

Does the Emergence of Private Actors in the Potable Water Market Reduce Inequalities and Improve Access? A Critical Analysis Based on a Case Study in Selected Municipalities of Benin

Gildas Sènamèdé Aizannon^{1*}, Gildas Hervé Adoté Akueson², Ismail Moumouni-Moussa¹

¹Laboratoire de Recherche sur l'Innovation pour le Développement Agricole (LRIDA), Université de Parakou, Parakou, Benin

²Institut Supérieur Agronomique et Vétérinaire Valéry Giscard d'Estaing de Faranah (IS AV-VGE/F), B.P : Faranah, République de Guinée-Unit of Applied Statistics and Informatics (USIA), Laboratory of Studies and Research in Forestry (LERF), University of Parakou, Parakou BP 123, Benin

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ABSTRACT

In Benin, population growth, rapid urbanization, and the effects of climate change exacerbate the challenge of supplying potable water. While many households aspire to access water from the public network, financial constraints make this difficult (Kèlomè et al., 2012). The conventional water supply model, primarily reliant on a single public operator, is increasingly inadequate to meet the growing demands of urban populations. Consequently, numerous small local private operators have emerged, providing water supply services in often informal settings (Marteau et al., 2010). This emergence highlights several critical issues: while these small private operators fill the gaps left by the public sector, their informal nature raises concerns about regulation, service quality, and supply sustainability. Although access to potable water has improved, reducing the water-fetching burden for women and children in 30% of the rural cases studied, the poorest populations appear to face greater financial strain. This is due to private operators' profit-driven motives, which often prioritize financial gain over health and environmental considerations. A univariate descriptive analysis was conducted to evaluate consumer perceptions, preferences, and satisfaction. Findings revealed that 63.10% of consumers rely on private operators to meet their daily potable water needs, while 52% of local producers lack a water safety plan. This study advocates for an innovative management model that aligns with achieving SDG 6, emphasizing both quality and equity in water provision.

Keywords: Drinking water supply - private actors - Benin - inequalities - public services - regulation

INTRODUCTION

The issue of access to drinking water in Benin is central to contemporary sustainable development challenges, with significant social, economic, and environmental implications. Despite efforts made, access to this essential resource remains a pressing challenge, particularly for populations in rural and peri-urban areas. An analysis of available data and current policies reveals a situation marked by structural deficiencies in public infrastructure. In response to these challenges, the emergence of private initiatives brings a new dynamic, presenting both opportunities and questions about the transformation of public services.

This concluding chapter offers a structured analysis of the observed transformations in the drinking water sector in Benin, highlighting the challenges and implications of integrating private actors. The first part examines the conditions conducive to the emergence of these private initiatives, both in the field of drinking water and other public services. The second part explores the specific dynamics driving this transition, along with the concrete manifestations of this evolution within the Beninese context. The third part analyzes the socio-cultural, economic, and political consequences of these changes, with a particular focus on the risks of exacerbating inequalities and the potential responses to better address the growing needs of the population. The postulates and corollaries derived from this analysis are presented, along with theoretical and methodological contributions

aimed at more effective regulation of these new governance models. The fourth part focuses on the contributions of this study to the theories mobilized, enriching the understanding of the emergence of private actors in public services and proposing new conceptual insights. Finally, the last part addresses the limitations of this research and outlines perspectives for future studies, while summarizing the major conclusions of the study.

Favorable conditions for the emergence of private actors in drinking water supply (DWS)

Factors explaining the rise of private actors in the provision of drinking water

The emergence of the private sector in public services in Benin and Africa: a phenomenon marked by significant changes in governance and public management models. In the drinking water supply sector, this emergence has been facilitated by several specific political, social, and economic conditions:

1. **Institutional reforms and decentralization policies:** The gradual decentralization since the 1990s has allowed municipalities to take on more responsibilities in managing public services, especially water. This opened the door to public-private partnerships (PPP) to address access challenges by transferring certain responsibilities to the private sector to mitigate the shortcomings of public authorities (Hounmenou, 2006).
2. **Legal framework and regulation:** The development of legal frameworks promoting private investment has played a central role. For instance, the 2010 Water Framework Law laid the foundation for including private actors in water supply, with regulations enabling private companies to sign management or concession contracts (World Bank, 2020).
3. **Financial support and aid from donors:** International organizations, such as the World Bank and the French Development Agency, have encouraged private sector involvement by financing infrastructure projects and offering financial guarantees for investments. This support has been crucial in reducing the risks associated with investments in rural and low-income areas (OECD, 2005).
4. **Growing demand and social pressure for quality services:** With rapid urbanization and population growth, the demand for drinking water has increased significantly. The public sector's inability to meet this demand has opened a space for the private sector, whose initiatives aimed at improving service coverage and efficiency (Faye et al., 2020).
5. **Economic challenges and limitations of public resources:** The budget constraints of the Beninese state have limited its capacity to invest in large-scale water supply infrastructure. This motivated the state to seek private capital and propose incentive initiatives to attract investors into the water sector (Assogba et al., 2017). In their work, Assogba and colleagues analyze the impact of water privatization in Benin, a key example where private companies play an increasing role. They show that while private participation can improve service efficiency, it also presents challenges in terms of accessibility for vulnerable populations, especially in rural areas.

These various contributions align with the findings of my study on the political and economic parameters that make the rise of small local private operators possible in meeting the growing demand for drinking water. The rules governing water supply in Benin are tolerant of private operators' involvement. Furthermore, my study demonstrates that the weakness of public service oversight and regulation is perceived as an opportunity by local private operators, who exploit the gap without prior authorization and without taking the necessary precaution of developing a water safety management plan under the guidance of SONEB. Aware of its own shortcomings in mobilizing financial and technical resources to ensure drinking water services for all, especially poor households, the state turns a blind eye and allows private operators to fill the gap, despite the sometimes negative consequences that our results highlight.

These combined conditions have contributed to the increasing integration of private actors in the drinking water sector in Benin, marking a shift toward management models aimed at addressing the gaps in the public sector and improving access for the population. The contributions from authors show that the pattern explaining the rise of private actors in other public services is nearly identical.

Postulate 1: The rise of private actors in water supply is based on political and institutional reforms aimed at addressing state shortcomings and improving access to essential services. Private intervention, while necessary, requires a robust regulatory framework to prevent abuses, ensure equity, and protect natural resources.

Theoretical Contribution 1: This thesis, particularly through Chapters 3 and 4, provides theoretical and methodological contributions that shed light on the institutional and socio-political foundations of the rise of small local private producers in the provision of drinking water. I have demonstrated, through several articles and scientific documents, how a favorable regulatory context and a policy of state tolerance, aware of its shortcomings, create opportunities and encourage the rise of private actors in providing drinking water and other public services. Unlike some earlier reflections, my findings show that demographic challenges and urbanization, combined with resource mobilization constraints, force the state to adapt its policies to leave portions of the public service market to private actors.

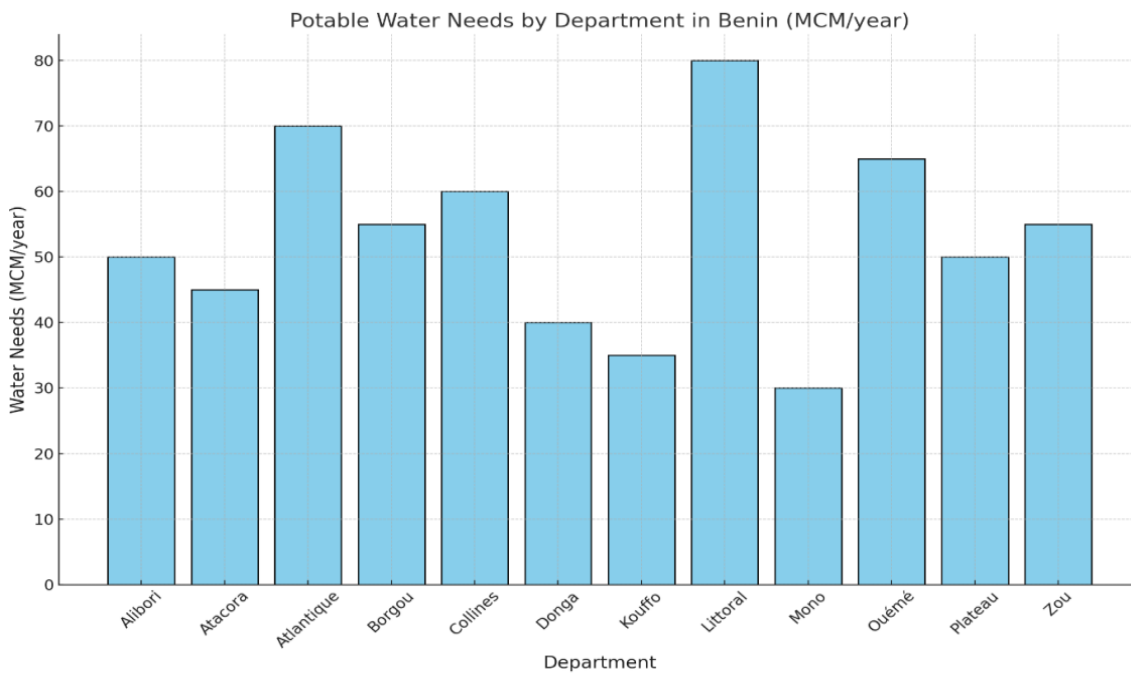
Table 1: Data on the quality and quantity of potable water resources in Benin and impacts of climate change and demography

Category	Indicators	Specific Data for Benin
1. Quantity of Water Resources	Availability of freshwater resources	Approximately 4,740 m³ per capita per year (source: FAO, Aquastat, 2021). Below the comfort threshold in some areas.
	Geographical distribution	Significant inequality: southern regions benefit from more abundant water resources (rivers, lagoons), while northern areas face greater water stress. Main rivers: Ouémé, Mono, Niger.
	River flows and groundwater levels	River flows and groundwater levels experience seasonal declines. Increased reliance on boreholes in rural areas. Irregular rainfall affecting aquifer recharge.
2. Quality of Water Resources	Contamination levels	Surface water: High pollution due to agricultural activities (pesticides, fertilizers), untreated domestic wastewater, and industrial waste. Groundwater: Growing salinization in coastal areas due to seawater intrusion. Frequent presence of fecal coliforms in unprotected water points (WHO, 2020).
	Water treatment	Treatment facilities are limited in capacity, and distribution infrastructure is aging in some urban areas.
	Regulation and monitoring	Lack of strict regulation to monitor the quality of resources exploited by private actors. Frequent absence of health monitoring in rural areas.
3. Impacts of Climate Change	Changes in precipitation	Increased variability of rainfall: intense rainfall concentrated in short periods, increasing runoff and limiting aquifer recharge.
	Prolonged droughts	Recurrent droughts in the northern part of the country, leading to reduced water flows and scarcity for rural populations. Impact on agriculture: Reduced access to irrigation, exacerbating food insecurity.
	Sea level rise	Saline intrusion into groundwater in coastal areas (Cotonou and Ouidah are particularly affected).
4. Demographic Impacts	Population growth	Population growth rate: 2.8% per year (source: INSAE, 2021). Rapidly increasing demand for potable water, particularly in urban areas (Cotonou, Porto-Novo).

	Urbanization	Rapid and unplanned urbanization, leading to increased pressure on water infrastructure. Public systems struggle to meet growing demand, paving the way for private actors.
	Inequalities in access	Rural areas remain underserved, with potable water coverage at approximately 60% in rural areas compared to 85% in urban areas (source: UNICEF, 2022).

Summary of combined Impacts

Impacts	Consequences on potable water supply
Climate change	- Reduction in aquifer recharge and river flows. - Increased risk of water pollution from runoff.
	- Increased water stress in northern regions. - Greater reliance on boreholes and unsustainable local systems.
Demography and urbanization	- Significant pressure on existing infrastructure. - Growing inequalities between urban and rural areas in terms of access and quality.
	- Rising investment needs to ensure sustainable potable water coverage.



Estimated potable water needs by department in Benin, expressed in million cubic meters (MCM) per year.

Table 2: Centralizing the key issues related to water supply in Benin across various stages of the process:

Process	Key Issues
Captage	- Limited access to reliable surface and groundwater sources.
	- Overexploitation of available water resources due to rising demand.
	- Pollution of water sources from agricultural, industrial, and domestic activities.
Traitement	- Insufficient or outdated treatment infrastructure in many localities.

	- Lack of access to modern purification technologies, especially in rural areas.
	- High costs of maintaining and upgrading treatment facilities.
Distribution	- Inequalities in access to water, with urban areas better served than rural zones.
	- Aging and inefficient distribution networks, leading to water loss and contamination.
	- Financial constraints affecting the expansion and maintenance of distribution systems.
Assainissement	- Insufficient sanitation facilities contributing to water contamination.
	- Poor coordination between water supply and wastewater management systems.
	- Health risks associated with untreated wastewater discharged into the environment.
Purification	- Inadequate quality control mechanisms for drinking water purification.
	- Lack of standardized processes among private and informal water providers.
	- Challenges in monitoring and enforcing water quality standards across decentralized operators.

Dynamics encouraging private actors and manifestations of this evolution

Dynamics favoring private actors

My findings in the communes of Abomey-Calavi, Banikoara, Boukombé, and Parakou indicate that the local dynamics favoring the integration of private actors in drinking water supply in Benin are driven by several social, economic, and environmental factors. These dynamics, highlighted by several contributors, manifest in tangible realities on the ground and translate into initiatives and practices that shape the landscape of water access in the served regions:

Public sector deficiencies

The limitations of public infrastructure and the lack of funding to maintain or expand water access create a need that the public sector struggles to meet. This encourages local populations and authorities to turn to private companies to provide efficient and sustainable services. Dysfunctional water distribution infrastructures (intermittent water supply, frequent shortages from SONEB even in economically active urban neighborhoods such as Akpakpa and Fidjrossè in Cotonou, aging networks with recurring breakdowns and massive water losses that can last for weeks before maintenance services intervene, suspicious discoloration of water at times, and deposits observed at the end of networks) also favor this opening to private actors to meet the growing expectations of communities. Small local private operators, through their water conditioning services, provide practical solutions for distribution during various events such as ceremonies (weddings, baptisms, funerals, religious services...), sporting and cultural events in stadiums, political rallies, and large markets like Dantokpa, Arzèkè, and major university centers.

Regional inequalities and access disparities

In Benin, rural and peripheral areas are often the most disadvantaged in terms of access to drinking water. Our findings show that the poor in villages, already weakened by limited access to other public services, pay more for drinking water than the wealthy in large urban centers. Private companies, often better equipped to operate in challenging contexts (remote areas far from public network facilities, regions with difficult terrain like Boukombé), become indispensable actors in serving these areas. For example, companies or organizations take charge of wells, boreholes, or mini-distribution networks where public infrastructure is not available. We have observed many installations by national and international NGOs, as well as Muslim and Christian humanitarian organizations in some remote areas and even in peripheral neighborhoods of Parakou, such as Banikanni, Assagbiné-Baka, and Korobororou.

Involvement of associations and public-private partnerships

Local NGOs (Caritas Benin, Dedras...) and international ones (Wateraid, SNV, UNICEF, Helvetas, OmiDelta...) as well as public-private partnerships (PPP) play a key role in structuring the drinking water service offer. Local initiatives, often led by non-profit organizations or companies in collaboration with local governments, allow the deployment of solutions tailored to local realities, such as community management of boreholes and hand pumps.

Climate change and water scarcity

Climate variability in Benin leads to extended dry periods, affecting water resources. The testimonies of consumers, especially in northern Benin ("We are told not to drink dirty water, but here, water is simply a luxury. I walk about 5 km every day, at least three times with my children, to get drinking water and prepare meals," says Gniré, a woman from a village in Banikoara; "We suffer a lot. Not only is the heat unbearable, but the village wells dry up during the dry season, and we are forced to fetch water from the riverbed. Again, we have to wake up early," says Adama, a homemaker from Boukombé. "From February onwards, I have to play the 'bad guy' to ration the water in my well. Neighbors often rush to fetch it, and as our tradition dictates, we don't refuse water, so I ration it to a basin, otherwise, at my age, I'd be forced to walk hundreds of meters," adds Dame Awélé, a woman in her sixties from the Banikanni neighborhood in Parakou.) These reactions show that from January to May, there is significant water stress. This suffering even extended into July 2024 in some areas due to the scarcity of rain. This context encourages private actors to invest in more resilient water capture and distribution technologies, such as rainwater tanks and water purification installations. Innovative solutions developed by the private sector help strengthen the resilience of communities facing the water crisis (Falkenmark, 1997).

Perceptible manifestations of this evolution

Increase in private water treatment and sales stations: There has been a rise in the number of private enterprises managing water points, which ensure a constant supply of water and, according to consumer perceptions, better quality.

Diversification of sources and supply methods: Private solutions include the installation of boreholes with solar pumps, the use of mini-networks for isolated villages, and sachet water distribution systems for urban areas.

Improvement of collection and storage infrastructure: In response to demand, the private sector has invested in reservoirs and tanks, ensuring water access during shortages.

In summary, the dynamics on the ground that favor the emergence of the private sector in the drinking water sector are based on a series of unmet needs, local initiatives, and collaborations. These dynamics aim to compensate for the limitations of public infrastructure, enhance resilience to climate change, and respond to growing community demands for reliable access to drinking water.

Postulate 2: The duality of public and private offerings raises structural challenges, particularly in terms of equity, quality, and accessibility. A strategic complementarity between the two sectors can maximize.

Socio-cultural, economic, and political consequences of these changes and recommendations to address the challenges

Consequences of current dynamics

It should be noted that the privatization dynamics of potable water supply services in Benin and Africa have several cultural, socio-political, and economic consequences. These changes can be analyzed through various key aspects:

Cultural consequences

- **Transformation of local perceptions of water:** In many African cultures, water is considered an

inalienable common good. Privatization, by introducing a concept of commodification, may contradict these traditional values, leading to reluctance and distrust towards private companies (Swyngedouw, 2004).

- **Change in usage practices:** Private management may encourage users to adopt more rational water use, but it risks excluding vulnerable populations due to high costs, leading to changes in consumption habits (Gleick, 2000).

Socio-political consequences

- **Reduction of trust in public authorities:** The privatization of public services is often seen as an acknowledgment of the state's failure to provide basic services, which can reduce the legitimacy of the state. When costs rise or services become less accessible, it fuels public criticism of the authorities (Hounmenou, 2006).
- **Creation of tensions between local actors:** The presence of private actors in a sector once public creates complex power dynamics between the state, local communities, and companies. Managing conflicts between urban and rural areas becomes more complicated, especially in regions where infrastructure is already limited (World Bank, 2020).

Economic consequences

Improvement of infrastructure and increased efficiency:

The entry of the private sector often accelerates infrastructure modernization, introduces new technologies, and optimizes management. This can reduce losses and improve water quality, but the benefits are not always evenly distributed (Pahl-Wostl et al., 2016).

Risk of tariff increases:

Private services tend to introduce higher tariffs to cover their operational costs and maximize profits, making water less affordable for some communities, especially in rural areas and informal neighborhoods (Van der Zaag & Savenije, 2006). The findings of this research revealed a willingness to pay more for potable water even in rural areas. However, this does not reflect a higher purchasing power but indicates that these populations are forced to pay more just to ensure that potable water is available at all times. This willingness to pay more should not be seen as an opportunity to further increase the price of water. Some contributors rightly warn that a lack of information or a poor understanding of the benefits associated with the service can lead to an underestimation or overestimation of the willingness to pay. Loomis et al. (1994) highlight that willingness to pay is often overestimated when participants do not fully understand the long-term impacts of the service or product being evaluated.

Impact on economic development:

A reliable water supply supports agriculture, industry, and local SMEs, boosting the regional economy. However, high costs can hinder these benefits and harm small producers who rely on water for their activities.

In summary, while privatization may offer solutions to state failures, it also creates socio-political, economic, and cultural challenges that must be managed to ensure equitable and sustainable access to potable water.

Recommendations for optimal and equitable management of potable water supply

In analyzing the ongoing dynamics of potable water supply and other public services in Benin and the sub-region, I offer the following recommendations to address the major challenges:

- **Strengthen basic data:** Encourage Beninese authorities and private organizations to improve the collection and publication of data on the quality, access, and efficiency of potable water services. The

establishment of an independent observatory could also be considered to regularly monitor these developments.

- **Adapt governance and regulation:** To reduce access inequalities, it is crucial to establish strict regulatory policies that govern private sector involvement while ensuring accessibility for vulnerable groups. This could include subsidies or progressive tariffs for essential services.
- **Promote public-private collaboration:** Create more inclusive partnerships between the public and private sectors, ensuring these collaborations benefit local communities. This could include participatory governance mechanisms allowing citizens to express their needs and concerns.
- **Promote equity in access to services:** Introduce programs to ensure that rural or low-income populations are not excluded by privatization. A fair pricing model, coupled with awareness initiatives, could facilitate more inclusive access to potable water.

These recommendations aim to improve service efficiency while minimizing the social and economic disparities that privatization might generate. In short, it is important to note that private involvement in public services can be beneficial under certain conditions, including strict regulation and a focus on population needs. However, in the absence of adequate regulation and a balance between profitability and social mission, this approach could exacerbate inequalities and reduce access to services for the most vulnerable.

Postulate 3: The privatization of public services leads to complex consequences, redefining cultural behaviors, social inequalities, and governance relations. Active citizen involvement in regulation and governance can reduce tensions and enhance service effectiveness.

Theoretical Contribution 3: In Chapter 7, I demonstrated that many previous works only present a partial view of the effects of the development of the potable water market. The results presented in this research help fill this gap. They provide a broad perspective that allows for a better understanding of the motivations of producers and consumers, preferences, satisfactions, and socio-cultural and ideological influences guiding individual choices. My findings show that organoleptic properties still play an important role in how many consumers perceive water quality, and an increasing number believe that water produced by private companies is of better quality than public tap water. Generally, other postulates arise from this study:

Postulate 4: Increased private sector involvement leads to varied effects depending on the population category, ranging from improved access to heightened inequalities. Proper regulation is essential to prevent private services from excluding vulnerable populations due to high costs or limited access. Public policies must ensure services are accessible to marginalized communities through subsidies or social tariffs.

Postulate 5: The emergence of private actors redefines governance standards by integrating participatory approaches and stricter service regulation.

Corollaries:

5-1. A clear legal framework establishing the roles and responsibilities of different actors fosters collaborative governance.

5-2. Monitoring and evaluation mechanisms must include local stakeholders to ensure transparency and sustainability.

5-3. Including communities in decision-making about local services improves acceptance and the effectiveness of initiatives.

5-4. Governance must evolve toward participatory models where citizens influence the regulation and management of public services.

Postulate 6: The success of private initiatives varies according to the local economic, institutional, and socio-

cultural context, highlighting the importance of solutions tailored to the specificities of each region.

Corollaries:

6-1. Private initiatives must consider economic disparities and local perceptions to ensure their viability and acceptance.

6-2. Hybrid models combining public support and private innovation are particularly suited for economically fragile contexts.

6-3. Strong and independent institutions are needed to effectively regulate private actors and protect collective interests.

6-4. Local governments must be supported in developing administrative and technical skills necessary for overseeing private projects.

This structure highlights that each postulate is accompanied by specific corollaries aimed at addressing identified challenges and opportunities while laying the foundations for adapted governance and regulation.

Contribution of the study's results to the enrichment of the theories mobilized

The emergence of private actors in public services in Benin has significant cultural, political, social, and economic implications. Analyzing these impacts can be illuminated by several economic and social theories, each offering a unique perspective on this transformation.

Posner's Regulation Economics Theory:

According to Posner, regulation aims to correct market failures and ensure basic services for the public. In the Beninese context, private intervention, responding to state shortcomings, seeks to address the inadequacy of public coverage, but it also leads to a dependence on private actors for access to essential services, changing the dynamics of public control and accountability. By examining the emergence of private actors in public services in Benin, this thesis offers a perspective on the regulatory adaptations needed to balance private interests and equitable access, highlighting how regulators can evolve in partially privatized markets.

Institutional Economics Theory:

This theory emphasizes the importance of institutions in guiding economic and social choices. In Benin, the encouragement of private participation in services such as water, health, and education is often driven by an institutional framework influenced by international organizations and structural reform policies. The institutionalization of privatization creates a setting where private actors become indispensable, even though it may lead to a reduction in sovereignty over public service decisions. The conclusions of our research demonstrate how local political and cultural institutions in Benin shape privatization and the effectiveness of public services, showing that the success of private involvement largely depends on institutional stability and governance mechanisms.

Participatory Governance Theory:

With the rise of the private sector, the state tends to delegate more responsibilities for managing public services to local communities and municipalities. This dynamic, theorized in participatory governance, manifests in stronger community integration in monitoring and managing delegated services. However, this approach can also exacerbate inequalities if populations lack the resources to influence decisions made by private actors. This thesis demonstrates the importance of inclusive governance in a context of privatization, where citizen participation is crucial to ensure that services remain aligned with the population's needs.

Privatization Theory:

Privatization is based on the idea that private companies can deliver services more efficiently than the state. This

theory holds in some contexts in Benin, where private entities are seen as improving the quality and availability of services. However, it also has economic and social consequences, particularly in terms of increased costs for users and the risk of unequal access to essential services. This work enriches the theory by revealing the specificities of privatization in essential services in Benin, illustrating how contextual factors (social and economic) modify the impact of privatization.

Planned Behavior Theory:

This theory suggests that attitudes, social norms, and perceived control influence behaviors. In Benin's public sector, the positive perception of private services, linked to norms and perceived effectiveness, can influence individual choices in favor of private services. However, this dynamic is often hindered by socio-economic factors, such as household income levels, which limit access to privatized services. By studying consumers' choices for drinking water services between public and private sectors, this thesis provides new insights into the behavioral determinants in a diverse public services environment. By contextualizing the Beninese experience, this thesis expands and adapts these theories to similar environments, highlighting the necessary conditions for balanced and equitable governance of public services in emerging markets.

The thesis emerging from this research

The emergence of private actors in public services in Benin, particularly in the drinking water sector, profoundly reshapes the access and management of these essential services. Through political and institutional reforms, the Beninese state has encouraged a dual supply system by combining public and private interventions. This situation certainly increases the efficiency and coverage of services, but it also presents significant challenges in terms of equity and regulation. The coexistence of these two systems creates tension between financial accessibility for the poorest households and the profitability requirements of private companies, while also transforming cultural expectations and political responsibilities.

In this thesis, I have focused on this transformation, analyzing both the positive aspects such as improvements in quality and diversification of services, and the challenges posed by this dynamic. My thesis seeks to demonstrate that the success of such a model relies on inclusive governance that considers the need for strict regulation and equal access for all social groups. This research contributes to a better understanding of the foundations and effects of privatization in an African context and offers recommendations for balancing private involvement with the maintenance of an accessible and equitable public service.

However, it is important to consider certain biases in assessing the overall scope of this study.

Limitations of the study and research perspectives

Here, I present the biases of this thesis work related to data collection and analysis, and I discuss the validity of the results obtained. I delve more deeply into the theoretical and methodological limitations of my research on the emergence of local private actors in the provision of drinking water in the communes of Abomey-Calavi, Banikoara, Boukombé, and Parakou in Benin. I also list some aspects related to my topic that I could have developed further, which are avenues to explore in future research.

1. **Access to data:** The quality and availability of data may be problematic, especially in the Beninese context, where access to updated and reliable statistics on drinking water and public services is limited. This could restrict the study's ability to analyze certain dynamics in depth. Although I made an effort to be diligent, it is possible that some biases in conducting and analyzing the interviews remain, which may affect the quality of this thesis. Despite my best efforts, I was unable to secure a meeting with certain key officials and politicians involved in the governance of the water sector. Clearly, their perspective would have been valuable for refining some of my data. Moreover, my study starts with a specific case of public service (drinking water provision) to reach a broader conclusion on the emergence of private actors in public services in Benin. Since field data was collected solely on drinking water, it may be insufficient to fully assess the situation in other public services that are experiencing a growing influx of local private actors. The trends identified in other public services were based on documentary research. This approach

remains limited and cannot adequately replace field data. Therefore, I could not triangulate data from different sources (interviews, questionnaires, secondary data, and observations) to ensure convergence in the facts studied. Another limitation of this thesis is related to the timing of the research. I conducted interviews with local producers and consumers in 2023. The results represent a snapshot of the situation at a particular point in time. Some realities may have evolved more than 20 months after the research was conducted.

2. **Representativeness of the sample:** In qualitative research, cluster sampling, while effective in capturing the diversity of perspectives, may sometimes fail to capture certain regional or socio-economic particularities that influence access to public services. More localities in Benin could have been included in the clusters to provide a more comprehensive view of the country. Maxwell (2013) warns about the lack of diversity in qualitative sampling, which reduces the external validity of the results. Meanwhile, Creswell (2018) emphasizes the importance of purposive sampling to balance representations in qualitative studies.
3. **Perception bias:** Participants' responses may be influenced by their personal experiences or their expectations of the public and private sectors. This could introduce bias in the interpretation of the results, especially concerning satisfaction or perceived effectiveness. Respondents may have given answers they believe to be socially acceptable rather than their true opinion. For example, a producer may exaggerate their commitment to sustainable practices to conform to perceived expectations. Fisher (1993) describes social desirability as a common distortion in qualitative surveys. Podsakoff et al. (2003) analyze techniques to minimize this bias, such as anonymity and indirect questions. Although I took care to guarantee anonymity for respondents, it is possible that some answers were not entirely sincere. Also, as a researcher, my desire to see certain hypotheses confirmed may have biased some analyses. Convincing of the opportunity for the emergence of local private actors in drinking water provision, especially to achieve SDG 6, I may have minimized or overlooked criticisms expressed by some consumers. Nickerson (1998) explains how pre-existing expectations influence data collection and interpretation. In this thesis, I made an effort to capture differences in consumer opinions on drinking water, so as not to provide a unified or stereotyped view of respondents' expectations (see Chapter VII). However, I did not conduct a detailed analysis of the different profiles and expectations of consumers, as this was not the focus of my study. Future studies could address these gaps.
4. **Lack of comparability:** The duality between public and private offers can be difficult to compare systematically, due to different standards and objectives between the sectors, which complicates the analysis of the advantages and disadvantages of each management model. My study revealed that the emergence of local private producers significantly reduced the water-fetching burden for women and children, especially in rural and peripheral areas. However, it would have been pertinent to further explore the impacts of this development on the social and economic empowerment of women. Furthermore, Benin, which has been facing the threat of violent extremism for some time, raises new research questions. In continuation of my work, I plan to examine the effects of this phenomenon on drinking water provision in border areas, while also exploring the broader consequences of radicalization on water infrastructure and its various uses. Additionally, in the context of climate change, I wish to direct my future research toward domestic practices related to water use, exploring innovative solutions such as recycling and water-saving strategies for certain uses. Finally, from a broader perspective, it is crucial to better understand the overall impact of the rise of private actors in public services. Complementary studies will be necessary to deepen the dynamics at play and assess the socio-economic and environmental consequences of this transition.

Table 3: Comparative analysis of the advantages and disadvantages of drinking water provision in Benin by a single public operator versus expansion to private actors

Criteria	Provision by a single public operator	Provision expanded to private actors
1. Geographical Accessibility	Advantages: The state can prioritize rural and underserved areas in its national planning,	Advantages: Private actors are often more flexible and capable of quickly

	ensuring balanced coverage. Disadvantages: Limited resources and centralized management may lead to incomplete coverage, especially in remote areas.	addressing specific needs, particularly in peri-urban and rural areas. Disadvantages: Less profitable areas (rural or low-density) may be neglected.
2. Service Quality	Advantages: Uniform quality standards imposed through strict public regulation. Disadvantages: Outdated infrastructure and lack of maintenance can affect water quality.	Advantages: Private actors often introduce technological innovations and modern quality control systems. Disadvantages: Without strict regulation, disparities in quality may arise between operators.
3. Cost for Consumers	Advantages: Public tariffs may be subsidized, making water more affordable for vulnerable households. Disadvantages: High operational costs and bureaucratic inefficiencies can lead to budget deficits and limit infrastructure investments.	Advantages: Competition among private actors can drive efficiency and potentially lower costs. Disadvantages: Private services are often more expensive, which may exacerbate inequalities for low-income households.
4. Regulation and Governance	Advantages: Centralized governance simplifies planning and implementation of national policies. Disadvantages: Monopolized management can lead to inefficiencies, corruption, and slow decision-making.	Advantages: Opening up to private actors can enhance governance by introducing control mechanisms from multiple stakeholders. Disadvantages: Fragmentation of operators complicates regulation and may foster conflicts of interest.
5. Sustainability and environmental impact	Advantages: Centralized management can better integrate sustainability objectives into long-term planning. Disadvantages: Hydrological resources may be overexploited due to limited technical capacity for sustainable management.	Advantages: Private actors can introduce innovative practices (recycling, advanced technologies) to optimize resource use. Disadvantages: Unregulated exploitation by private actors may accelerate resource degradation.
6. Socio-economic impact	Advantages: Water is treated as a public good, promoting a perception of equity. Disadvantages: Lack of economic incentives may limit job creation and local investment opportunities.	Advantages: Private actors contribute to local economic development (jobs, supply chains). Disadvantages: The commodification of water may transform a common good into an inaccessible product for some.

Challenges related to the expansion to private actors:

1. **Insufficient Regulatory Framework:** Without a robust regulatory framework, private operators may prioritize profitability over accessibility and sustainability.
2. **Increased Social Disparities:** Private services, often more expensive, may worsen inequalities in access.
3. **Coordination Among Stakeholders:** Coexistence of multiple operators (public and private) requires effective coordination to avoid overlaps or uncovered areas.
4. **Social Acceptability:** The emergence of private actors may face resistance, especially if communities perceive water as being privatized.
5. **Resource Sustainability:** Without strong control mechanisms, overexploitation of water resources by private actors may lead to long-term shortages.

GENERAL CONCLUSION

The study conducted on the emergence of private actors in the drinking water sector and more broadly in public services in Benin addresses a complex issue that intertwines political, economic, social, and environmental aspects. This general conclusion revisits the main findings while incorporating the theoretical and practical implications arising from the analysis of the observed dynamics.

Political and institutional foundations: Between reforms and decentralization

The emergence of private actors in the water sector in Benin is primarily based on political and institutional reforms aimed at addressing the failures of public systems. Decentralization, accompanied by a legislative framework encouraging public-private partnerships, has emerged as a key strategy to improve drinking water coverage. These reforms align with the ambitions of the Sustainable Development Goals (SDGs), particularly SDG 6, which focuses on universal and sustainable access to water. However, the implementation of these reforms has encountered significant challenges, notably:

- **Fragmented Governance:** The lack of effective coordination between national and local levels hampers the effectiveness of interventions.
- **Insufficient Funding:** While reforms have attracted private investment, the lack of public resources complicates the implementation of strict regulation.
- **Structural Inequalities:** Rural areas, historically underdeveloped in terms of infrastructure, remain underserved, despite increased private involvement (Gomis, 2022; Hountondji et al., 2022).

These reforms reflect an acknowledgment of the limitations of centralized approaches, while underscoring the need to rethink governance and regulation in a context marked by a growing duality between public and private actors.

Current dynamics: The duality of public and private offers

The analysis of ongoing dynamics reveals a gradual shift toward a mixed management model for public services. This transformation is accompanied by notable changes:

- **Rise of local private actors:** Small businesses, cooperatives, and individual operators have become key players, particularly in peri-urban and rural areas. Their flexibility and technological innovation enable them to meet the specific needs of local communities (Odoulami, 2009; Lagnika, 2014).
- **Service diversification:** The private sector has introduced various options, such as individual boreholes, small water treatment plants, and community distribution networks (Banon and Bonnassieux, 2011).
- **Economic integration:** In addition to addressing social needs, these initiatives stimulate the local economy, particularly through job creation and the development of supply chains.

Despite these advances, the coexistence of public and private systems raises significant questions regarding regulation and social justice:

- **Private services,** often more expensive, exacerbate inequalities between low-income households and wealthier populations (Friedman, 1962; Marteau, 2010).
- **Fragmentation of the supply** complicates the establishment of a coherent regulatory framework, which may lead to economic inefficiencies and conflicts of interest (Ki Zerbo, 2006; Rhodes, 1996).

Consequences of private emergence: Between opportunities and challenges

The impacts of this transformation are multiple and sometimes ambivalent.

- **Economic impact:** The integration of private actors has improved drinking water coverage in previously neglected areas. However, this progress is accompanied by high costs for consumers, limiting access for vulnerable households. Additionally, the lack of robust financial regulation mechanisms risks further deepening economic disparities.
- **Social and cultural impact:** The rise of private actors is redefining perceptions of public services. Communities, once dependent on state systems, are gradually adopting market-driven consumption behaviors, reinforcing the privatization of common goods (Yetongnon, 2020).
- **Political impact:** This evolution disrupts the power dynamics between public and private actors. Regulatory policies, often insufficient, give way to fragmented governance, where the responsibility of actors remains unclear.
- **Environmental impact:** The increased exploitation of water resources, sometimes without adequate regulation, poses a threat to their sustainability. Unchecked overexploitation risks harming future generations, requiring urgent political intervention.

In conclusion, the emergence of private actors in the drinking water sector represents a partial but promising response to the failures of public systems. However, to maximize benefits and minimize risks, a holistic approach supported by inclusive policies and technological innovations remains essential. This transition must be guided by collective commitment to ensure both equity, sustainability, and the well-being of present and future generations.

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Gildas Sènamèdé Aizannon



Gildas Hervé Adoté Akueson



Ismail Moumouni-Moussa