

# The making of Bottom-up Innovations in Urban Water Services in Precarious Neighborhoods of Ouagadougou

## Case Studies in Goundrin and Boassa

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### Abstract

Research into the supply of drinking water in urban areas in the Global South has focused on inequalities of access in precarious neighborhoods. The explanatory factors put forward refer to the technical deficiencies of the centralized water network (leakage rate, continuity of service, lack of financial and human resources to maintain infrastructures, etc.) as well as to what is considered to be poor governance. Faced with the limitations of the conventional model, local innovations, initiated by various types of stakeholders (individuals, groups), have emerged outside of the centralized network, hence the term “off-grid”. Long regarded as transitory, do-it-yourself solutions, they are now attracting particular attention and questioning the relevance of the single centralized network model that has been promoted internationally. To what extent can we speak of innovations? While the emphasis is once again put on technical aspects (mini-networks, adaptability of infrastructures to the structure of precarious neighborhoods, etc.) and decentralized modes of governance (proximity, delegation to local operators or associations, pricing adapted to the context, etc.), there are few works that question local dynamics, particularly bottom-up innovations, beyond these technical and regulatory dimensions.

In order to present these dynamics of change from a different angle, we have analyzed innovative experiences in the precarious neighborhoods of Goundrin and Boassa in Ouagadougou (Burkina Faso), based on qualitative surveys and case studies. First and foremost, our article identifies the plurality of meanings conferred to the term “innovation” as applied to the drinking water sector, thus highlighting the complexity of the processes involved, and this beyond the technical and governance dimensions. In addition, we discuss the endogenous dimension of these bottom-up innovations, questioning their interactions with donor-funded projects from above concerning access to water in precarious neighborhoods in African cities. Then, we analyze two case studies, the Goundrin and Boassa neighborhoods, to explain the conditions of emergence of these innovations carried out by “contextual experts” from these neighborhoods and motivated by logics of commitment. These are Y.O., an individual informal operator, and the Yaam Solidarité association, which are helping to improve access to water services by setting up residents’ collectives, mini-water networks, day-to-day do-it-yourself projects and different operating methods. While the commitment of these stakeholders is initially based on a logic of action on a local scale, the spread of these innovations generates

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unforeseen events that can result in a shift from a logic of cooperation and solidarity to one of competition and profitability. Would institutionalization be a guarantee of the preservation of collective action logics with the aim of achieving social and territorial justice? This article makes an original contribution to the literature on the “off-grid”, which has developed strongly in water services studies in recent years.

## Keywords

Bottom-up innovation, contextual expert, urban water services, decentralized systems – off-grid, Ouagadougou

## Introduction

Water is an essential element for all living organisms and for the survival of ecosystems, of which humans are an integral part. It conditions socio-economic and territorial development, and plays a part in the urban fabric (Rosillon, 2016). In Sub-Saharan Africa, 400 million people still have no access to water services, and most live in peri-urban areas with no legal status (UN-Water, 2022). For decades, African cities have been facing numerous challenges linked to difficulties of supply and access to drinking water due to strong urban growth. This growth is accompanied by a rise in the precariousness of populations and urban sprawl, making it difficult to extend networks. In addition, water resources are dwindling as a result of the climate crisis affecting the Sudano-Sahelian countries.

Ouagadougou is no exception to this reality. According to the RGPH (2019), the capital's population is 2,415,226, 40% of whom reside in unallocated areas<sup>1</sup>, occupying 27% of urban space. Given this situation, how can we ensure access to water via the conventional centralized model for households in precarious neighborhoods? This question is widely discussed in the literature, with the emphasis on service dysfunctions (Baron & Bonnassieux, 2021; Jaglin, 2012; Kouiyé, 2020). The explanatory factors put forward refer to the technical deficiencies of the network (leaks, continuity of service, lack of financial and human resources to maintain infrastructures, etc.) as well as to governance considered deficient, and more rarely to ecological factors. Faced with these limitations, which have an impact on precarious households, initiatives have been developed, on the bangs of the centralized network, hence the term “off-grid” (Misra & Kingdom, 2019), to ensure access to water in neighborhoods neglected by public policies. Long considered to be transitional, do-it-yourself solutions, these initiatives are now attracting particular attention and questioning the relevance of the single, centralized network model conveyed on an international scale. To what extent can we speak of innovations, and how can we qualify them? While the emphasis is once again on technical aspects (mini-networks, adaptability of infrastructures to the structure of precarious neighborhoods, etc.) and decentralized modes of governance (proximity, delegation to local private operators, adapted collection, etc.), few studies examine these local dynamics from the point of view of “bottom-up innovations”. The term “bottom-up” is used to distinguish these from the “top-down” innovations designed and disseminated by international institutions as part of the institutional reforms they have supported (Lavigne Delville & Schlimmer, 2020). In order to approach these dynamics from an original angle, we have analyzed innovative grassroots experiences, local micro-dynamics (Ndongo & Klein, 2020), on the scale of the precarious neighborhoods of Goundrin and Boassa in Ouagadougou, based on qualitative surveys. Indeed, alongside the conventional, centralized water system, there are endogenous initiatives ensuring the supply of water. These initiatives, some of which are bottom-up innovations, reflect the existence of endogenous knowledge of the “world below” (Ela, 1998, p. 24), adopted and implemented by stakeholders who are relying daily on their “own strengths” (Olivier de Sardan, 2022) “to experiment, to hack, to tinker, to make and to innovate” (Dauphin, 2012; Ambrosino et al., 2018). These “contextual experts” (Olivier de Sardan, 2022) can be small private entrepreneurs or players from the associative world, formal or informal, who adapt to the “real world” lifestyles of precarious neighborhoods.

1 In Burkina Faso, institutional players and city dwellers use the term «unallocated» to describe neighborhoods whose inhabitants have no official land title, resulting in a lack of access to public services.

The article first explores the multiple meanings given to the term “innovation” as applied to the drinking water sector, in order to highlight the complexity of the processes involved, beyond the technical and governance dimensions. This is followed by a description of the rationale behind the two undeveloped districts selected (Goundrin & Boassa) and the methodology used to collect and analyze field data. These bottom-up innovations, identified in these neighborhoods, are discussed from the following angles: their endogenous dimension in territories characterized by project logics; the conditions of their emergence through the role of “contextual experts”; understanding the making of these innovations, inscribed in collective dynamics; and their dissemination beyond the territories of origin and the consequences of scaling up in terms of sustainability.

## Debating the Concept of Innovation

Innovation is a “catchword” with a variety of meanings, depending on the disciplines and approaches that refer to it. In economics, innovation is sometimes seen as “a sustainable improvement in the overall economic efficiency of society” (Noailles, 2011, p. 3), made possible by the introduction of “novelty” into the economic system (Badillo, 2013; Ben Yakoub & Achelhi, 2021). A systemic approach enriches this vision by distinguishing several types of innovation with reference to Schumpeter’s (1999) theory of innovation. The latter identified process, product and organizational innovations, linked to the discovery of new sources of raw materials, and the opening up of new markets, each with a different impact on growth. His contribution also lies in the link he establishes between innovation and the figure of the entrepreneur as a source of change.

Understood in its technological dimension, innovation has long been seen as a linear process, associated with the idea of progress. This view restricts its scope, as “innovation cannot be represented, symbolized or summarized by a simple mechanical and linear process, even when extended to the notion of a system” (Noailles, 2011, p. 4).

In order to move beyond this technical, linear and evolutionary vision of innovation, and away from the idea of progress, some authors have highlighted its social dimension (Noailles, 2011). Several conceptions of social innovation can be identified in the literature. For some, the emphasis is on innovation, with the objective of promoting the well-being of individuals and communities (Cloutier, 2003). For others, it’s a question of analyzing the function of the social enterprise as a support for this innovation (Richez-Battesti et al., 2012). Finally, some works analyze the implementation process instead, showing under what conditions innovations can be socially effective and become “sources of social transformations that can foster the emergence of a new development model” (Cloutier, 2003, p. 4). The improvement of individuals’ quality of life and territorial development are discussed (Bouazza & Nafil, 2019).

While these two dimensions of innovation - technical and social - may appear to be opposed, they are nonetheless complementary. For example, the socio-technical approach seeks to overcome any opposition between the technical and the social. In this approach, innovation refers to the “art of interest” and is based on the construction of networks of alliances (Akrich et al., 1988). To interest stakeholders, the innovator must weave agreements based on negotiations and socio-technical compromises (Akrich et al., 1988). The success of the innovation depends on the process of interest and the compromises worked out, which is decisive for the level of adoption and diffusion of the innovation. The socio-anthropological approach also leads us to consider this link between technical and social aspects. Innovation is defined as “any grafting of new techniques, knowledge or modes of organization onto existing techniques, knowledge and modes of organization” (Olivier de Sardan, 1995, p. 78). It is seen as a local adaptation, based on borrowing and importing. This grafting process involves several dimensions - technical, normative, organizational, relational and decision-making - combined within “local social systems” in which innovation takes root and spreads via “social carriers” (Olivier de Sardan, 2022). This definition therefore goes beyond the socio-technical aspect, as it integrates knowledge and learning, which are necessary factors in the organization and implementation of an innovation. What’s more, moving from one stage to the next during the adoption process calls on the know-how of the innovator, described as a contextual expert

(Olivier de Sardan, 2022), a terminology we'll be using throughout the article. Olivier de Sardan distinguishes two types of "contextual expert". Direct contextual experts are operational people who work with users, within government departments or in projects run by aid agencies. On the other hand, indirect contextual experts, like researchers, decipher and analyze local contexts. According to Olivier de Sardan, contextual expertise must have three properties: "familiarity, critical capacity and engagement" (2022, p. 7). In this article, we refer to the "direct contextual expert" who, on the basis of Olivier de Sardan's threefold approach, is familiar with his or her environment and innovates on the basis of his or her knowledge of practical norms (Olivier de Sardan, 2022). Their ability to implement innovations can contribute, in practice, to improving access to urban water services in precarious neighborhoods.

Insofar as water-related problems often refer to the technical dimension of the service or exploitation of the resource, researchers often refer to the literature on innovation in its technical-economic dimension. It appears as the solution that would enable the resolution of water-related problems (Wehn & Montalvo, 2018; Kydyrbekova et al., 2022). This is why it is defined by Mvulirwenande and Wehn (2020, p. 1) as "any innovative and practical solution of products, processes or services, likely to contribute to improving the performance of the water sector by increasing the efficiency and effectiveness of the water value chain". However, this definition gives over-determining weight to technical and economic factors, whereas, particularly in the water sector, innovation dynamics are based on a multiplicity of factors: organizational, economic, social and institutional, as well as endogenous knowledge and informal rules (Ahmed et al., 2023). The institutional factor is particularly significant. For example, based on case studies in Ghana, Kenya and Mozambique, Mvulirwenande & Wehn (2020) show that public policies, through formal regulations, certainly govern innovation at national level, but that it is above all the interactions between formal and informal players, particularly at local level, that contribute directly to the emergence of innovation processes. Under certain conditions, these innovations can generate institutional reforms in the water sector.

## Methodology and Rationale for Fieldwork

We favor a socio-anthropological approach (Olivier de Sardan, 1995, 2008) to identify and analyze the contextual specificities and discourses of the stakeholders and recipients of downstream innovations in water services. We use the methodological tools of field research to understand the context in which downstream innovations emerge, are adopted, disseminated and scaled up. We have chosen a qualitative approach to identify, observe and question these innovations (Beaud & Weber, 2010). This is not, therefore, an impact study, and we did not carry out a quantitative study, which would require the respondents to be representative.

We use a comparative method (Olivier de Sardan, 1995) to identify the invariants and specificities of bottom-up innovations, through two in-depth case studies in two unallocated districts of Ouagadougou<sup>2</sup>. This terminology of "unallotted" (Baron & Bonnassieux, 2021 ; Guigma, 2017 ; Robineau, 2014) is used in Burkina Faso by institutional stakeholders and Burkinabes to designate "informal" neighborhoods, with no legal recognition of occupation, where the public operator - the Office national de l'eau et de l'assainissement (ONEA) - does not directly provide water service. These neighborhoods are therefore particularly interesting areas in which to study the innovations implemented by different types of stakeholders (public, private or associative) to overcome the lack of access to water.

We surveyed the neighborhoods of Goundrin and Boassa<sup>3</sup> in order to report on bottom-up innovations carried out by contextual experts with varied profiles, since they are small private operators, formal and informal, or associations, inserted in these territories. The choice of neighborhoods stems from their singularity, which emerges when we consider the "context of real life" (Yin, 2018), taking into account their geographical location, their history, their place in local power plays and the modalities

<sup>2</sup> Since the new 2012 division, Ouagadougou comprises 12 districts, 55 sectors and 7 rural communes (INSD, 2022).

<sup>3</sup> Each district of Ouagadougou is subdivided into sectors. Boassa corresponds to sector 32 of district 7, while Goundrin is located in sector 43 of district 10, straddling the undeveloped precarious neighborhoods of Nioko II (sector 41) and Tabtenga (sector 45).

of access to water, beyond a homogeneous vision of the unallocated. These in-between spaces, between rural and urban (Robineau, 2014), have different morphological structures and occupancy statuses. In Goundrin, an unallocated district, occupied plots were counted but not allocated (Broyer, 2009), due to the halting of allotment operations in 2011 following the denunciation of large-scale speculation (Sory, 2019). Boassa used to be a village attached to the commune of Boulmiougou, but following the subdivision of Sandogo, a district of this commune in 2009, those who didn't have plots moved to Boassa. Since the new division of Ouagadougou in 2012, Boassa has become an unparcelled district attached to arrondissement 7 of Ouagadougou. The specificity of the Boassa non loti lies in its socio-spatial structuring, which is better organized than other unallocated places. What's more, these two districts have not benefited from decentralized mini-water networks with management delegated<sup>4</sup> to small private operators, as has been the case for some unallocated districts (Baron & Bonnassieux, 2021; Baron et al., 2016, 2022).

In-depth interviews were conducted in January and February 2023, following repeated exploratory visits in 2022. A total of 19 interviews were conducted with 6 informal operators, 2 delegates, one association (Yaam<sup>5</sup> Solidarité), and 10 households. In the case of interviews with contextual experts (Yaam Solidarité and Y.O., an informal operator), we favored face-to-face interactions, in the form of long interviews (two hours) with repeated passages over the period. Empirical data were generated using a semi-directive interview guide. Each discourse collected constitutes a singular point of view on our object of study. The relevance of this technique lies in understanding the meaning stakeholders give to their practices. While favoring a socio-anthropological type of inquiry, we also used the technique of direct observation, based on an observation guide. This enabled us to perceive the interactions between the stakeholders involved in the making of bottom-up innovations in Goundrin and Boassa. Given the small number of people surveyed, we did not carry out an analysis of socio-economic profiles, which would not be representative.

## Bottom-up Innovations: Endogenous Dynamics or Dependence on Policies from Above?

Bottom-up innovations are often considered to be endogenous initiatives. But what about those identified in Goundrin and Boassa?

Since the recognition of precarious neighborhoods as places of sustainable settlement in the South (Deboulet, 2016), several policies have been put on the agenda by international and national institutions to facilitate access to water for the populations of these neighborhoods. The Fifth World Urban Forum, organized by the United Nations Human Settlements Programme in April 2010 in Rio (Deboulet, 2016), contributed to the recognition of a “right to the city”, the right to water having been recognized as a fundamental right by the UN that same year. Projects linked to these issues were then financed by donors, notably in Burkina Faso.

As part of the Participatory Slum Upgrading Program (PPAB<sup>6</sup>) adopted by UN-Habitat in 2000, urban projects were funded to “improve the lives of at least 100 million slum dwellers by 2020” (Guigma, 2017, p. 9). The Ouagadougou neighborhoods of Bissighin and Watinoma Noghin were chosen in 2011 to implement this program, with a particular focus on access to drinking water and housing.

Another project financed by the Agence française de développement (AFD) is the Projet d'aménagement et de désenclavement des quartiers périurbains de Ouagadougou (PAQP, 2007-2011). The aim was to improve housing and access to basic services, facilities and public spaces in precarious neighborhoods (AFD, 2014). One component aimed to ensure access to drinking water for the populations of Ouagadougou's peri-urban neighborhoods through the installation of

4 Burkina Faso has not opted for a public-private partnership, and the drinking water service is managed by a public operator, ONEA. However, in some unallocated areas, a delegation contract has been signed between ONEA and delegates selected following a call for proposals (Hydroconseil, 2011).

5 In the Mōaga language, Yaam means the transmission of knowledge. In other words, “Yaam Solidarité” refers to the transmission of knowledge in solidarity in Mooré. The acronym stands for “Young African Architecture for Metropolitan” (YAAM).

6 The PPAB covers 55 cities in 34 countries in Africa, the Caribbean and the Pacific.

decentralized mini-water networks, with standpipes and private connections for households able to finance them. In 2009, the Nioko II and Tabtenga districts benefited from this scheme. These networks are managed by small private operators, under ONEA supervision. SOZHAKOF<sup>7</sup> operates in Nioko II and BERA<sup>8</sup>, an engineering firm, in Tabtenga. However, this model of delegated management to small private operators has shown its limits (Baron et al., 2016). The delegates are faced with numerous problems, both technical (difficulties in coping with increasing demand, extending the network) and commercial (timely collection of invoices). Nevertheless, this scheme represents a first step in the recognition of initiatives that question the universalization of the centralized network model (Jaglin, 2012; Hardy & Poupeau, 2014).

In neighborhoods that have not benefited from these government and donor projects<sup>9</sup>, such as Goundrin and Boassa, grassroots innovations have emerged endogenously. They are part of urban development trajectories, in response to inequalities in access to public water services throughout the city of Ouagadougou.

## Conditions for the Emergence of Bottom-up Innovations: The Role of “Contextual Experts”

Field data show that bottom-up innovations in the water sector are embedded in specific contexts and territories, and are initiated by stakeholders who are “contextual experts” involved in collective logics or intervening on an individual basis.

In the case of Goundrin, this was an individual initiative by an informal water operator (Y.O.). An office worker at the Ministry of the Environment, Water and Sanitation, Y.O. has lived in the Goundrin district since 2010. His commitment to finding a solution to the lack of water in his neighborhood was triggered by a particular event: when a pregnant woman fell while returning from fetching water:

What really motivated me to fight for water to be able to get to the non-loti here was a real struggle. I was sitting outside my door one day, it was in the evening around 6 p.m., when I came back from work, I wanted to go to Loumbila to my wife's house and at the same time, I saw a pregnant lady pushing a barrel of water. It was the rainy season and there was mud everywhere. The barrel got stuck and fell over. She fell with the barrel of water, even though she was pregnant. I followed the whole scene, went to help her up, picked up the barrel of water and pushed it back to her house. She told me she'd spent the whole day at the hydrant before she got any water, because the water would come and go, it would come and go. I tell you, I cried myself to sleep that day. My witnesses are still there. Since that day, I've decided to fight with the means at my disposal to bring water to my neighborhood. (Y.O., informal water operator in Goundrin, interview in January 2023).

Motivated by a logic of mutual aid and solidarity, Y.O. decided to take measures to solve the neighborhood's problems of access to drinkable water. First of all, he decided to legitimize his action by creating an association, the Association Jeunesse et Développement (AJD), in order to publicize his action on a neighborhood scale. He then became involved in politics to defend the right to water for the Goundrin population at the institutional level, and then more widely for the unallocated neighborhoods. His commitment was both political and financial, as he took out a loan to build water points for households in the neighborhood. He built a human-powered pump, followed by stand-alone water stations with individual connections (pictures 1 and 2). In this particular case, this informal private operator seized opportunities to build water infrastructures on his own initiative, for the “common good”, in response to local emergencies. Although water is not free, Y.O. does not focus on profitability. Innovation takes hold when the environment is favorable (Achrich et al., 1988).

7 Société Zoungrana Hamado Koudougou et Frères

8 Bureau d'études et de recherches appliquées

9 Even though they benefited from the construction of a few standpipes by ONEA.



Picture 1: Autonomous water station in Goundrin



Picture 2: Location of a tap at a private home in Goundrin

The case of Boassa is somewhat different, since Yaam Solidarité<sup>10</sup> association has been active in the neighborhood since 2016. It is involved in supporting self-building by valorizing local materials, in a participatory approach. Funding from the Fondation Abbé-Pierre and the AFD for the “Habiter et mieux vivre dans les non lotis” project<sup>11</sup> (2020-2022) has raised its profile as a local contextual expert. However, at the start of the project, the local population did not want to benefit from these actions as they were waiting for a future housing development. Faced with this situation, the association decided to carry out a survey to identify the needs of the inhabitants, who mentioned water problems as a priority. Yaam Solidarité then decided to respond to these needs by financing, thanks to the project, an autonomous water station in Boassa.

<sup>10</sup> Yaam Solidarité was created following the 2009 floods in Burkina Faso. It is active in several towns in the country, notably Dori and Fada, and in Ouagadougou’s « unallocated » areas to improve living conditions and housing. It employs 11 people.

<sup>11</sup> This project on the social production of housing includes a «multi-country» component (Tiemtoré, 2023), which has led to collaboration with the Research Group for the Achievement of Rural Development in Guinea-Bissau and the NGO UrbaSen in Senegal.

In short, Boassa and Goundrin share common concerns as neighborhoods “not connected” to the conventional network, while water needs are growing. In one case, however, the innovation is the result of an individual initiative linked to a specific event; in the other, it is the result of an association’s initiative to identify local needs. Whether it’s an individual actor (Y.O.) or an association (Yaam Solidarité), the use of the term “contextual expert” is justified by their territorial roots and the skills they have acquired in the course of their involvement in the right to water.

Moreover, in both cases, political decisions favored the adoption of these bottom-up innovations. While the project to delegate water service to small private operators in the non-parcelled-off areas was due to be scaled up, given the size of the non-parcelled-off area in Ouagadougou, the project came to a halt in 2019 due to lack of funding. In addition, the cessation of allotments in 2011 (Sory, 2019) had an impact on the installation of water networks in these neighborhoods. Finally, precarious neighborhoods that have not benefited from the delegation of public water services remain in this in-between situation, benefiting from both one-off actions within the framework of internationalized public policies (Lavigne Delville & Schlimmer, 2020) and bottom-up innovations, often of an informal nature, each trying to set up a particular communication with meaningful messages (O’Callaghan, 2020).

## The Making of Bottom-up Innovations in Water Utilities: What are the Logics of Collective Action?

In organizational terms, the implementation of an innovation is part of a collective dynamic, even if the original impetus is individual. It follows a non-linear process, punctuated by shocks and unforeseen events (Greenhalgh et al., 2004). In Goundrin, Y.O., in his efforts to set up a water infrastructure, first created an association, Jeunesse et Développement (AJD):

I had the idea of creating an association called Jeunesse et Développement (Youth and Development), so in the statutes and internal regulations, we included access to drinking water and sanitation, and even cleaned up districts, high schools, the reception area and the town hall. In its time, we cleaned up quite a few structures for which I was president, because that was just the beginning. On my own, I couldn’t set up an association that would enable people in the neighborhood to get together to fight for the cause of water, so I started by creating an association. From the association, I got help. First of all, we received food supplies, it was with the Larlé Naaba<sup>12</sup> that we received food supplies, bags of rice, bags of corn too. After that, people started to trust me to accompany me in my endeavors. I asked for support from the town hall, but the mayor refused, asking me if I had space to build a hydrant. I was prepared to give up part of my residential yard, but negotiations were unsuccessful. The association was born just to quench people’s thirst. I was also a member of the self-defense group for neighborhood security, when insecurity was on the rise here, before entering politics to become a councillor. (Y.O., informal operator in Goundrin, interview conducted in January 2023).

The association’s aim is to defend the right of access to water and sanitation for the inhabitants of Goundrin. The actions undertaken have enabled this “contextual expert” to make a public name for himself through citizen actions, and to establish a network of allies (Akrich et al., 1988). In such a situation, contextual innovator-experts forge relationships with other stakeholders in order to obtain and maintain a climate of cooperation, drawing on available material and human resources.

Another strategy adopted by Y.O. was to enter politics; he succeeded in convincing the Minister of Water and Sanitation of the water problems in Goundrin. At the end of the political transition in 2015<sup>13</sup>, Y.O. seized the opportunity to take part in the political campaign to defend access to water for Ouagadougou’s poor. This is how Y.O., an informal private operator, managed to position himself as a municipal councilor in Goundrin. After the elections, Y.O. took out a first loan (three years), as a

<sup>12</sup> Customary authority among the Mossi

<sup>13</sup> The political transition of 2015 followed the departure of ex-president Blaise Compaoré.

civil servant, to build a human-powered pump (PMH) in front of his home and enable the population to obtain water free of charge. He then obtained a second five-year loan to transform the PMH into an autonomous water station (PEA), so as to be able to make individual household connections.

Initially, approaches to the mayor of District 10 to obtain approval for the installation of these infrastructures were unsuccessful. The city authorities were of the opinion that the peri-urban neighborhoods would soon be subdivided, so there was no need to install “informal” water points there. However, the Minister ordered ONEA’s General Manager to send a team to Y.O.’s home to carry out pumping tests. Following the tests, Y.O. carried out his project, without external funding, and proposed home connections from the PEA. So, in this case, involvement in politics appears to be a necessary condition and a channel that the contextual expert uses to convince the relevant public authorities. Through this channel, Y.O. bypasses institutional constraints (at town hall level) to bring his project to fruition. Here, innovation is a political and strategic issue (Baregheh et al., 2009).

In Boassa, the steps taken by the Yaam Solidarité association to set up an autonomous water station are quite different. The association drew up a project to obtain funding from donors (Fondation Abbé-Pierre and AFD), and identified water as a major issue following a survey to assess the needs of the population. The Fondation Abbé-Pierre carried out a mission to Ouagadougou to diagnose the situation and identify potential beneficiaries, before financing the construction of a borehole equipped with a PMH. In view of the growing demand for drinking water, Yaam Solidarité then decided to replace the PMH with a PEA to increase water production capacity. The infrastructure is managed by a local management committee. A local savings system has been set up for the upkeep and maintenance of the autonomous water station, to avoid having to turn to technical and financial partners in the event of a breakdown.

In both neighborhoods, the implementation of bottom-up innovations has required the help of other people, facilitators, to bring the projects to fruition. Although Y.O. uses its own resources to carry out its project, it relies on political players at national level. Yaam Solidarité, for its part, relies on an external network to finance its water station. Consequently, the implementation of innovation follows an uncertain and complex process, comprising interdependent activities. This process generally requires the involvement of several people, with different interests and strategies (Boer & Pendant, 2001).

In the case of both Goundrin and Boassa, bottom-up mobilization is a necessary basis for implementing the innovation; in reality, the contextual expert is the “chief operator” of the innovation, being the only one to determine the technical standard, choose the business model, find financing and market by setting the price (Noailles, 2011). Goundrin and Boassa appear as innovative environments for urban water services, from which innovators, who have become contextual experts, drive local initiatives. These bottom-up innovations “can compete with conventional public service providers and have the potential to spread” (Mvulirwenande & Wehn, 2020, p. 4).

## From Dissemination to Scaling-up: Between Sustainability and Disappearance

Are these grassroots innovations destined to survive as they are recognized by public water policies targeting precarious neighborhoods and based on principles of justice, or are they doomed to disappear? Does the spread of these bottom-up innovations encourage the development of an alternative model to the centralized network?

Our surveys show that Y.O.’s ideas have spread beyond the Goundrin district.

I’m J.S., the manager of the Faso Nooma borehole, and the promoter’s name is D.O. At first, our company only produced mineral water in bags costing 25 CFA francs. Three years ago, my boss and I learned that it would be possible to use our borehole to make house connections. After a lot of digging, we were able to meet with the former district councillor to find out how to make house connections. With him, we had the experience and to be able to make the connections, we submitted a file to the District 10 mayor’s office

to get authorization. Then we went to the Ministry of the Environment so that government officials could come and inspect the site and carry out an environmental impact study. That's how we managed to get the connections into the homes, and today we have 420 subscribers. There are other traders in the non-parcelled-off areas of Saaba, who have also come to learn from our experience. It's not just Saaba, but also Nioko 2 and even others in the Tougouri commune. At the beginning, we started with 40,000 CFA francs as connection fees, but now with the high cost of the equipment, we're up to 75,000 CFA francs. (J.S., resident of Goundrin, manager of the Faso Nooma borehole, interview conducted in February 2023).

This model of profit-sharing (Akrich et al., 1988) clearly shows that innovation circulates beyond Goundrin. The sharing of knowledge and experience encourages the emergence of other water production chains to meet growing demand. During the course of our data collection, we counted six informal private operators, all commercial agents (two with independent water stations and four making house connections). These local initiatives are spreading on a large scale, and are based on a commercial logic (Mvulirwenande & Wehn, 2020) due to the profitability of water sales. In this entrepreneurial dynamic of “unconventional supply” of water, the solidarity dimension that used to meet people's needs at a lower cost becomes less important.

This informal dissemination process has led to the creation of associative structures to support the contextual experts. The “Association pour la promotion d'eau potable” (Association for the promotion of drinking water), based in Saaba, has set up a watchdog unit to frame and guide the activities of the contextual experts, in order to resolve the difficulties encountered. In the case of Goundrin, the dissemination of the innovation at district level has led to the creation of a system of local cooperation to collectively manage problems and promote local water governance.

However, the spread of innovation has also generated unexpected effects, particularly in the areas covered by the formal water delegates (under contract with ONEA), where informal operators are making clandestine private connections. Among the households interviewed, some justify their two subscriptions, the conventional one and the informal one, to protect themselves from ONEA water cuts. The water production and distribution systems set up by informal private operators are hybrid systems. As a result, there are fewer water cuts, but this contributes to the depletion of the water table. Other households use the water distributed by informal private operators for domestic purposes other than drinking. In addition, these informal players help to improve access to water for people “not connected to the centralized network” and “outside the mini-network”, left to their own devices as public standpipes are inadequate. Their number is not recognized by the public authorities, even though they serve the majority of households in precarious neighborhoods.

In Boassa, bottom-up innovations are part of an exchange and sharing of experience within networks that extend beyond Burkina Faso. Thus, the networking system initiated by Yaam Solidarité is based on multi-country collaborations, notably Senegal, Guinea-Bissau and Mali. For example:

To ensure long-term management, we have set up a management committee made up of members of the Fédération des Habitants du Burkina Faso, similar to the Fédération des Habitants du Sénégal, given that we work together on the same projects in disadvantaged neighborhoods. The federation is made up of 134 women's groups, with 30 people per group. In fact, the federation is a residents' organization, and we receive technical support from UrbaSen in Senegal and the Research and Implementation Group for Rural Development in Canchungo, Guinea-Bissau, who are well ahead of the game when it comes to structuring groups. By sharing experiences, we are able to better organize the federation to manage the water point and habitat rehabilitation activities, following a participatory logic. (O.S., financial manager at Yaam Solidarité, interview conducted in January 2023).

These interventions follow the logic of “traveler models” (Olivier de Sardan & Vari-Lavoisier, 2022), advocated by some international aid stakeholders to make up for the failings of the State and conventional operators.

It therefore appears that the State implicitly supports these bottom-up innovations, by authorizing them, without however recognizing them institutionally, as they are out of step with public policies that consider the non-housed as territories without legal existence. As for informal private operators, the state does not appear to be regulating their practices at present, which can lead to profit-seeking logics that run counter to greater social and territorial justice.

The question remains as to the extent to which the recognition and institutionalization of certain practices, based on a logic of solidarity, will make it possible to ensure equitable access to water services, by framing and limiting the logics of profitability and profit that seem to characterize bottom-up innovations, at odds with the original initiatives.

## Conclusion

This contribution shows that, in the field of water services, bottom-up innovations, as we have defined them on the basis of the literature review and the case studies of Goundrin and Boassa, abound in Ouagadougou's unsheltered, precarious neighborhoods. While in Goundrin, Y.O. is the key figure who, through his resourcefulness and daily handiwork, is the social bearer of bottom-up innovations made in Goundrin, in Boassa, the Yaam Solidarité association has worked to set up a bottom-up innovation, based on a local dynamic of participative management within the framework of a project it initiated. The spread of these initiatives takes different forms as they make their way into other areas, with all the attendant risks, such as the shift from a logic of solidarity to one of profitability, or from principles of cooperation to competition. In some cases, this can lead to conflict between formal and informal players, or between informal players driven by opposing logics. What's more, the sustainability of such activities is largely influenced by the decisions of public authorities. This leads us to question, or at least to reflect on, innovative ways of coordinating different stakeholders (formal and informal; public, private and associative), in order to consider water services, and the water resources on which they depend, as commons. How can we think about the co-production<sup>14</sup> of urban water services, conceived as commons, in these urban contexts rich in bottom-up innovation?

## Bibliography

- Agence française de développement. (2014). *L'AFD et l'intervention en quartiers précaires, retours d'expériences et recommandations stratégiques*, <https://issuu.com/objectif-developpement/docs/afd-quartiers-precaires-vf>
- Ahmed, F., Johnson, D., Hashaikeh, R., & Hilal, N. (2023). Barriers to Innovation in Water Treatment. *Water*, 15(773), 11. <https://doi.org/10.3390/w15040773>
- Akrich, M., Callon, M., & Latour, B. (1988). À quoi tient le succès des innovations, l'art de l'intéressement, gérer et comprendre. *Annales des Mines*, 14-29. <https://halshs.archives-ouvertes.fr/halshs-00081741>
- Ambrosino, J., Masson, D., Abi Akle, A., & Legardeur, J. (2017, 21-25 Aug). *Fostering Collaborative Project Emergence Through Divergence of Opinion* [21st International Conference on Engineering Design, ICED17, The Design Society]. The University of British Columbia. <https://hal.science/hal-01577761>
- Badillo, P.-Y. (2013). Les théories de l'innovation revisitées : une lecture communicationnelle et interdisciplinaire de l'innovation ? Du modèle « Émetteur » au modèle communicationnel. *Les enjeux de l'information et de la communication*, 1(14/1), 19-34. DOI:10.3917/enic.014.0019 ou <https://www.researchgate.net/publication/316857426>
- Baregheh, A., Rowley, J., & Sambrook, S. (2009). Towards a multidisciplinary definition of innovation. *Management Decision*, 47(8), 1323-1339. <https://doi.org/10.1108/00251740910984578>
- Baron, C., & Bonnassieux, A. (2021). Quelles politiques publiques pour les quartiers irréguliers des villes africaines ? Entre lotissement et laisser-faire. Le cas de Ouagadougou au Burkina Faso. *Annales de géographie*, 2(738), 22-49. <https://www.cairn.info/revue-annales-de-geographie-2021-2-page-22.htm>
- Baron C., Bonnassieux A., Bontianti A. (2016). Eau des villes, assainissement et précarités : Des réalités contrastées à Ouagadougou, Burkina Faso et Niamey, Niger, Paris, Editions AFD, Notes techniques/Collection recherches, n°19, Sept 2016, 277p. <http://librairie.afd.fr/nt-19-eau-burkina-niger/>

<sup>14</sup> This is currently the subject of a doctoral thesis on the co-production of urban water services in Ouagadougou's precarious neighborhoods.

- Beaud, S., & Weber, F. (2010). *Guide de l'enquête de terrain, produire et analyser des données ethnographiques*. Éd. La Découverte,
- Ben Yakoub, S., & Achelhi, h. (2021). Fondements théoriques et importance de l'innovation : Regards des auteurs au cours des années. *Revue internationale du chercheur*, 2(1), 60-84.
- Boer, H., & Pendant, W.-E. (2001). Innovation, what innovation ? A comparison between product, process and organizational innovation. *Int. J. Technology Management*, 22(1/2/3), 83-107. <http://dx.doi.org/10.1504/IJTM.2001.002956>
- Bouazza, A., & Nafil, Y. (2019). *Rôle de l'innovation sociale dans le développement socioéconomique au Maroc. Premières constatations à partir de la littérature, et étude de cas de 4 associations socialement innovantes*. [7<sup>th</sup> CIRIEC International Research Conference on Social Economy, 6-9 June]. <http://doi.org/10.25518/ciriec.wp201907>
- Boyer, F. (2010). Croissance urbaine, statut migratoire et choix résidentiels des ouagalais : vers une insertion urbaine ségrégée ? *Revue Tiers Monde*, (201), pp. 47-64. <http://hal.ird.fr/ird-00475201>
- Cloutier, J. (2003). Qu'est-ce que l'innovation sociale ? *Cahier du CRISES*. Université de Montréal. <https://www.researchgate.net/publication/272566640>
- Dauphin, S. (2012). Expérimenter, innover : d'où ça vient ? Comment cela fonctionne ? *Informations sociales*, 6(174), 8-11. <https://www.cairn.info/revue-informations-sociales-2012-6-page-8.htm>
- Deboulet, A. (2016). *Repenser les quartiers précaires*. Agence française de développement, 13, 276 p. <http://librairie.afd.fr>
- Ela, J.-M. (1998). *Innovations sociales et renaissance de l'Afrique noire, les défis du monde d'en-bas*. Éd. L'Harmattan.
- Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., Olivia Kyriakidou, O. (2004). Diffusion of Innovations in Service Organizations: Systematic Review and Recommendations. *Milbank Quarterly*, 4(82), 581-629. <https://www.researchgate.net/publication/8133844>
- Guigma, L. (2017). *Vivre dans le non loti de Ouagadougou : processus de marchandage foncier entre citoyens, chefs traditionnels et autorités publiques*. [Thèse de doctorat]. Université Paris 8, Vincennes-Saint-Denis.
- Hardy, S., & Poupeau, F. (2014). L'auto-organisation de la gestion urbaine de l'eau. La fonction des coopératives dans le grand système de La Paz et d'El Alto. *Actes de la recherche en sciences sociales*, 203(3), 86-105. <https://www.cairn.info/revue-actes-de-la-recherche-en-sciences-sociales-2014-3-page-86.htm>
- Hydroconseil. (2011). *Rapport d'évaluation du projet pilote AEP quartiers périphériques de Ouagadougou, rapport final*. <https://www.hydroconseil.com/fr/references-2/24-africa-2/309-burkina-faso-fr>
- Institut national de la statistique et de la démographie (2022, décembre), *Cinquième recensement général de la population. Monographie de la commune de Ouagadougou*. [www.insd.bf](http://www.insd.bf)
- Institut national de la statistique et de la démographie. (2022, décembre). *Résultats du 5<sup>e</sup> recensement général de la population : volume 2. Caractéristiques des ménages et de la population*. [www.insd.bf](http://www.insd.bf)
- Jaglin, S. (2012). Services en réseaux et villes africaines : l'universalité par d'autres voies ? *L'Espace géographique*, tome 41(1), 51-66. <https://shs.hal.science/halshs-03937117>
- Kydyrbekova, A., Meiramkulova, K., Tolysbayev, B., & Kydyrbekova, A. (2022). Investigation of Different Water-Related Innovation Aspects within the Past Three Decades: A Case Study of Kazakhstan and Neighboring Countries. *Economies*, 22. <https://doi.org/10.3390/economies10080190>
- Lavigne Delville, P., & Schlimmer, S. (2020). Saisir l'action publique en Afrique à travers les instruments. *Revue internationale de politique comparée*, 27(2), 9-32. <https://www.cairn.info/revue-internationale-de-politique-comparee-2020-2-page-9.htm>
- Misra, S., & Kingdom, B. (2019). *Citywide Inclusive Water Supply: Adopting Off-Grid Solutions to Achieve the SDGs*. World Bank.
- Mvulirwenande, S., & Wehn, U. (2020). Fostering water innovation in Africa through virtual incubation: Insights from the Dutch VIA Water programme. *Environmental Science and Policy*, 114(2020), 119-127. <https://doi.org/10.1016/j.envsci.2020.07.025>
- Ndongo, M., & Klein, J.-L. (2020). Les innovations sociales en Afrique subsaharienne : la place des communautés et des territoires locaux. *ANSERJ*, 11(2), 56-81. <https://doi.org/10.29173/cjnser.2020v11n2a379>
- Noailles, P., (2011). De l'innovation à l'innovateur. Pour une approche structuraliste de l'innovation. *La Revue des Sciences de Gestion*, 1-2(247-248), 13-28. <https://www.cairn.info/revue-des-sciences-de-gestion-2011-1-page-13.htm>
- O'Callaghan, P. (2020). Dynamics of Water Innovation Insights into the rate of adoption, diffusion and success of emerging water technologies globally. [PhD thesis, Wageningen University], <https://doi.org/10.18174/536755>
- Olivier de Sardan, J.-P. (1995). *Anthropologie et développement. Essai en socio-anthropologie du changement social*. Éd. Karthala.
- Olivier de Sardan, J.-P. (2008). *La rigueur du qualitatif. Les contraintes empiriques de l'interprétation socio-anthropologique*. Bruylant-Academia.
- Olivier de Sardan, J.-P. (2022). « Compter sur ses propres forces ». Face à la dépendance à l'aide, promouvoir les experts contextuels dans les politiques publiques en Afrique. *Global Africa*, 1(1), 96-111. <https://www.researchgate.net/publication/369112527>

- Olivier de Sardan, J.-P., & Vari-Lavoisier, I. (2022). Introduction : pour une approche comparatiste des modèles voyageurs. In *Les modèles voyageurs : une ingénierie sociale du développement* (pp. 7-28), *Revue Internationale des Études en Développement*, 248. <https://doi.org/10.4000/ried.280>
- Rapport Mondial des Nations Unies sur la mise en valeur des ressources en eau. (2022). *EAUX SOUTERRAINES, rendre visible l'invisible*, UNESCO, p. 270.
- Richiez-Battesti, N., Petrella, F., & Vallade, D. (2012). L'innovation sociale, une notion aux usages pluriels : Quels enjeux et défis pour l'analyse ? *Innovations*, 38, 15-36. <https://doi.org/10.3917/inno.038.0015>
- Robineau, O. (2014). Les quartiers non lotis : espaces de l'entre-deux dans la ville burkinabé. *Carnets de Géographes*, rubrique « Carnets de recherche », 7. <https://doi.org/10.4000/cdg.478>
- Rosillon, F. (2016). *L'eau dans les pays en développement, retour d'expériences de gestion intégrée et participative avec les acteurs locaux*. Éd. Johanet.
- Schumpeter, J. A. (1999). *Théorie de l'évolution économique : recherches sur le profit, le crédit, l'intérêt et le cycle de la conjoncture*. Dalloz (œuvre originale publiée en 1911).
- Sory, I. (2019). Les politiques publiques foncières dans l'impasse à Ouagadougou. *Afrique Contemporaine*, 1-2(269-270), 135-154. <https://www.cairn.info/revue-afrique-contemporaine-2019-1-page-135.htm>
- Tiemtoré, S., Dadjouari, L., Keita, P. A., Leporcq, P., Coly, A., Moles, O., Chamodot, M., & Hinschberger, B. (2023). *Habiter et mieux vivre dans les non-lotis ! Fédérer les habitant.es du quartier précaire de Boassa (Burkina Faso, Ouagadougou) pour leur donner accès à un habitat digne*. CRAterre éd.
- Wehn, U., & Montalvo, C. (2018). Exploring the dynamics of water innovation: Foundations for water innovation studies. *Journal of Cleaner Production*, 171, 1-19. <https://doi.org/10.1016/j.jclepro.2017.10.118>
- Yin, R. K. (2018). *Case Study Research and Applications: Design and Methods*. Sixth edition. SAGE. <https://lccn.loc.gov/2017040835>