Water Works project made public water supply one of the daunting challenges to be inherited by the Gabriel Suswam led administration which came on board in 2007. It was therefore the Suswam led administration that re-awarded contract for the Greater Makurdi Water Works project to the tune of N4.99bn. The project was touted to have a daily generation capacity of 100,000M³ and the contract was awarded to an Israeli firm, Gilmore Nigeria Limited, in 2007. There are indications that the decision to embark on the Greater Makurdi Water Works project was to keep pace with the ever changing Makurdi demographic progression as expressed through the development of new settlements (Consumer, Benue State, personal communication, March, 21, 2013). In this regard, government had to plan ahead particularly due to the rate at which the state population was increasing; hence the project was expected to serve the state capital for the next 100 years.

The decision to site the Greater Makurdi Water Works where it is presently located stemmed from the reason that the present water site has the highest depth at the point of pumping which can effectively accommodate the 'low lift pumps.' The implication of this argument is that throughout the course of flow of River Benue from Lokoja to Ibi, the spot where the Greater Makurdi Water Works is located has the highest point of water volume at all seasons of the year. Secondly, the place also has the highest height along the river side within Makurdi metropolis. Again, there is the added advantage of minimal risk of the water works submerging in the event of flood as was the case in 2012 when Benue State University, Makurdi, University of Agriculture, Makurdi and the Nigeria Army School of Military Engineering (NASME) water works along the Benue River were flooded.

Another factor that influenced the site of the Greater Makurdi Water Works where it presently stands (Premises of the Benue State Water Board) was the fact that the part of the River where it is sited is considered to possess the higher water yield when compared to other places and the area is good for reticulation coverage. The expert advice regarding the siting of the plant was supposedly given by Bi-Water Company when it was initially responsible for the execution of the project during the administration of George Akume, then Governor of Benue State. The firm had submitted that the site was the best place for a water project of the magnitude in Makurdi. This submission was based on a technique which relies on a period measurement of the

depth of the river. In this wise, the depth of River Benue where the Greater Makurdi Water Works is sited usually measures up to 7 metres deep by the side of the river and 14 metres at the middle of the river during the dry season and the depth extends to as much as 27 metres during the rainy season (Consumer, Benue State, personal communication, June, 8, 2013).

Urban Water Governance and Public Utility Management

Contemporary studies on urban water governance emphasize that effective water service delivery depends not only on physical infrastructure but also on institutional capacity, accountability, financial sustainability, stakeholder participation, and regulatory effectiveness (UN-Water, 2023; OECD, 2021). Rapid urbanization across developing countries has placed significant pressure on existing water systems, resulting in service deficits, infrastructure deterioration, and increased reliance on informal water markets.

In many African cities, public water utilities face challenges associated with aging infrastructure, inadequate cost recovery, weak maintenance cultures, political interference, and limited investment in network expansion (World Bank, 2022). Consequently, even where treatment facilities possess sufficient production capacity, distribution bottlenecks often prevent water from reaching intended beneficiaries. This phenomenon has been documented in cities such as Lagos, Nairobi, Accra, and Kampala, where deteriorating reticulation systems and governance deficiencies contribute to intermittent water supply and unequal access to potable water (Ainuson, 2022; Nilsson & Nyanchaga, 2021).

Recent scholarship further argues that successful urban water governance requires integrated planning that combines infrastructure investment with institutional reforms, transparent tariff systems, customer accountability mechanisms, and participatory governance structures (Biswas & Tortajada, 2023). The experience of Makurdi therefore reflects broader challenges confronting urban water utilities across sub-Saharan Africa.

Challenges of Water Distribution in Makurdi Metroplis

Despite the commissioning of the Greater Makurdi Water Works in 2012 (five years after contract for the project was awarded), residents of Makurdi and its environs who were the target population of the project have not felt its impact. Even after the completion of the project, the Benue State Water Board has continued to release about 18,000m³ of water per day which serve a few areas within the town. Even this quantity cannot be guaranteed on a daily basis or for 24 hours a day. However, sources at the Board contended that the installed capacity of the Water Works as at 2012 was 47,000m³ which was the estimated quantity of water needed by residents of the town and its environs daily but this could not be supplied to the town due to the ageing reticulation infrastructure (Consumer, Benue State, personal communication, June, 8, 2013). The persistence of aging and deteriorated pipelines directly undermines distribution efficiency. Significant volumes of treated water are lost through leakages before reaching consumers, thereby reducing service coverage, and increasing operational costs. Consequently, despite improvements in treatment capacity through the Greater Makurdi Water Works Project, actual household access remains limited. Staff of the Board also argued that the Greater Makurdi Water Works could generate as much as 100, 000m³ of water but how this could get to the consumers was the problem (Consumer, Benue State, personal communication, March, 21, 2013).

In a bid to address the problem of water reticulation in Makurdi and its environs, expansion was undertaken by the Petroleum Trust Fund to reach the Federal Housing Estate, North Bank, Benue State University and its environs, Ankpa Quarters/Modern Market areas and Nigerian Army School of Military Engineering (NASME) water works under the project titled Makurdi Mini Booster Station (Daily Independent, March, 8, 2013). It was pointed out that Benue State government needed the sum of 17 billion naira to carry out reticulation work on the Greater Makurdi Water treatment plant which supports the 100,000 m³ capacity of the Greater Makurdi Water Works Project. There are arguments that Benue State was not financially buoyant enough to finance the reticulation project; hence a bill for the reticulation work was submitted to Minister of Water Resources for onward delivery to the President Consumer, Benue State, personal communication, March, 21, 2013). It was also pointed out that, the last reticulation in Makurdi was carried out in 1978 and since then, the town had expanded considerably thereby necessitating an overhaul of the existing reticulating system. Apart from the

fact that the emergent parts of Makurdi also need water, most of the old pipes were worn out and had leakages and needed to be replaced more so as they were no longer capable of sustaining pressure from the new generating facilities of the Water Board.

Another challenge to water distribution in Makurdi metropolis is weak revenue management. Ineffective consumer enumeration, inadequate billing systems, and poor revenue collection have reduced the financial sustainability of the Water Board. Sources at the Water Board usually blame water consumers for refusing to pay the stipulated flat monthly rate of N2, 000 (Daily Independent, March, 8, 2013). According to some of these sources; this refusal has largely been responsible for the lack of funds needed to sustain efficiency in the operations of the board. There have also been arguments that residents of the State were usually misled by opposition politicians who used the promise of providing water for free as a propaganda tool to canvass for votes. According to this source, the residents became totally dependent on government for the provision of amenities such as water for free as they became convinced that government was supposed to do all things for them for free. The Daily Independent had quoted a government sources as saying:

‘The problem (of water) is that a lot of them (Makurdi residents) cannot even connect pipes to their various houses. There is no main pipeline in town that if you break, you won’t see water. This water has to be connected to your house. It is not the responsibility of the Water Board to connect this water free of charge (Staff, Benue State, personal communication, March, 8,2013).

The submission above sharply contrasts with the actual situation on ground. Indeed, it is noteworthy that there is no clear structure for water billing or collection of water rates in Makurdi. There is also the apparent lack of effective monitoring machinery on the part of the Board to track revenue generated or fund injections (Daily Independent, March, 8, 2013). As argued by Adeyemi, a former Ogun State Water Corporation engineer, while it is necessary that cost recovery on water supply is made through the reasonable, practical and timely payment of tariffs on services, the managers of the sector must first enhance service coverage; enabling consumers, including the urban poor, access to water while ensuring a workable structure of payment which is efficient and consistent to acceptable regional benchmarks (Staff, Benue State, personal communication, March, 8,2013). There are opinions that people should pay for water because the average Nigerian can pay and will pay if they get the services. Again, it is argued that if the payment is made convenient while default is made difficult with the introduction of penalties there will be more compliance in payment (Daily Independent, March, 8, 2013). International evidence suggests that weak cost recovery mechanisms often constrain maintenance activities and delay infrastructure upgrades, ultimately resulting in declining service quality and intermittent water supply (World Bank, 2022).

It can therefore, be contended that the Water Board needs to do a lot of internal re-engineering in order to enhance the efficiency of its supply structure. If there is 95 percent collection efficiency, the per capital incidence of tariff will reduce. If we can achieve efficiency because we are bringing in technology among others and you can get 95 percent of consumers to pay, definitely in recovering cost, the tariff comes down. That is why efficiency is important at the service delivery end. Furthering this argument, Samuel Zaka, a resident of New GRA in Makurdi explained that:

‘We do not owe NEPA power bills. We want public utilities’. If I have good water, there are lesser diseases, why will I not pay? Do I prefer paying hospital bills? No! So if government gives us water and there are proper bills, we will pay. If these facilities are here we will gladly pay.’ (Daily Independent, March, 8, 2013).

The poor state of the water supply network in Makurdi town is exacerbated by leakages from broken pipelines. As a result of leakages from the old pipes, much of the water that was pumped to the town by the Water Board is wasted as it flowed freely along some streets and drainages. In some cases, people could be seen scooping water from the broken ends when water is pumped. In order to salvage the situation and improve the deplorable state of water distribution in Makurdi and its environs, the State government decided to procure water tankers shortly after the commissioning of the Greater Makurdi Water works in 2012. This had however been an old practice which is hitherto restricted within Makurdi town as far back as the 1980s.

The recent trend however involved the transportation of water to suburb areas such as Kanshio, Apir, Tionsha and Adaka in the southern bank and Agan, as well as areas such as Fiidi, Mu and Abua. The practice was not sustained as the tankers ceased to offer these services. Some of the tankers however continued to offer skeletal services to government officials. It is worthy to mention that the covenants of the National Water Rehabilitation Project sub-loan agreement between the federal government of Nigeria and participating states of the federation, the government of Benue State is required to, among other things, enact or amend an enabling edict that will give the Water Board some degree of autonomy and properly position it for commercialization. On its part, the federal government constructed numerous boreholes in Makurdi to provide potable water supply to the people in the area although some of the federal Government acclaimed water schemes in the area were non – existent or remained uncompleted. In Tatyough for instance, the MDG records in the state suggest that a borehole was sunk in the area whereas there is actually no borehole in the area. At LGEA Primary School, Wurukum and Holy Family Primary School, Kanshio, the boreholes do not have water while the water from the boreholes at Orowa, Agan and Adaka are too salty.

The findings further suggest that institutional and governance deficiencies constitute a critical barrier to improved water distribution. Contemporary urban water governance literature identifies transparency, accountability, and operational autonomy as essential factors influencing utility performance. Where governance systems are weak, infrastructure investments frequently fail to translate into improved service outcomes (OECD, 2021).

CONCLUSION

The current conclusion is rather brief and places excessive emphasis on corruption. A more balanced international-journal conclusion would read:

This study has examined the historical evolution of public water supply in Makurdi and assessed the performance of the Greater Makurdi Water Works Project within the broader context of urban water governance. The findings indicate that while substantial investments were made in expanding water production capacity, improvements in service delivery were constrained by inadequate reticulation infrastructure, weak institutional capacity, ineffective revenue management systems, aging pipelines, and insufficient maintenance. Consequently, the expected benefits of the Greater Makurdi Water Works have not been fully realized by residents of Makurdi metropolis.

The study demonstrates that water distribution challenges are not merely infrastructural but also institutional and governance-related. The increasing dependence on private boreholes and water vendors reflects deficiencies in public service provision and highlights the growing role of informal water markets in urban Nigeria. Addressing these challenges requires integrated infrastructure rehabilitation, modernization of distribution networks, improved financial management, enhanced utility autonomy, and stronger accountability mechanisms.

Ultimately, sustainable access to potable water in Makurdi will depend on the ability of policymakers to align infrastructure development with sound urban water governance principles and effective public utility management practices.

Contributions

This research was conceptualized and drafted by Geri Tor Godfrey. Aondoahemen Edward Adamgbe collected the data, designed, and wrote the manuscript. All the authors reviewed and edited the original manuscript.

Ethical Approval and Consent to Participate

This study was exempt from full ethical review by National Health Research Ethics Committee (NHREC, 2007) and Benue State Ministry of Health Research Ethics Committee guidelines under category as it involved minimal risk, non-sensitive ethical principles of voluntary participation, informed consent, confidentiality, and right to withdraw were strictly observed.

Consent for Publication

All participants provided consent for their anonymized responses to be used in this publication.

Competing Interests

Authors have declared that no competing interests exist.

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