

Article

Public management and private participation in water supply and sanitation in Minas Gerais: possible impacts of Law nº 14.026/2020

A gestão pública e a participação privada no abastecimento de água e esgotamento sanitário em Minas Gerais: possíveis impactos da Lei nº 14.026/2020

Gestión pública y participación privada en abastecimiento de agua y alcantarillado en Minas Gerais: posibles impactos de la Ley nº 14.026/2020

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Submitted on: 08/19/24

Revision on: 10/07/24

Approved on: 10/13/24

Abstract

Objective: to present and discuss the main changes brought about by Law nº. 14.026/2020 for the implementation of public basic sanitation policies, in particular, in the provision of water supply and sewage services in Minas Gerais, Brazil. **Methodology:** the study was carried out by reviewing

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technical literature, relevant legislation and qualitative and exploratory data analysis. The research was conducted from February 2023 to September 2024 and carried out consultations in the databases Web of Science, Portal of Periodicals of the Coordination for the Improvement of Higher Education Personnel, Scopus and other databases indexed in the Virtual Library. The results found were compared with information from other sources. **Results and discussion:** the preliminary critical analysis regarding the update of the Sanitation Law made it possible to identify challenges, helping to reflect on established public policies. The research revealed that there are several flaws in the international experiences of privatizing sanitation services. Proponents of privatization argue that the private sector is more efficient and innovative than the public sector. However, critics point out that privatization could lead to tariff increases, reduced quality of services and lack of investment. **Conclusion:** the results demonstrated that the privatization of the sanitation sector in Minas Gerais could be disastrous, especially for the most vulnerable population, making it difficult to efficiently universalize these essential services.

Keywords: Health law; Sanitation; Sanitation policy; Regionalization in basic sanitation.

Resumo

Objetivo: discutir as principais alterações trazidas pela Lei nº 14.026/2020 na execução das políticas públicas de saneamento em Minas Gerais, tendo em vista a intensificação da previsão de participação privada nas ações de abastecimento de água e esgotamento sanitário. **Metodologia:** o estudo foi realizado mediante revisão da literatura e legislação pertinentes, bem como análises de dados de forma qualitativa e exploratória. A pesquisa foi realizada entre fevereiro de 2023 a setembro de 2024, e procedeu-se a consultas nas bases de dados Web of Science, Portal de Periódicos da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior, Scopus e em outras bases da Biblioteca Virtual. Os resultados encontrados foram comparados com informações de outras fontes. **Resultados e discussão:** a análise crítica preliminar permitiu identificar desafios, auxiliando na reflexão sobre as políticas públicas instauradas. Observou-se que Lei nº 14.026/2020 traz mecanismos de intensificação da participação privada nas ações de saneamento, sob o argumento de universalização do acesso aos serviços. A pesquisa revelou que são diversas as falhas nas experiências internacionais de privatização dos serviços de saneamento. Os defensores da privatização argumentam que o setor privado é mais eficiente e inovador do que o setor público. No entanto, críticos apontam que a privatização pode levar a aumentos tarifários, redução da qualidade dos serviços e falta de investimentos. **Conclusão:** os resultados demonstraram que a privatização do setor de saneamento em Minas Gerais pode ser desastrosa, especialmente para a população mais vulnerável, dificultando a efetivação de um direito coletivo, que passa a ser tratado como um direito de consumo.

Palavras-chave: Direito sanitário; Saneamento; Política de saneamento; Regionalização em saneamento básico.

Resumen

Objetivo: presentar y discutir los principales cambios producidos por la Ley n. 14.026/2020 en la ejecución de las políticas públicas de saneamiento, especialmente en la prestación de servicios de abastecimiento de agua y de alcantarillado en Minas Gerais, Brasil. **Metodología:** El trabajo ha sido desarrollado mediante la revisión de la literatura y legislación relevante, y el análisis cualitativo y exploratorio de datos. La investigación se realizó de febrero de 2023 a septiembre de 2024 y se realizaron consultas en las bases de datos Web of Science, Portal de Revistas de la Coordinación para el Perfeccionamiento del Personal de la Educación Superior, Scopus y otras bases de datos indexadas en la Biblioteca Virtual. Los resultados encontrados se compararon con información de otras fuentes. **Resultados y discusión:** el análisis crítico preliminar sobre la actualización de la Ley de Saneamiento permitió identificar retos, ayudando a reflexionar sobre las políticas públicas establecidas. La investigación ha revelado varias fallas en las experiencias internacionales de privatización de servicios

de saneamiento. Los defensores de la privatización argumentan que el sector privado es más eficiente e innovador que el sector público. Sin embargo, los críticos señalan que la privatización podría conducir a aumentos de tarifas, reducción de la calidad de los servicios y falta de inversiones. **Conclusión:** Los resultados han demostrado que la privatización del sector de saneamiento en Minas Gerais puede ser desastrosa, especialmente para la población más vulnerable, lo que dificulta la universalización eficiente de estos servicios esenciales.

Palabras clave: Derecho Sanitario; Saneamiento; Política sanitaria; Regionalización en saneamiento básico.

Introduction

Access to sanitation is provided for in the 1988 Constitution as an urban development action, whose guidelines are the responsibility of the Federal Government (Art. 21, XX) and as part of programs related to housing conditions, which are the common responsibility and administrative nature of all federal entities (Art. 23, IX). At the same time, sanitation is related to the realization of the right to health, since “participating in the formulation of the policy and the execution of basic sanitation actions” is one of the attributions of the Unified Health System (SUS), in Article 200, item IV⁽¹⁾.

Among the components of sanitation, water supply is even more important, given that access to this natural resource is considered a universal human right⁽²⁾. However, population growth and the greater diversity of anthropogenic activities have led to intensified exploitation of this natural resource and the use of products with various chemical formulations (pharmaceuticals, cleaning products, cosmetics and others). This consequently leads to the generation of sanitary sewage with increasingly complex chemical characterization, which is often introduced into public water supplies, making them more polluted and scarce.

Minas Gerais - MG belongs to the Southeast Region of Brazil, and is the country's third largest economy and second most populous state. Due to the importance of its river basins, the state has become known as Brazil's “water tank”⁽³⁾. In addition, Minas Gerais has the largest ore reserves in the country, with a history of exploitation, which is still expanding today, coming close to Conservation Units. What's worse, Minas Gerais has poor governance over its territory, with planning and supervision subject to different interests, which significantly threatens its hydrographic potential and the environment⁽⁴⁾.

At the same time, in Minas Gerais, many public water supply sources also receive untreated or poorly treated sewage⁽⁵⁾. This occurs, for example, in the Paraopeba and Velhas rivers, in the Metropolitan Region of Belo Horizonte, the state capital.

Water polluted by sewage and contaminated with emerging micropollutants is subjected to the conventional process (coagulation-flocculation) for potabilization. However, this technique is not suitable for removing these contaminants and the health of the population is constantly at risk. These micropollutants cause negative environmental impacts even at trace concentrations ($\mu\text{g/L}$ or ng/L) and, even at low concentrations, have the potential to cause adverse effects on the ecosystem^(6,7). Some of these substances induce the formation of mutations that result in antibiotic resistance in bacteria, affect the growth, reproduction and behavior of non-target organisms, cause acute and chronic toxicity, bioconcentration in food chains and carcinogenic and endocrine effects⁽⁸⁻¹⁰⁾. Studies on the occurrence, effect, fate and removal of micropollutants in water are still scarce, especially in emerging countries^(5,6,11).

Sanitation services associated with strategic urban planning promote sustainable development and are essential for meeting public health goals. Access to water in adequate quantity and quality, as well as efficient collection and treatment of sanitary sewage are fundamental requirements for reducing the incidence of disease, protecting the health of the population and reducing SUS expenditure⁽⁵⁾.

Once again, basic sanitation is shown to be a right connected to the right to health, and according to an estimate made in 2014 by the World Health Organization (WHO), every US\$1 invested in water and sanitation reduces US\$4.3 in health costs. Furthermore, investment in sanitation services leads to a 1.5% increase in global Gross Domestic Product (GDP)⁽¹²⁾. These positive effects demonstrate the need for the Public Administration to make a priority effort to develop sanitation infrastructures, in order to serve the community as a whole.

In Brazil, 13 years after the sanitation regulatory framework came into force, the law that updated it (Law N°. 14.026 of 2020) brought changes to the regulation of the sector through the regionalized provision of services, the competitive selection of the provider and the concurrent provision of services^(13,14). The current regulation encourages private sector participation and sets targets for universalization of services. However, its application in the specific context of Minas Gerais requires in-depth critical analysis in order to understand how legislative transformations are shaping public water and sewage management in the state.

Minas Gerais has a population of 21,411,923 inhabitants, of which 17.6% have no access to drinking water and the rate of treated sewage is 44.1%. This index measures the volume of wastewater that is treated before being released into the environment^(15,16).

Guaranteeing access to drinking water and sewage for the people of Minas Gerais requires an investment of R\$103.2 billion by 2041, with an additional R\$75.8 billion over the next twelve years. This estimate was officially presented during the 32nd Congress of the Brazilian Association of Sanitary and Environmental Engineering (Abes), and is part of a study developed by the National Association and Union of Private Concessionaires of Public Water and Sewage Services (Abcon/Sindcon) in partnership with the Government of Minas Gerais, as published by the State Secretariat for the Environment and Sustainable Development⁽¹⁷⁾.

Understanding the legislative changes at the federal level allows for an assessment of the challenges, helping to formulate effective and targeted public policies to guarantee universal access to quality sanitation services.

Therefore, the central problem of the article consists of a critical analysis of public sanitation policies in Minas Gerais in light of the legislative changes brought about by Law N°. 14.026/2020, considering the existing challenges and the possible implications of greater participation by the private sector in the management of water and sewage services. To answer this question, the potential impacts of updating the sanitation regulatory framework on the supply and management of water supply and sewage services in Minas Gerais were discussed, using the experience of other countries with regard to the participation of the private sector and its relationship with efficiency, quality and accessibility in the provision of services, as well as its implications in relation to the Sustainable Development Goals and the Human Rights to Water and Sanitation.

Methodology

For this research, a qualitative and exploratory bibliographic review was carried out by surveying the relevant literature and legislation, as well as the Virtual Library Database. The searches were

carried out between February 2023 and September 2024, by consulting the *Web of Science* databases, the journal portal of the Coordination for the Improvement of Higher Education Personnel (CAPES), university institutional repositories, Scopus, among other databases indexed in the virtual library.

The search strategies used the terms: “basic sanitation”, “sanitation regulatory framework”, “sanitation legal framework”, “sanitation in Brazil”, “national sanitation policy”, “water and sewage in Brazil”, “water and sewage in Minas Gerais”, “sanitation standards”, “basic sanitation”, “legislation on basic sanitation”, “sanitation privatization” with the aid of the Boolean operator “AND”.

Searches were also carried out on Google Scholar, using the same descriptors. These searches were carried out with caution when checking sources, selecting only indexed works (with ISSN - International Standard Serial Number).

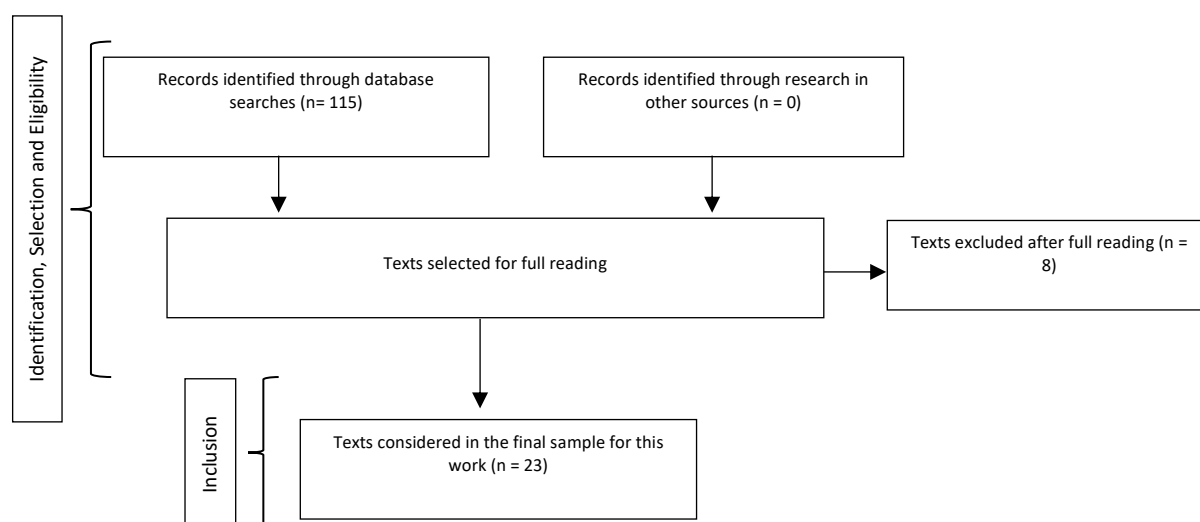
In addition to these selection criteria, another method used was to include studies that address private participation in the sanitation sector, issues related to basic sanitation policies, regulation of this sector and the provision of sanitation services, the advantages and disadvantages of public sanitation management in the national and international context and specific legislation related to the topic. Information on water supply and sewage systems in Brazil and Minas Gerais was collected from relevant platforms specializing in the subject.

It should be noted that protocols and guidelines that have already been established and scientifically accepted were followed in order to prepare this review. The search for materials included texts available free of charge and in electronic format that met the search criteria mentioned above. With this in mind, the search was conducted by consulting original articles, editorials, technical notes, literature reviews and/or commentaries. The texts were initially analyzed by title, followed by an analysis of the abstract.

For those papers that did not contain enough information to allow them to be selected or excluded by title or abstract, vertical readings were carried out and the rest were excluded. As a result, 115 articles published in scientific journals during the research period were identified, according to the terms used in the searches, plus four articles obtained from other sources. Thirty-one articles were selected for full reading. After reading, 8 articles were excluded because they did not meet the inclusion criteria, resulting in a final sample of 23 articles considered in the preparation of the paper (Figure 1).

Finally, the selected texts were read in detail, in an interpretative way, trying to find consensus among the authors, adopting positions on the issues raised. We also used papers published in annals of specialized events, master's dissertations, doctoral theses, books and other documents available on specific websites to discuss the results.

Figure 1 - Diagram of the methodology for selecting the full articles used in the review



Source: Prepared by the authors (2024).

A search was also carried out on the website <https://www.gov.br> to identify specific Brazilian legislation related to the topic, as well as on websites such as the World Health Organization (WHO) and the Inter-American Commission on Human Rights (IACHR). The information collected was organized descriptively into topics, with the aim of succinctly presenting the reader with the main changes introduced by Law 14.026/2020, as well as related international experiences. For the purposes of analyzing the relevant Brazilian legislation, we considered the time period immediately before the Constitution of the Republic in force until the present day (1987 to 2024).

Searches were also carried out in printed books, technical notes from Brazilian government bodies and those from other countries, as well as other texts that dealt with the subject, but which were not the result of searches in the databases mentioned above.

Results and discussion

Failed experiments in the privatization of sanitation services: an international overview

An analysis of international experiences has shown that there are many failures related to the privatization of sanitation services. A study carried out by the Transnational Institute in the Netherlands between 2000 and 2017 revealed that approximately 1,600 municipalities in 45 countries opted to privatize basic public services, including water supply and the expansion of sewage systems⁽¹⁸⁾. The survey identified at least 835 cases of re-municipalization and 49 of nationalization, the majority since 2009. The main reasons for privatization were abusive tariffs, non-compliance with contracts, unmet investment targets and lack of expansion and universalization, especially in peripheral areas inhabited by economically disadvantaged people. Cities that privatized their water and sewage systems in recent decades and ended up reversing this decision include Atlanta, Berlin, Paris, Budapest, Buenos Aires and La Paz⁽¹⁸⁾.

In Cochabamba, Bolivia, the population managed to prevent the privatization of the company responsible for supplying water (Servicio Municipal de Agua Potable y Alcantarillado - SEMAPA),

after decades of water scarcity due to both the local geography and the negligence of public managers. The lack of investment in infrastructure and alternative ways of collecting water led the population to find autonomous solutions to deal with the scarcity. However, under pressure from the World Bank and the International Monetary Fund (IMF), the Bolivian government decided to privatize SEMAPA, approving a new Water Law that treated the exploitation of the resource as a private right. The increase in tariffs promoted by the company Aguas del Tunari, which won the bid, generated great dissatisfaction and popular pressure led by the Cochabamba Water Coordination, resulting in the privatization being reversed, which was considered an unprecedented achievement in Latin America⁽¹⁹⁾.

Research carried out by Flores in 2007 also showed that in Uruguay and the province of Santa Fe, Argentina, society resisted the privatization of water services, promoting re-statization in search of more democratic and participatory management. The study highlighted the importance of understanding the social dynamics and contradictions inherent in these processes, going beyond the hegemonic approaches in organizational studies⁽²⁰⁾.

France, for its part, has experienced a significant movement towards re-municipalization of water services, after decades of private management, impacting the sector as it is home to two of the largest global companies in this segment, Suez and Veolia. In Paris, a notable example of this process occurred in 2008, when an audit revealed high costs and a lack of transparency in the accounts related to the delegation of the public service. Before remunicipalization, Paris divided water management into three stages, involving production, distribution (awarded to Suez and Veolia) and quality control. Audits resulted in the non-renewal of the private concessions, which ran from 1985 to 2010, leading to the dissolution of the mixed company. Paris regained control of the water cycle in 2010, resulting in an 8% reduction in the price of water the following year⁽²¹⁾.

In addition, user satisfaction reached 97% and the service met almost 100% of the technical parameters. The remunicipalization process in France has not been limited to a political stance, extending to cities with right-wing majority governments. Internationally, France leads the way in water-related re-municipalization cases, with a total of 104 between 2000 and 2017, followed by the United States, with 61 cases. The approach is not hostile to companies, as evidenced by the recent five-year contract with Suez, highlighting that remunicipalization is not a confrontation, but a management strategy⁽²¹⁾.

According to a study by the Transnational Institute, criticism of the privatization of basic sanitation is based on negative international experiences, which reveal a high number of cases of privatization in various cities around the world^(16,22). While advocates of privatization highlight exceptional cases of success, such as in England and Wales, research shows that these successes were achieved in specific contexts and do not represent the reality of the majority of cases⁽⁵³⁾. The re-statization of the sector, observed in more than 35 countries and affecting millions of people, reflects recurring dissatisfaction with inflated, inefficient services and insufficient investment, driving a global movement for a return to public control of basic sanitation⁽²³⁾.

Critics point out that privatization can lead to tariff increases, a reduction in the quality of services and a lack of investment. This dichotomy between the perspectives for and against privatization of sanitation reflects the complexity of public policies, in which the search for efficiency and innovation often clashes with the concern for accessibility, quality and universalization of services.

The main changes brought about by Law Nº. 14.026/2020

The commitment expressed in article 11-B of Law 14.026/2020, which establishes the pursuit of universalization by 2033, reinforces the strategic importance of providing 99% of the population with drinking water and 90% with sewage collection and treatment⁽¹⁴⁾. The quest for universalization set out in this law has a different deadline to SDG 6⁽²⁴⁾, which is set for 2030, which makes it difficult for the country to comply.

The approval of this law has generated expectations and concerns about its impact on the public management of water and sanitation, especially in Minas Gerais, since the planned changes could influence the social determinants of health in the state, considering the complex interactions between access to treated water, basic sanitation and health⁽²⁵⁾.

Since the enactment of Law 14.026/2020, the regulatory relationship between the National Water Agency (ANA) and the sanitation sector has taken on a new dimension, with the ANA playing the role of drawing up reference standards. These standards cover quality and efficiency standards in the provision of services, tariff regulation, standardization of business instruments, universalization targets, accounting criteria, water loss control, regulatory governance, reuse of treated effluents, among others⁽²⁶⁾.

In addition, the ANA now has responsibilities related to solid waste management and rainwater drainage, integrating these activities into the scope of basic sanitation. In addition to its regulatory function, the agency also assumes the role of promoting training for those involved in municipal, inter-municipal, district and state regulation of the sanitation sector and, when requested, arbitrating conflicts between the granting authority, the sanitation service provider and local regulatory agencies⁽²⁶⁾.

On the other hand, it can be said that Law 14.026/2020 meant the naturalization of the process of privatization of basic sanitation services in the country. The inclusion and intensification of competencies related to the private provision of services reveals the view of the character of basic sanitation services that the guarantee of universalization is independent of who will provide them. In other words, by establishing criteria and standards for contracting the private sector and including among the ANA's duties the encouragement of free competition, competitiveness and economic sustainability, a basic sanitation market has been definitively created, especially given that the public providers live with chronic underfunding, since many of the states that controlled the companies had little financial capacity due to their debt situation^(27,28).

Law Nº 14.026/2020 and considerations on private sector participation in sanitation

Based on the above discussion, we can identify various challenges and threats to the universalization of basic sanitation in Brazil and Minas Gerais with the promotion of the increasing use of the private sector by Law No. 14.026/2020. The impacts of privatization on human rights have been approached from various angles. A study published by Léo Heller, former United Nations Special Rapporteur on the human rights to water and sanitation, analyzed the risks that the privatization of services can entail for the maintenance of these rights⁽²⁹⁾. Three factors can, in combination or not, lead to these risks: profit maximization, natural monopoly of services and imbalance of power. The first refers to the private logic of relentless pursuit of profits, which can affect accessibility and service provision. The second, the lack of competition for service provision, can lead to greater risks of

corruption. The last points to asymmetries of power, information and resources, which can disadvantage authorities with fewer resources and bargaining power.

The report points out that privatization has resulted in a rise in tariffs, an increase in water cuts due to non-payment, a drop in water quality, the use of alternative and unsafe sources by the population, among other factors that have resulted in a risk to the Human Rights to Water and Sanitation (HRWS). At the same time, the document indicates that privatization has generated health risks for the population of some municipalities, with an increase in the incidence of cholera and other diarrheal diseases⁽²⁹⁾. At the same time, in the case of other infectious diseases, the emergence and high spread of SARS-CoV-2 in 2020, for example, resulting in a difficult-to-control pandemic, revealed the importance of access to water and soap for proper hand washing and prevention of infection⁽³⁰⁾.

The position in favor of private participation in the provision of basic sanitation services in Brazil is generally based on the same arguments defended for other infrastructure sectors: increased efficiency and more investment.

According to Carvalho, the main objective of the proponents of privatizing sanitation services is “to make prices perform their function of signaling the best allocative efficiency in the relationship between water production and consumption and not just to confer an economic value on water resources”⁽³¹⁾. This author argues that, in certain cases, there should be a tariff reform to ensure the economic viability of projects. He also defends the importance of the financial autonomy of the enterprises, which would promote the sustainability of the provision of services through explicit definitions of contractual obligations.

Vargas and Lima pointed out that there is a potential role for private initiative in water supply and sanitation, highlighting case studies on concessions in the Southeast region of the country. When analyzing the risks and opportunities of private involvement, they highlight the possibility of attracting capital to invest in infrastructure, believing that concessions can contribute to improving the quality of services. However, the authors emphasize the need for a robust regulatory apparatus, balanced contracts and qualified regulators to guarantee compliance with rights and obligations⁽³²⁾.

The expansion of private participation is seen as an opportunity to increase the sector's efficiency through competition between public and private operators. On the other hand, the literature warns of potential risks, such as the subordination of political regulation to the economic logic of the market, which can harm the poorest populations, leading to a form of social exclusion. This occurs as private concessionaires prioritize profitable areas and can raise sanitation tariffs to recoup their investments and make a profit. In addition, private participation can result in the regulator being captured by the regulated, due to the private concessionaires' greater power to influence the regulator. The research carried out by Hübner, based on case studies between 2001 and 2003, reveals ambivalent results, establishing limits and conditions for the sustainability of private involvement in basic sanitation services in developing countries⁽³³⁾.

The privatization of basic sanitation services can aggravate injustices and socio-spatial segregation by reducing service coverage, especially in areas lacking this infrastructure and access to health care. This process can also lead to an increase in the price of services in disadvantaged regions, making them unaffordable for the poor, and a reduction in the quality of services in deprived areas, exposing the population to environmental risks⁽³³⁾.

Those who oppose the privatization of these services claim that private enterprise does not consider water to be a common good, belonging to everyone and, for this reason, a human right. However, it should be noted that both access to water and access to sanitation are human rights recognized by United Nations resolutions in 2010, with broad support from member countries, including Brazil. The human rights framework defines that governments are responsible for fulfilling their human rights obligations, at the risk of violating these obligations. Thus, in the water and sanitation sector, state intervention is crucial. Because these services are monopolized (there is only one provider in each location), they require firm action by the state to regulate, monitor, control and guarantee this human right. When these services are left completely to the markets, there is a real risk of rights violations⁽²⁹⁾.

The commercialization of water would go against the guarantee of this right to the less economically advantaged, curtailing the enjoyment of a good that is indispensable to life. Added to this theory is the fact that the poorest regions are not attractive to investors for various reasons, such as more costly works, a more dispersed population and less economic conditions to bear the costs. Others fear that private initiative will favor economic advantages (profits) over the quality of service provision.

Furthermore, it is worth emphasizing the close relationship between the realization of the right to sanitation and the right to health, which are not only constitutionally related rights, but are also interdependent. The absence or deficiency in access to these rights generates the risk of being affected by infectious and parasitic diseases and results in a loss of quality of life for the population, especially women⁽³⁴⁾, given that access to water and sanitation are social determinants of health⁽³⁵⁾.

It should not be overlooked that the same privatization movement has been carried out within the health system, under the argument of universal access to services. On the contrary, the growing entry of the private sector into health has reduced the state's capacity to invest in the system, as well as interfering greatly in the model of care, making it more individualized and hospital-centric⁽³⁶⁾. The spread of private providers leads to a lack of territorialization, which ends up damaging health surveillance itself, especially in its environmental component, increasing the lack of access to basic sanitation.

On the other hand, investments in sanitation aimed at rural, quilombola and indigenous communities in alternative systems and solutions that are not maintained by charging tariffs can be part of health actions that have minimum amounts to be invested annually by the Union, States, Federal District and Municipalities, in accordance with Complementary Law N°. 141/2012⁽³⁷⁾.

In short, the advocates of privatization argue that the private sector is more efficient and innovative than the public sector. This trend claims that only with financial resources from private investors will Brazil achieve the long-awaited universalization of sanitation services, given the restriction of public resources for the sector. It is known, however, that in many countries the experience of privatizing sanitation services has been unsuccessful.

Overview of Basic Sanitation in Minas Gerais

Minas Gerais' water and sanitation coverage rates are below 75 and 70%, respectively^(16,38) and, as in other parts of Brazil, the state has significant disparities in access to drinking water and sanitation. The more urbanized areas (the Centre-South and Triângulo Mineiro regions) have better indices than

the less urbanized areas, where the worst indicators of social well-being are observed (the Jequitinhonha and Mucuri Valleys and the North and East of Minas Gerais)⁽³⁹⁾.

In the least economically favored region of the state - the Jequitinhonha River Basin - after the implementation of the Legal Framework for Sanitation (Law 11.445/2007), there was an improvement in the supply of water to the population. However, the situation has worsened since 2014, with less than 650,000 people, out of an estimated population of 1,445,405, having access to this service⁽⁴⁰⁾.

In this context, significant financial resources are needed to achieve universal access to services. The investments required to serve the state's 853 municipalities are in the order of 5,370 million reais for sewage collection and 4,177 million for sewage treatment, for a total investment of 9,547 million reais⁽⁴¹⁾. These investments are equivalent to 6.4% of the amount estimated to universalize sewage services throughout the country.

Since 2009, the Minas Gerais State Regulatory Agency for Water Supply and Sewage Services (Arsae-MG) has had the power to issue technical, economic and social standards for the regulation of water supply and sewage services provided by the state or a direct administration entity, as in the case of Copasa, as well as other providers, provided they are authorized by the municipality or public consortium⁽⁴²⁾. At the national level, the ANA aims to create reference standards, including guidelines for the regulation of basic sanitation services that cover the supply of water for human consumption, sewage disposal, solid waste management and rainwater drainage⁽¹⁴⁾.

As for the quality of water for human consumption, the health sector, together with the service operators, are responsible for monitoring and surveillance, carried out at federal, state and municipal level⁽⁴³⁾. Of the 853 municipalities in Minas Gerais, Copasa supplies 640 with water and 310 with sewage⁽⁴⁴⁾ and only seven have granted the water supply service to the private sector⁽⁴⁵⁾, while the rest are served by services provided by the municipalities themselves. According to the "*Atlas Esgotos: Despoluição de Bacias Hidrográficas*"⁽⁴¹⁾, the investments needed for this universalization in Brazil by 2035 would be around 149,496 million reais. Of this amount, R\$102.1 billion would be earmarked for expanding sewage collection and interception and R\$47.6 billion for treatment. The largest portion of the investments would be earmarked for the Northeast region, where around 70% of the funds would be used to set up collection networks. The states of Pernambuco, Bahia and Ceará together would receive 56% of the funds earmarked for the region.

In the Southeast, the estimated value represents around 29% of the total for the country. Approximately R\$7 billion has been earmarked for the four capital cities, more than 15% of the total for the region. With a large number of densely populated urban agglomerations in the region, 612 cities require their sewage to be treated with an efficiency of more than 80% in terms of organic load removal and demand R\$30.1 billion of the total R\$43.5 billion estimated⁽⁴¹⁾.

Despite this scenario, the basic sanitation situation in Minas Gerais is different from the rest of Brazil, and there has been notable progress in the state's improvement plans. Nine municipalities stand out among the 50 best in the country in terms of basic sanitation, led by Uberlândia, which has services provided by a municipal authority⁽⁴⁶⁾.

In the case of the state's urban population, 90.9% have access to treated water; 88.8% have access to sewage collection; and 77.9% of the sewage collected is treated. These indicators are higher than the national average: 83.6% for water supply; 53.2% for sewage collection; and 46.2% for sewage treatment⁽⁴⁷⁾.

When analyzing the correlation between sanitation indicators and human development indicators, Alana Junho found that the greater the access to sanitation services, the better the human development of the population⁽⁴⁷⁾. The study shows that municipalities with greater access to treated water have higher rates of life expectancy at birth and the Municipal Human Development Index (MHDI). This strategy is in line with Sustainable Development Goal 6, "Ensure availability and sustainable management of water and sanitation for all", and its target 6.1 of achieving universal and equitable access to safe and affordable drinking water for all by 2030⁽²⁴⁾. Thus, promoting access to treated water can contribute both to the health and quality of life of the population served, as well as to meeting the premises of sustainable development

The survey also concluded that Minas Gerais is moving towards universal basic sanitation, even without privatizing services. However, there are still challenges to be overcome, especially increasing the percentage of sewage treatment⁽⁴⁷⁾.

Another study carried out in the state by the João Pinheiro Foundation⁽⁴⁸⁾ found that 76.6% of Minas Gerais municipalities have municipal basic sanitation plans, with 28.5% already implemented. Access to drinking water in the state is significant, ranking second nationally with 90.3% coverage in 2014. There was also a 3.5% relative increase in coverage between 2011 and 2014, but only 31.9% of municipalities treat the sewage they collect.

Despite these advances, Minas Gerais has been facing the consequences of more flexible sewage discharge standards. This process, which began in 2001, has resulted in more permissive standards, with lower requirements for the removal of pollutants, such as carbonaceous organic matter, in sanitary sewage treatment plants, even eliminating the requirement to monitor other important discharge parameters relating to sanitary sewage pollution control, such as ammoniacal nitrogen and detergents^(49,50).

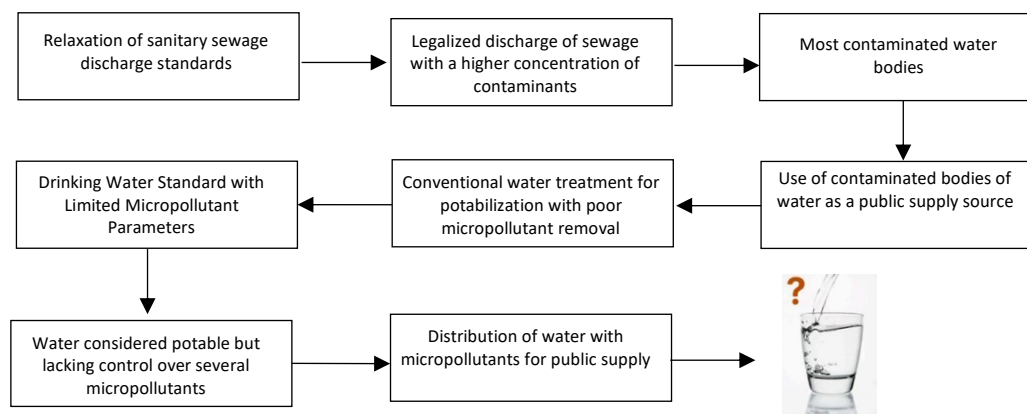
In this context, a technical survey carried out in 2008 by the state public prosecutor's office showed that Minas Gerais had established less stringent criteria for discharging sewage into watercourses than other states. In relation to the removal of biochemical oxygen demand (BOD), for example, before the relaxation, the percentage standards were as follows: Minas Gerais, 85%; Goiás, 80%; Paraíba, 80%; Santa Catarina, 80%; São Paulo, 80%. Currently, the requirement for BOD removal in sanitary sewage treatment plants in Minas Gerais is only 60%^(49,50).

In this way, it can be said that the relaxation of the standards that dictate the level of efficiency of treatment systems has enabled (legalized) an anaerobic treatment technique that is not very efficient at removing various pollutants. In addition to causing damage to the environment (pollution of water sources receiving sewage and atmospheric pollution through the emission of toxic, corrosive and foul-smelling gas - hydrogen sulphide), these systems are affected by the corrosion of materials and structures in sewage treatment plants caused by the gases. Furthermore, the economic advantage claimed for the viability/legalization of the method consisting of *Upflow Anaerobic Sludge Blanket* (UASB) reactors is not passed on to users, who are charged for the "treatment" of their sewage⁽⁴⁹⁻⁴⁸⁾.

In this respect, less efficient sewage treatment systems contribute to further degradation of the quality of public water supplies, with the introduction of micropollutants that have a negative impact on the health of the population. Removing these micropollutants from increasingly polluted water sources requires complex and costly treatment techniques. As it is unlikely that the country and the state will be able to afford this in the short term, the population will receive water for human consumption within the drinking water standards set by the Ministry of Health⁽⁴³⁾, but not free of

contaminants (Figure 2). This fact, as well as contributing to people becoming ill with chronic diseases (cancer, infertility, endocrine disease, among others), also has an impact on the increase in SUS spending^(5,7,8,9,11).

Figure 2 - Route of contamination of public water supplies due to the relaxation of sanitary sewage discharge standards.



Source: Saraiva Soares, Souza e Souza⁽²⁾.

In conclusion, despite progress in some areas, Minas Gerais still faces significant challenges in the basic sanitation sector, such as indebtedness, which makes it difficult to provide the financial resources needed to expand the coverage of water supply and sewage services and their quality. There is a need for substantial investment in order to universalize and improve the quality of services, which is crucial for public health and socio-economic development. However, the private sector, which is seen as a possible source of funds for these investments, tends to take on concessions in areas where the population is better off financially, in contrast to the most vulnerable populations, who in many cases do not have adequate access to these services.

In addition, the relaxation of sewage treatment standards has resulted in negative impacts on the environment and health, highlighting the importance of effective public policies and investments in more efficient treatment technologies, contributing to quality of life and long-term sustainability.

Final considerations

To guarantee universal access to drinking water and sanitation, effective measures are needed, such as investments in infrastructure, public policies and awareness programs. Minas Gerais has made progress, but there are still challenges such as financial difficulties that limit the investments needed to expand and improve water supply and sanitation. Significant investments are essential for the universalization of these services, positively impacting public health and socio-economic development.

The policies implemented in the country, particularly Law No. 14.026/2020, seek to respond to these issues, but remove responsibility for the provision of services from the state, which, despite being the largest funder, becomes merely a market regulator. In this context, Law 14.026/2020 could

represent yet another health and environmental setback, given its exclusionary nature for the most vulnerable populations, who may face restricted access to drinking water and sewage services, since this public does not attract investors.

International experiences show that privatization of sanitation will not guarantee efficiency and quality of services, nor will it ensure effective universalization of services. In many cases, privatization has led to re-statization, driven by a range of problems, including rising tariffs, inefficiency of services and lack of investment.

In short, it is crucial that public policies are developed with care to ensure that the universalization of basic sanitation is achieved in a fair and efficient manner, taking into account the needs of the most vulnerable populations and seeking solutions that guarantee equitable access to these services. It is hoped that this study can contribute to the discussion on basic sanitation policies, as well as intersectoral policies, with a view to making the population's fundamental rights, including the right to health, a reality.

Thanks

The authors would like to thank the Minas Gerais School of Public Health for its support in carrying out this research.

Conflict of interest

The authors declare that there is no conflict of interest.

Authors' contribution

Soares AFS contributed to the conception/design of the article, data analysis and interpretation, writing of the article, critical revision of its content and approval of the final version of the article. Ramos AM contributed to the conception/design of the article, data analysis and interpretation, writing of the article, critical revision of its content and approval of the final version of the article. Ribeiro EL contributed to the conception/design of the article, data analysis and interpretation, writing of the article, critical revision of its content and approval of the final version of the article. Da Silva FR contributed to the conception/design of the article, data analysis and interpretation, writing of the article, critical revision of its content and approval of the final version of article. D'Ávila LS contributed to the conception/design of the article, data analysis and interpretation, writing the article, critically reviewing its content and approving the final version of the article.

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How to cite

Soares AFS, Ramos AM, Ribeiro EL, Da Silva FR, D'Ávila LS. Public management and private participation in water supply and sanitation in Minas Gerais: possible impacts of Law nº 14.026/2020. Cadernos Ibero-Americanos de Direito Sanitário. 2025 jan./mar.;14(1):58-75

<https://doi.org/10.17566/ciads.v14i1.1279>

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