G-Eau Working Paper/Rapport de Recherche No.21

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Guérin-Schneider, L.; Mayaux, P.-L.; Colon, M.; Bourblanc, M. & Lejars, C. 2026. The global trajectories of water utilities: a post-evolutionist approach. G-EAU Working Paper/Rapport de Recherche No.21. Montpellier, France. http://www.g-eau.net/

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Les auteurs remercient Grace Delobel pour sa contribution à la rédaction en anglais.

Abstract :

The dominant discourse in the urban water services sector often suggests that services should progress along a universal and desirable trajectory, and that deviations from such trajectory would be an anomaly. These perceptions, conveyed by international donors in particular, but also by some academics, reflect an evolutionist conception of transitions that deserves to be explicited but also discussed. First, in a bid to flesh out these evolutionist assumptions, this paper elaborates an analytical framework to describe the trajectories of water services along three dimensions (technical, financial, governance). This framework makes it possible not only to unravel these so-called universal configurations, but also to characterize the trajectories observed in the field. Second, using a socio-technical approach, this paper shows that changes result not only from an evolutionist pressure (alignment of functional configurations) but also from an institutional pressure (alignment with norms, values, rules in uses). The ability of actors to strategically mobilize and seize windows of opportunity is also seen as a lever for change. Implementing our socio-technical framework on five case studies, we demonstrate that while evidence of typical trajectories producing homogenizing effects across the world, can be found, many exceptions do exist. This confirms the importance of social and cultural determinants. These results emphasize that prescribers should broaden the spectrum of what is considered as desirable possibilities in the urban water sector.

Résumé :

Les discours dominants dans le secteur des services d'eau urbains laissent souvent penser que ces services devraient progresser suivant une trajectoire désirable et universelle et que les écarts à cette trajectoire seraient dysfonctionnels. Ces discours, véhiculés en particulier par les bailleurs internationaux, mais aussi par certains auteurs académiques, traduisent une vision evolutioniste des transitions. Elle mérite d'être explicitée et mise à l'épreuve. Cet article propose d'abord un cadre analytique pour décrire les trajectoires des services d'eau suivant trois dimensions (technique, finance, gouvernance). Ce cadre permet d'expliciter ces soit-disant configurations universelles, mais aussi de qualifier les trajectoires observées sur le terrain. Puis, dans une approche socio-technique, cet article propose de considérer que les changements ne résultent pas seulement d'une pression évolutioniste (s'aligner sur des configurations fonctionnelles) mais aussi d'une pression institutionnelle (s'aligner sur les normes, les valeurs, les règles en usage). La capacité des acteurs à se mobiliser de manière stratégique pour saisir des fenêtres d'opportunité est également considérée comme un levier de changement. L'application de ce cadre socio-technique à cinq cas d'étude montre que des trajectoires typiques existent, produisant des effets d'homogénéisation à travers le monde, on rencontre aussi beaucoup d'exceptions. Cela confirme la force des déterminants sociaux et culturels. Ces résultats soulignent que les prescripteurs devraient envisager d'élargir le champ des possibles dans le secteur de l'eau urbaine.

TABLE DES MATIERES

1 Introduction

Since the 19th century, piped water supply has been promoted for public health purposes in industrialized countries. This trend was grounded in the so-called wave of hygienism, based on knowledge produced by scientists such as Pasteur, Koch,Virchow and Snow. Beyond the health issues, having access to in-house, piped drinking water is still considered today a key indicator of human development, and a favourable condition for economic activities (see for instance (Li, Xi et al. 2024). Since the Water Decade in the 1960s, the United Nations has advocated devoting more resources to the development of water supply networks worldwide. In 2015, access to safely managed drinking water for all was recognised by the United Nations as a Sustainable Development Goal. However, developing water supply systems is highly capital intensive, and requires not only financial but also human, institutional and organizational resources that many countries are still struggling to develop. In 2022, only 63% of the global urban population had safely managed access to drinking water (Who/Unicef JMP 2023). Organising water supply has proven challenging, especially in cities of the Global South facing unplanned urbanisation, fast growing populations, poverty and governance issues.

However, whatever the practical difficulties encountered by water utilities around the world, many documents and discourses convey the idea that there is a standard, desirable trajectory for water services. This conception, whether implicit or explicit, can best be described as evolutionist. It invites water policy-makers to move towards, for example, network universalization, full cost recovery, increased sophistication in potabilisation and treatment processes, greater transparency and inclusion of civil society (Schwartz 2008; Baron and Peyroux 2011; Colon and Guérin-Schneider 2015; Colon 2018). Regardless of the specific stage at which a water service is, the evolutionist assumptions convey the idea of a steady progression towards greater efficiency and performance based on a single blueprint.

In this paper, we first aim to explicit the evolutionist assumptions embodied in many best practices, and then to challenge these assumptions. In our view, this is far from being merely an academic debate as international best practices have always been intended to exert a concrete influence on water policies, whether indirectly (as models to be imitated, or through international benchmarking) or more directly (e.g., loan conditionality). In so doing, we offer a new perspective on the trajectories of water supply services worldwide based on the approach developed by Guérin-Schneider and her colleagues (2016). We argue that water trajectories are shaped by models, best practices and watchwords disseminated by influential international organizations, but that these interact with the political mobilizations of stakeholders who advance a wide array of local interests and contrasting values regarding water services. This combination gives a nuanced picture of the global trajectories of water services. While the normative, typical trajectory retains some predictive value - and is therefore a useful heuristic for describing the socio-technical arrangements of actual water services - there are many deviations from this norm. Evolutionist assumptions, in other words, remain necessary building blocks, but they must be complemented. This is why we call our approach post-evolutionist.

The rest of this article is organized as follows. Section 2 highlights the evolutionist assumptions conveyed by most best practices and guidelines worldwide, and shows that these assumptions form a fairly coherent model that combines technical, economic and governance dimensions. It also presents works that call into question these purely functionalist assumptions. Section 3 looks at the effective homogenizing effects of international prescriptions, showing in particular how an evolutionist model can effectively shed light on the trajectory of countries as different as France and Uganda. Section 4 examines evidence that trajectories may deviate from the expected path, highlighting the moments when trends have changed, mainly for political reasons. Section 5 discusses our results, examining the presumed universality of the values underlying evolutionist assumptions.

2 Evolutionist assumptions and their critiques

2.1 The stages of water services: shedding light on some prevailing evolutionist assumptions

Is there a universally desirable organization of water services that may be used to guide their development and reform? At first sight, the answer given by some of the academic literature and by supranational prescribers (World Bank, OECD, European Union, etc.) seems to be positive: organizational principles for structuring the desirable development of water services throughout the world seem to be appearing in a recurring manner.

We have already shed light on these “stagist” assumptions in previous works (Guérin-Schneider, Mayaux et al. 2016). To do so, we drew on grey literature, the actual evolution of regulatory systems, and academic research on the historical and legal analysis of water services around the world (Okun 1977; Tarr and Dupuy 1988; Barraqué 1995; Graham and Marvin 2001; Juuti, Katko et al. 2005; Barraqué 2013; Saraiva, Schmidt et al. 2014) and more particularly in France (Goubert 1986; Offner 1993; Auby 1997; Pezon 2000; Pflieger and Trancart 2001; Bezançon 2005; Lorrain 2008; Pezon and Canneva 2009; Bouleau and Guérin-Schneider 2011; Guérin-Schneider 2011; Deutsch and Gautheron 2013; Barbier 2015). We focused on France due to the widespread adoption of the "French water model" over the last 30 years, which was developed from both the experience of major private operators and the financing model of river basins authorities.

In reading this heterogeneous body of work, three recurring dimensions characterized a “normal” trajectory for water services, in the dual sense of a trajectory to be factually expected and, at the same time, normatively desirable: a technical dimension, an economic dimension and a governance dimension. It should be noted that the dimension of the public vs. private nature of the operator was not included, precisely because there was no consensus on the matter.

As highlighted in Guérin-Schneider et al. (2016), the technical dimension describes the main options in terms of technical solutions and the operational tasks expected to ensure the provision of the service (type of infrastructure, technologies, technical and health standards, work methods and organization). The economic dimension describes the financing methods and the business model considered preferable for providing the service at a cost that is presumed to be "acceptable" to the population. The third dimension, that of governance, defines the identity and mode of coordination of the players involved in the arrangement. In accordance with an evolutionist understanding, the evolution of each of these three dimensions follows successive phases, the main attributes of which are described in Table 1. If we approach these dimensions simultaneously, we can go further and highlight typical combinations that describe a standard trajectory, which is presented as the ideal trajectory in the corpus cited above. These combinations are presented in Table 2.

The next sections, which are devoted to case studies, provide illustrations of the dimensions, phases and arrangements that are defined in the following tables.

Table 1: Standard stages in the development of water utilities according to the three structuring dimensions of water services management, according to Guérin-Schneider et al. (2016)

Dimension	Phase	Description
Technical dimension	T0 : Network of communal standposts	Limited network, mainly distributing communal standposts with a partial household-based service delivery ensured by water carriers.
	T1 : Centralized and collective piped water network with limited treatment (civil engineering*)	In-house connections are widespread, but with a limited level of treatment. Access to safe water is favoured. When existing, wastewater treatment is limited to effluent isolation and disposal.
	T2 : Centralized and collective piped water network with sophisticated treatment (sanitation engineering*)	Drinking water standards and wastewater treatment requirements are more stringent, entailing significant investment in treatment technologies. Environmental protection requirements focus on means (as opposed to in-field results).
	T3 : Focus on customers	Water service provision encompasses services directed at the end-user now perceived as a customer (client charters, satisfaction surveys, call centers, and so on).
	T4 : Integrated management of water resources and urban water services (environmental engineering*)	The management and technical organization of water services increasingly takes into account impacts on water resources (in terms of quality and quantity). Environmental protection requirements focus on results (as opposed to means to attain such objectives).
	T5 : Collective decentralised micro-networks **	Establishment of micro-perimeters of collective distribution (possibly under private or community management).
Financial dimension	F1 : non-recovery of costs	Funding of water services through taxes (subsidies and tariff equalization). Subsidies cover a significant portion of capital and operating costs. The price of water is far below the production cost.
	F2 Recovery of operating costs	Subsidies cover a significant part of the capital costs but operating costs are financed through the water bill. The price of water is below the production cost.
	F3 : Financial full cost recovery	Water tariffs paid by end-users through their water bill make it possible to balance capital and operating costs.
	F4 : Economic full cost recovery	Water tariffs paid by end-users also include environmental costs corresponding to the damage caused to the environment, to the ecosystem and indirectly to those who benefit from it.

Dimension	Phase	Description
Governance dimension	G1 : Direct government	Uni- or bipolar organization with a single authority that sets up and operates water service (typically management in direct control for water authorities) or with an entity, generally public, that organizes service provision and a separate service provider (public or private). Absence of regulator and weak power for the end-users.
	G2 : Simple governance	New actors emerge, independent of water authorities or their service providers: regulator (observatory, etc.) and representative of users and / or participatory platforms.
	G3 : Extended governance	Integration of water resource managers.

*qualification of the three types of engineering according to Barraqué (2013).
** a step less common in the literature, proposed in particular by Deutsch et Gautheron (2013) as an emerging model.

Table 2: The standard configurations of water services arrangements according to Guérin-Schneider et al. (2016)

Standard Configuration	Technical Dimension	Finance Dimension	Governance Dimension
Initial growth phase of water systems T1-F1/2-G1	T1 centralized and collective piped water network with limited treatment	F1 Non-recovery of costs then F2 Recovery of operating costs	G1 Direct government
Water quality development phase T2-F2-G2	T2 centralized and collective piped water network with enhanced treatment	F2 Recovery of operating costs	G2 Simple governance
Network maturity phase T3-F3-G2	T3 Focus on customers	F3 Financial full cost recovery	G2 Simple governance
Integration phase between small and large water cycles T4-F4-G3	T4 Integrated management of water resources and urban water services	F4 Economic full cost recovery	G3 Extended governance

International prescriptions usually define successive stages in the development of water services following these configurations. As in any evolutionist model, the descriptive and normative dimensions are inextricably intertwined. The transition from one particular stage to another is considered both probable and desirable. In practice, however, the transition from one configuration to the next is not straightforward. It usually involves major changes in all three dimensions, and implies new infrastructure, new costs, and the involvement of new actors.

2.2 Explaining water supply sector trajectories: a socio-technical approach

Sustainable transitions frameworks have been used to analyse transition pathways for the development of water services in developing countries (Markard, Raven et al. 2012; Fuenfschilling and Truffer 2014; van Welie, Cherunya et al. 2018; Heiberg, Truffer et al. 2022). These works analyze the water sector as a socio-technical regime, i.e., networks of "actors (individuals, firms, and other organizations, collective actors) and institutions (societal and technical norms, regulations, standards of good practice), as well as material artifacts and knowledge" (Markard et al. 2012, p 956). A centralized piped water supply network, combined with the network of actors involved in operating, funding, and regulating the framework, form a regime. Sustainable transitions of socio-technical regimes designate the process by which a sector shifts from one regime to another, for instance from a fully central piped network to the coexistence of a central network with modular supply systems involving other types of actors, rules, and practices. A transition includes all dimensions, not only technological, but also "material, organizational, institutional, political, economic, and socio-cultural." (Markard et al. 2012, p 956). The transition is called sustainable when it is institutionalized, i.e., taken for granted and stable over time. Most empirical work on the water sector emphasizes transitions, which involve profound changes in regime, mainly presented around technological innovations (Heiberg, Truffer et al. 2022). However, reconfiguration of socio-technical regimes results from the co-evolution of institutions and technologies over time (Heiberg, 2022), with institutional pressures that may come from "the landscape" (Geels 2002; Geels 2004), designating rules and norms at the macro level. Regime reconfiguration may occur when the actors, technologies and institutions within the regime are not well aligned or stabilized. This opens windows of opportunity for change. In theory, this approach renders it possible to analyze how changes at the landscape level (new model, new good practices) may influence a regime. Again, in theory, it also renders it possible to raise the issue of alignment between actors, technologies and institutions. However, it has limitations in terms of understanding power relations and political analysis in a highly political sector such as water.

We propose to adopt a refined and complementary approach:

- to analyze the impact of the evolutionist model described in the previous section as being part of the landscape of the regime.
- to encompass, in the reconfiguration of the regime, changes that might not necessarily lead to a sustainable transition of regime, but instead lead to incremental change in actors (e.g., promotion of user participation), in some rules (e.g., new billing rule) or in technology (e.g., new treatment norms).
- to enrich the framework with political science's concepts that analyze the opening of windows of opportunity as well as the formation of actors' coalitions.

Guérin-Schneider et al. (2016) suggest that the socio-technical approach to change in the water sector should be refined by political analysis. Several political science authors (Kingdon 1984; Sabatier 1988; Jabko 2009) highlight the importance of windows of opportunity and actors' coalitions in bringing about change. Kingdon's work (1984) emphasizes that change can only occur if three dimensions are aligned: a problem stream, a policy stream, and a poltics stream. Policy entrepreneurs are instrumental in this alignment process. However, in most cases, this alignment mainly affects agenda-setting. Putting an issue on the agenda does not guarantee that a decision will be made unless these policy entrepreneurs manage to build large coalitions of actors in support of the issue. In addition, Jabko (2009) has shown that such coalitions do not always need to share the same values, beliefs, or interests. By relying on a broad coalition, even a heterogeneous one, these policy entrepreneurs will have all the more chance of influencing policy content and achieving change.

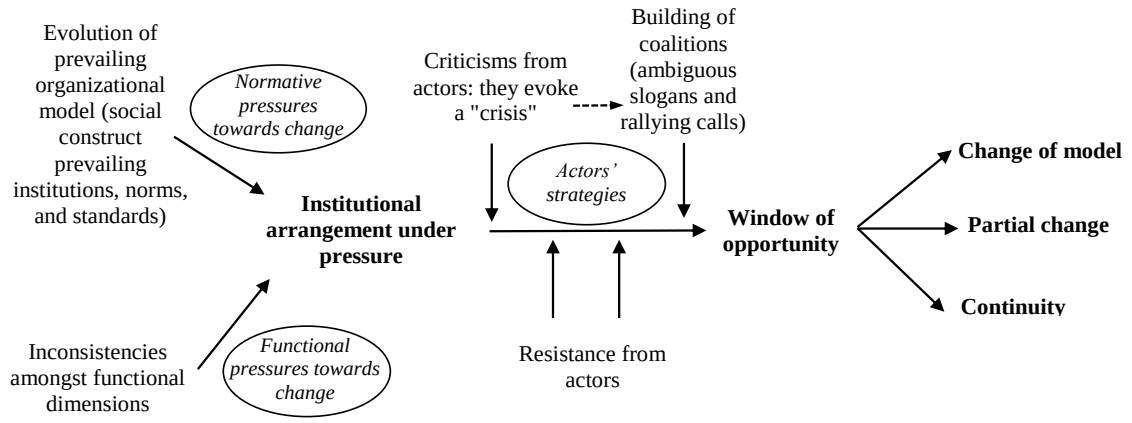
By integrating the evolutionist view and the socio-political view, Guérin-Schneider et al. (2016) propose that we consider three types of explanatory factors for changes in the management of water services:

- The dominant organizational models (institutions or social conventions) that, at a given time, produce normative visions which either value or discredit certain arrangements. This corresponds to a normative source of change.
- The degree of consistancy between the technical, financial, and governance dimensions of the arrangements. The degree of adequacy (or contradiction) between dimensions determines the pressure for change. This corresponds to a functional source of change.

  Taken together, these two sources determine the size of the window of opportunity for change.
- The actors or coalitions of actors who will work within or in reaction to these institutions to characterize the arrangements in place, consolidate them, undo them or make them evolve. The flexible nature of the solutions being promoted encourages the formation of coalitions advocating for reform.

This analytical framework closely links two sources of change (see Figure 1). The first is social and contingent; it can be observed in the evolution of the dominant models, as well as in the interplay of stakeholder coalitions. The second is functional and technical; arrangements that are too inconsistent with a standard configuration are a source of inefficiency, and this inefficiency can also generate pressure to make them more consistent.

Figure 1: A comprehensive framework to interpret the trajectories of water services adapted from Guérin-Schneider et al. (2016)



According to Guérin-Schneider et al. (2016), such an analytical framework requires a re-examination of the truly universal nature of the stages and combinations identified above. If the development of water services is also determined by an institutional and socio-political context, are the stages actually respected everywhere? And finally, are the stages identified desirable in absolute terms, whatever the context?

In sum, the socio-technical regime approach and the framework developed by Guérin-Schneider et al. (2016) are complementary in terms of understanding changes in the water sector. The first approach is a model grounded in theory, while the framework developed by Guérin-Schneider et al. (2016) was primarily built through empirical work. They bear similarities: both emphasize the combined influence of the macro (institutional) context and the micro (material) dimension. Both insist on the importance of windows of opportunity and on inconsistencies in dimensions that can trigger a change in prevailing regimes or arrangements. However they also differ. In particular, the first model focuses on the technical dimension, which remains the main factor for regime change, while the second focuses on three core dimensions (technical, financial, governance) in a more balanced way. The second framework provides a more precise and comprehensive analytical framework for describing the configurations

encountered in the field (Table 2). It therefore aims to more directly challenge the model of good management developed empirically by international prescribers.

The next two sections illustrate the relevance of this second approach, both to explain an observed trend towards the homogenization of water services development around the world, and to explain the deviations, counter-trends and asynchronies with respect to the norm that nevertheless occur.

3 Homogenization effects

The first two cases illustrate situations where the successive standard configurations seem to have been reached. In spite of extremely different national and cultural contexts, we can observe in these cases a homogenizing effect in the organization of water services, gradually following the standard phases.

Elements from the comprehensive framework presented in Figure 1, Table 1 and Table 2 are in italics.

3.1 Mainland France (1945-2024): a coherent evolution through the standard configurations

The French case illustrates a trajectory that seems endogenous or at least in line with the dominant model largely influenced by the "French water model" as mentioned above (see Table 1).

In France, during the reconstruction period following the Second World War, the expectations of stakeholders converged and the water management model in place was stable. The main objective was to develop access to the network, which meant increasing service revenue. Local authorities were in charge of water utilities, and could choose to either opt for direct management, or sign lease contracts with private operators. Subsidies were high and the price of water was low. *Prevailing institutions* enforced standard contracts and price control. Customers were not involved and did not express any dissatisfaction (Pezon 2000). The model in place matched the *initial growth phase* (*T1-F1-G1*) and was not challenged.

The *water quality development phase* began during the 1980s. From 1982, local authorities obtained more autonomy from the central State. *Prevailing institutions* changed following European directives requiring higher quality standards (*T2*). National public accounting standards reinforced full cost recovery (*F3*). In this context, the investments required for these new treatment assets induced price increases. During the same period, corruption affairs were revealed,[1] triggering a *legitimacy crisis*. Relationships between consumers, operators and local authorities became conflictual. A first *window of opportunity* for change opened.

During the 1990s, private operators responded to the *crisis* by developing marketing strategies and proposing customer charters (*T3*) (Pflieger and Trancart 2001). This was not enough to restore confidence. Institutional reforms were introduced to strengthen competition among private companies and improve transparency in the water sector.[2] However, the new rules continued to be insufficiently specific and reporting remained poorly implemented. The governance did not really reach the *G2* phase.

These tensions maintained a *window of opportunity* which was seized by the French Minister of Environment, D. Voynet. She planned to establish a national regulator for the water sector, inspired by English regulation. A *G2* governance became the expected model. However, her first proposal was rejected by the *Conseil d'Etat* (the French court monitoring the legality of draft legislations) in 1998. The next draft legislation faced various delays and did not materialize quick enough. This context favoured voluntary reporting and accountability. The practice of measuring performance using performance indicators became widespread (Guérin-Schneider 2001). A *coalition* emerged on this draft legislation gathering local authorities, State administration and operators. The former sought new regulation tools,

[1] The most emblematic in Grenoble (judgment of the Lyon Court of Appeals of 9 July 1996).

[2] The Sapin law (1993) provides a new bidding procedure framework. The Barnier and Mazeaux (1995) laws introduce the requirement of annual reports on the service management.

the latter wished to give sign of goodwill and avoid stricter control. For different reasons, everyone agreed on the need for reporting based on performance indicators. The development of a national performance indicator list really took off against a backdrop of strong lobbying (Canneva and Guérin-Schneider 2011).

In 2002, due to a change in the government majority, the political agenda turned on its ear. The national regulation project was abandoned. Only a mandatory list of performance indicators was to be included in the annual report on water services (2007 decree). These indicators were to be gathered on a voluntary basis in a national observatory (2006 water law).

Finally, the 2006 Water Law transposed the 2000 water framework directive, directly enhancing the technical dimension (*T4*) and cost recovery (*F4*).

Table 3: Development of the management of water services in France (1945-2024)

Period	1945-80	1980-98 (legitimacy crisis in the mid 1990s) ①	1998-2006	2006-2024
Expected configuration	T1-F2-G1 FNDAE established in 1954	T2-F2-G1 1982: more autonomy of local authori-ties by decentra-lisation law directives: - nitrate 1991 - urban waste water 1991 - drinking water 1998	T3-F3-G2 water law draft, 1998 and even T4-F4-G3 water framework directive, 2000	T3-F3-G2 water law, 2006
Actual configuration	T1-F2-G1	T1-F2-G1 ⇨ **T2-F3**-G1	⇨ **T3**-F3-G1	⇨ T3-F3-**G2**
Level of functional consistency	High Consistent with initial growth phase	Low *Water quality development phase* T2-F2-G2 is not yet reached	Low *Maturity phase* T3-F3-G2 is not yet reached	High Consistent with *maturity phase*

Diagram legend

① Legitimity crisis, opportunity window

Pressure to change

Change in the configuration in place

The *legitimacy crisis* thus led first to a re-composition of voluntary practices, and second to new reporting obligations. However, the political will for *change* remained limited. Instead of being reinforced, public control over water service management weakened in 2008 when a national reform[3] removed the State's responsability to assist local authorities water and sanitation management (Barone, Dedieu et al. 2016). Governance continued to widen slowly. Stability seemed to be restored (*continuity*) but remains tenuous today. Whether the performance observatory can inspire renewed confidence in the sector cannot yet be confirmed since the Ministry of Ecology has just initiated a redefinition of the indicators. There are some signs of a trend towards *G3* with new forms of citizen participation being tested, for instance in Montpellier and Grenoble Metropoles, that create citizen committees involved in major water service decisions.

3.2 Government and donors form a coalition to lead change: NWSC in Uganda (2000-2010)

In Uganda, in the 1990s, water services were in their *initial growth phase* (*T1-F1-G1*) (see Table 2). The State company in charge, the National Water and Sewerage Corporation (NWSC), had been created in 1972 to operate the water systems inherited by the British in the three main cities of the country (Kampala, Entebbe and Jinja). Two decades of political unrest in the 1970s and 1980s (dictatorship and war) had devastated infrastructure and prevented the water utility from gaining professional capacity. When Museveni came to power in 1986 and restored political stability, NWSC was only supplying city centres, intermittently, with poorly treated water. On top of its technical limitations, the State company suffered bad management, including cronyism, poor and irregular pay for staff, poor billing and financial capacity (Colon 2014). *Functional pressure toward change* was high.

Lacking political legitimacy, the then new government opted to conform to the structural adjustment program led by the World Bank (WB) and the International Monetary Fund (IMF) in 1987. The *prevailing model* put *normative pressure towards change*. The government chose to implement a neoliberal policy to address the dramatic economic state of the country, but also to gain legitimacy among both Ugandans and western countries. It was a response to a *legitimacy crisis*. The water sector went through a sectorial reform, as part of a wider reform of the public service (*change of model*). The first steps of the reform tackled both infrastructure and management. On the management side, the main measures comprised increasing tariffs, training engineers, and putting staff to work (better salary but compulsory attendance to work). In parallel, infrastructure was rehabilitated and extended with the support of mainly the WB (*T1* and *F1*). The water systems were gradually moving to the *water quality development phase* (*T2*) with a focus on billing (moving towards *F2*). In 1995, the NWSC Act stipulated that NWSC should have financial autonomy and fully recover its costs. The commercial orientation of water supply and sanitation was then adopted.

By the end of the 1990s, the utility had significantly improved its technical and financial situation. However, the utility was indebted. The public status of the utility was then considered by the WB as the main obstacle to improving the utility's performance (Muhairwe 2009). At that time, private management of water utilities was the *dominant model promoted* by the financial institution. NWSC's legitimacy was threatened and its divestiture was planned. However, its fragile financial situation did not appeal to investors. A new managing director therefore was appointed, W. T. Muhairwe, to improve the utility's performance so as to make it profitable.

The national water and sanitation operator underwent a deep managerial reform towards corporatization. Performance contracts were signed between the government and the managing director with the main objective being to reach a financial balance. This would be done by reducing costs (improve staff productivity, full cost recovery from water sales) while seeking extension of supply (more cash) and focusing on customers (towards *T3*). Muhairwe developed customer services and focused on bill collection. He also set up incentive mechanisms targeting managers to stimulate performance. This orientation accelerated the increase in the number of connections and water

[3] Révision Générale des Politiques Publiques

production. Non Revenue Water (water produced that is not sold, including water losses, water used for the process, theft water, etc.) had decreased and bill collection improved. By 2010, the utility had reached the level of operating costs recovery (*F2*) and could partially self finance some investments (towards *F3*). By acting like a private company, NWSC eventually escaped the divestiture plan in 2004. By conforming to the dominant model, approved by the dominant coalition formed by the government and donors, NWSC gained legitimacy and remained in public hands.

This rapid improvement was recognized by the coalition and in particular by the WB (Matta and Murphy 2005). In 2010, NWSC received an award by the International Water Association for "its outstanding contribution to water management". This media coverage served the interest of the WB. This case presented an alternative privatization model (Baietti et al, 2006), which had received increasing criticism. The NWSC's case was acceptable for public management defenders and neo-liberals.

However, in 2011, the emblematic managing director was forced to leave, under severe criticism[4]. He was suspected of hiding the real performance of the utility. Moreover, the water supply was developed for the richest part of the population, and shortsighted management caused damage to infrastructure and the environment (World Bank 2012). This sudden shift in discourse regarding NWSC's management revealed a new *legitimacy crisis*. It was neither technical failures nor pressures from civil society that pushed for change, but another coalition between the government and donors (specifically the German bilateral aid agency, GIZ). Drawbacks of the management opened a window of opportunity for the Ministry of Water to increase its influence over the sector. With the support of GIZ, the ministry planned to create a regulation department (Colon 2014). In 2011, the governance was enlarged, incorporating a new actor: the regulation unit (*G2*) (Colon and Guérin-Schneider 2015). NWSC's operating area was later extended to include all urban centres in the country. Hence, from the *initial growth phase* (*T1+F1+G1*), the urban water sector in Uganda now aims to reach a new stage (*T3 + F2 + G2*) following a series of legitimacy crises. In a country where civil society and opposition movements have little power, it is the coalition formed by the government and donors, along with the national utility, that are the driving force to define the criteria for determining what constitutes of a 'good water service'.

[4] See for instance the paper by MATSIKO "Uganda: Behind the Scenes of Muhairwe's exit", The Independent, 22 Nov. 2011

Table 4 Development of the management of water services in Uganda (1972-2011)

Period	1972-1986	1986-1999 (Legitimacy crisis of State policy in 1986 and of the public status of NWSC in 1998) ① ②	2000-2010	From 2011 (Legitimacy crisis in NWSC top management in 2011) ③
Expected configuration	T1-F1-G1 Reconstruction of infrastructure (creation of the State company NWSC in 1972) in a context of restored political stability (from 1986)	T2-F2-G1 Neoliberal reforms: Political decision to conform with adjustment program (of WB and IFM) (in 1987) NWSC Act (1995) stipulating financial autonomy	T3-F3-G2 Accountable and financially autonomous utility NWSC management based on performance contracts	T3-F3-G2 Plan to create a regulatory authority of the water sector
Actual configuration	T1-F1-G1 (where the service is in place)	**T2**-F1-G1	T2-F1-G1 **T3-F2**-G1	**T2/**T3-F2-G2 Some doubts about long-term asset management are being expressed (degradation of technical dimension)
Level of functional consistency	High Consistent with *initial growth phase*	Low *Water quality development phase* (T2-F2-G1) is not yet reached	Low Neither *Network maturity phase* (T2-F2-G2) nore *network maturity phase (T3-F3-G3)* are yet reached	High Consistent with *water quality development phase*

Diagram legends: see above

4 Deviations from expected trajectories

We shall now turn to three cases that show a different result from the ones analysed in the previous section. Hence, in certain contexts, the linear evolution described by the evolutionist vision seems to be called into question.

4.1 Cochabamba (Bolivia): The development of multiple, community networks

As shown in Table 2, the first stage in the implicit evolutionist model for water services is the extension of a main piped water distribution network that is largely financed by the State and managed by a public utility (*initial growth phase*). This marks the advent of what Tarr and Dupuy (1988) dubbed the "networked city". However, urban scholars and anthropologists have long documented the persistence of informal, collective forms of urban infrastructure across cities in the Global South, casting doubt on the teleology of the expansion of major public networks (Amin 1996). This is particularly true of water services. Many of these widespread, alternative forms of water supply are precarious and costly. In these cases, users hope that they eventually will be replaced by more modern water services.

Some cities, however, have seen the recent development of community networks that enjoy a robust legitimacy with their users. In these cases, the extension of the main municipal network has been successfully opposed and thwarted by alternative forms of organization. According to our diagram, instead of the completion of phase *T1*, this corresponds to a rapid leap to phase *T5*. Therefore, even the first standard configuration in the evolutionist model, that of the *initial growth phase* leading to the universalization of a centralized network, does not hold true everywhere.

The case of Cochabamba, Bolivia, provides a good example of how multiple networks can be created alongside the main, municipal network, with no integration in sight. Collective water systems, built and organized by local communities, emerged in the 1980s in response to the limitations of the existing municipal water system. This system only served a relatively small proportion of the population in the northern part of the city (around 50% in 2000, roughly the same today). The areas not served by the municipal operator, SEMAPA, which are mostly located in the southern part of the city, are home to around 400,000 inhabitants (Ledo Garcia 2009, 72). Today, around 70% of these residents are integrated into one of the 200 collective supply networks, with the remainder relying mainly on water trucks (Cabrera 2018, 206). These systems vary greatly in size, supplying anywhere between 50 and 900 households. They are self-managed by their users and come under different legal forms, all non-profit: cooperatives, associations, committees, etc. In some cases, they are supplied with groundwater through wells; in other cases, they do not have access to groundwater and rely on elevated tanks that are filled with water bought in bulk from water tankers. Some systems are mixed, combining elevated tanks and wells.

The proliferation of small, alternative networks can be explained first and foremost by the failure of the large-scale public system to cope with urban growth, as the Cochabamba metropolitan area grew from 200,000 inhabitants in 1976 to almost a million in 2008. As elsewhere, this inability led to the fragmentation of urban networks (Graham and Marvin 2001). However, it has also been greatly stimulated by the particular social backgrounds of the inhabitants. Most were migrants originating from Andean farming communities or mining cooperatives who had recently settled in the city. There, they were able to redeploy, in original and novel ways, the organizational know-how and customary participatory practices in which they had been socialized in their former communities (Linsalata, 2014).

Within water committees or associations, major decisions are usually taken in assembly meetings, which typically take place every month but can be held more frequently when necessary. The assembly then normatively "obliges" its members, especially with regard to their participation in system maintenance and improvement work (network expansion, purchase of new components, tank cleaning, etc.) – work that is carried out through community work days or financial contributions (Martí 2019). This illustrates the bottom-up emergence of regulation through the participation of local residents (*G2*).

These systems do not work seamlessly and should not be overly romanticized. In particular, the aquifer is overexploited and appropriated by the neighbouring communities which are located immediately above it, excluding others. Water rates also vary by a factor of three depending on local conditions, raising issues of social justice. *The functional pressure toward change* remains high. Nevertheless, members of the "southern area" – the area served by these small networks, but which also conveys a sense of belonging (*T5*) - have repeatedly manifested their attachment to their systems (*resistance from actors*). In 2000, for example, they were heavily involved in protests against the privatization of SEMAPA (which gained international fame as the Cochabamba "water war"), not because they were directly affected by the tariff increases that resulted, but because the new private operator had a mandate to extend the main network into their areas (Razavi 2019). Since the beginning of the 2000s, these multiple systems have been organized into a federation (Asica-Sur). Users have also been united in demanding access to water from the Misicuni dam, located a few dozen kilometres away, which is currently reserved for SEMAPA, in order to ensure their long-term survival. There is nothing to suggest, therefore, that they will soon be integrated into the main water network.

Table 5: Configuration of water services in Cochabamba (1980-2020)

Period	1980s to 2020 (Legitimacy crisis linked to privatisation contest in 2020) ①	2020:
Expected configuration	T1-F1-G1 Gradual universalisation of the municipal public network	T1-F3-G1 Full universalisation of the municipal public network
Actual configuration	T0-F1-G1 Persistently limited, and unpopular, municipal public network	**T1-F2**-G1 in few areas T0-**F2**-G1 in some others **T5-F3-G2** in others
Level of functional consistency	Low Initial growth phase (T1-F1-G1) is not yet reached	Medium where T1-F2-G1 is reached but remains fragile. Low elsewhere. Users are involved and attached to their water systems, but they provide a service of very variable quality

Diagram legends: see above

As summarized in Table 5, the evolution of water services in Cochabamba has been markedly desynchronised when compared with the evolutionist model. Far from the continuous extension of the public distribution network that was expected, alternative networks were created (*T5*), for which users

are being asked to bear all economic costs (*F3*). At the same time, sophisticated modes of governance, including users and residents, have been developed by water committees (*G2*).

4.2 South Africa's decoupling and eventual retrogradation of phases

South Africa has been praised around the world for allegedly being one of the first countries to have enshrined a right to water in its new Constitution (1996). Alongside the issue of land during Apartheid, access to water was a major benchmark of harsh inequalities between the white minority and the rest of the population. A reform of the water law was a top political priority for the new democratic government (*normative pressure towards change*). The Water Services Act (1997) and the National Water Act (1998) were passed and radically transformed water management in the country. Very much influenced by the Dublin Declaration (1992) and so-called best international practices in the water sector, the government adopted decentralized management of water resources, pledged to protect aquatic ecosystems and recognized water as an economic good (*F2*). The latter ignited a vivid social movement against the perceived commodification of water (*legitimacy crisis*) (Bond 2002). The White Paper on National Water Policy for South Africa also proclaimed the goal of recovering full financial costs (*F3*), and even the costs of managing the water resources (*F4*) (DWAF 1997). Hence conflicting principles have been co-existing within the water reform, namely water as an economic good inspired by international water norms, along with the right to water put forward as a high profile political reform in post-Apartheid South Africa.

The human right to water has been operationalized through the concept of free basic water (FBW). This was no small ambition. In the mid-1990s, only white areas had a full-pressured water supply in homes and flushing toilets linked to a waterborne sewerage and wastewater treatment system (*T2*). In comparison, only public fountains (often dysfunctional) could be found in most Black areas[5] (*T0*). The reform's new slogan promised "some water, for all, for ever". The challenges of connecting everybody to the centralized collective network were tremendous, both technically and financially. The former regime of racial segregation relegated the vast majority of the Black population outside the cities, sometimes dozens kilometres away from the city center. In other more rural parts of the country, local municipalities in charge of supplying drinking water had been created *ex nihilo* and formally established in 2001. They struggled to ensure the financing of basic services in indigent areas and had to be assisted by subsidies from National Treasury (Municipal Infrastructural Grants and Equitable Share) to be able to expand the network (*F1*).

The FBW concept was first introduced in the Durban metropolitan municipality in 2001. Set at 25 litres/person/day following the World Health Organisation recommendations, this amounted to 6 kL per month for an average informal settlement family size of about eight people. This quantity soon became national government policy. Amid public health concerns surrounding the outbreak of a cholera epidemic, FBW was initially given to all domestic customers, regardless of household income. In addition, although FBW initially was a water sector initiative, it soon became a part of a wider social welfare policy (Muller 2023). The different levels of government were willing to act swiftly for a speedy implementation of the water reform aimed at redressing past inequalities. For practical reasons, to not delay further the reform's rollout, this commended to not discriminate amongst South African citizens, the previously disadvantaged ones but also the ones who did not suffer the same historical discrimination. Hence, even for the more affluent (white) households which already enjoyed quality service (steadily progressing towards *T2/3*), the expected full cost recovery (*F3*) was delayed. The focus on customers (*T3*) has made a furtive appearance, notably in Johannesburg, during the Suez concession, which was supposed to instill a corporate and customer relations culture. But the contract was not renewed, and this new culture was not widely shared. This FBW policy was supposed to be financed

[5] In 1994, 12 million people (1/3 of the population) did not have any access to safe domestic water supply.

through cross-subsidization with rising block tariffs. However, poor households did not limit themselves to their entitled 6kL, and refused to pay for their extra consumption (*T1-F1*), resulting in huge debts for the municipality in rural areas especially. Eventually, the broad-based FBW programme proved too costly for most local governments, even for metropolitan municipalities, which have discontinued the broad FBW programme since 2018. It has been replaced with a (very impractical) self-identification process which requires poor households to register administratively as indigent. Other strategies to prevent perceived abuse of the FBW notion include the installation of pre-paid meters, criticized by radical scholars as neoliberal anti-poor devices (Dugard 2008; Von Schnitzler 2013).

While the network has expanded over the years, access reliability has decreased for almost everybody, including recently connected Black rural areas and now even the economic hub of the country. The richest neighbourhoods of Johannesburg were subject to water cuts for several days in 2023-2024 (from *T2* to *T1*), prompting well-organized social mobilizations demanding action from local government. Everywhere, water potability is decreasing and wastewater treatment plants are in critical conditions. A good indication of the fast-deteriorating quality of water services is that the Department of Water Affairs has stopped releasing yearly Blue Drop (tap water quality) and Green Drop (river water quality) indicators for each municipality since 2014 due to the appalling results reported. This rapid decline in the quality of water services in South Africa is partly due to a lack of investment in infrastructure maintenance, as well as to the economic challenge of financing the provision of "water for all" in sometimes very difficult terrains. In itself, it does not contradict what the evolutionist model could have predicted. The indecisive policy and hesitation on the financial aspects of the water reform illustrates a conflict of values between the recognition of a constitutional right to water and economic realism, which has sparked a controversial discussion on how to define "the right to water": does that mean in-house access or would communal handpumps 200 metres away from households be sufficient (*legitimacy crisis*)? Such a conflict of values will complicate a realignment of phases.

As shown in Table 6, the evolution of water services in South Africa appears rather desynchronized when compared with the evolutionist model. Entangled with social imperatives, and coupled with political dissent around a willingness to pay for water services, the rollout of the water reform never really implemented full cost recovery. Consequently, the reform programme has lacked the economic means required to achieve its goal of universal network coverage. Today, technical and financial challenges are hindering the extension of the distribution network. This has resulted in a regression in both the Black areas that needed to catch up with the better-served part of the population, as well as in the most sophisticated parts of the water network. However, this *functional pressure* to reconnect the different dimensions is not the only explanation. Political aspects also are a significant factor contributing to the backward dynamics of water services. Until very recently, water users have been little involved in water affairs, which has granted a free pass for deviant practices, such as mismanagement, corruption, incompetence or just the inability to ring-fence the water budget within municipalities and plan for infrastructure maintenance and future demand.

Table 6 Development of the water services' management in South Africa (1994-2024)

Period	Apartheid time-2001 (Political regime transition) (Legitimacy crisis linked to unequal access to water) ①	2001-2014 (Legitimacy crisis linked to unwillingness to pay for water services) ②	2014- 2024 (Legitimacy crisis linked to deterioration of service quality) ③
Expected configuration	1996: Right to water in the new Constitution 1997: Water Services Act; White Paper on National Water Policy for South Africa 1998: National Water Act 2001: Free Basic Water T2-F3/4-G3 (White areas) T1-F2/3-G1 (Black areas)	Water Reform implementation Gradual universalization of water access for all T2/3-F3-G3 (White areas) T2-F2-G2 (Black areas)	Full universalization of water access for all T3-F3-G3 (across the country)
Actual configuration	T1-F1-G1 (White areas) T0-F1-G1 (Black areas)	T2-F2-G1 (White areas) **T1**-F1-G1 (Black areas)	**T1**-F2-**G2** (White areas) **T1**-F1-G1 (Black areas)
Level of functional consistency	Medium to low In White areas *the water quality development phase* is not reached In Black areas *the initial growth phase* is not reached	Low In White areas neither *the water quality development phase* nor the *maturity phase* are reached In Black areas *the water quality development phase* is not reached	High (but fast deterrioration of service quality and remaining inequality of access) Consistent with: - *Water quality phase* in White areas - *initial growth phase* in Black areas

Diagram legends: see above
(*nota bene*: Although the regulations and standards are in theory the same for the entire country, the gap between the initial situations in Black and White areas makes it pragmatically necessary to lower ambitions in terms of the timetable for development of water service in Black areas.)

4.3 Case of Voh-Koné-Pouembout (VKP) area in New Caledonia (France): An extended governance implementation with no transition in other dimensions (limited treatment and no cost recovery)

New Caledonia, a French oversea territory, provides an example wherein governance was prioritized over the technical or financial dimensions, in a bid to preserve resources and water quality. New Caledonia has been engaged in a process of negotiated decolonization since the political agreements of Matignon-Oudinot (in 1988) and Nouméa (in 1998). In the field of water governance, the political agreements led to specific legislative frameworks. For instance, the water potability standards are less stringent (*T1*) than those in mainland France, which are subject to European directives (*T2*). The 1999 Organic Law divided the responsibilities of water management between four different authorities: New Caledonia government (manager of the fluvial public domain outside customary lands), provinces (for environmental jurisdiction), municipalities (for drinking water and sanitation) and customary authorities (waterways and groundwater customary properties on customary lands, which represent 24% of all land). As of 2024, the New Caledonian Water Law is still being developed. It strives to take into account the different land and water rights statutes, and to update drinking water standards and build qualitative and quantitative standards to protect rivers and groundwater (as the French and European standards are not applicable).

The municipalities of Voh, Koné and Pouembout, called VKP (1900 km², second largest urban area after Nouméa) are rural areas that experienced unprecedented development generated by the setting-up of an international nickel mining industrial complex. Water services in the region were gradually introduced in the 1960s by municipalities, miners, or customary authorities (*T0 to T1*). In the 1980s, the majority of networks (particularly those belonging to mining companies) were given to municipalities and a large majority of the population had acess to water (*T1*). Until 2008, water distribution was provided by each of the three municipalities. The price of water was very low (0.1 euro/m^3) and the non-payment rate was around 80% (*F1*). Drinking water networks were also used for agricultural purposes, in particular for cattle. Apart from some claims associated with the pollution of rivers by mining activities, the quality of the water distributed was considered good overall (water is sourced from catchments located in preserved highlands) even if the treatment remained simple (*T1*). In-house connections are widespread but with very limited level of treatment (with some chlorination units and no filtration).

Starting from 2006, a strong expansion of mining activities contributed to massive population growth (+76% in Pouembout between 2004 and 2014) and rapid urbanization. The population was expected to double by 2020. In 2010, due to the challenges caused by the lack of water legislation, the need for mining pollution control, and funding difficulties, local stakeholders created a unique and informal governance structure that gathered all institutional actors involved in water management. This structure was called 'WMC VKP' (*G2*), and operated according to the will and resources of its members. The members developed a program of integrated water resource management (IWRM program - *G3*), including over one hundred individual actions over a period of five years. This program aimed at developing functional governance of water resources. It supported the implementation of a drought plan, the acquisition and sharing of water data, discussions and public awareness programs about the reduction of water use and water payment.

In 2018, in VKP, the level of drinking water and wastewater treatments was still limited (*T1*). From a technical point of view, the network was improved thanks to the installation of decanters, but the level of treatment remained limited (*T1*). The quality of the water distributed had remained good because the catchments are often located in preserved areas. The water services continued to be mainly funded by the municipalities' general budget, i.e., by taxpayers (*F1*), despite strong pressure from the Court of Auditors to balance budgets. The price of water had increased (multiplied by 10 between 2008 and 2011) but recovery rates remained low (65% in 2017). At the level of water services, the objective was thus to reach the recovery rate of operating costs (towards *F2*), and to improve the protection of catchments. At the beginning of 2018, New Caledonian government launched a national public

engagement program to build the first national water policy (Lejars, Bouard et al. 2024). This new policy showed a willingness to include in water governance not only all local institutions, but also broad consultations with users, and to reinforce the link with resource management (towards *G3*).

Table 7 Development of the management of water services in WKP - New Caledonia (1980-2018)

Period	1980- 1998 (Legitimacy crisis linked to aspirations for independence in 1988) ①	1998-2008 (Legitimacy crisis linked to aspirations for independence in 1998) ②	2008-2018 (Legitimacy crisis in water sector leading to the informal creation of WMW VKP in 2010) ③	2018
Expected configuration	T1-F1-G1 1988: process of negociated decolonisation agreement of Matignon	T1-F1-G1 1998: process of negociated decolonisation agreement of Nouméa 1999: organic Low	T1-F2-G1 Lack of water legislation Pressure of the Court of Auditors to balance budget	T1-F2-Toward G3 Launching of the national public engagement program
Actual configuration	T1- F1- G1	T1- F1- G1	T1-F1-**G2/G3** Informal creation of a participative committee	T1-F1-G2/Toward G3 Creation of first water policy
Level of functional consistency	High Consistant with *initial growth phase*	High Consistant with *initial growth phase*	Low Far from any typical phase	Low Far from any typical phase

Unfortunately, tensions between those in favour and those opposed to independence recently have escalated, compromising the progress of the national public engagement program leading towards the first national water policy. The whole process is on stand-by.

5 Discussion

In this paper, we have presented the expected trajectory of water services, and explored various cases, some of which follow this trajectory, and some of which do not. Analyzing these different cases together provides meaningful insight.

It is not surprising that the French case fully follows the standard trajectory described in Table 2, as many references used to propose the standard configurations are rooted in the widespread "French water model". The case of Uganda, where the same trends are broadly being followed, confirms that the same trajectory can be found in very different contexts.

However, the Ugandan case – rapidly moving from phase T2 to T3 and then coming back to T2 – also highlights that trajectories are not always regular or linear. They can be highly dependent on the dominating paradigm of the time (in that case, New Public Management rather than the Welfare State). A stage can be almost skipped, and it is possible to take steps backwards. The implementation of such so-called universal principles is, therefore, selective. The NPM might be applied with zeal, but on other dimensions, governments prove once again that they only adopt what serves their political interests. A narrow-minded application of the NPM indicators also can have adverse effects and exacerbate inequalities, as it excludes populations who cannot pay and neglects sanitation and regulation.

In addition, we have highlighted three cases (in Section 0) that call into question the founding principles of the purely evolutionist model when confronted with different cultural values that are specific to various societies. Even in France, which is supposed to be the canonical case illustrating the succession of configurations complying with international recommendations, we found that institutional and cultural factors play an important role. In New Caledonia, tribes refuse to have water pipelines on some of their territories, and would rather favour individual access to water resources than a connection to the collective network. Thus the social pressure has been suffisant to induce a change (toward *G3*) in a configuration that seemed to be stable from a purely functionalist view (*T1-F1-G1*). In this case, which involves an overseas French territory, the dynamic was completely different from that observed in mainland France, with the governance dimension appearing as the most decisive. The governance dimension has unexpectedly been progressing faster than the other dimensions.

We also witnessed a conflict of values in Cochabamba, Bolivia. There, the imposition of a single network was not socially accepted. Many users considered that it would involve a distant management that would be little responsive to their needs and lack transparency. As a result, they are fighting to keep their alternative, small-scale networks, over which they exercise greater control. This confirms the relevance of considering *collective decentralised micro-networks* (T5) as an emerging category. Thus the phase of *integrated management of water resources and urban water services* (T4) is not necessarily the ultimate target.

In South Africa, we highlighted a financial problem that is not incompatible with what the evolutionist model predicts, but we also emphasized how the Black poor population refuse to pay for water service delivery. In their view, the State should provide access to water for free. In a post-Apartheid context, what is at stake here is a sense of citizenship, of really belonging to the new South African democratic society. Such conflicts of values often reveal a specific relation to the State. This result is in line with some neo-institutionalist works (Thornton and Ocasio 2008). Institutions are not monolithic. They can hold different logics, which can lead to conflicts of values (in this case, between the market vision of water and the welfare state vision of the right to water). These institutional tensions are leading to non-linear evolution, and even to downgrading on certain dimensions.

In New Caledonia, the customary authorities also convey different representations of water, seeking first the preservation of resources, and access to a “water who lives” rather than a treated one (Peytavi, Bouard et al. 2023).

The hygienist trend has historically promoted the centralized network model to ensure water access for all. Yet on the ground, we are far from witnessing a widespread rollout of the centralized network. In that respect, a conversation about the desirability of such a centralized model is now gaining more and more traction globally. A growing number of works question the model of water supply systems based on a centralized network of pipes, and call to adopt a new model of water services delivery. According to Jaglin (2005)), cities of the South are cities of unfinished networks. Authors such as Lorrain and Poupeau (2016) and Misra and Kingdom expect water supply to occur through a hybridization of centralized and decentralized water services, comprising a diversity of technologies and organisations in charge, requiring new governance schemes (Bakker, Kooi et al. 2008).

Some stakeholders also consider that technological solutions pushed in the name of hygienism went too far. They argue that if the pollution of water resources had been under control in the first place, sophisticated water treatment could have been avoided.

To sum up, recognizing both functionalist influence and human agency, we have built a hybrid and more comprehensive framework that we view as a heuristic tool to help us analyze the progress of water services on the ground. Through our selected case studies, we also have questioned so-called universal principles. The case studies show that these principles are based more on the role of norm prescribers from the international donor community than on an absolute rationality. It is indeed the international organizations that disseminate these standards from above. Such international norms are appropriated differently and strongly hybridized along the way depending on the domestic context in which they are applied. Yet, we did not want to over-emphasize the single-handed role of actors at the origin of a pressure for change either. Instead, we strived to offer a more balanced analytical framework making space for an explanation in terms of functional pressure combined with normative pressure and actors' strategy as a source of change.

6 Conclusion

This article focuses on the determinants of the trajectories of water services around the world. We began by bringing to light the generally implicit, and seemingly universal, evolutionist model of water service reform promoted by international best practices. This evolutionist model is conveyed by the dominant discourse in the urban water services' sector. It suggests that the evolution of services should follow orderly and coherent stages, and thus will, probably, move towards an increasingly developed and satisfactory organization. Such implicit models do not exist in all areas of development aid. In the field of sanitation, for example, we do not find the same global consensus around universal norms. As a result, we observe a greater diversity of trajectories across countries.

Building on the approach developed by Guérin-Schneider et al. (2016), our first contribution is to explicitly present this evolutionist model of the urban water supply sector. We empirically identify the dimensions on which there appears to be a consensus concerning the trajectory to be sought, namely the technical, financial and governance dimensions. We also describe the various typical phases for each of these dimensions (see Table 1). The combination of typical phases in a functionalist perspective produces standard configurations of water utilities. Table 2 shows these successive configurations that provide an evolutionist model of water management change.

Our second contribution is to complement this purely functionalist model by a more political perspective, considering institutions and actors' strategies as other levers of change (see Figure 1).

By applying this framework to five different cases from around the world (mainland France, Uganda, Cocha Bamba in Brazil, South Africa and New Caledonia in overseas France), several results emerge.

First, we confirm that the typical phases proposed to analyze trajectories according to three dimensions is applicable and relevant in a large variety of contexts and countries. It offers a suitable means of describing the water utilities trajectories in a systemic and structured way and for carrying out comparative studies around the world.

Second, we highlight that, to some extent, the evolutionist model has been performative. It *does* shed light on actual water services' trajectories. In particular, we used mainland France and Uganda as cases in point to demonstrate the applicability of the model. However, the in-depth analysis of case studies and socio-technical perspectives presented in this paper made clear that such an evolutionist model is neither as universal nor as deterministic as it professes to be.

The case studies also show that deviations from the model have occurred in different ways. Each of the three dimensions can evolve in different directions (sometimes going backwards) and independently,

even if they are often linked. In particular, the governance dimension can also be the driving force behind transitions, ahead of the technical dimension, even in absence of functional pressure (i.e. misalignment with a standard configuration). This result enriches previous works using a socio-technical regimes approach. Most empirical papers refering to that approach emphasize technological innovation as a main driver to change.

From an operational point of view, our results suggest that prescribers in the urban water sector should consider broadening the spectrum of possibilities. In particular, the relevance of the total cost recovery principle or of sophisticated treatment as being the dominant solution should be discussed. Our findings also encourage further exploration of how the governance dimension could be more strongly mobilized as a driver for change.

Our framework could complement those developed by researchers examining transitions with a socio-technical regime approach (Markard, Raven et al. 2012; Fuenfschilling and Truffer 2014; van Welie, Cherunya et al. 2018; Heiberg, Truffer et al. 2022). By highlighting the role of coalitions and windows of opportunity to bring change, the framework may help shed light on the conditions for transformations within a regime or from one regime to another.

Finally, future research may consider the importance of the cultural and economic context to explain divergent trajectories, as suggested by the comparaison between mainland and overseas France. Our analytical framework could also be improved by empirically identifying new typical stages that are still emerging or are little described in the literature (for example, for the technical dimension, a stage based on water circularity technologies could be proposed), or additional dimensions (for example, the scale of integration or the centralization level of the service). It would also be interesting to generalize the approach by identifying typical phases along the three dimensions (technical, financial and governance) for other kinds of public utilities in a similar manner.

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