

Water true-cost to manage social contestability? Users' perceptions about community-managed water standpipes networks in Kinshasa, Democratic Republic of Congo

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ABSTRACT

In suburban areas of African megalopolis, the development and commissioning of water production and distribution infrastructures fail to keep pace with unplanned urbanisation. Therefore, millions of households do not have access to safe tap water. In Democratic Republic of Congo, associations of users of drinking water standpipes networks (ASUREP) have emerged in the peripheral districts of major cities. They share the same operating principles of governance and participatory management organized in a reference model (the ASUREP model). It was designed as an alternative to governmental model to respond proactively to the criticisms that frequently target tap water producers and distributors, therefore reducing their exposition to social contestation. A rigorous evaluation of the impacts generated by the application of the ASUREP model is therefore particularly useful, for the Congolese society but also to shed light on other innovative alternatives. In the framework of this evaluation, we conducted in 2020 a survey of more than 1,000 households in the peri-urban areas of Kinshasa. In this paper we remind the key operating principles that should be applied by the managers of the ASUREP serving these households. We synthesize our observations about the difference between the reference model and its application when it comes to water pricing. We stress that most of the households served by the ASUREP do not master the water true-cost concept and that most of the respondents have a limited understanding of the determinants of the unit price of water. There is a form of contestant vigilance expressed by many households because the price of water is depicted as not transparent and is therefore likely considered as too high. In the peri-urban areas of Kinshasa, most users put up with this situation rather than lapsing into active protests and many of them do not use the communication channels provided for participatory governance. We discuss these results and conclude this evaluation step by identifying two avenues for future research related to the role of informal institutions in the management of social contestability and of full transparency on water production costs.

Keywords: ASUREP; Alternative drinking water supply model; Water true-cost; Social contestability; Kinshasa

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1. Introduction

In developing countries, water crisis in the slums areas has become a major concern put on the international community's agenda [1]. This concern is in line with the ambitions of the Sustainable Development Goals (SDGs), and more particularly with Goal 6 that seeks to ensure safe drinking water availability and sustainable management of water and sanitation for all. In large African cities, and particularly in the peripheral urban districts, this goal is far from being achieved because demographic explosion combined with anarchic urbanization and growing impoverishment [2]. Many African countries face tap water supply and management challenges in the peripheral urban districts of major cities. These challenges arise from large scale water scarcity, as experienced by the Republic of South Africa [3,4], or many West-African states, for instance, Mali, Niger, Chad, and Burkina Faso and governance issues [5–8]. In several African developing countries, public governance and public-private partnerships showed their limits in the 1980s–2000s [9]. Lack of governmental funding or poor maintenance of infrastructures have pushed water supply to a critical level [10,11]. Population growth and the agricultural sector also contribute to increasing pressure on water resources. Indeed, the growing demand for water in the agricultural sector is less and less satisfied by the use of rainwater and surface water, but more and more by underground abstractions, which often lead to the exhaustion of the resource [12].

Democratic Republic of Congo (DRC) is no exception: the country experiences limited access to tap water, especially in rural areas and peri-urban neighbourhoods. Apart from the aforementioned root causes of failure in safe access to tap water, drinking water supply and sanitation sector in the DRC is characterized by a fragmented institutional framework with a multitude of actors [13–15]. Two major state actors dominate the institutional landscape: REGIDESO, the public company officially responsible for water treatment and distribution in urban areas, and SNHR, created in 1983 to serve rural areas [16–18]. The peri-urban environment, meanwhile, is often considered a 'neglected area' [19–21]. No institution has the mandate or capacity to pilot projects there. As the peripheral neighbourhoods of the major Congolese cities had little or no access to water supply until recently, the population relied heavily on unprotected water sources, exposing households to high risks of contamination by 'water-borne' diseases (cholera, dysentery, amoebiasis, etc.), and the few standpipes provided by non-state operators were heavily used. Access to drinking water is therefore a daily struggle for hundreds of thousands of city dwellers living in these outlying areas [22]. Currently, in the DRC capital, Kinshasa, the public company (REGIDESO), which holds a monopoly on the production and distribution of drinking water is unable to extend its services to all of the capital's peripheral neighbourhoods, any more than to the peri-urban areas of the other large Congolese conurbations [23]. Civil society and international aid organizations have therefore sought to develop and diffuse non-state-owned alternatives to the one of the dominant public company [24], in order to improve access to the resource and guarantee its quality [16]. Numerous projects have already been implemented in developing countries to improve access to safe

water in urban and peri-urban areas [25,26] and they have contributed to significantly increase the number of people drinking safe water [27]. These alternatives model of safe water production and management are frequently designed to meet a dual objective: on the one hand, to ensure a transparent management of activities through the establishment of principles of governance defined precisely to meet this objective, and on the other hand, to ensure the efficiency of the service and its sustainability through the technical quality of the infrastructure [28]. Indeed water production and distribution activities have long been challenged for lack of transparency, particularly on water pricing. Boistard [29] and Fauquert [30] point out that for all drinking water distributors in the world, the lack of transparency, in particular regarding the pricing of drinking water, is the most frequent reason for social protest against distributors. This is undoubtedly one of the main constraints encountered in the implementation of alternative and innovative governance and institutional arrangements.

As a matter of fact, water production and distribution are characterized by their contestability (exposure to contestation movement in the name of potential risk for the Public Health, for the Environment or on the grounds that fundamental principles relating to equity are not respected) or their social acceptability. The notions of social acceptability and contestability are developed by Hommel [31,32], Barbier [33], Adant and Hommel [34], Boissonade et al. [35], Bonnotte [36], Batelier [37], and Moreau et al. [38]. Adant [39,40] developed and applied the Model of Contestable Management of Hommel to the water industry.

In response to the lack of adequate drinking water infrastructures in the peri-urban neighbourhoods of large Congolese cities, a project to decentralize the water supply service was launched in the mid-2000s [14,41]. This project aimed to implement innovative systems of autonomous community-managed small water networks to supply drinking water to neighbourhoods not served by REGIDESO [24,42–44]. These small standpipes networks have been given the name ASUREP, this term being an acronym for 'Association d'Usagers de Réseau d'Eau Potable' (ASUREP). Originally developed by the Congolese NGO ADIR, the ASUREP model was supported in 2007 by Belgian and British bilateral cooperation, as well as by the European Union, and since 2008 by French bilateral cooperation [25,45]. The technical and institutional setup of this project has made it possible to implement a type and level of service adapted to local demand and the beneficiaries' ability to pay [44,46].

ASUREPs are civil society associations structured in the legal form of a non-profit association. These ASUREPs manage a drinking water distribution infrastructure (Fig. 1) consisting of a deep borehole or a tapped spring, which fills a reservoir. The reservoir drains by gravity flow into a distribution network that is equipped with two-tap or four-tap standpipes [41,47,48].

The ASUREP model is defined through key operating principles to follow when a new water distribution infrastructure is commissioned. Local participatory governance is at the heart of the functioning of this ASUREP model (Fig. 2). Water users choose representatives from their community to form a general assembly [45,47,49]. These representatives will elect the members of a board of directors that

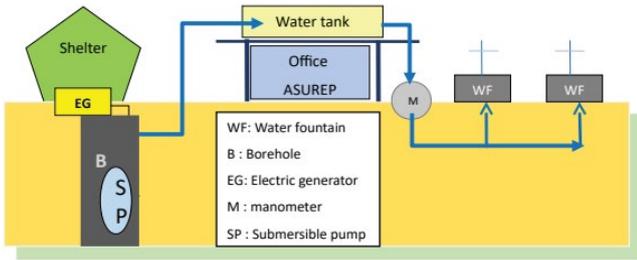


Fig. 1. Schematic drawing of an ASUREP water distribution standpipes network. Modified from Mott Mac Donald, 2016.

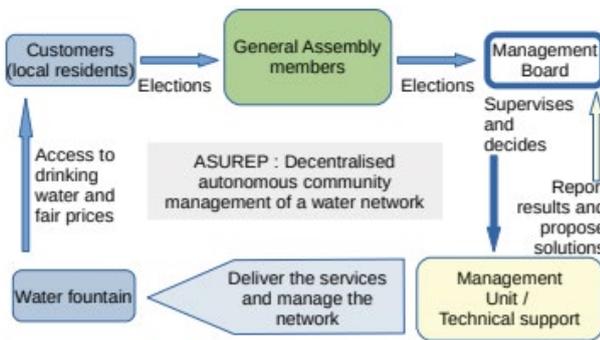


Fig. 2. Diagram of the administrative structure of an ASUREP.

ensures the administrative management of the ASUREP. The board hire the members of a management unit, which will be responsible for the day-to-day technical management of the water standpipes network. The population obtains water from standpipes, paying for this service at a unit price set by the general assembly. The revenue from the sale of water theoretically ensures full cost recovery and the profits from the operation of the network are reinvested in the extension and maintenance of the standpipes network and/or in social activities in the neighbourhood [21].

The users of the service (the consumers or the beneficiaries in the sequel) are therefore those ultimate responsible for the management of the water network. This management is therefore called “autonomous”, “community-based” or “representative”. A total decision-making autonomy is granted to each ASUREP. The appropriation of the ASUREP model by the beneficiaries requires their effective involvement in all the task from construction to management: the construction of the technical infrastructure (the ASUREP as a legal entity is the owner of it), the technical and financial management of the network, the choice of the water unit price, the application of the tariff that takes into account all the expenses of the cost of the water service (the water true-cost, the maintenance of the infrastructures and the empowerment of the users).

The institutional legitimacy of the ASUREP model is guaranteed in two ways: by the national law on water (Fr.: “loi-cadre sur l’eau”) delegating the management of drinking water distribution infrastructures to civil society organizations, and by the law on decentralization, granting decentralized territorial entities the power to delegate this management [47,50–52]. In Kinshasa, in parallel

to the creation of the ASUREPs, a federation of ASUREPs (called FEDASU) was organized and established in 2012 [14,45,53]. The FEDASU is mandated by its members to provide technical and administrative support to each and every ASUREP that requests it [14]. FEDASU also carries out technical and financial monitoring of the ASUREPs. Thus, reports are sent to it every month by the latter. These standardized reports contain financial information (income, savings in the bank, expenses, etc.) and technical information (system operation, diesel consumption, pumping time, etc.) [53]. They are checked and analyzed by the FEDASU secretariat teams. They are then disseminated at ASUREP general meetings, and aggregated data are presented at FEDASU general meetings with the aim of assessing the efficiency of network operations and comparing the performance of member ASUREPs. FEDASU’s governance is structured around a general assembly made up of representatives from each member ASUREP and an executive secretariat which is currently provided by the local NGO ADIR [47]. To cover its own operating costs, FEDASU collects 10% of the revenue generated by the sale of water from member ASUREPs [45]. Grants from external projects supplement the federation’s operating funds.

Among the key operating principles defining the ASUREP model, two are fundamental to ensure both the sustainability and appropriation of the model. The first principle is the application of truthful costing of water, also called water true-cost (TC, in the sequel, from the French “Coût-Vérité”). In the ASUREP model, true-cost pricing requires to take into account all capital and operating expenditures to fully recover the cost of water production and distribution; however, the unit price of water does not internalize existing social and environmental externalities. Water true-cost pricing and related communication improve transparency of water pricing. Consumers are therefore better informed about the actual cost of supplying safe water. Thanks to the application of water TC, the classical problem of asymmetric information (managers are better informed than consumers about the costs that have actually been borne) is less likely to occur if not completely ruled out. It also allows consumers to monitor the evolution of the water unit price and better understand the changes in tariffs. In theory, following the model’s requirements, the ASUREP management committee determines the operating costs of the system (including human resources) and provides the general assembly with an assessment of the TC of the water service. The notion of TC implies taking into account the local conditions of production of the water resource and its specific capital and operating costs. On this basis, it is expected that the general assembly, in accordance with the operating principles of the ASUREP model, will set the water service price at, or above, the water true-cost. This managerial approach ensures the sustainability of the service.

In order for the General Assembly to correctly interpret the nature and calculation of the water true-cost, and for beneficiaries to accept its justification, each ASUREP must make an effort to communicate about this issue to its target audience, the consumers belonging to the local community. The ASUREP model foresees, in theory, that the effective participation of the beneficiary population and local elected officials will lead to a better understanding of (i) the TC of

drinking water and (ii) of the all determinants of pricing¹. “Fair treatment” or “fair pricing” is expected in the sense that (i) each and every consumer of an ASUREP will pay the same unit price and that (ii) the price set above the TC will remain affordable (frequently called “fair pricing”). The degree to which the managers of an ASUREP are exposed to social protests or contestation movements depends on the transparency of water pricing in the following way. The effective application of the water TC contributes to increase the transparency of water pricing. Explanations and communication about water TC are necessary for consumers to appropriate water TC; if users assimilate water TC, they will be able to detect deviations from the operating principles and from the expected mode of management and governance. This will result in perceptions or beliefs that the water price is – or is not – a “fair price” (adjusted to the charges and applied equally to all consumers), reducing – respectively increasing – the contestability of the managers and their activity.

Decision-making autonomy is the second key operating principle: each ASUREP should decide about the water unit price in full autonomy and should price drinking water according to its own costs. This should result in each ASUREP setting a unit price independently of the price set by the other ones. This enables to sell water at a price that better takes into account the local socio-economic context, including the standard of living of the beneficiary population, the users. In other words, an ASUREP is free to determine the price of drinking water. This freedom to operate can also lead to choose a single common tariff for several ASUREPs and to adjust it differently when the price determinants changes. Given the decision-making structure of an ASUREP, the unit price is, in theory, *de facto* set by the beneficiaries themselves [47,48].

The key operating principles of the ASUREP model are systematically explained to the consumers well before commissioning the networks, to ensure the appropriation of the model by the users and to empower the governance framework of the ASUREPs. Indeed, an ASUREP cannot be created, on a legal basis, without the agreement of the local population.

However, in Kinshasa, FEDASU has chosen to depart from these two key operating principles by introducing a single common tariff for all ASUREP members of the Federation, set at 100 Congolese francs for a 25-L can. The tariff cannot be modified, even temporarily, in the event of variations in the costs of producing drinking water. The margin between unit price and the water true-cost will vary depending on the local situation and the unit price will be more or less different with users’ readiness to pay for safe water. This imposed tariff strongly restricts the freedom to operate of the managers.

As an innovative management model for water production and distribution designed to respond proactively to the criticisms targeting tap water producers and distributors, the ASUREP deserves scientific attention. A rigorous evaluation of the impacts generated by the application of the

ASUREP model is needed and will be particularly useful for the Congolese society but also to shed light on other innovative alternatives. This paper is part of a broader research aiming at evaluating the actual impacts of the ASUREPs and their efficiency. Apart from grey literature provided by donors and technical cooperation agencies in charge of implementing the ASUREP model in DR Congo, there is not, to our best knowledge, independent and thorough scientific research carried out to analyse the strengths and weaknesses of the model, its relevance to the socio-economic context in which it took place, the lessons to be learned from success and failures and the ways one could improve this model. Hence an urgent need to provide data, conceptual frameworks and methodologies to build a deep understanding of the ASUREP model, the socio-economic properties of the local activities applying – or pretending to apply – the key operating principles of this model and their impacts. As the ASUREP model is only one of many initiatives set-up in Africa in order to cope with drinking water supply challenges, getting insights into how the ASUREP model is implemented could provide relevant knowledge to evaluate the overall efficiency of this model and to estimate its transferability to other African socio-economic contexts. The basic knowledge for this type of study has not yet been well developed and this article aims at filling that gap.

This evaluation process encompasses an investigation on the perceptions of the beneficiaries about water pricing, their understanding of the concept of the water TC, and the resulting contestability of the local ASUREPs. This is precisely the focus of the present paper.

2. Material and methods

The territory under study is the eastern part of the City-Province of Kinshasa. It covers three peripheral municipalities: Kisenso, Kimbanseke, and N’sele (Fig. 3). These three municipalities are among the peri-urban ones that are the worst served by the REGIDESO network. In these three municipalities, our study focused on 17 neighbourhoods (Fig. 4). These are 2 neighbourhoods in the commune of Kisenso (Mbuku and Libération), 8 neighbourhoods in the commune of Kimbanseke (Disasi, Bikuku, Esanga, Kikimi, Mangana, Ngandu, Ngamazita, Way-Way) and 7 neighbourhoods in the commune of N’sele (Maba, Mikonga 1, Mikonga 2, Munke, Ngamaba, Ngina, Mpasa1). In these neighbourhoods, the failure of the public sector to supply safe drinking water is compensated for by the involvement of the informal sector, namely ASUREP and other few small private or religious operators [21,54–59].

The data analysed in this study were collected through a survey of 1,230 households in the neighbourhoods targeted by the study. This field survey took place over a period of 2 months (July and August 2020) with the help of 6 interviewers, recruited for this work. The survey addressed, among other things, the following topics by means of a questionnaire, that include some of the questions hereafter:

Does the respondent understand the concept of water true-cost and how it is calculated?

1. Perception and understanding of the water true-cost
 - 1.1. What do you think is the water true-cost?

¹ It should be noted that some ASUREPs in Kinshasa practice quasi-free access for the infirm and disabled because they have lower incomes but also because this is part of a traditional approach to the less able-bodied. There are therefore determinants of pricing that are more related to cultural factors than to economic ones.

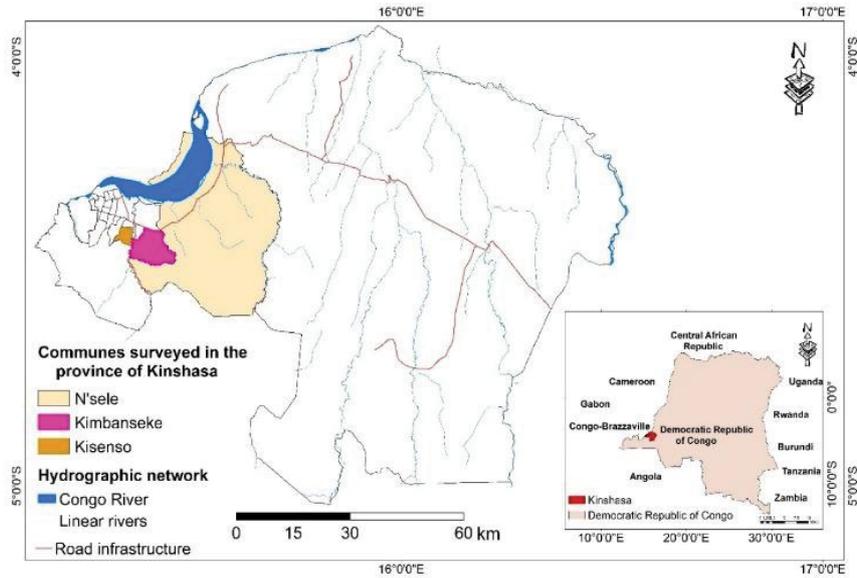


Fig. 3. Location of surveyed municipalities.

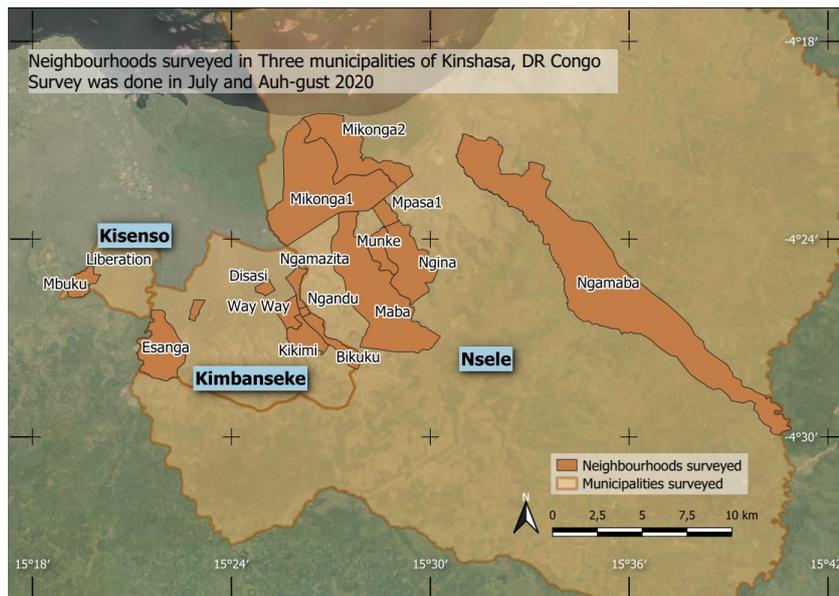


Fig. 4. Location of surveyed neighbourhoods.

- 1.2. What is the purpose of the water supply true-cost?
- 1.3. How do you think the water supply true-cost is calculated?
- 1.4. Can it be modified by ASUREP and why?
- 1.5. What other elements do you think are used to calculate the price charged by the water standpipe manager?

- 2.2. Do you discuss it with or within ASUREP?
- 2.3. When and how?
- 2.4. Would you like more information?
- 2.5. What do you expect from ASUREP on this issue?
- 2.6. Would you like information from another person and why?

In the operation of the ASUREP that provides the respondent's water, is there a clear understanding of the price determinants

2. Ownership of the truthful cost of water
 - 2.1. Who do you discuss it with?

2.1. Conceptual framework

According to the "Contestable Management Model" [60], a company is characterized by two types of contestability: its economic contestability (EC) and its social contestability (SC). The former is defined as the degree of exposure

to economic competition or to entry threats on its markets [39,61–63]. The latter is defined as the degree of exposure to social movements targeting the firm and questioning its public legitimacy because of potentially adverse effects on the Public Health, the Environment, and/or because of a lack of equity. Social contestation can take various forms. A mild form is contestant vigilance characterized by actors raising questions about the targeted activity but not entering into a coordinated action. On the other hand, some protest movements will be strongly coordinated and even marred by violence [34,63,64]. Depending on the context and characteristics of the entity studied, a change in one type of contestability can result in a change in the other type. In the same direction or in opposite ones. The two types of contestability can also vary independently [39,60–65].

In the context of our study, exposition to competition refers to the one that exist between the former legal monopoly (REGIDESO) and non-state structures (ASUREPs and other distribution structures). Exposure to social contestation is high when there is a lack of trust and of public legitimacy of water supply activities on the side of users and citizens and when the entity cannot escape actions that are or could be taken to express dissatisfaction and/or to obtain a modification of the choices on the side of the targeted entity. In the case of drinking water supply, quality problems, opacity of pricing or negative externalities on the environment are the most frequent sources of social contestation, which can take various forms, ranging from mild expression like contestant vigilance where actors are mainly expressing doubts without setup a contestation movement to violent actions [40].

This conceptual framework makes it possible to highlight what follows. In the context of Kinshasa's peri-urban neighbourhoods, ASUREPs have to follow key operating pricing principles: (i) TC-based pricing or price adjusted to the true cost of providing drinking water, (ii) equal treatment of users or "fair pricing" and (iii) pricing autonomy. When water pricing deviates from these key principles, it could be an issue for the social and economic contestability of an ASUREP. While the designers of the ASUREP model considered that the application of key operating principles of the model would reduce the exposure to social contestation of their innovative model for water production and distribution (and respond in advance to the criticisms aimed at the competing model, that of REGIDESO), it is highly plausible that an ASUREP not applying the key pricing principles will increase its exposure to both forms of contestation and specifically increase its social contestability. Any form of ignorance or uncertainty about the pricing of drinking water by the ASUREP may be a cause of (increased) mistrust and (higher) social contestability. More specifically the lack of understanding and appropriation of the concept of water TC by beneficiaries would be detrimental: users would complain about pricing because of its opacity and adapt to the situation by (for example) choosing another supplier, challenging managers or political representatives. And all this can be captured through careful observations and data collection.

In the sequel, we will focus on the analysis of one determinant – pricing according to water TC – of the ASUREPs' social contestability to better understand the current

situation and the users' reaction to an everyday functioning that is not the one envisioned when the ASUREP model was conceived.

3. Results

We first characterize the sample of respondents (Table 1). The gender distribution among the 1230 households surveyed is as follows: 43% of the respondents are men, while 57% of the respondents are women. The management of drinking water supplies within the household is mainly the responsibility of women and children, both in terms of managing financial resources or choosing sources of supply and transporting water. In our survey, 78% of respondents are also in charge of taking decisions as regard the water purchases. It is worth mentioning that, if 43% of respondents are men, only 9% of those who fetch water from an ASUREP's standpipes are men. So, a significant proportion of the men who respond to the survey make decisions about water purchases but do not fetch water themselves. The average size of the households surveyed is 6.7 persons, including 3.6 adults. The average number of children per household is therefore 3 children.

These households live in dwellings (multiroom houses or single room studios, respectively 63% and 9% of respondents) that are constructed from resistant materials. Precarious housing (28% of respondents) is built using materials such as scrap metal, planks, tarpaulins, and even palm leaves or plant fiber boards.

The majority (63%) of respondents state that the head of the household (who is not always the respondent) works in the informal economy (Table 1). The informal sector is therefore the main provider of jobs in the peripheral neighbourhoods of Kinshasa where our survey was conducted.

We now analyse the data about pricing. A key statistic from the survey is that 100% of respondents said they did not know how the water TC is calculated! The concept of water TC is in fact not understood by consumers. More specifically, 50% of respondents stated that they did not know what charges or operational costs were included in the price of water, although 40% of respondents stated

Table 1
Characteristics of surveyed households

Gender distribution	Women = 57% Men = 43%
Who is responsible for water management in the household?	Women = 87% Father = 9% Children = 4%
Who gets the water from the ASUREP fountain?	Women = 53% Children = 44% Water carriers = 2% Household servants = 1%
Economic activity of the head of the household	Informal economy = 60.2% Public officer = 18.2% Private sector = 12.4% Other/Retired = 6.7% Parapublic sector = 2.4%

that they believed that the price of water at least covered ASUREP’s staff costs. In the same vein, 60% of respondents stated that ASUREP’s personnel costs determine the price of water. There is therefore a clear lack of knowledge on the part of the respondents about the elements that underpin water pricing in ASUREPs. Following our conceptual framework expression of disagreement should be observed because of the increasing social contestability of the local entity, the ASUREP.

Furthermore, communication between water consumers and ASUREP managers on the subject of water TC seems to be poorly developed, as approximately 75% of respondents stated that they did not discuss it with ASUREP officials (ASUREP Board or management unit) or with other interlocutors (Fig. 5). However, this survey result should be interpreted with caution, as if respondents do not have a clear understanding of the concept of water TC, exchanging on this matter with managers or other stakeholders is difficult. Nevertheless, since 8% of the respondents claim to discuss the water TC issue either with ASUREP Board members or with members of the management unit, it can be assumed that the concept of water TC is not totally unknown to consumers. In a similar logic, if respondents assimilated this concept of water TC with the water pricing, the rate of respondents that communicate with ASUREP officials about water price remains surprisingly low.

Communication between respondents and ASUREPs on the subject of water prices (Fig. 6) is mainly through contact with the women in charge of the water fountain/standpipes (~32% of respondents), or during the Water Day – a cultural event organized each year on the theme of access to drinking water – (~30%) or with the neighbourhood chief, who represents a very active traditional authority (~22%). The ASUREP general assembly (~16% of respondents) is clearly not a place where consumers prefer to discuss the price of water, which goes against one of the main functions of these general assemblies.

This lack of knowledge about the determinants of water price on the side of the consumers and the fact that this issue is only rarely discussed through the communication

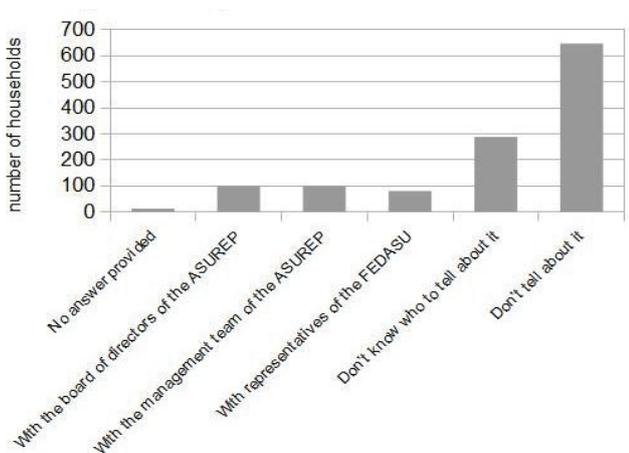


Fig. 5. Bar chart illustrating the responses of surveyed households to the question: “Who do you talk to about the water true-cost?”.

channels provided for this purpose within the ASUREP mode of governance may influence consumers’ perceptions of the justification of the price of water. Fig. 7 presents the mosaic plot of the relationship between the price of the water being perceived as high, medium, or low price, and the justification of this price. The proportion of users who consider that a water price that they perceive to be high has little or no justification (584 respondents on a total of 1,170 respondents) is significantly higher than it would be in a random allocation of responses (Pearson’ Chi-squared test $X^2 = 458.91$, $df = 2$, $p\text{-value} < 2.2e-16$). In other words, consumers that complain about the price also complain about the lack of justification for water price.

However, this statement should be qualified, as the perception of the price of water as being justified or not

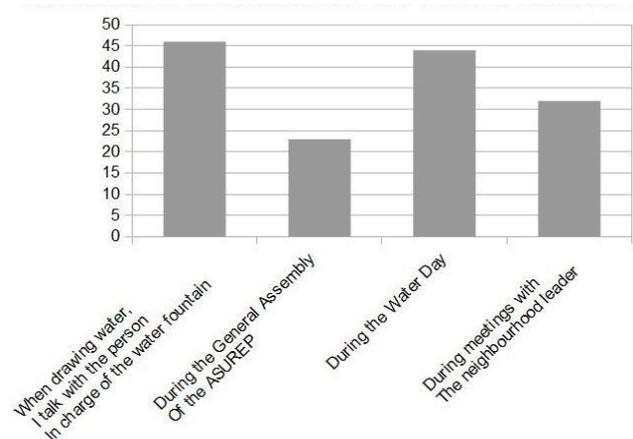


Fig. 6. Bar chart illustrating the responses of surveyed households to the question: “On what occasion do you talk to the ASUREP members about water price?”.

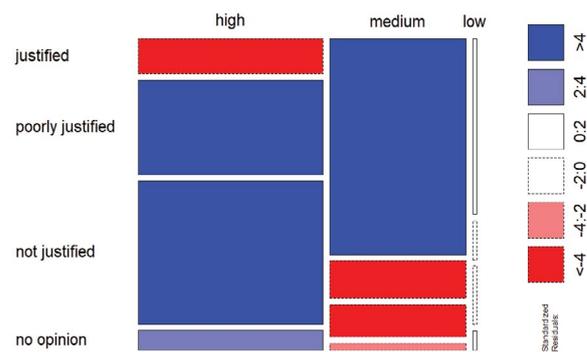


Fig. 7. Mosaic plot of the relationship between the price of the water can be perceived as being a high, medium, or low price and the justification of this price. The mosaic plot expresses the result of a chi-square test as being superior or inferior to the standardized residuals of the test. The blue colour indicates a significantly higher rate of answer for a combination of two classes of values belonging to two variables than it would be in a random allocation of responses. The red colour indicates a significantly lower rate of an answer than it would be in a random allocation of responses. The width of the columns is proportional to the frequency of data.

justified by a respondent varies according to the ASUREP that supplies this consumer (Pearson’s Chi-squared test $X^2 = 164.2$, $df = 16$, $p\text{-value} < 2.2e-16$). Some ASUREPs (Libération and Mbuku) have a higher-than-average proportion (all ASUREPs combined) of their consumers who consider the price of the water can be justified, while other ASUREPs (Mikonga and Ngina) have a lower-than-average proportion (Figs. 8 and 9). There may therefore be ASUREPs where communication between network managers/ASUREP officials and consumers has helped to reassure the latter and thus limit the exposure of the ASUREP to social contestation based on the price of the service and/or the perceived justification of this price.

Furthermore, there are no significant differences in the distribution of the different modalities “financial situation of the household vs. perception of the price of water”. In other words poor households (as the respondents state to be in a critical financial situation) do not find water more expensive than others (Pearson’s Chi-squared test, $X^2 = 6.3246$, $df = 4$, $p\text{-value} = 0.1762$). As regards the perception of the justification of the price of the can, one can observe a significant difference (Pearson’s Chi-squared test, $X^2 = 17.619$, $df = 8$, $p\text{-value} = 0.02427$): there is an over-representation of households in financial balance (therefore not in debt) who find the price unjustified! This seems to support the hypothesis that there is indeed an issue of communication between ASUREPs and consumers, or in other words, a problem of price justification,

rather than an issue about the level of the price considering the household’s total income.

4. Discussion and conclusions

Alternative mode of water production and distribution are designed to improve access to safe water and to respond proactively to social contestation. In addition to the quality of the drinking water itself, a key determinant of the social contestability of an ASUREP is the pricing of drinking water and its opacity. In this study, it more precisely lies in the perception, understanding and appropriation of the water true-cost concept by the consumers. We rely on a simple conceptual framework that explains this causal relationship and on a questionnaire. We find that users of ASUREPs are generally aware that the price of drinking water has economic determinants. A large proportion assimilates these determinants to the salary costs of ASUREP employees. However, the vast majority of respondents do not master the notion of the water TC, and are therefore unable to grasp this concept, which is essential to water pricing and the choice of a ‘fair price’ by the general assembly.

The lack of understanding of TC concept seems to stem from considerable gaps in communication by ASUREP managers. At the very least, the communication channels provided for in the ASUREP model (General Assembly, Board of Directors’ reports) are not used or very little. Consumers who declare that they discuss water price issues with

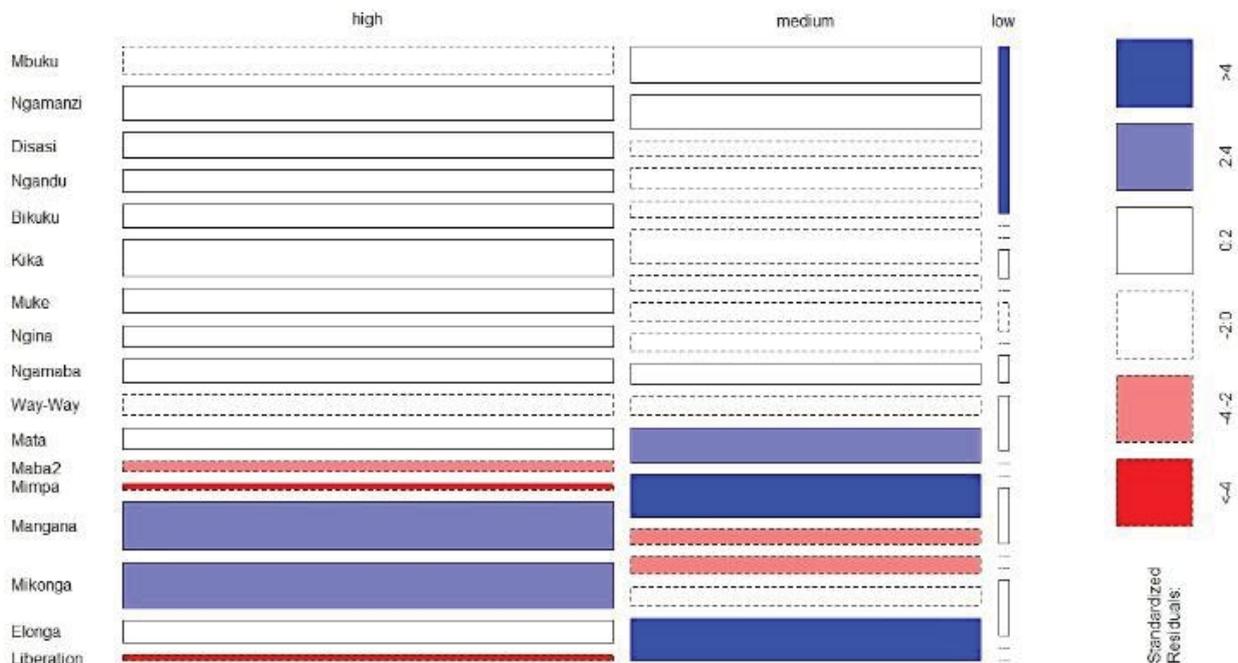


Fig. 8. Mosaic plot of the relationship between the water canister price perception (perceived as being high, medium, or low) and the ASUREP that deliver the water can. Names of ASUREPs are mentioned at the left side of the figure. Some ASUREPs have a different name from the neighbourhood they serve. The mosaic plot expresses the result of a chi-square test as being superior or inferior to the standardized residuals of the test. The blue colour indicates a significantly higher rate of answer for a combination of two classes of values belonging to two variables than it would be in a random allocation of responses. The red colour indicates a significantly lower rate of an answer than it would be in a random allocation of responses. The width of the columns is proportional to the frequency of data.

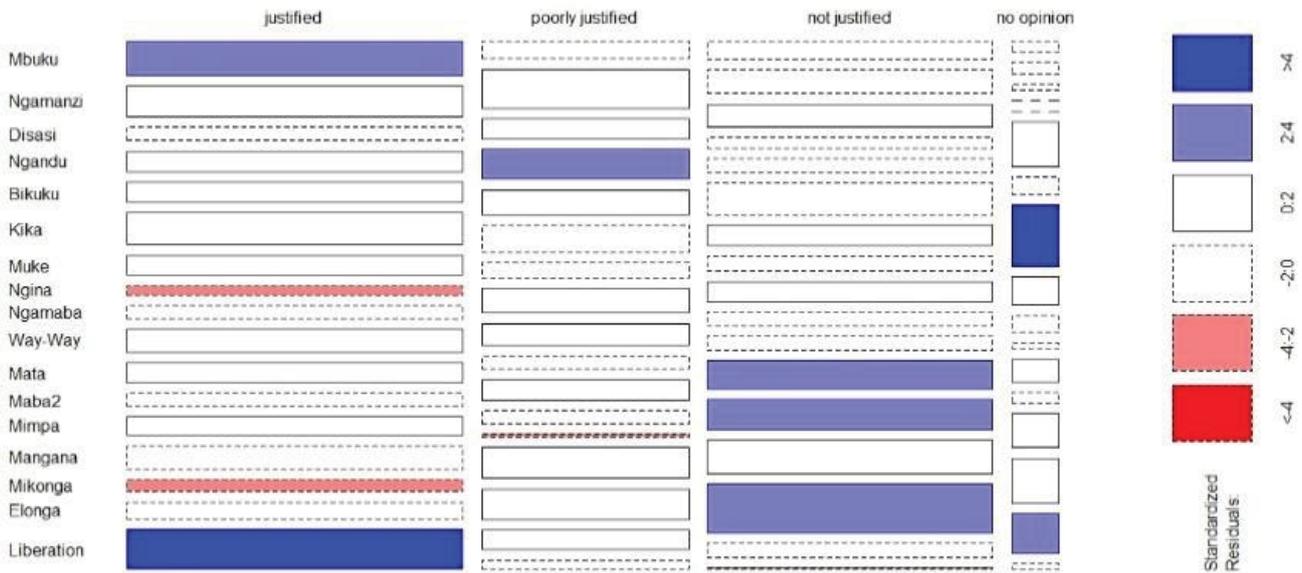


Fig. 9. Mosaic plot of the relationship between the perception of the water canister price (perceived as being justified, poorly justified, or not justified) and the ASUREP that delivers the water can. Names of ASUREPs are mentioned at the left side of the figure. Some ASUREPs have a different name from the neighbourhood they serve. The mosaic plot expresses the result of a chi-square test as being superior or inferior to the standardized residuals of the test. The blue color indicates a significantly higher rate of an answer for a combination of two classes of values belonging to two variables than it would be in a random allocation of responses. The red colour indicates a significantly lower rate of an answer than it would be in a random allocation of responses. The width of the columns is proportional to the frequency of data.

members of the ASUREP do it outside the channels designed for this purpose. They do it with the women in charge of water standpipes (that is also a member of the local community served by the ASUREP) or with traditional governance structures (the neighbourhood chiefs). The setting of a single tariff by an actor external to the local community, the FEDASU, is seen here as an aggravating factor, insofar as there is no reason for ASUREPs to explain and communicate around the concept of water TC since the latter is not applied! In the same logic, there is no need for ASUREPs to explain to their consumers what the determinants of water prices are, as these determinants are not calculated or set by ASUREP but are set by an external actor.

The direct consequence is a lack of justification of the unit price in the eyes of the consumers that express their distrust by complaining about the price and by stating it is too high. These observations are indications of distrust and contestant vigilance on the side of beneficiaries while the ASUREP model was designed to avoid such a situation.

Does it mean that this lack of justification or the opacity of water pricing triggers social contestation of the ASUREPs? This is not straightforward.

First a contestant vigilance exists on the side of consumers but it is far from being generalized to all the users of the ASUREPs studied here. A loss of legitimacy – or an increase of social contestability – of the ASUREP model originates in the lack of justification of the unit price for drinking water and the failure of the communication channels designed in the ASUREP model.

Second the contestation is not aimed at the ASUREP model itself (that amounts at a strong contestation), but instead at well identified local activity that serves them

on a daily basis on which each beneficiary depends for its drinking water supply. One might conclude that, in some municipalities of Kinshasa, the ASUREP model has not been fully successful in its implementation and has not been able to develop its full potential as a social cement and as a large social ‘experimental design’ in the participatory management of a common resource. If contestation against Kinshasa’s ASUREPs develops and becomes widespread, it may be organised around the criticism of the ASUREP model as an alternative for drinking water supply.

Our analysis is the first to question the empirical link that could exist between the non-application of key operating principles of the ASUREP model and the contestability of water production and distribution activities claiming this mode of governance and management. Two limits are identified which leads to new avenues of research.

The lack of price justification could be managed by informal institutional mechanisms and informal communication channels not captured through our questionnaire. Our conceptual framework and our analysis ignored the possibility that such mechanisms were developed to adapt to an imperfect application of the original ASUREP model and currently prevent the adverse consequences of a lack of legitimacy for a local drinking water supply activity.

One might expect that informal communication channels developed to prevent social protest and the risk it generates for the local community, the local ASUREP being a key activity (providing the local community with an essential good for their subsistence, safe water) run by the members of its own community. In this logic, the ASUREPs could serve consumers, provided that they are able to improve their social acceptability by either adapting their

communication and improving the transparency of pricing or by participating in complementary informal institutions not envisioned by the promoters of the ASUREP model.

The situation is not uniform across all ASUREPs; it is likely that some ASUREPs have developed a more subtle way by which the stakeholders interact and that are not captured through our questionnaire while others are stuck in a more conflictual situation. This calls for a different but complementary methodology (immersion and participatory observation enabling to identify and understand the role of informal institutions not expected in the original ASUREP model). Therefore, further investigations will follow this first analysis. In addition, the role of FEDASU should be studied. Indeed, in the minds of some service users and certain ASUREP managers, the financial transfers to FEDASU raise questions (Ditona Tsumbu, pers. com., non-published information collected during interviews with ASUREP officials, including members of some units of management) and these transfers are sometimes associated with a loss of credibility of ASUREPs among consumers. Complementary to this, the current conceptual framework should be developed to enable a fine understanding of the effects of the full transparency requested in the name of the management of the contestability of water production and distribution activities. Transparency does not only have virtues, it is a preconceived idea. The ASUREP model emphasizes transparency but the actors who must apply it in real situations, particularly in the peri-urban areas of Kinshasa, can encounter other problems which may not be resolved under full transparency.

The results presented here are part of a broader research aiming at understanding and improving the efficiency and social acceptability of the ASUREPs. By highlighting the strengths and weaknesses of this model of community-based management of drinking water supply, this study therefore contributes to reinforce this model, aiming at improving the ways it is implemented in DRC and proposing a path to ground similar models in other African countries. However, the research questions addressed in the present work are not limited to ASUREPs. They address the broader issue of the effectiveness of development aid and the relevance of socio-economic models that are implemented in technical cooperation projects. As donors, NGOs and governmental cooperation agencies are working on improving access to tap water in Africa, they could benefit from data and conclusions presented here or in similar studies to build scientific analysis of their projects. From the opposite perspective, the scientific community could benefit from valuable data and observations on sociological and economic traits that are affected by these technical cooperation projects, allowing scientists to observe the “real world” experiencing fast, non-directed and non-supervised changes. Indeed, there is a crucial need for a robust method of assessing the real impacts of these cooperation activities and alternative water production and distribution arrangements. Are they meeting their objectives and doing so through the strategies they implement? Are the causal hypothesis verified or only claimed? Are the paths of change really being followed or are other processes at work? This analysis can be done in a way that is complementary to the *ex-post* evaluations usually funded by donors. It is indeed necessary to question

the hypotheses of causality to validate them scientifically in order to support NGOs and GOs and that is what scientific research is all about. It therefore seems relevant and legitimate to conduct such studies.

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