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Adaptive Strategies for Meeting Domestic Water Supply Shortage in Southwestern Nigeria

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Abstract*—Domestic water supply shortages remain a major challenge to household water security in Southwestern Nigeria, where inadequate infrastructure, seasonal variability, poor water quality, affordability constraints and weak institutional capacity have increased reliance on alternative water sources. This study examined the adaptive strategies adopted by households, communities and institutions for meeting domestic water supply shortages in Akure, Abeokuta and Ibadan, with a view to promoting sustainable domestic water supply in Southwestern Nigeria. A mixed-method research design was adopted, involving household surveys, field observations, water-quality assessment and institutional investigations. Data were analysed using descriptive and inferential statistical techniques, while selected physicochemical parameters were assessed against permissible standards. Findings revealed that only 20.2% of households relied on piped and motorised water systems, whereas 52.8% depended on self-dug wells. Affordability was a major determinant of water-source selection, while only 37.2% of respondents considered their existing adaptive strategies successful. Water shortages were predominantly seasonal, with the dry season constituting the most critical period. Water-quality assessment also revealed elevated nitrate, conductivity and total dissolved solids in some sources, while a considerable proportion of households did not treat water obtained from alternative sources. City-specific challenges were evident, including high dependence on rivers and streams in Abeokuta, pronounced water-quality and accessibility challenges in Akure, and significant seasonal and affordability constraints in Ibadan. The study concludes that existing household adaptations are largely coping mechanisms rather than sustainable solutions. It recommends rehabilitation of public water infrastructure, expansion of solar-powered boreholes, promotion of rainwater harvesting, improved water-quality management, equitable water tariffs and strengthened community participation to achieve sustainable domestic water security in Southwestern Nigeria.

***Keywords*— Domestic water supply; water shortage; adaptation strategies; household water security; Southwestern Nigeria**

I. INTRODUCTION

Domestic water supply remains one of the most pressing development challenges confronting both developed and developing countries. Safe, reliable, and sufficient water is indispensable for human health, food preparation, sanitation, economic productivity, and environmental sustainability (United Nations, 2023; World Health Organization, 2022). However, rapid population growth, urbanisation, climate variability, ageing infrastructure, and weak institutional capacity have intensified pressure on available water resources, making it increasingly difficult for public water supply systems to satisfy growing household demand, particularly in developing countries (United Nations, 2022; Sakketa, 2023). Consequently, millions of urban households experience persistent water shortages and are compelled to develop alternative means of meeting their daily water requirements.

The challenge is particularly evident in Nigeria, where domestic water supply remains inadequate despite the country's considerable surface and groundwater resources. Access to potable water continues to be constrained by deteriorating infrastructure, inadequate investment, poor maintenance of existing facilities, weak governance, and rapid urban expansion (UNICEF, 2017; Bello et al., 2018). As a result, many households depend on multiple water sources, including private boreholes, hand-dug wells, water vendors, rainwater harvesting systems, and household storage facilities. While these alternatives enable households to cope with inadequate public water supply, they often impose additional financial, physical, and health burdens, especially where the alternative sources are unreliable, costly, or of poor quality.

These conditions are particularly pronounced in the core urban areas of Southwestern Nigeria, notably

Akure, Abeokuta, and Ibadan, where increasing population density, seasonal rainfall variability, inadequate distribution networks, and ageing water infrastructure have contributed to persistent domestic water shortages (Ezenwaji et al., 2014; Bello et al., 2018). Faced with these challenges, households rarely depend on a single coping mechanism. Instead, they combine various adaptive strategies according to their socio-economic circumstances, accessibility to water sources, and the severity of water shortages. Such adaptive responses have become an essential component of household water security because they determine the extent to which families are able to sustain their domestic water needs despite the inadequacies of formal water supply systems.

Although previous studies have examined water availability, accessibility, infrastructure, and water quality in Nigerian cities, comparatively limited empirical attention has been devoted to understanding the specific adaptive strategies households employ to manage recurring domestic water shortages, particularly within the major urban centres of Southwestern Nigeria. More importantly, there remains insufficient evidence regarding the relative reliance on different adaptive measures and the extent to which these strategies provide sustainable solutions to household water deficits. Understanding these adaptation strategies is therefore essential for designing policies and interventions that strengthen household resilience while improving the sustainability of domestic water supply systems. This paper therefore examined the adaptive strategies adopted by households, communities and institutions for meeting domestic water supply shortages in Akure, Abeokuta, and Ibadan with a view to promoting sustainable domestic water supply in the study area.

II. MATERIAL AND METHOD

Southwestern Nigeria is one of the six geopolitical zones of Nigeria and comprises Ekiti, Lagos, Ogun, Ondo, Osun and Oyo States. The region occupies the southwestern part of the country and extends approximately between 2°31′ and 6°00′ E longitude and 6°21′ and 8°37′ N latitude. It is bounded by the Republic of Benin to the west, Kwara and Kogi States to the north, Edo and Delta States to the east, and the Atlantic Ocean and Gulf of Guinea to the south (Oladimeji et al., 2021). The region constitutes an important geographical, economic and cultural component of Nigeria and is predominantly inhabited by Yoruba-speaking populations, although considerable cultural and linguistic diversity exists across the states (Adediji & Ibitoye, 2013).

Southwestern Nigeria is also characterised by a rapidly changing settlement system and substantial urban development. Lagos, Ibadan, Abeokuta, Akure, Osogbo and Ado-Ekiti are among the major urban centres within the region. Lagos functions as a major commercial and financial centre, while Ibadan, Abeokuta and Akure constitute important administrative, educational, commercial and service centres. The region has experienced substantial urban expansion and land-use transformation, particularly around major metropolitan areas and growth corridors. Remote-sensing evidence indicates significant changes in built-up surfaces and vegetation cover associated with increasing urbanisation across the six states of the region (Adawa et al., 2022). Similarly, rapid urban expansion has been particularly evident along the Lagos–Ogun urban fringe, where the conversion of different land-use types to urban uses has intensified over time (Abiodun & Salami, 2023).

The study adopted comparative cross-sectional mixed-methods research design to investigate the adaptive strategies adopted by households to cope with domestic water supply shortages in Southwestern Nigeria, with particular reference to Abeokuta, Ibadan and Akure. The quantitative component generated measurable information on the availability, reliability, accessibility and adequacy of domestic water supply, the nature and frequency of water shortages, household characteristics, and the adaptive strategies adopted by households. The qualitative component will provide contextual explanations of household experiences, institutional responses and the rationale underlying the adoption of particular adaptive strategies.

The comparative approach is appropriate because Abeokuta, Ibadan and Akure differ in population characteristics, urban structure, physical environment, infrastructure provision and socioeconomic conditions. Comparing the three cities will therefore facilitate an assessment of similarities and differences in household exposure to domestic water shortages and the strategies employed to address them. The unit of analysis will be the household, while the household head or an adult

household member who has adequate knowledge of the household's domestic water supply situation will serve as the principal respondent. Moreover, data were obtained through household questionnaire administration.

III. RESULTS AND DISCUSSION

The discussion in this section focuses specifically on identifying the adaptation strategies adopted for meeting the water deficit in Southwestern Nigeria. This objective represents the culmination of the preceding analyses because it synthesises how households, communities, institutions respond to the combined effects of water source availability, socio-economic conditions, water quality, and the severity of domestic water shortages. The section therefore examined the adaptive measures employed by households across Akure, Abeokuta, and Ibadan, including infrastructural, behavioural, and management strategies adopted to ensure continuous access to domestic water despite persistent supply deficiencies, and discusses their implications for achieving sustainable household water security in Southwestern Nigeria.

3.1 Rehabilitation and Expansion of Public Water Supply Infrastructure

The findings revealed that only 20.2% of households rely on piped and motorised water systems, while 52.8% depend on self-dug wells. This reflects decades of underinvestment in formal water infrastructure and confirms that the public water supply system in Southwestern Nigeria has largely failed to serve the urban majority. As a consequence, households have been forced to self-provision; affordability has become the primary driver of water source selection for 44.5% of respondents, and only 37.2% consider their current adaptive strategies genuinely successful.

The rehabilitation of public water supply infrastructure must therefore be treated as the primary, non-negotiable adaptation to address the water supply deficit. This includes the repair and replacement of ageing distribution networks, the restoration of water treatment plants to full operational capacity, the extension of piped water supply to underserved neighbourhoods, and the enforcement of quality-control standards throughout the distribution chain. Without this foundational investment, all other household and community-level adaptations will remain temporary coping mechanisms for a structural failure rather than permanent solutions. The World Bank (2019) similarly emphasises that sustainable urban water security in Nigeria requires systemic infrastructure reform rather than piecemeal household-level responses.

3.2 Water Quality Improvement and Safe Treatment Practices

The physicochemical analysis conducted under Objective Three provides evidence for targeted adaptation. In Akure, nitrate concentrations ranged from 525.74 mg/L to 818.63 mg/L, far exceeding the Standards Organisation of Nigeria (SON) permissible limit of 50 mg/L. In Abeokuta, the Okeifon sample recorded 98.63 mg/L, and in Ibadan, the Dugbe sample recorded 97.60 mg/L. Excessive nitrate in drinking water is associated with methemoglobinemia in infants and adverse health outcomes in pregnant women. Conductivity and total dissolved solids also exceeded permissible limits in all three cities, while high magnesium concentrations in Akure and Ibadan indicate water hardness, rendering the water unsuitable for certain domestic uses.

These findings necessitate the introduction of ion-exchange resin or deionisation treatment across the three cities to remove excess dissolved ions, particularly nitrate, magnesium, and total dissolved solids. This is especially urgent in Akure, where nitrate levels are dangerously elevated. Additionally, findings from Objective Four show that 27.8% of households apply no treatment to water obtained from alternative sources, rising to 33.0% in Akure. A structured public health education programme on point-of-use water treatment, covering boiling, filtration, and chemical disinfection, should therefore be implemented across the cities, with particular urgency in Akure.

3.3 Addressing the Waterborne Disease Burden through Integrated Sanitation and Water Safety

The disease burden data from Objective Three presents an alarming public health picture. Typhoid, a direct indicator of contaminated drinking water, was reported by 95.3% of respondents in Akure, 78.3% in Abeokuta, and 69.4% in Ibadan. Dysentery was reported by 82.1% in Akure, 81.4% in Abeokuta, and 73.8% in Ibadan, while malaria prevalence stood at 93.4% in Akure, 94.6% in Abeokuta, and 68.2% in

Ibadan. Water pollution was perceived by 72.6% of respondents in Akure, 59.7% in Abeokuta, and 41.6% in Ibadan, while 52.8% of respondents in Akure reported the death of aquatic animals in nearby water bodies.

Addressing this disease burden requires an integrated response targeting water quality, treatment, storage hygiene, and environmental sanitation. The high malaria burden linked to stored water in open containers reinforces the need for a transition to sealed plastic storage tanks. The high typhoid rates point to the need for systematic chlorination of well and borehole water, particularly in Akure. The pollution and aquatic death data further call for environmental investigation and enforcement of pollution controls. These adaptations must be coordinated across the ministries of health, environment, and water resources to achieve lasting impact.

3.4 Addressing Seasonal Water Scarcity through Storage and Source Diversification

Water scarcity in Southwestern Nigeria is fundamentally seasonal, with the dry season representing the period of greatest deprivation. In Akure, 83.0% of respondents reported that water shortage are most severe during the dry season, compared to 70.5% in Abeokuta and 89.0% in Ibadan. This is driven by reduced groundwater recharge and surface water flow, which lowers the yield of wells and shallow boreholes relied upon by households.

Two complementary adaptations are required. First, rainwater harvesting systems with adequate dry-season storage capacity should be prioritised, particularly in Akure and Abeokuta, where adoption rates remain low at 17.9% and 27.1%, respectively. These systems should be designed for multi-month storage that bridges the dry season. Second, the drilling of deeper boreholes, less susceptible to seasonal fluctuations than shallow wells, should be supported through public investment and community schemes. Notably, 9.4% of respondents in Akure, 17.8% in Abeokuta, and 8.2% in Ibadan reported year-round shortages. For this group, seasonal interventions alone are insufficient; access to reliable perennial sources such as deep boreholes or expanded piped supply is required.

3.5 Expansion and Maintenance of Public Solar Borehole Infrastructure

Public solar boreholes are among the most contextually appropriate institutional adaptations identified in this study. They combine the reliability of deep groundwater with the energy independence of solar-powered pumping, a critical advantage given Nigeria's unreliable electricity supply, which constrains the operation of conventional pump systems. Public solar borehole adoption stands at 31.1% in Akure and 20.6% in Ibadan, significantly lower than the 50.4% recorded in Abeokuta, pointing to substantial unmet demand in the former two cities.

Three actions are necessary. First, new public solar borehole facilities should be strategically sited in high-density, low-income neighbourhoods in Akure and Ibadan. Second, existing facilities in Abeokuta, which show higher adoption during the wet season than the dry season, suggest that seasonal underperformance must be regularly maintained and, where necessary, deepened to ensure year-round functionality. Third, community management committees should be established at each facility to ensure local ownership, preventive maintenance, equitable access, and financial sustainability through modest user contributions, a model demonstrated to significantly improve long-term water point performance across Sub-Saharan Africa.

3.6 Water Tariff Reform and Institutional Strengthening

The findings from Objective One reveal a significant governance challenge with direct implications for infrastructure sustainability. In Akure, 91.5% of respondents do not pay any water tariff, compared to 85.7% in Ibadan and 76.7% in Abeokuta. Among those who do pay, 51% do so on an irregular, on-demand basis. The World Bank (2014) documents that Nigerian state water agencies collect only 40%–60% of billed revenue due to poor billing systems, irregular supply, and a lack of metering a revenue shortfall that directly constrains their ability to maintain and expand infrastructure. Two reforms are necessary. On the revenue side, metered billing systems should be introduced or expanded across all three cities, with tariff structures designed on a progressive basis to ensure affordability for low-income households while recovering adequate costs from higher-income users. On the institutional side, state water corporations in Ondo, Ogun, and Oyo States require significant capacity strengthening

including performance-based management, transparent financial reporting, and consumer accountability mechanisms. As Adeoti and Fati (2022) observed, willingness to pay for water increases significantly when households trust that their payments will result in improved and reliable service delivery.

3.7 Equity-Based Water Supply Interventions for Low-Income Households

A recurring theme across Objectives One, Two, and Four is the inequitable distribution of the water supply burden along income lines. A segment of the population earns below ₦30,000 monthly 2.8% in Akure, 4.7% in Abeokuta, and 6.1% in Ibadan with a further proportion earning between ₦30,000 and ₦60,000. These households are least able to invest in private boreholes and are therefore more dependent on vendor water, which is the most expensive option on a per-litre basis. Affordability was cited as the primary reason for water source selection by 33.0% of respondents in Akure, 38.8% in Abeokuta, and 49.1% in Ibadan, confirming that financial constraints are a major barrier to water access.

The necessary adaptation involves targeted subsidy programmes to enable low-income households access borehole installation or connection to public solar borehole schemes at reduced or no cost. Community borehole schemes, supported by the state government and development partners, provide an effective mechanism for extending reliable access to groundwater for households that cannot afford individual installations. Additionally, given that the majority of households in Akure (72.6%) and Abeokuta (76.0%) have between five and eight members, water allocation and tariff policies should account for household size to avoid disadvantaging larger, typically lower-income families.

3.8 City-Specific Adaptation Strategy for Water Supply in Abeokuta: Addressing River and Stream Dependence

Abeokuta presents a unique and urgent adaptation challenge that is entirely distinct from those of the other two cities. The findings from Objective Five revealed that 93.8% of Abeokuta respondents use rivers or streams as a water source, reflecting the city's historical relationship with the Ogun River. However, rapid urbanisation, increasing industrial activity, poor solid waste management, and inadequate sanitation have rendered river and stream water increasingly unsafe. This is corroborated by the findings of Objective Three: 40.3% of Abeokuta respondents reported that their water is not safe for drinking; 59.7% perceived water pollution as a problem; and the physicochemical analysis detected elevated nitrate levels in water samples from the city.

The adaptation strategy for Abeokuta must facilitate a transition from dependence on untreated surface water to a safe, treated water supply. This requires: expansion of water treatment capacity along the Ogun River corridor using riverbank filtration and conventional treatment technologies; rehabilitation and extension of the Ogun State Water Corporation's distribution network to reach neighbourhoods currently relying on river sources; targeted public health campaigns communicating the serious risks of consuming untreated river water, particularly in light of the city's high malaria (94.6%) and typhoid (78.3%) burden; and development of a long-term water source protection plan for the Ogun River, including watershed management, industrial discharge regulation, and solid waste control.

3.9 Reducing Physical Distance to Water Sources

Findings from Objective One reveal that while most residents enjoy relatively close access to water, significant disparities exist, particularly in Akure, where 13.2% of respondents travel over 500 metres to access water, compared to 5.4% in Abeokuta and 0.7% in Ibadan. A further 29.2% of Akure respondents travel between 501 metres and one kilometre. These distances impose a daily time and energy burden on households, one that falls disproportionately on women and children, and reduces the frequency and volume of water collected, directly compromising household hygiene, cooking, and sanitation.

The necessary adaptation involves strategically siting new water points, including public solar boreholes, community standpipes, and rainwater-harvesting collection points, in underserved neighbourhoods where residents currently travel long distances. In Akure, where the problem is most pronounced, water infrastructure planning should explicitly prioritise peripheral and low-income areas. The WHO/UNICEF standard of a maximum 30-minute round trip to a water source should serve as the benchmark for planning new water point locations across the study area.

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3.10 Education, Awareness, and Community Engagement

The findings from Objectives Two and Three point to significant gaps in water quality awareness. In Akure, 48.1% of respondents expressed indifference about whether their drinking water is tasteless, suggesting a normalised acceptance of poor water quality. In Ibadan, 25.7% were indifferent about water pollution in their communities. These patterns indicate that a segment of the population has become so accustomed to poor water conditions that they no longer actively recognise or respond to them a phenomenon with serious implications for disease prevention and community advocacy. The necessary adaptation involves targeted public awareness campaigns that communicate water quality standards, the health risks of consuming untreated or contaminated water, and practical steps to improve water safety at the point of use. Given the religious composition of the study area, Christianity predominates in Akure (55.7%) and Abeokuta (55.0%), and Islam in Ibadan (48.1%). Religious institutions offer a particularly trusted platform for disseminating water safety messages. Community-based organisations, women's groups, and local schools should similarly be mobilised, drawing on the high levels of formal education documented among respondents over 54% post-secondary in Akure and 69.6% in Ibadan as a foundation for receptive and engaged audiences.

Table 1 presents a comprehensive adaptation framework that consolidates all necessary adaptations identified in this section. Each measure is organised by intervention level, supported by specific evidence from the study findings, and targeted at the city or cities where the need is most acute. This framework is intended to serve as a practical reference for water supply planners, state water corporations, local government authorities, development partners, and community organisations working to address the domestic water supply deficit in Southwestern Nigeria.

Table 1: Consolidated Adaptation Framework for Meeting the Water Supply Deficit in Southwestern Nigeria

Level	Adaptation Needed	Evidence from the Study	Target City/Cities
Household	Transition to sealed plastic storage tanks	Drums (34.7%) and buckets (33.8%) dominate storage; only 15.2% use sealed plastic tanks (Obj. 4)	All three cities — priority in Akure and Abeokuta
	Adopt point-of-use water treatment.	33.0% in Akure, 24.8% in Abeokuta, and 27.3% in Ibadan apply no treatment to alternative water sources (Obj. 4); nitrate levels exceed SON standards in all three cities (Obj. 3)	All three cities — most urgent in Akure
	Install rainwater harvesting with dry-season storage.	Dry season is the peak scarcity period: 72.6% Akure, 81.4% Abeokuta, 76.2% Ibadan (Obj. 1 & 5)	Akure and Abeokuta — priority (adoption rates 17.9% and 27.1% respectively)
Community	Community borehole schemes for low-income households	Only 44.0% own personal boreholes; 21.0% indifferent — likely due to financial constraints; 5.3% earn below ₦30,000 monthly (Obj. 2 & 5)	All three cities — most urgent in Ibadan (26.4% indifferent)
	Community-level water safety and hygiene campaigns	Malaria: 93.4% Akure, 94.6% Abeokuta, 68.2% Ibadan; Typhoid: 95.3% Akure, 78.3% Abeokuta, 69.4% Ibadan; Dysentery: 82.1% Akure (Obj. 3)	All three cities — most critical in Akure
	Engage religious and community leaders in water governance	Christianity dominates Akure (55.7%) and Abeokuta (55.0%); Islam dominates Ibadan (48.1%) — both are platforms for community mobilisation (Obj. 2)	All three cities

Institutional	Expand and maintain public solar borehole infrastructure	Public solar borehole adoption: 31.1% Akure, 20.6% Ibadan, 50.4% Abeokuta; solar boreholes underperform during dry season in Abeokuta (Obj. 5)	Akure and Ibadan — priority expansion; Abeokuta — maintenance and deepening
	Regulate informal water vendors and packaged water producers	Packaged water usage: 80.6% Ibadan; vendor reliance: 29.2% Akure; vendor water described as costly and unreliable (Obj. 1 & 4)	All three cities — most urgent in Ibadan
	Establish ion exchange water treatment systems	Nitrate levels exceed SON limit (≤50 mg/L) in all three cities — Akure: 525–818 mg/L; Ibadan Dugbe: 97.6 mg/L; Abeokuta Okeifon: 98.6 mg/L (Obj. 3)	All three cities — most critical in Akure
	Reform tariff collection and billing systems	91.5% in Akure, 85.7% in Ibadan, and 76.7% in Abeokuta do not pay water tariffs; 51% of payments are on-demand and irregular (Obj. 1)	All three cities — most urgent in Akure
Policy	Rehabilitate and expand piped water infrastructure	Only 20.2% of households use piped/motorised systems; 52.8% rely on self-dug wells; only 37.2% rate adaptive strategies as successful (Obj. 1 & 4)	All three cities — systemic and urgent
	Develop a city-specific water strategy for Abeokuta.	93.8% of Abeokuta respondents use rivers/streams; river-reliant households at risk from contamination; 40.3% report water is not drinkable (Obj. 1, 3 & 5)	Abeokuta — city-specific and urgent
	Introduce equity-based subsidies for low-income households.	Affordability is the primary reason for source selection (44.5% overall; 49.1% Ibadan); 5.3% earn below ₦30,000 monthly (Obj. 1 & 2)	All three cities — priority for the lowest income bracket
	Address water-related environmental pollution	72.6% Akure, 59.7% Abeokuta, 41.6% Ibadan report water pollution; 52.8% Akure report death of aquatic animals (Obj. 3)	All three cities — most critical in Akure

Source: Author's Field Survey, 2025

IV. CONCLUSION AND RECOMMENDATIONS

The study revealed that domestic water supply shortages in Southwestern Nigeria are driven by inadequate public water infrastructure, seasonal water scarcity, poor water quality, affordability constraints and institutional weaknesses. Households in Akure, Abeokuta and Ibadan have responded through self-dug wells, boreholes, water vendors, rainwater harvesting, water storage and household water-treatment practices. However, the relatively low success rate of these strategies indicates that most household responses are coping mechanisms rather than sustainable solutions. The study further establishes that water-supply challenges vary across the three cities. Akure is characterised by severe dry-season shortages, poor water quality and long distances to water sources; Abeokuta has particularly high dependence on rivers and streams; while Ibadan experiences significant seasonal shortages and affordability constraints. Sustainable water security therefore requires city-specific interventions combined with rehabilitation and expansion of public water infrastructure, improved water-quality management, equitable financing, community participation and stronger institutional capacity. Ultimately, household adaptation should complement, rather than substitute for, reliable and affordable public water supply.

Across the study area, the study further established that sustainable domestic water security in

Southwestern Nigeria cannot be achieved through household adaptation alone. Household, community and institutional adaptations must be integrated with substantial investment in public water infrastructure, effective water-resource governance, improved water-quality management, equitable financing mechanisms, and community participation. The most sustainable pathway is therefore a transition from predominantly reactive household coping towards a coordinated, resilient and equity-oriented water-supply system in which public institutions assume their appropriate responsibility for ensuring reliable, affordable and safe domestic water supply. Based on findings, the following recommendations are envisioned:

i. Domestic water supply shortages in Akure, Abeokuta and Ibadan are driven by inadequate infrastructure, seasonal scarcity, poor water quality, affordability constraints and institutional weaknesses.
ii. Households have adopted various coping strategies, including self-dug wells, boreholes, water vendors, rainwater harvesting, storage and water treatment, but many remain temporary rather than sustainable solutions.
iii. The nature of water-supply challenges varies across the three cities, requiring city-specific adaptation strategies that reflect local water sources, seasonal conditions and socio-economic circumstances.
iv. Sustainable water security requires the integration of household and community adaptation with rehabilitated public infrastructure, improved water quality, effective water-resource management and equitable access.
v. Ultimately, strengthening institutional capacity, expanding reliable public water supply and promoting community participation are essential for achieving sustainable domestic water security in Southwestern Nigeria.

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