



Water and Sanitation as a Wicked Governance Problem in Brazil: An Institutional Approach

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The world is facing a large number of interrelated crises that have seriously increased the level of uncertainty and ambiguity in many areas. In 2018, the UN anticipated that the world was careering toward a global water crisis with a 40% shortfall in freshwater resources by 2030 coupled with a rising population. This nascent crisis represents a “connected challenge” for countries: it contains a multitude of causes and consequences, a multitude of actors and interests for which no “one-size-fits-all” solutions are available. The adequate approach to this type of complex—or “wicked”—problems is not to search for technological solutions only, but to consider new forms of governance that make use of complementary institutional logics. Effective governance depends on the extent of alignment with the complexity and the root causes of the issues. This paper applies wicked problem theory to identify the root institutional and governance causes of uncertainty in a developing country like Brazil, which provides insights to (also) identify approaches that could navigate change in less uncertain and ambiguous directions. We distinguish three types of relevant institutional constraints: logics, complementarities, and voids. Based on semi-structured interviews with representatives from Brazil’s water and sanitation sector, we delineate institutional constraints precipitated by the plurality of the governance system. We argue why a tripartite partnership approach—as for instance pioneered by Dutch international water projects in the global South—presents a way out of the wicked water and sanitation problems in Brazil.

OPEN ACCESS

Edited by:

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Specialty section:

This article was submitted to
Water and Human Systems,
a section of the journal
Frontiers in Water

Received: 23 September 2021

Accepted: 13 April 2022

Published: 27 May 2022

Citation:

Carvalho DM and van Tulder R (2022)
Water and Sanitation as a Wicked
Governance Problem in Brazil: An
Institutional Approach.
Front. Water 4:781638.
doi: 10.3389/frwa.2022.781638

Keywords: institutional complementarity, institutional constraints, institutional logics, institutional voids, tripartite partnerships, water and sanitation sector, wicked problems

INTRODUCTION: A GOVERNANCE CHALLENGE?

Too many people still lack access to safely managed water supplies and sanitation facilities. Water scarcity, flooding, and lack of proper wastewater management also hinder social and economic development. Clean water and sanitation problems are among the most significant challenges the world is facing in the decade to come (UN-United Nations, 2018a). Despite substantial progress during the 1990–2015 period in increasing access to clean drinking water and sanitation, 2.1 billion people (29% of the global population) lacked access to safe, readily available water at home, and 6 on 10, or 4.5 billion did not have safely managed sanitation in 2015 (WHO/UNICEF, 2017), including 892 million people—mostly in rural areas of Southern Asia and sub-Saharan Africa—that still practiced open defecation, and 2.3 billion people that lacked even a basic level

of service (UN-United Nations, 2018b). In 2018, the UN anticipated the world was careering toward a global water crisis with a 40% shortfall in freshwater resources by 2030 coupled with a rising population. In March 2018, the UN General Assembly launched the Water Action decade to mobilize action to transform how water has been managed. The COVID-19 pandemic has reiterated the tantamount importance of sanitation, hygiene, and adequate access to clean water to prevent and contain diseases.

Water and sanitation problems do not only refer to water-scarce countries but also to relatively resource-abundant countries like Brazil. The country presents a very controversial situation regarding to water, even though it holds 12% of the surface fresh water of the planet (Whately and Campanili, 2016), about 16% of the population (35 million) in 2019 did not have access to piped treated water, and 46% (100 million) had unsanitary ways of dealing with wastewater (SNIS, 2019). The 9th largest economy in the world scores #106 in terms of access to basic water and sanitation services (ABCON, 2019), which has also contributed to its greater susceptibility to the COVID pandemic. Brazil has the highest open defecation rate in Latin America (WHO/UNICEF, 2017). Water and sanitation have become one of the key targets of the Sustainable Development Goals (SDG6) as it has many externalities that requires a “nexus” approach and the involvement of different societal actors to address the problems (Cronin et al., 2015; Rasul, 2016; Pahl-Wostl, 2019; Van Zanten and Van Tulder, 2021).

Water and sanitation problems are primarily rooted in poorly managed governance systems and policies, resulting in a skewed allocation of resources and a relatively low provision of services (Cosgrove et al., 2000). For many decades the discussion on appropriate governance approaches centered around decentralized governance models, privatization policies (Bakker, 2010; Boelens, 2015), and market-based approaches to overcome the failure of governments to adequately deliver services and manage scarce resources (Achterhuis et al., 2010). Countries are struggling with the nature of water and sanitation as a natural monopoly, a private, public, or common pool good for which appropriate governance models must be developed. Water and sanitation challenges have all the traces of a “tragedy of the commons” or “common pool” problem, where wrong decisions can lead to its overuse and depletion (Hardin, 1968; Ostrom et al., 1999).

Studies claim for novel governance models that promote a better balance between public and private participation in the water and sanitation systems and to encourage the involvement of multiple stakeholders (Cain et al., 2020). This trend brings potential opportunities for solving the problems but also increases the complexity of governance systems.

Successful complex network governance results from the self-articulation between different leaderships, interests, and power relations (Pahl-Wostl, 2015). Overcoming complexity requires a better understanding on the roots of the institutional “wickedness” of the water and sanitation problems that block innovative governance approaches for these systems. More integrated governance approaches require improved dialogue and collaboration between government, civil

society, and the private sector (Lane and Robinson, 2009). Defining the institutional preconditions for “complexity-sensitive” interventions and collaborative arrangements (Van Tulder and Keen, 2018) still lacks theoretical elaboration and empirical testing.

This study aims to explore the dimensions of institutional complexity on the water sector by investigating the institutional constraints—complementarities, voids, and logics—that make it difficult to discuss and resolve agency, administrative structure, and the relationship between three key institutional spheres of society: state, market, and civil society. Institutional complexity contributes to fragmentation of water management and characterizes the wickedness of the governance challenge of the sector in Brazil. In section 2 (theory development), we construct a theoretical model that identifies key components of those societal complexities that could be blocking decisions and frustrating advancements to address (wicked) water and sanitation problems in weak institutional contexts like Brazil. Multi-stakeholders’ engagements in network approaches as partnerships represent a governance proposition to come up with effective solutions to pressing needs of society, as sanitation, mainly originated by the failure of acting of government, civil society, and market actors. Although partnerships have been introduced to deal with complex problems in diverse contexts in developed, developing and under developing countries, it is relatively unclear what are the elements of the institutional setting that can hamper or encourage engagement processes between partners in the formation of this arrangements. We applied these theoretical insights to document the water and sanitation sector’s governance situation in Brazil.

In section 3 (Methodology) we explain the use of semi-structured interviews to understand—from the perspective of those involved in the sector—the extent to which the institutional constraints contribute to the wickedness of the governance problems on the water and sanitation sector in Brazil and affect the effectiveness of establishing new solutions such as partnerships arrangements. In section 4 (Findings), we critically reflect on the policy initiatives in the country and accumulate relevant insights on key aspects to way out of the crisis. Our analysis examines the roots of governance complexity of the water and sanitation sector in Brazil in terms of institutional constraints and considers the extent to which tripartite partnerships (TPPs) can be considered an appropriate “way out” for the governance sector’s challenges in the country (section Discussion: On Institutional Constraints and Wicked Problems and Conclusion).

THEORY DEVELOPMENT: WATER AND SANITATION AS A WICKED GOVERNANCE PROBLEM

Complex and interconnected problems related to the provision of clean water and sanitation can be classified as “wicked problems.” Wicked problems are difficult to define and address and have no fixed solutions (Rittel and Webber, 1973). Originally, wicked problem scholars argued that there was no template to follow

when tackling these problems. But four decades later, second-generation wicked problem scholars started to acknowledge that arrangements can be identified, all based on a more solid understanding of the way ecosystems of collaborating actors can create novel governance arrangements (Crowley and Head, 2017). Wicked problems are systemic and require a deeper understanding of the institutional constraints and how the institutional setting can influence new approaches and possible solutions. Wicked “opportunities” can then be created by overcoming institutional constraints, expressed in this study through institutional complementarities, voids, and logics.

In recent decades, the water and sanitation sector has experienced growing social complexity that evolves from conflicting logics, making the feasibility of the sector primarily a governance issue (Franco-Torres et al., 2021). Water and sanitation governance must encompass a wide diversity of policy areas, water policy formulation, a sectoral fragmentation of tasks at different levels of government, between ministries and public agencies, a diversity of actors—government, private market, and civil society—that face conflicting goals and logics. Numerous issues related to water are the result of population growth, economic activities, climate change, pandemics, which makes water governance a highly complex system (Vannevel and Goethals, 2021).

Governance, seen as a (complex) system, needs to capture multiple elements involved in providing goods and services, such as the diversity of actors, roles, logics of interactions, and the dynamics of sharing responsibilities (Pahl-Wostl, 2019). Governance processes might take different forms and modes, while conflicts tend to occur at the interface between state, market, and civil society (Van Tulder and van Mil, 2020).

Dealing with complexity requires governance at different hierarchical levels. Water governance needs to be approached within a systemic framework, requiring the understanding of the key drivers of water management (Akhmouch and Correia, 2016). Water governance takes place at different levels, ranging from the national or supranational level to the regional or local level. The management approach can vary a lot depending on the scope, from climate change, that transcends territorial boundaries and are usually addressed on a global scale, to national water resources management, and even more particular to regional and local management of drinking water supply services. Institutional arrangements and different governance models must span the full range of regions, national and supranational levels. Water governance can bring fundamental issues and dilemmas of scale to modern environmental management and governance (Moss and Newig, 2010).

Akhmouch and Clavreul (2016, p. 2) delineated water governance as “encompassing political, institutional and administrative rules, practices, and processes through which decisions are taken and implemented, stakeholders can articulate their interests and have their concerns considered, and decision-makers are held accountable in the management of water resources and the delivery of water services.” The OECD definition on water governance offers a broader view as “the set of administrative systems, with a core focus on formal institutions

(laws, official policies) and informal institutions (power relations and practices) as well as organizational structures and their efficiency” (Romano and Akhmouch, 2019, p. 2).

The type of challenge to be faced determines the combination of governance modes that define more or less effective approaches. Hybrid forms of governance have been suggested as a possible approach that combines the strengths of different modes and allows combining complementary forces of different actors through a mix of policy instruments such as hierarchical regulation, economic incentives, and voluntary and participatory approaches (Pahl-Wostl, 2019). Effective governance is a normative concept, and purposes need be negotiated among different stakeholders (Young, 2013).

The existing governance models do not reflect the current reality of the water and sanitation sector and even less the increasing complexity of the sector and the need to search for new solutions. It is urgent to clarify what would be the constraints that could be hampering the establishment of proper solutions for the water and sanitation sector, as our analysis proposes on tripartite partnerships. We brought the institutional theory, shaped by different logics, lack of complementarity and regulatory voids in this attempt. We addressed institutional constraints at the national level of water governance that affect the implementation of partnership arrangements (tripartite governance model at partnership level).

We define governance of water and sanitation services as the whole system, with their supporting structures (institutional organization, with networks and hierarchies of interactions between institutes) and the combine content (e.g., policies, laws, norms, plans, programs, and management instruments) and the technical decision-making process that set the scene for management of services and that could encompass the promotion of new approaches such as partnerships.

But what should our focus be when addressing wicked governance problems? The complexity of water and sanitation problems can be addressed by (1) distinguishing the relevant components of the institutional constraints in water and sanitation that define a weak governance setting, (2) applying second-generation wicked problem approaches to assess the degree of “wickedness” of water and sanitation, and (3) considering as a reference collaborative approaches that have proven successful nationally (in Brazil) and, due to the diversity of solutions, in international cooperation programs between developed and developing/underdeveloped countries, that in this study refer in particular to Dutch partnerships programs. From the interviews and document analysis we identify elements of institutional constraints of the local contexts and how they are handled through the local governance level and the role of partnerships in this endeavor. The partnerships contracts involve not only the improvement of the existing physical facilities, but local capacity building through behavioral change and communities’ mobilization and also the creation of an enabling environment, by policy development and institutional structure development and strengthening sustainable financing models. Empowering the actors and enabling the environment, it will ensure the continuity of service delivery, as well as the institutional structure to underpin it.

This is not a comparative study and by considering the Dutch example it was possible to obtain categories, from different dimensions for a deeper understanding on how cross-sector social partnerships can be managed across different contexts. Institutional analysis is proposed as an approach for dealing with the complexity of wicked problems. We consider that the institutional logic at a societal level pervades the organizational field and influences the governance of the cross-sector arrangements. According to authors Khanna and Palepu (2010), developed country operators in emerging markets may take the institutional context as given, or they can actively work to change it. In this sense, the efforts of the Dutch partnerships are concentrated, as can be seen in the structuring of programs aimed at different areas as the basic sanitation sector, where one of the common goals is tied to the development of local capacity. This can be seen in the challenges imposed in terms of goals in the TST project (The Special Treat project) project, where we conducted some interviews and which involve enabling and creating institutional environment, by policy development, institutional structure development and financial model, and the development of an educational program to create awareness of the local population and greater awareness in terms of citizenship.

Figure 1 explains the basic framework developed to cover relevant components of an institutional approach to the water and sanitation challenge. The structure of the analysis is based on the premises that a weak institutional setting can be associated with institutional constraints—complementarity, voids, and logics—which in turn aggravates the wickedness of water and sanitation governance problems. Defining institutional constraints makes it possible to discuss how to increase the effectiveness and coherence of the institutional arrangement of the sector and to enable the establishment of the innovative approaches as partnerships to help to mitigate the problems.

Institutional Constraints

Institutional constraints in any governance context stem from the interactions between multiple actors and logics—defined as different standards of conduct (Friedland and Alford, 1991; Thornton et al., 2012). The institutional structure defines the formal and informal rules through regulatory and normative arrangements and compliance mechanisms to control the application of these rules (Djelic and Quack, 2003; Thornton and Ocasio, 2008); from three different societal spheres (state, market, and civil society) and to qualify the tensions that organizations are exposed to when they come together. Some logics are shared and provide the basis for collaboration, whereas others present conflicting perceptions and practices (Jooste and Scott, 2012), generating institutional voids. The interplay of institutional logics can result in (1) institutional complementarity and/or (2) institutional voids.

Institutional Logics

Complementarity logics—synthesizing collaboration and competition—can be achieved when national, regional, or sectoral institutions create more balanced forms of behavior and social coalitions (Hall and Gingerich, 2004). Water and

sanitation challenges involve societal complexity, in which all relevant stakeholders are involved. Each stakeholder potentially adds, from their own institutional sphere, a complementary form approach and a logic to deal with the matter (Van Tulder, 2018).

Institutional Complementarity

Through considering the institutional complementarity allowed us to analyze how institutions come together to create new organizational forms, or when they contrast with each other due to certain incompatibilities. Complementarity arises when a particular set of national, regional, or sectoral institutions creates balanced forms of behavior, combined with a broader set of other factors like the influence of public and social coalitions and socioeconomic conditions (Hall and Gingerich, 2004).

Lacking institutional complementarity in the water and sanitation sector can be identified through the plurality of entities, the duplicity and overlapping of the roles, the contradictions in rules and the lack of integration among parts of the system.

Institutional Voids (Gaps)

Institutional voids can arise from the relationship between formal rules and their purposes (regulatory voids), or from the lack of effectiveness in their implementation (enforcement voids). The emergence of voids in emerging markets is distinct, where economic growth usually advances faster than institutional structures. Sustainable development in emerging markets depends on the simultaneous growth of relevant institutions (Rodrigues, 2013). The inability of institutional systems to match different and simultaneous demands results in institutional gaps (Rodrigues, 2013). In the Brazilian water and sanitation sector institutional voids appear due to regulatory ambiguities, inadequate enforcement mechanisms, and weak governance system.

All relevant stakeholders—state, private sector, and civil society—are needed to be involved in innovative approaches, enhancing the effectiveness of institutional arrangements, and leading to mitigation of the problems. One of the central arguments in the analysis of institutional complexity is that the involvement of different actors usually brings conflicting institutional logics, which can lead to contradictory actions by actors (Greenwood et al., 2011). In contrast, second-generation wicked problem theory argues that each stakeholder potentially adds a complementary approach and logic to deal with the matter (Van Tulder and van Mil, 2020) expanding beyond individual capabilities when acting together, emphasizing the requirement of more complex interventions (partnering and multi-stakeholder arrangements) to deal with complexity of the problems (Austin and Seitanidi, 2012).

Water and Sanitation as Wicked Problem?

The literature on wicked problems and systems change distinguishes several relevant dimensions that denote sources of complexity (Waddock et al., 2015; Alford and Head, 2017; McConnell, 2018). Relevant insights that shed further light on the nature of linkages and the dynamics at play can be clustered

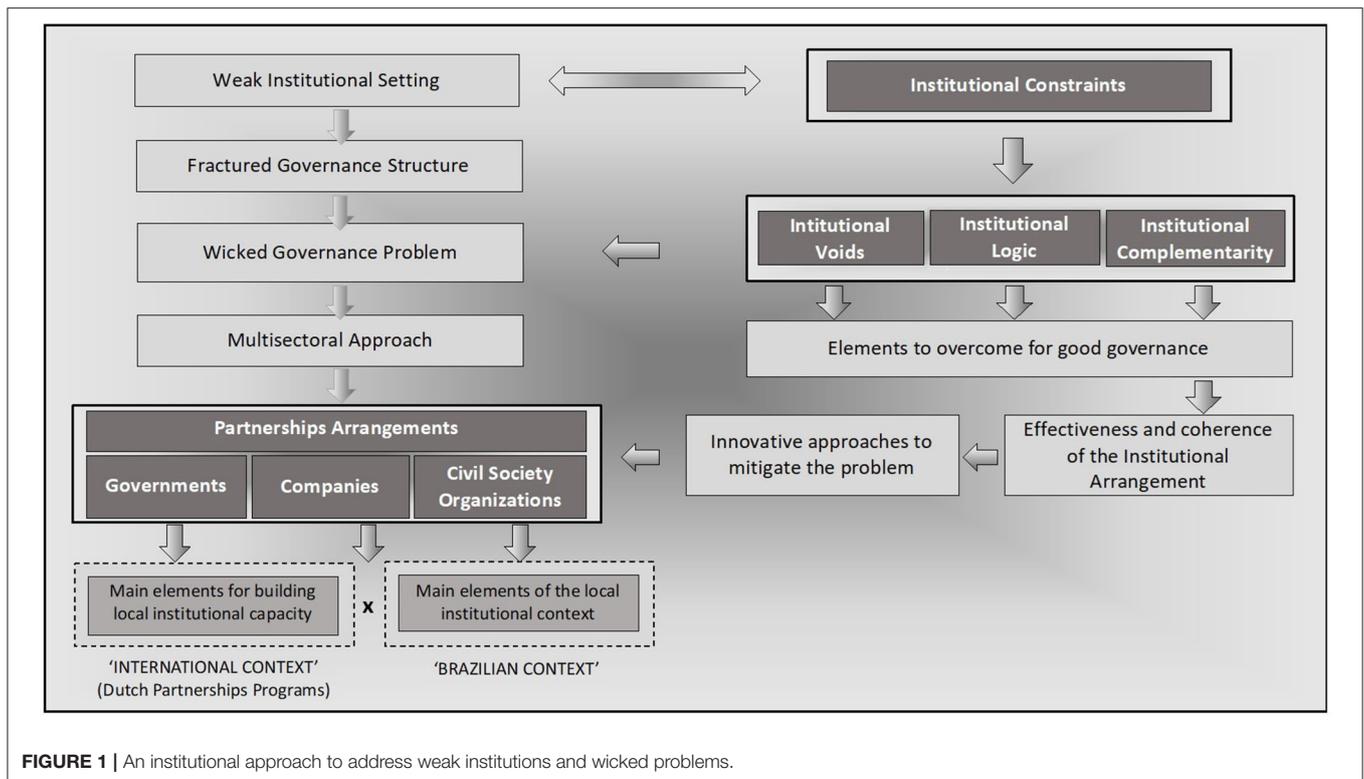


FIGURE 1 | An institutional approach to address weak institutions and wicked problems.

along five general classifications of complexity (Van Tulder and van Mil, 2020).

- **Structural complexity** shows how systemic is the problem and is characterized by the existence of a massive number of elements. More dimensions come into play (political, economic, social, legal, technological, and environmental) at different levels (micro, meso, macro).
- **Generative complexity** increases when the interconnectedness between elements of the phenomenon intensifies. Interacting elements can unfold in unpredictable ways; cause (root) and effect are not easy to distinguish and tend to sprawl different effects across time (“now” versus “later”) and across boundaries (“here” versus “there”).
- **Dynamic complexity** involves variety in pace and direction in the involvement of—and between—different elements or parts of the phenomenon. Urgency, momentum, and inertia can exist simultaneously, as can be seen in the discussions on climate action.
- **Communicative complexity** is created if information is (a) actively molded to accommodate the interests of some, (b) influenced by the perception, behavior, preferences, emotional connectivity and receptivity of people, (c) is not fully understood and cannot be verified due to a lack of transparency, (d) not reliable and reduces trust in the messenger, or (e) leads to further fragmentation, individualism, and polarization.
- **Societal complexity** exists when the number and diversity of stakeholders involved or affected is extensive. This dimension

is mirrored by the variety of and differentiation in “logics,” interests, perceptions, behaviors, and identities, and by diffused responsibilities related to roles, loci of power, control, means, and spheres of influence.

Approaching Wicked Problems Through Partnerships

Wicked problems cannot be solved by single solutions but require collective and collaborative action in which all three societal spheres are equally represented and are able and willing to work on solutions to the collective interest of all (Van Tulder and Keen, 2018). Partnerships can develop collaborative links to improve the level of integration and coordination between different stakeholders (Lane and Robinson, 2009). Tripartite partnerships (TPPs) can better combine complementary institutional characteristics and logics between public and private, profit and nonprofit, governmental, and non-governmental, to provide public goods (Van Tulder and Pfisterer, 2014; Van Tulder and van Mil, 2020). TPPs offer “collaborative advantages” in involving stakeholders from different societal spheres—state, market, and civil society, based on the assertion that “no single actor has sufficient potential to address the issue unilaterally” (Van Tulder and Pfisterer, 2014, p. 113). TPPs can address wicked problems and sizable institutional voids as they help to minimize the individual failure of the societal sectors involved, instigating a greater level of complementarity and engagement between them. They have been more effective than bilateral arrangements (public-private between governments and business) by developing innovative approaches to mitigate conflicts between societal actors, achieve

a fairer distribution, and address common pool dilemmas more effectively.

Wicked problems require pooling and reinforcing the complementary strengths of each sector: (i) governments in developing proper laws and sufficient regulation, (ii) companies in providing goods and services to the population, and (iii) civil society in reaching the neediest part of the population by providing security and stability. Hybrid governance solutions often lead to compromise, weakened accountability, and low transparency, resulting in sub-optimal approaches (Van Tulder and van Mil, 2020). Filling the institutional voids requires societal sectors to bear the responsibilities beyond their primary influences and transcend their individual influence scope (Clarke and Fuller, 2010). This means collaborate and align the compromise on their own longer-term interests. TPPs represent a governance approach capable of tackling perverse problems such as water and sanitation, especially in contexts of weak governance systems.

METHODOLOGY

To explore whether second generation wicked problem theory and related partnering approaches can help identify and address institutional constraint in water and sanitation challenges in Brazil, we engaged in qualitative research using data from semi-structured interviews with key informants from Brazil basic sanitation sector.¹ We interviewed key representatives from the government, private sector companies, and civil society organizations, at national, regional, and local levels and at the partnership level.

We conducted 68 interviews (80 h) with a semi-structured script with managers, consultants, and experts from medium to senior levels (Table 1). The interviewees were selected a priori (intentional sample), and we used a snowball process to reach the most senior representatives in the sector. We did 18 preliminary interviews for initial approach (nine in Brazil and nine in the Netherlands) and 50 in-depth interviews for deep research (32 in Brazil and 18 in the Netherlands). Most interviews were face-to-face and took place during the year of 2017 and 2018. All interviews were recorded in English and Portuguese and were transcribed in their original language and translated to English.

As secondary data, we used documentary sources from government and organizations' websites. Partnership data were also made available as contractual documents, reports, official documents, publications on institutional websites. The use of multiple data sources enabled data triangulation. The in-depth data collection involved multiple sources of information, not only interviews and partnerships documents, but also public access documents on partnerships and on the three sectors involved—government, market, and civil society, reducing potential bias.

¹Water and sanitation systems comprise different activities and arrangements that cover the whole cycle to provide the services. In this study, we use the following terms: (i) basic sanitation services as a reference for all water and sewerage services; (ii) water services for all water supply systems, and (iii) sanitation (or sewerage) for all wastewater services.

Partnership level interviews were conducted with people involved in a partnership in Brazil, SISAR Project (Integrated Rural Sanitation System), and a partnership in Ghana, The Special Treat Project (TTP). SISAR project is one of the few solutions in Brazil for water and sanitation supply systems to rural areas in one of the most populated semi-arid regions in Brazil (northeastern, state of Ceará) and in the world (FUNCEME, 2017). It has a configuration that resemble a TPP. SISAR has been operating for over 20 years and has been achieving important results considering the low effectiveness challenge shown in rural water supply systems. The interviews with people from SISAR offered important insights to understand the constraints to the development of the initiatives of rural water supply systems in a developing country context. Three states in Brazil have developed similar solutions to deal with the challenge of providing water supply and sanitation to rural areas. The SISAR (Integrated Rural Sanitation System—SISAR), in Ceará state, the CENTRAL (Central of Community Associations for Maintenance of Water Supply and Sanitation systems), in Bahia state and Piauí—SISAR in the state of Piauí (Castro, 2015). We choose SISAR project due to the results obtained, achieving a higher rate of attendance to the rural population.

The Ghana project was selected by a snowball process initially indicated by an interviewee from the public sector in the Netherlands. After a careful analysis of other nominated projects, we chose the Ghana project because its tripartite partnership structure, with different types of partners, from different societal spheres and also because of the partnership's own objectives, particularly those related to creating an enabling environment, through policy development, institutional arrangement and sector governance. The Special Treat Project (TTP) belongs to the Ghana Wash Window—Sustainable Water Fund (GWWFDW) call 3 2014. The Ghana-Netherlands WASH Program (GNWP) was funded by the Ghanaian and the Dutch government and has RVO (Rijksdienst voor Ondernemend Nederland—The Netherlands Enterprise Agency) as the responsible for its managing the subsidy program (RVO, 2019). The project aims at improving the living conditions of people in small municipalities of Nsawam-Aodoagyiri, Ga Central, and Ga West by treating fecal sludge (Ghana Wash Window, 2014). Interviews and document analysis were used as data source for the research about the Dutch partnerships' initiatives. The documents from the partnerships were mainly about to contractual documents, reports, official documents, publications on institutional websites. Documents were also obtained about other entities involved in these programs, mainly official documents and publications available on institutional websites.

We engaged in a content analysis by considering the actors' interpretation and understanding of the problems. We codified and categorized the respondents' interpretations based in the main aspects of the content.

By conducting a document analysis and a preliminary interview analysis, we identified, a priori, broader categories to be researched, which helped to structure the interview script for deeper follow-up research. A semi-structured script was used to obtain new elements that emerged during the interviews (Patton, 2002). The interview script aimed to obtain participants'

TABLE 1 | Interviewees by type of organization and management level.

Interviewees/country	Interviewees		Number	Management level
	Total	Organization type		
		CSO/PSO/GOV	Partner-ship	
1. Initial approach				
Brazil	9	9	–	Senior Management; Senior Consultant; Middle Management
Netherlands	9	9	–	Senior Consultant; Senior Researcher; Senior Management; Senior Advisor; Middle Management
Total (1)	18	18	–	
2. Deep research				
Brazil	32	24	8	Senior Consultant; Senior Researcher; Senior Management; Senior Advisor; Middle Management; Consultant; Management Assistant
Netherlands	18	13	5	Senior Consultant; Senior Researcher; Senior Management; Middle Management; Consultant
Total (2)	50	37	13	
TOTAL (1) + (2)	68	55	13	

CSO, Civil Society Organization; PSO, Private Sector Organization; GOV, Government Entity.

perceptions of the main categories: Wicked Problems (sources and nature), Institutional Constraints (complementarities, voids, and logics), and Partnerships Approaches (TPPs). The scripts comprised four main strands: (i) conception of the problems on water and sanitation sector; (ii) main characteristics of the institutional setting of the sector's governance; (iii) partnerships approaches and stakeholder roles and responsibilities; and (iv) trends for partnerships.

In Search of a Benchmark: The Dutch Collaborative Experience

Evidence of the value of TPPs can be found in the Dutch example. Many partnership programs had already been developed by the Dutch Government in underdeveloped and developing countries in the water and sanitation sector. The Netherlands has traditionally been known for its expertise in the water sector and is arguably the most successful delta economy in the world. One-third of the country is below sea level, and it is a world reference regarding the development of water and sanitation technology. The Dutch government relies on partnerships arrangements whenever faces a challenge about water. Most of the advancements and solutions were based on TPPs—a delicate balance between public or semi-public institutions, commercial companies, and civil society. The Dutch Government has also embraced the concept of public-private partnerships (PPPs) since the early 2000s as part of foreign policies linked to sustainable development programs in Africa and Asia. These programs have been particularly successful in weak institutional environments and one of the reasons is the acknowledge importance in adapting to local institutional circumstances and created new (proto) institutions to fill in institutional local voids (Lawrence et al., 2002). Dutch PPPs involve cooperation between government, businesses, civil society organizations (CSOs), and knowledge institutes. The Dutch Ministry of Foreign Affairs

designed policies for these partnerships and implemented by the Netherlands Enterprise Agency (RVO). Many WASH (water, sanitation, and hygiene) programs are carried out by CSOs and the Dutch and local government and with the participation of private water companies (GWW, 2018).

The Dutch approach seeks innovative solutions and systemic change with a long-term vision, strengthened by strong ties with local partners and reinforced by Dutch embassies and Dutch entities (PPPLAB-PPPLab Food Water, 2018). The partnership programs focus on structural poverty reduction, sustainable economic growth, and self-capacity growth. They have a premise to build local institutional setting capacity by creating an enabling environment, comprising policy development, institutional development, and sustainable financing models (FDW-Sustainable Water Fund, 2014, 2018; RVO, 2014). Interviews with Dutch representatives were held to identify the main dimensions and to configure the categories of a general theoretical framework to a first interview script. Also, to obtain their experiences in implementing TPPs in developing countries contexts. The interviewees reported two key aspects, considered critical for the continuity of the services provision after the implementation phase of the projects: (i) local capacity building, through training and education in behavioral change and mobilization of local people (communities); (ii) development of a favorable institutional environment to support post-construction local service providers to maintain the services level, and keep the commitment and engagement of public and private local entities.

According to the interviewees, for the partnerships to become a viable solution, a greater institutional support is needed, to guarantee the engagement of all stakeholders in the process (service provision). The Dutch partnerships programs represent an innovative approach aiming at empowering the users target group, encouraging local private sector participation and promoting capacity building at local governments level

to improve water management systems. Also, the financial sustainability model of the projects seeks to reduce the dependency on grants from foreign donors (Table 2). The construction of an enabling environment is one of the key aspects to ensure the sustainability of partnership arrangements (Amjad et al., 2015). This requires a system of regulation, policies and the development of programs in a comprehensive framework, defining and detailing the roles and responsibilities of all stakeholders (De Palencia and Pérez-Foguet, 2011; Al'Afghani et al., 2019).

The main characteristics of the Dutch partnerships' programs were reported as the necessity of creation of a local environment that incentives community organizations. Partnerships deal better with the institutional constraints by promoting a greater balance between the actors. The Dutch partnerships programs were taken as reference on how to overcome the institutional constraints through partnerships approaches. Lessons can be learned on how to deal with the governance problems that the water sector has been suffering in Brazil.

Although the Dutch example emphasizes the strengths of a considerable part of research regarding partnerships from the global north (Glasbergen, 2011; Van Tulder and Pfisterer, 2014), analyzing the experiences in the global south, like in Brazil, could be an important step toward to the understanding of the impact of institutionalized structures in terms of constraints. Also localizing the theoretical debate that can helped to reflect on the characteristics, limitations and possibilities of the Brazilian water and sanitation sector's governance arrangements and to understand why the partnerships are barely used in the country, even in the face of the wickedness of the sector's problems.

FINDINGS: BRAZILIAN WATER AND SANITATION CHALLENGES

Brazil is the fifth-largest country by territory in the world and sixth largest by population (211 million). The water resources are concentrated in the sparsely populated Northwest (Amazon Basin), while the populous coastal cities are in the less endowed Southeast (São Paulo and Rio de Janeiro states). Brazil is a continental country with huge regional disparities due to geographic conditions, climate zones, income, demographic distribution, and cultural issues. The differences between water and sanitation service indicators among the regions are enormous. The problem is more severe in the north and northeast regions, which are considered the country's poorest areas.

The big challenges for the universalization of the services in Brazil are concentrated in peri-urban areas, slums, and many informal settlements (high density of people) and in rural areas (low density of people). In rural areas the problems can be even greater, like in the northeast and northern regions, where the natural resources are extremely scarce. The provision of services in these vulnerable areas is a complex task that needs the consolidation of formal and informal infrastructures to fulfill the requirements of each territory (Narzetti and Marques, 2021a).

Regulation should set the patterns and norms to guarantee access to quality services for users, ensuring compliance with the standards established by health organizations and preventing the abuse of economic power by stabilizing affordable tariffs to guarantee the sustainability of the provision of services. The regulatory system must ensure the achievement of a universal service level by defining a balance between actors and avoiding discrimination of the vulnerable population (Narzetti and Marques, 2021a). However, it is in these regions of high vulnerability that regulation and public policies are neglected, not suitable to local conditions and even worse, as in the case of Brazil, following regulatory norms to urban areas that generate innumerable voids in the sector management.

Since the PLANASA (National Water and Sanitation Plan) was extinct in 1980s (end of military government) not much attention was given to sanitation in the country. The federal government enacted the Brazilian Sanitation Law in 2007 (Law 11.445, 2007), known as the basic sanitation regulatory framework, and settled policies for the provision of basic sanitation services. Through the National Sanitation Plan (PLANSAB), the government set the goals to universalize water and sanitation services by 2033. PLANSAB was initial published in 2013 and revised in 2019, when the goals were defined (Narzetti and Marques, 2021a). The current institutional setting places the responsibility of water and sanitation services at the municipal level (Federal Constitution Brazil, 1988, Article 30, V). This setting represented an opportunity to customize policies closer to local circumstances but, on the other hand, raised challenges regarding management capacity at the municipal level. The municipalities can render the services directly or grant these to a public (at the state or municipal level) or private company. The distribution of service providers, according to scope and legal-administrative nature is 93% public sector companies (26% municipal companies and 67% state-owned companies) and 7% private sector companies (SNIS, 2019).

Major water governance reforms in the regulatory and managing system were taking place in 2019–2020, causing tension and insecurity in the sector. A new regulatory framework (NRF) for basic sanitation in Brazil was sanctioned in July 2020 (Law 14.026, 2020) aiming at bringing uniformity to the regulatory system and the universal standardization of basic sanitation services by December 2033. The NRF also increased the incentives for private sector participation to improve the necessary investments for the universal access. The new law brought further attributions to ANA (former National Water Agency, now called National Water and Basic Sanitation Agency), a federal government autarchy linked to the Ministry of Regional Development, in addition to its current scope of managing water resources, adding a challenging task of centralizing, and standardizing at national level the regulation of the sector. Currently, there are ~73 regulatory agencies operating in the country, 1 national, 34 municipal, 13 inter-municipal and 25 state, however, only 52% of the municipalities are supported by these regulatory agencies (ABAR, 2019; Narzetti and Marques, 2021b). It was attributed to ANA the responsibility for coordinating the regulatory agencies of water and sanitation services at the national government level, being responsible for

TABLE 2 | Dutch partnerships programs strengths: main elements from interviewees statements.

Institutional constraints	Interviews main elements
Governance and Regulatory System (Complementarity); Enforcement (Voids); CSOs Participation (Logics)	Community management system protect by law as an approach for water services delivery in rural areas and small communities.
Governance and Regulatory System, Integration (Complementarity); Enforcement (Voids); Stakeholders Participation (Logics)	Formal definition of the roles of CSOs and communities' organizations in the water services sector; Institutional strength.
Governance and Regulatory System, Political Engagement (Complementarity); Enforcement (Voids)	Framed institutional setting to incentivize the innovative approaches as partnerships.
Enforcement (Voids); CSOs Empowerment (Logics); Integration (Complementarity)	Political environment support to the establishment of partnerships programs countrywide (government engagement). Create conditions to scaling up a sustainable, urban wash approach in other cities of the country.
Governance and Regulatory System (Complementarity); Enforcement (Voids)	Local support (managerial and technical) for the local services providers (from federal and state governments).
CSOs Empowerment (Logics); Integration (Complementarity); Enforcement System (Voids)	Programs for building managerial capacity at local level/communities (social rights, citizenship).
CSOs Empowerment (Logics); Integration (Complementarity)	Establishment of a governance system and accountability; Law enforcement.
CSOs Empowerment, Stakeholders Participation (Logics); Governance System and Integration (Complementarity); Enforcement System (Voids)	Development of a structure legal and policy frameworks.
Enforcement (Voids); Governance and Regulatory System (Complementarity); Stakeholders Participation (Logics)	Enabling environment through capacity building and organizational development of local entities.
Private Sector Participation (Logics); Integration (Complementarity)	Enabling environment through behavior change campaigns and awareness at local community level, mobilization to improve sanitation and hygiene.
	Enabling environment through network development.
	Capacity building of local authorities and other key actors concerned with governance and management of water and sanitation.
	Development of a sustainable financial model.

Source: Interviews transcripts.

standardizing their operation and aligning their performance parameters (quality of service, operational and commercial efficiency), also economic regulation matters and the definition of a pattern for the contract's contents nationwide (Narzetti and Marques, 2021b). ANA will carry out decisions on regulators autonomy, distribution of regulatory processes, transparency and predictability in decision making.

The new law also determines that state governments must compose groups of municipalities (called regional blocks) to collectively contract the services and implement municipal and regional sanitation plans, making the contracts also more financially attractive. Although the new law was expected to bring changes to the institutional setting and the regulatory framework of the basic sanitation sector, it seems to promote even more centralization in the state government's hands, also leaving aside a relevant issue, being to increase managerial capacity at the municipal level.

The NRF brought no expected changes for rural basic sanitation and for vulnerable areas, worsening the constraints for the universalization of services since has indicated the responsibility for the universalization in these areas to other policies, such as urbanization, housing, and poverty eradication. There is no specific regulation for the rural sector and vulnerable areas, only the definition of social tariffs and cross subsidies programs, but with no specific regulatory direction for universalization for the poorest.

SISAR – A Brazilian Partnership Approach

Drinking water in rural communities represents one of the biggest challenges for developing countries as they receive little attention and priority from authorities. Its management and governance need to promote interactions among several actors at different administrative levels, and also with the local social actors' participation (Franco-Torres et al., 2021).

Rural areas represent one of the most vulnerable areas regarding to water and sanitation lack of provision in Brazil. The universalization of drinking water in rural areas in Brazil pose a great challenge to the sector due to the large territory and the dispersed allocation of communities in rural zones. According to the 2013 National Household Sample Survey—PNAD (IBGE, 2013) there were ~31 million inhabitants living in rural areas and isolated communities and only 22% had access to adequate sanitation services. The rest collected water from fountains and wells largely unsuitable for human consumption. Only 34.5% of households in rural areas of Brazil were connected to water supply networks. Numerous communities still depend on supplies by water tank trucks from the nearest reservoir. The interviewees reported the necessity of create a strong enabling institutional environment, that recognizes and gives support to the small communities and their solutions for the provision of services at the local level. It also necessary to increase private sector participation that could provide greater financial and technological sustainability to the projects. SISAR managed to

significantly increase rural coverage of clean water to the local population (World Bank-World Bank Group, 2017).

SISAR, is a nonprofit civil society organization, considered one of the few Brazilian partnerships initiatives operating in the sector with a similar configuration of a TPP. It is based on a community management model (users) and has a participatory management model to supply rural communities with drinking water and sanitation facilities in the State of Ceará, in northeast Brazil, considered one of the most vulnerable areas regarding to basic sanitation services provision in the country. SISAR focused on improving the quality of life for the rural population through projects and training on water & sanitation, health, and the environment. In partnership with user groups and affiliated community associations, municipalities, the state water operator (CAGECE), the state government of Ceará, and the German bank KfW and the World Bank.

The SISAR project was developed through the institutional support of CAGECE, that defined the sanitation plans, provided technical and managerial support, and developed a legal framework by engaging the project under the same regulatory entity at the state level. Rural sanitation does not have a specific regulatory system in Brazil, and they have to adapt the rules from the urban areas. The support from a state company provided legitimacy for the partnership, emphasizing the predominance of state logic. City halls exert a strong political influence on local communities, where water bargaining for votes is still a frequent practice. This makes it difficult to strengthen and expand the partnership model to cover 100% of rural areas in the state. SISAR, with support from CAGECE, strives to improve the level of participation of local communities in the system and bring a greater number of municipalities to participate in the partnership.

Institutional Complementarities

Through the interviews it was possible to identify many elements that configure the wickedness of the governance and regulatory system in Brazil. **Table 3** shows main elements regarding to the lack of institutional complementarity between public entities, emphasized by a fragmented (pulverized) governance system, and a decentralized regulatory system and complex to manage. Also reported was the weakness of management at municipal level, which, by Constitution (Federal Constitution Brazil, 1988), is the responsible entity for the management of the services.

We identified four main categories related to the lack of complementarity in the governance and regulatory system: (i) the plurality of the system, (ii) the duplicities and overlaps on the system, (iii) the lack of integration on system, and (iv) the political interferences (**Table 3**). Weighted the roots of the lack of institutional complementarity are composed as follows: 33% Plurality; 24% Lack of Integration; 24% Political Interference; 19% Duplicity and Overlaps. Plurality was the theme most attributed as a cause of lacking complementarity.

The *plurality* of the regulatory system is related to the diversity of entities involved at different levels (national, state and municipal governments, individuals, communities, and companies) and other societal spheres (government, private market, and civil society).

The configuration of the basic sanitation sector in Brazil involves different government levels, creating a complex institutional setting (World Bank-World Bank Group, 2016) and resulting in a fragmented governance structure that gives rise to many voids in the regulatory and enforcement system. Although, under the Constitution (Federal Constitution Brazil, 1988), the entity responsible for water services is the municipalities, for these services to be offered to the population there is a broad chain of sharing co-responsibilities with different government levels entities participating: (i) the federal level that has the resources, (ii) the state level that operates the water and sanitation systems through contract with the municipalities, and (iii) the municipal level that owns the systems and is responsible for providing the services to the population under their jurisdiction (Federal Constitution Brazil, 1988).

The home for the water and sanitation services sector in Brazil is shared between the Ministry of Regional Development (through SNS—National Secretariat of Sanitation) and the Ministry of Health (through FUNASA—National Health Foundation). SNS serves municipalities with over 50 thousand inhabitants or members of metropolitan regions and integrated development regions (MDR—Ministry of Regional Development, 2020). FUNASA supports rural areas and small municipalities (up to 50 thousand inhabitants).

In Brazil, by law, municipalities are responsible for the regulatory bodies. Regulatory entities can be municipal agencies, state agencies, or a consortium between municipalities. Each municipality (5,570 in total) can create its own regulatory agency or contract an existing one at state or municipal level. The sector is fragmented in 73 regulatory agencies with municipal, inter-municipal, district or state operations and at national level (34 municipal, 13 intermunicipal, 25 state and 1 at national level) (Narzetti and Marques, 2021b). The agencies regulate about 2,906 municipalities or 52% of Brazilian cities (ABAR, 2019). These agencies regulate water supply services as well as sewage collection and treatment, solid waste management and urban drainage, alone or together.

Duplicity and overlaps in regulatory entities' roles and responsibilities lead to a multiplicity of rules and approaches for control and supervision of the services, sometimes inconsistent between each other, causing legal insecurity and mistrust of the system. Each regulatory entity can dictate its own rules, resulting in different and sometimes contradictory criteria among entities. An example given by one of the interviewees was the Brazilian water and sanitation operator of the state of São Paulo—SABESP, who must comply with eight different regulators at state and municipal levels.

The *lack of integration* was associated with the gaps in the macro guidelines at the country's regulatory system at a federal (national) government level, making it difficult to establish an integrated management structure in the sector and leading to a segmented public policy system with many inconsistencies and conflicts between rules. In the NRF this will be one of the main roles of ANA, define a standard of rules at the national level and promoting regulatory uniformity and integration between different entities at different levels (national, state, municipal and intermunicipal).

TABLE 3 | Institutional constraints—institutional complementarities in the governance and regulatory system: categories and main elements.

Categories	Main elements
(i) Plurality	<p>(i.1) Water management fragmentation: Fragmented governance system (different entities at Federal, State and Municipal levels); Segmented public policies.</p> <p>(i.2) Decentralized regulatory system: Pulverization (spraying) of the regulatory agencies (at state, municipal and municipal consortiums levels). High number of entities involved.</p> <p>(i.3) Complex governance and regulatory systems: Different and inconsistent rules applied between regions; Widespread solutions (that do not adapt to specific contexts); Difficulty in decoding and implementing the different rules; Plastered system.</p> <p>(i.4) Weak managerial capacity at municipal level: Low legitimacy and weakness at municipal level to act as responsible for the provision of services (Gap of support from a central government entity).</p>
(ii) Duplicity and overlaps	<p>(ii.1) Roles' overlapping and ambiguities: Weak structure for definition and distribution of responsibilities; Duplicity in roles; No clear definition about the role of state-owned operators.</p> <p>(ii.2) Multiplicity of regulatory rules and conflict of interests: Conflicting regulatory rules; Contradictions in rules; Different regulatory entities at State and Municipal levels; Structure's Redundancy.</p> <p>(ii.3) No clear interactions between government entities: Lack of trust at government agencies; Low legitimacy at municipal level to enact and implement the water and sanitation local rules; Space for ambiguities; Supremacy of state operators.</p>
(iii) Lack of integration	<p>(iii.1) Lack of a central regulatory authority: Lack of a macro regulatory macro guideline at federal government level; Lack of support from a central government body; Weak integration between regulatory system agencies.</p> <p>(iii.2) Regulatory conflicts: Conflicts of interests between state regulators and state operators; Space for opportunistic actions.</p> <p>(iii.3) Lack of concertation: Lack of coordination to promote greater articulation between stakeholders; Low interconnections and weak division of responsibilities between main stakeholders and also with stakeholders from other sectors; Poor communication between government agencies; Lack of complementarity.</p>
(iv) Political interference	<p>(iv.1) Political imbalance: Different political strength between municipalities and state government entities; Political dependency of municipalities in state-owned water operators; Political power concentrated at state level; Political power at state level creates difficulties for the participation of private sector's companies.</p> <p>(iv.2) Political articulation between government spheres: Subordination of municipalities to the state government; Political clientelism; Water as an exchange good, especially on rural and small/peri urban areas.</p> <p>(iv.3) Culture of short-termism: Influence of electoral cycles (create difficulties for the implementation of long-term water and sanitation infrastructure projects). Short term election (political) cycles influence; Lack of regulation to avoid political interference; Difficulty in structuring a long-term strategy for longer term investment and initiatives.</p> <p>(iv.4) Conflict of interests at government level: State regulatory agencies and state-owned operators; Privileges to state operators.</p> <p>(iv.5) Negative effect and misalignments between government entities: Actions motivated by political interests; Protection of public enterprises—mainly state-owned; Political will and priorities from the state government; Lack of criteria to define priorities among municipalities within the state.</p>

Source: Interviews transcripts.

The provision of basic sanitation services, especially by local governments in developing countries, is hampered by *political interference* (Bardhan, 2002). Brazil is characterized by a legacy of political clientelism, an exchange system based on political subordination in trade for providing public services as water and sanitation (Kitschelt and Wilkinson, 2007). Political interference occurs mainly in the political articulation between federal government, state enterprises, and municipalities. The protection of public enterprises, statewide and municipal, overestimate their relationship, tightening the dependence of municipalities on state-owned companies, hampering the participation of private sector organizations.

The small municipalities are more dependent on state-owned companies to provide the services and political alignment is an important criterion for prioritizing among the municipalities to be served (Sampaio and Sampaio, 2020). The political clientelism in Brazil is based on municipalities' political subordination to the state government, and water has become an exchange good (Kitschelt and Wilkinson, 2007). The practice of exchanging

water trucks for votes in the elections is observed in many poor regions of the country.

Political rather than business issues influence the performance of state-owned operators. As reported by interviewees, the Brazilian political cycle established the “culture of short-termism.” Elections take place (at municipal, state, and federal level) every four years, resulting in discontinuity of the political support to the sector and the lack of management priorities, affecting public service provision.

The state regulatory agencies regulate the operation of the state-owned operators' companies in their jurisdiction, resulting in conflicts of interest and increasing the risk of capturing the agency by state political interests and making private sector participation even more difficult. The situation results in the same government entity at state level working as an operator and regulator.

Institutional Voids

Institutional voids identified by the respondents can be grouped into two categories (Table 4): (i) regulatory ambiguities

and failures and (ii) the lack of enforcement structure and mechanisms to coordinate the implementation and application of the rules provided by the Sanitation Law (Law 11.445, 2007). Weighted statements of the interviewees regarding the roots of the institutional voids show the following composition: 39% Governance and Regulatory system and 61% Enforcement system.

In Brazil, the *voids in the regulation and governance* system are about the institutional structure of the sector. The basic sanitation sector regulation system is based on the agency model, and the regulators agencies can be at the state or municipal level. It also allows for various institutional arrangements, such as the formation of consortia between states and municipalities, or among municipalities for the regulation of services, or the delegation of this activity to the regulatory agency of another federated entity. In addition, the formats allow combinations of different forms of regulation, as through contract with the presence of a regulatory agency (ABAR, 2019). As reported by interviewees several entities became involved in the regulation function, without standardization and coordination among them, creating performance gaps in the structure. Also reported the low management capacity at the municipal level in dealing with the complexity of the system, increasing their dependency at state-owned companies.

Table 4 presents the interviewees' statements about the institutional voids in the system. The regulatory system lacks a macro-level alignment at the federal level to set a standard of reference norms and guidelines for all agencies operating in the country. There was no single regulatory entity to dictate the basic rules for the sector, resulting in a weak system with different regional/local criteria.

In Brazil, rural areas and small municipalities lack a specific regulatory system and they must attend the general rules for urban areas. Subsidy and tariffs policies are defined at local operators' level, resulting in different standards and criteria throughout the country.

The lack of central coordination result in ambiguity in institutions' roles, generating bias and conflicts of interest. This is the case of the state regulatory agencies, that also regulate the state-owned operators, resulting in privileges and protectionism to them, inhibiting private sector participation.

The new regulatory standards, containing guidelines at national level, for the regulation of public basic sanitation services in Brazil is being prepared by ANA (National Water and Basic Sanitation Agency) until 2022 according to the new legal framework (Law 14.026, 2020).

The roots of *enforcement voids* were reported in the form of insufficient enforcement mechanisms to implement the country's Sanitation Law. Also, the poor coordination among stakeholders aggravates and make more difficult to decode and understand the system. This has led to low legitimacy of the system, low adherence to the rules, and in a high-risk perception over the sector.

The Federal Water and Sanitation Law (Law 11.445, 2007) stated that municipalities must establish fundamental principles and guidelines by developing a local plan for basic sanitation and supervise its implementation. The fragmentation of regulatory

agencies, without the alignment of a central institution, leverages the lack of managerial and technical capacity of municipalities to meet the demands of the sector. Only 52% of municipalities have an established regulatory entity (statewide, municipal, or consortia), and only a third has a sanitation plan. This is a serious concern for the sector, as it is legally responsible for the design, implementation, and governance of sanitation policy.

The federal government has allowed countless postponements for the municipalities to deliver the Municipal Basic Sanitation Plans (PMSB), resulting in a loss of credibility of the system. The lack of a government structure to support the municipalities in drafting sanitation plans was one of the biggest pointed bottlenecks of the sanitation sector.

In 2013, the federal government adopted a national plan for basic sanitation (PLANSAB), according to the Water and Sanitation Law (Law 11.445, 2007), aiming for 100% access to water by 2033 and 92% access to sanitation services. The plan required a €100 billion investment over 13 years (2021–2033), an average of €7.7 billion a year, far below the average value achieved in the last decade (€2 billion). The respondents qualified the PLANSAB goals as unrealistic, compromising the legitimacy of the sector. The NRF kept the previous Federal Government's goals to achieve 99% of water access by 2033 for the Brazilian population and 92% to sewage treatment and collection.

Institutional Logics as an Explanation for the Found Patterns?

The interviews reported (i) the state-centered logic and (ii) the low appreciation of civil society as the main cause of the lack of balance between the stakeholders that participate in the water and sanitation sector. **Table 5** presents the categories and the main elements attributed to them. The statements of the interviewees regarding institutional logics presented the composition: 55% State Center Mode and 45% Low Appreciation of Civil Society. The state center mode was the theme most attributed to institutional logics constraints.

The *state-Centered Logic* was reported about the configuration of the sector, mainly on public companies' hands, leading to a low private sector participation and low competitiveness in the sector. The public service providers represent 93% of the companies operating in the sector (26% municipal and 67%). The private sector represents 7% (SNIS, 2019).

In Brazil, the governance of the water and sanitation sector is based on a hierarchical and corporate state logic with an emphasis on a market and commercial decision-making form. The system's operation is centralized in governments companies with a strong link between state-owned enterprises and municipalities, reducing the opportunities for private companies to participate. According to the interviewees this strong centralization strengthens the political articulations between state-owned enterprises, state governments, and municipalities that results in protectionism and privileges to state-owned companies.

The *low appreciation of civil society* was attributed to the lack of citizenship identity, mainly in the poorest layers of the

TABLE 4 | Institutional constraints—institutional voids in the governance and regulatory system: categories and main elements.

Categories	Main elements
(i) Regulatory voids	<p>(i.1) Lack of a central regulatory authority: Lack of a central body at a federal level to dictate the basic principles and the macro policies to the sector. Lack of a comprehensive regulatory system.</p> <p>(i.2) Ambiguity on the roles of institutions and responsibilities definition: Tragedy of Commons; Legal insecurity providing space for privileges; Conflict of interests at state government level.</p> <p>(i.3) Low legitimacy of the system: Gaps between policy system and the enforcement mechanisms.</p> <p>(i.4) Lack of standardization on the legal and regulatory framework: Definition of tariffs and subsidy policies at local level (disparities between different regions in the country).</p> <p>(i.5) Parts of the system without regulation or with a weak regulation system: Lack of regulation for rural areas and small municipalities.</p> <p>(i.6) State-owned companies' protectionism: Privileges for state enterprises (Different contracting regimes between public and private operators).</p> <p>(i.7) Low private sector participation: Weak legal structure for incentivizing private sector participation.</p> <p>(i.8) Accountability for water and sanitation services at Municipal level: Lack of support to municipalities from a central government body.</p>
(ii) Enforcement voids	<p>(ii.1) Lack of an enforcement structure to guarantee the application of sector's laws and rules: Lack of a central body to support and coordinate the implementation; Poor mechanisms for coordination and implementation of Sanitation Law—Lack of enforcement structure to help at municipal level; Ambiguity about government entities responsibilities; Different demands due the regionals diversities; Lack of a subsidy program at a national level considering the regionalities.</p> <p>(ii.2) Governance fragmentation: Water and sanitation sector is under coordination of Ministry of Regional Development and Ministry of Health.</p> <p>(ii.3) Low Capacity at Municipal level to assume the responsibility: management and regulation systems; Lack of support from federal government level.</p> <p>(ii.4) Low legitimacy and adherence to the law system: Unreal and unattainable goals in the National Sanitation Plan; Successive delays in the implementation of the national/municipal sanitation plan; Lack of commitment and efforts to pursue the unattainable goals; Low capacity of the Municipalities to structure the municipal sanitation plans; Discredit with the Sanitation Plan.</p> <p>(ii.5) Contract standardization: Different contracting modalities for service operators (different levels of demand between public and private companies).</p>

Source: Interviews transcripts.

TABLE 5 | Institutional constraints—institutional logics: categories and main elements.

Categories	Main elements
(i) State center mode	<p>(i.1) Government (State) as the main agent: Public configuration; Political articulation between government entities; Protection of state-owned companies; Water and sanitation sector is organized under public configuration.</p> <p>(i.2) Emphasis on public-private relations: Predominance of a managerial logic—market and commercial.</p> <p>(i.3) Low private sector participation: 6% of the population served with water services; The structure of the sector does not favor the participation of private sector companies.</p> <p>(i.4) Low level of competitiveness in the sector: Sector stagnation.</p>
(ii) Low appreciation of civil society	<p>(ii.1) Low participation of Civil Society on the sector: Crisis of social participation in Brazil; Lack of the exercise of citizenship rights.</p> <p>(ii.2) Lack of empowerment (capacity gap) of Civil Society: Low political activation and engagement; Low awareness about water and sanitation problems; Lack of institutional strengthening; Need for a higher degree of professionalization.</p> <p>(ii.3) Need to build capacity: Lack of knowledge on what directs their actions and interests.</p> <p>(ii.4) Lack of civil society identity and citizenship: political forces restrict participation, dominance of political forces; Need to increase civil social engagement; Break the disbelief in civil society.</p> <p>(ii.5) Low image of civil society: Difficult image reversal (background facts); Lack of reputation and trust on civil society organizations (disruptive practices); Government bias regarding CSOs.</p>

Source: Interviews transcripts.

population and the low level of trust and reputation on them, when organized on an individual form or around a CSOs due their involvement in disruptive practices in the past. According to the interviewees is urgent for the country to build capacity at local communities' level, being necessary to better understand what

directs their actions and what must be done for their organization to take place.

The Sanitation Law (Law 11.445, 2007) is ambiguous about the role of civil society in the water and sanitation sector. The law describes social control as a fundamental requirement,

but also defines social participation as optional and with a consultative character.

In this study, civil society comprises private organizations representing local populations, communities, and associations of communities, all nonprofit driven entities engaged in public utility services such as water and sanitation. According to the interviewees, in Brazil, many small communities (low income) are too poor for cost-effective water and sanitation supply and participatory management models to supply the population of rural areas and small communities are virtually nonexistent.

The local population needs to be informed about their rights within the political community they belong (Castro, 2011). According to the respondents, it is necessary to build a sense of citizenship in the country, asserting the population's political rights, reducing their political inertia and domination by political forces, and increasing their awareness in actively participating in the decision-making processes in the sector (SNSA, 2011).

DISCUSSION: ON INSTITUTIONAL CONSTRAINTS AND WICKED PROBLEMS

Water services governance in Brazil involves different government bodies, at federal, at state and at municipal level, pressuring the system on how to integrate and coordinate them. A weak governance system is affecting the whole organizational structure of a sector. The sources of the institutional complexity were analyzed by examining the institutional complementarities, voids and logics that hinder the establishment of more appropriate solutions. Partnerships have key elements to deal with governance complexities, by combining different logics and interests, promoting complementarity and balance between stakeholders.

The plurality in the governance system in Brazil is causing redundancy and roles duplicity, contradictions and incoherence in rules and policies leading to many institutional voids. The main causes of governance complexity are difficult to be diagnosed and we suggest three main causes for the Brazilian water services' sector: (i) as a result of lack of complementarity between different stakeholders, resulting in lack of integration, duplicity, pulverization, mismatch between policy and management and segmented public policies (institutional complementarity); (ii) as a result of a lack of a governance, regulatory and enforcement structure to guarantee the implementation of the law (institutional voids); and (iii) as a result of multiple government bodies, from different levels, crowding the policy landscape with different logics and divergent interests (institutional logics).

Institutional Complementarity

A governance system must provide robust public policies aimed at tangible goals, with a balanced institutional structure for distributing functions and responsibilities among stakeholders, monitoring, and evaluating the whole system (OECD, 2015). A strong governance system is necessary through policy integration and regulatory intervention to promote and align stakeholders.

In environments of institutional plurality, governance is vital (Fligstein, 1991).

In Brazil, regulatory bodies are at state, municipal, and municipal consortia levels. There is no central body to dictate the main guidelines to standardize the system, resulting in multiple approaches for the function in different regions, generating contradictory rules. From the regulatory dimension perspective, the main problems include the plurality of the system, the duplication of roles, the contradiction in rules applied in the sector, and the lack of integration among stakeholders. Overlaps of roles and rules resulted in contradictions, making the system complex, and difficult to decode. From a political dimension perspective, problems include political interference and articulation at state-level government.

Institutional integration increases governance capacity to incorporate different perspectives and deal with collaboration as a necessary process to foment the participation of all stakeholders (Lane and Robinson, 2009). Many problems linked to the water and sanitation sector result from a fragmented structure, which lacks institutional integration between entities to enable state and non-state actors to participate in the decision-making. In Brazil, this resulted in many negative effects and misalignments among stakeholders, providing space for opportunistic behaviors as the political interference from the government side.

Institutional Voids

One of the big challenges associated with water and sanitation problems concerns the necessity of strengthening the role of governments as a central authority in the provision of regulation and policies for the sector, reducing the regulatory risks, and ensuring financial sustainability (Cosgrove et al., 2000). The lack of a macro-level alignment at the federal level to set a standard of reference norms and guidelines for the regulatory agencies operating in the country compromises the sector's effectiveness and generates many voids. A sound regulatory system should promote private sector participation following the interests of the public infrastructure sector.

In Brazil, the enforcement mechanisms are insufficient to implement the sanitation law throughout the country. The current mechanisms do not promote the necessary coordination among stakeholders, and the sector lacks a clear definition of responsibilities leading to low legitimacy of the system, low adherence to the law, and a high-risk perception of the sector, causing a great impact on the provision of financial resources for the sector.

The regulatory mechanisms cannot fully exploit the potentialities of all actors involved. There is a weak control system over basic sanitation plans, with ill-defined and unattainable goals. The national sanitation plan (PLANSAB) established unrealistic goals for the universalization of water and sanitation services for 2033, evidencing a huge gap regarding the current level of investments, without a clear plan of actions for the recovery of the investment level and the achievement of the goals, leading to a mistrust on the sector. A stable regulatory oversight system is one of the fundamental reforms needed to

provide credibility and ensure a flow of resources to the basic sanitation infrastructure sector in Brazil (World Bank-World Bank Group, 2005).

Institutional Logics

The water and sanitation sector operates in Brazil under a state-centered mode. The main framework has a pre-conceived model with a strong emphasis on the relations between the public and private markets, where managerial logic prevails in the system (market and commercial). There is great emphasis on the political articulation between state enterprises, the federal government, and municipalities. The focus in protecting public enterprises, statewide and municipal, compromise the participation of the private sector companies.

The low representativeness of civil society in the Brazilian sector is aggravated by the concentration of arrangements in the state-based models, making it difficult to develop a more integrated and balanced approach. In the legal framework of sanitation (Law 11.445, 2007), civil society participation is marked by dubiousness, since at the same time, it encourages and limits participatory action.

The social and community empowerment of the population is necessary to create a participative political culture, promoting a more balanced distribution of power. They need to develop the practical community census and to learn the basics of self-organization to promote trust and social inclusion.

Addressing the Wickedness of Brazilian Water and Sanitation Problems

It goes without dispute, that water and sanitation governance problems are complex and full of interconnections that are difficult to prioritize. The wicked problems' theory provides a good support to classify the main elements that not only constitute a problem, but also indicating key points that help to direct the search for more effective approaches to deal with them. We qualify the problems by examining their sources of complexity (Van Tulder, 2018) and although in Brazil they match all the requirements to qualify as wicked problems, we consider three main complexity dimensions—structural, generative and societal, that represent the most prominent ones for classify them as wicked. The other two, dynamic and communicative complexities, can thereby be recognized as relatively universal problems related to the SDGs (Van Tulder and van Mil, 2020). The three dimensions helped us to classify the various elements obtained from the data, making it possible to link them to each one of the dimensions, ordering and qualifying their analysis. The complexity dimensions are presented in **Table 6** and although we focus the discussions on 3 of the 5 dimensions, we present the table with the elements also of the other two—Dynamic and Communicative complexity (**Table 6**).

Structural complexity is related to various dimensions (multi-dimensions) and levels (multi-levels) related to the problems (Van Tulder, 2018). In this study, different roots of structural complexities were identified on regulatory and political dimensions and involving different levels of government

bodies and huge regional disparities. They pointed to the failures on the governance system (regulatory structure and policy management) of the Brazilian water sector to deal with them. The responsibility for water and sanitation services is at the municipal level, which sought in state operators to make up for their deficiency in managerial and technical capacity, becoming dependent on them. Also, the involvement of various government bodies levels (municipal, state, and federal) without a clear definition of roles brought complexity and insecurity to the sector's management (**Table 6**).

Generative complexity refers to the multi-causes and multi-symptoms attributed to the problems and their direct and indirect interconnections (Van Tulder, 2018). Water and sanitation problems unfold in unpredictable ways due to the innumerable externalities such as health issues related to the lack of basic sanitation, well-being, environmental security, and development. The main causes of the problems were pointed as fractured governance structure (plurality), the state centered logic, no clear division of responsibilities (direct and indirect) and a weak enforcement system to guarantee the application of the law (**Table 6**).

Societal complexity involves actors (multi-stakeholders) and responsibilities (multi-responsibility) with different values, logics of action, roles, power bases, and understandings, from different societal spheres (Van Tulder, 2018). The water and sanitation sector faces a complex interplay of conflicting stakeholders' interests (logics) at various government levels and with a low interaction of private sector and civil society. The societal complexity of the problems is demonstrated by the number and diversity of stakeholders involved in the sector and their distribution of responsibilities. Coordination among parties does not seem to occur efficiently in Brazil, and a balance between public and private sector participation and civil society participation is lacking. The number of regulatory bodies has resulted in a fragmented system, with no central guidelines for setting a standard of norms and rules. The various ministries and secretariats involved at the federal level result in lack of coordination (**Table 6**).

Brazil's water and sanitation problems are related to governance and regulatory systems failure. This has aggravated its wickedness and compromised the institutional setting capacity to support the necessary innovations. The findings reinforce the idea of wicked problems and imply possible solutions that require joint action of all stakeholders involved. Partnerships represent the organizational fit to better address wicked problems, as they could help fill the gaps by collaborative action. The governance system arrangement is important to promote complementary between stakeholders and form an institutional environment for cross-sector partnerships. The governance structure must add normative strength to a system, which is important in multiple and conflicting institutional logics such as the water and sanitation sector. A weak governance system can lead to a segmented and fragmented normative environment (Skelcher and Smith, 2015).

TABLE 6 | The wickedness of the Brazilian water and sanitation problems: dimensions of complexity.

Structural complexity			
Multi-dimensional	The systemic nature of the problem	Regulatory Political Financial	Weak regulatory system and law enforcement Political cycle influence/short term view ("shorttermism") High risk perception/lack of funding/low private sector participation/long term funding profile
Multi-level	Different levels of impact	Cultural Federal × State × Municipal Regionalities	Low citizenship awareness/low appreciation of CSOs. Impact at development level Large regional disparities
Generative complexity			
Multi-cause	Identifiable roots of the problems	Different roots	Fractured governance structure/regulatory voids Law system/poor policy system/lack of a comprehensive policy system/enforcement voids Low capacity at municipal companies and CSOs State centered logic Complex distribution of responsibilities
Multi-symptom	Symptoms attributed to the problems	Externalities	Many negative externalities (health, well-being, economy, poverty, equality, others)
Societal complexity			
Multi-stakeholder	Actors involved from different spheres	Many actors involved	Many stakeholders involved/lack of engagement Government × Market × Civil society (complexity of the arrangements)
Multi-responsibilities	Sources of responsibility	Many sources of responsibility	Lack of Integration Federal × State × Municipal (lack of coordination, lack of concertation) Lack of complementarity Overlapping of institutions
Dynamic complexity			
Multi-directional	Nature of the interactions and interdependencies	Mechanism of coordination	Interlocking vicious circles, difficult to break Lack of coordination
Multi-paced	Dynamics of the problems	Sector inertia × Sense of urgency	Path dependence: Same trajectory (model) over time Sector's inertia is blocking the viability of new solutions
Communicative complexity			
Multi-frames	Competitive explanations and understandings	Public × Private × Social	Different views and explanations about the problems.
Multi-sources	Transparency and validation of information	Types of service contracts	Inequalities in the process of contracting State-Owned (Program Agreement) and Private Companies (Concession Contract)

Source: Interviews transcripts.

In Search of Solutions? Institutional Constraints and Tripartite Partnerships (TPPs)

Water and sanitation problems are composed of interrelated problems that materialize primarily at the interface between public and private interests. They are wicked problems and require collective action among different sectors of society, governments, the private sector, and civil society. They call for shared responsibilities and complementary actions. The partnering effort provides the most relevant—but not easy approach for the Brazilian water and sanitation sector. TPPs make use of complementary logics from different institutional spheres, raising common issues more effectively for dealing with regulatory and enforcement gaps. TPPs are usually associated with wicked problems, and although they have been operating in many developing countries, as the example of Dutch partnerships programs, they have been barely observed in Brazil.

Through the lenses of institutional constraints, it was possible to analyze the institutional setting of the water and sanitation sector in Brazil and understand the main characteristics that are hampering the establishment of TPPs in the country. The interviewees pointed to the necessity of a higher level of institutional integration in the sector's management. The different reactions of the interviewees to wicked problems also provided practical insights that could be contextualized through the use of institutional constraints theory.

CONCLUSIONS

High fragmentation of the water and sanitation governance structures hamper the establishment of a more integrated management system. In Brazil, we identified some causes of this fragmentation focusing on the institutional constraints linked to the lack of complementarity, conflicting logics, and regulatory

voids that configure the wickedness of the problems in the sector, and help to explain the growing deterioration that sector is facing. The configuration of sector's governance in Brazil hampers the establishment of cross sector arrangements (TPPs) as illustrated by the SISAR model, where a great dependence on the public partner compromised the necessary engagement among other stakeholders. In contrast Dutch partnerships initiatives that also operate in relatively weak institutional setting, as the of developing countries, incorporated partnerships approach and were able to (re)construct and capacitate the local institutional environment, through policy and governance system development that integrated local populations and communities and also private sector organizations. We conclude that changing the governance configuration of the water and sanitation sector in Brazil depends mainly on a reformulation of the regulatory and enforcement system that promote a greater balance between the actors (from state, private market and civil society). Although the partnerships arrangements seem the right solution to help to solve the problems a wide scope of changes are needed, on which we provide in this some considerations based on institutional constraints. The development of an enabling environment to support and foster partnerships, by intervention in local capacity, should go through to empower civil society organizations that enable them to take a role and effectively participate in these arrangements. To extend competition between public and private operators and also improve the financing model would be necessary to maintain a strong regulation at a federal level entity to prevent price abuse and ensure the maintenance of quality of service. Partnerships programs in Brazil would focus on certain specific niches of the sector such as rural areas and low-income population areas helping to the achievement of the universalization goals in the services provision.

As a final remark, the new regulatory framework in Brazil for basic sanitation (Law 14.026, 2020) envisages substantial changes in regulation and will encourage competition and privatization of sanitation companies, seeking to attract private investments. The new law, however, leaves numerous gaps in relation to the institutional restrictions that we identified in this study: (i) Political interference; (ii) Lack of support at municipal level; Local managerial capacity building; (iii) Lack of governance, regulation and enforcement system for rural areas and small communities; (iv) Update of the water and sanitation goals (unreal) for 2033; and (v) Low appreciation of civil society, lack of empowerment and low participation level.

Recommendations for Future Research

This study has several limitations, opening the way for future research to complement and expand it. Future research could

conduct an in-depth analysis of the Brazilian context and identify the possible routes to operationalize (tripartite) partnerships in the water and sanitation sector. Also, the discussion on what drives the actions of civil society for their organization to take place, what mechanisms could improve social engagement and participation, and lead to the institutionalization of participatory practices. Another recommendation for research would be to analyze the institutional constraints individually—institutional logics, voids, and complementarities. This analyze would enable a deeper discussion on the elements that compound their dimensions and would bring more arguments on how to better approach the wickedness of the water and sanitation problems in Brazil.

AUTHOR'S NOTE

The world is currently facing a water and sanitation crisis that represents a connected challenge for countries: it contains a multitude of causes and consequences, a multitude of actors and interests for which no one-size-fits-all solutions are available. The adequate approach to this type of complex—or wicked—problems is not to search for technological solutions only, but to consider new forms of governance and institutional logics. This study aims to explore the dimensions of institutional complexity on the water sector by investigating the institutional constraints—complementarities, voids, and logics—that make it difficult to discuss and resolve agency, administrative structure, and the relationship between three key institutional spheres of society: state, markets, and civil society. Institutional complexity contributes to fragmentation of water management and characterizes the wickedness of the governance challenge of the water and sanitation sector in Brazil. By looking at a developing country like Brazil, we were able to identify the root institutional and governance causes of uncertainty, while at the same time delineate approaches that could navigate change in less uncertain and ambiguous directions. We argue whether that a tripartite partnership approach can effectively address the wicked water and sanitation problems in Brazil.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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