



# Quality dimensions of public water services in Abuja, Nigeria



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## ABSTRACT

In developing countries, access to public water services does not ensure clean or reliable supply; nor does it indicate equitable delivery. Further, concentrating on accessibility offers a biased picture of performance and exaggerates the level of accomplishment, while concealing the presence of major challenges to further progress. Through a qualitative study, this article explores the quality dimension of water supply services in Abuja city, Nigeria. Data were obtained from in-depth interviews with residents and city officials, supplemented by personal observations. Lack of reliability, low water pressure, inefficient billing systems, inadequate facility maintenance, spatial inequality in service delivery, and lack of public involvement were found to immensely undermine the delivery of water services in the city. The paper concludes by suggesting ways of enhancing the quality of water services in Abuja and other developing areas.

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## 1. Introduction

Domestic water supply remains one of the top priorities of urban planners, policy makers, and international development agencies, given that potable water is essential for life and in protecting public health and raising citizens' living standards (Hewett and Montgomery, 2001; WHO/UNICEF, 2014). The importance of drinking water can also be seen in the large volume of capital investments in water infrastructure by governments and international donor agencies. In Nigeria for instance, the Federal Government budgeted ₦5611.7 million<sup>1</sup> (USD \$28.06 million) in 2013 for water supply in the Federal Capital Territory alone (Budget Office of the Federation, 2013, p. 851). Such investment commitments are based on the belief that more coverage will help achieve not only the socio-economic benefits of water supply, but also local and international purposes, including the Millennium Development Goals (MDGs). Similarly, during election campaigns, local politicians often cite the number of communities provided with drinking water among their achievements.

There is indeed some progress in providing drinking water in developing countries. By 2012 about 89% of households have access to safe drinking water (one percentage point above the MDG target), and by 2014 more than half the world's population, almost

4 billion people, enjoyed the highest level of water access, defined as a piped water connection at their homes (WHO/UNICEF, 2014). Notwithstanding this achievement, the presence of a public water system in an area does not guarantee access; nor does access indicate that reliable and clean water will actually be provided (Lin, 2005; Nganyanyuka et al., 2014; Zérah, 1998). Furthermore, defining progress in water supply based on coverage offers a biased picture of performance and exaggerates the level of accomplishment, while concealing the presence of major challenges to further progress (Bell et al., 1993; Picazo-Tadeo et al., 2008).

Even the academic literature on water services concentrates mainly on coverage with little focus on service quality (Kumar and Managi, 2010; Lee and Schwab, 2005). One of the important reasons for studying water quality is to draw the attention of water-sector stakeholders to the significance of clean water in preventing and controlling waterborne diseases (Rakodi, 2000; Zeraebbruk et al., 2014). In addition, utility agencies could benefit from recommendations for designing and implementing effective policy and intervention initiatives towards improving the performance of the public water supply sector.

The importance of researching the quality dimension of water delivery was buttressed in 'Water Quality and Health Strategy: 2013–2020,' a WHO document that sets out strategies for managing water quality in order to protect and promote human health (WHO, 2013). One of the objectives of the strategy is to obtain 'relevant evidence,' establish a research agenda on emerging issues, and address 'major knowledge gaps' on water quality in developing

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<sup>1</sup> Based on exchange rate of \$1 USD to ₦200 Naira.

countries (WHO, 2013, p. 2). As such, studying the quality aspects of water services will contribute in achieving this objective.

Accordingly, this article investigates the quality dimensions of piped water supply in Abuja city, Nigeria, and suggests some means for improvement. This paper is important since Abuja was established to avoid some of Lagos' problems, including inadequate and dilapidated water supply. Abuja is also the most rapidly growing city in Africa (Myers, 2011) and water supply is among the huge challenges currently facing the city (Abubakar, 2014).

Previous studies on water supply in Abuja by Ojo (2011) and FCT MDG Office (2010) have surveyed citizens' satisfaction with water service regularity, pressure, and color features, without including officials involved in the city's water supply. Other crucial water-delivery issues not addressed in these studies include infrastructure maintenance, customer services, and community engagement. Further, these studies have only scratched the surface of water quality attributes by describing their incidence or prevalence without providing in-depth understanding of the context and nature of the water quality issues. The present study contributes in addressing these limitations. The next section reviews concepts of public-sector water delivery and the quantity and quality dimensions of water services. The paper then describes the research methodology, which is followed by the findings and discussion, and concludes with recommendations for the way forward.

## 2. Literature review

### 2.1. Delivery of public water services in developing countries

Werna (2000) defines the delivery of urban services as the act of ensuring service availability, including decisions about the quantities and qualities to be delivered to end users. Drinking water is considered and treated as an economic good that can be sold for a non-negative price (Garcia, 2005), a merit good or human right that everyone should have access to regardless of ability to pay (UNDESA, 2010), and as simultaneously an economic good and human right (Gleick, 1998). Water provision consists of infrastructure financing and development, system operation, billing and tariff collection, and system management and maintenance. Public-sector delivery is generally favored over private-sector delivery for reasons that include high infrastructure costs, the desire to avoid exclusive service and exploitative pricing, and the notion that unregulated markets would under-supply basic services that confer societal benefit (Thoenen, 2007). As such, water is produced and distributed mainly through government monopolies, which account for more than 90% of the world's water services (Hoedeman et al., 2005). Monopoly is also said to be more cost effective due to the advantages of scale economies and duplication avoidance.

In developing countries, the public sector is overwhelmed by rapid urbanization, handicapped by limited resources and hindered by inadequate management and technical capacity to effectively maintain and operate urban water systems. During the International Decade for Clean Drinking Water (1981–1990), international financial institutions provided substantial loans and aid to developing countries in order to improve water supply, especially in the rapidly growing urban centers (Jaglin, 2002). Later, at the turn of the century, world leaders adopted the Millennium Development Goals (MDGs), including Target 10 that aimed to cut in half the proportion of people without access to safe drinking water. By the end of 2010, the target was met and in the same year, the UN General Assembly passed a resolution that formally acknowledges water as a human right. The United Nations Development Programme (UNDP) defines the right to water as “the right of everyone to sufficient, safe, acceptable and physically accessible and affordable water for personal and domestic uses” (UN, 2010, p.1). As such,

the current debate on water supply in developing countries focuses not only on water coverage but also on the quality of water services. The next section comparatively analyzes these two dimensions.

### 2.2. Quantity and quality dimensions of water delivery system

Urban water services are jointly produced and delivered at large scale through networks that are geographically distributed within a community. Thus, we need to ascertain both the quantity and quality of service delivery. The quantity dimension of water delivery refers to coverage, which is usually the proportion of the population having access to drinking water. However, the definition of accessibility varies from one country to another and from (inter) national to local levels. According to the WHO, access to safe drinking water means having an improved source of water within 1 km of a home or within a walking distance of not exceeding 30 min (WHO, 2011). The improved water sources include a household piped connection, public standpipe, borehole, protected well or spring, and neatly collected rainwater (WHO/UNICEF, 2014). Though coverage allows local and international comparison of cities, regions, and countries and is easy to measure using tools such as household surveys and spatial analyses, the concept indicates little about service quality beyond what is meant by “access” and “improved” source.

The quality dimension of water services has varying conceptualizations since quality can be an abstract and elusive construct. While quality is often considered an indicator of how well water services meet user expectations (Parasuraman et al., 1994), to others, quality connotes the difference between customer expectations and perceptions of the services actually provided (Kendall, 2006). Although methods for measuring water quality vary across different organizations and settings, an increasing number of studies rely on customer satisfaction surveys that consider different water quality attributes.

Measures of water pressure and purity have also been used to assess water quality (Bell et al., 1993). Pressure, according to the authors, is that which is adequate to deliver water to the household throughout the day. Purity encompasses safety from both acute and chronic health risks, along with general public confidence that the water is safe for drinking, as well as observable measures of aesthetic appeal (odor, taste, and appearance, including visible color and/or solids). A shortcoming of this conceptualization of water quality is the focus on the delivered commodity and not on the quality of the entire delivery system. It fails to capture issues such as water facility maintenance, customer services, and billing practices.

Some studies have identified multiple dimensions of water service for use in evaluation. A measure developed by Lin (2005) consists of four variables: water purity (based on chlorine content); service coverage; service continuity; and the difference between water produced and sold (losses resulting from inefficient billing, illegal connections, or leakage). A comprehensive measure of service quality developed by Parasuraman et al. (1994) includes five attributes: Reliability, Assurance, Tangibles, Empathy, and Responsiveness. Reliability refers the ability to provide water continuously and with the quality and the quantity required; assurance denotes the knowledge and courtesy of water utility employees and their ability to inspire trust and confidence; tangibles are the physical characteristics of delivered water, including pressure, odor, taste, and color; empathy is the care and individualized attention provided to users with respect to issues like maintenance services; and responsiveness refers to the willingness to provide prompt customer services and accurate billing (Humplick et al., 1992).

In the present study, the quality of water service is evaluated using measures of reliability (continuity of supply), purity (odor,

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