

WATER SUPPLY MANAGEMENT IN RURAL TANZANIA: CHALLENGES, POLICIES AND PERSPECTIVES IN IRINGA REGION

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Abstract

This study provides an overview of the situation of rural water supply in Iringa Region, Tanzania. The changes in the legislative framework regulating rural water supply, the main challenges and strategies at local management level, the role of the private sector, and the conditions of monitoring and supervision plans are the main themes explored. As for the national policy and legislative framework, it aims at empowering local communities by decentralizing water management through the establishment of Community Owned Water Supply Organizations (COWSO), who are the entities entitled to operate, maintain and own water schemes. However, several challenges emerged at the local level, such as insufficient technical and managerial skills, lack of spare parts and difficulty in revenue collection.

COWSOs may delegate operational functions to private service providers, but the regulatory framework for public-private partnerships in rural water provision is unclear. Attention has been given to the Water Supply and Sanitation Act adopted in February 2019, which established the new Rural Water Supply and Sanitation Agency (RUWASA) and implemented a general redistribution of competences. This new institutional set-up seems to create a sort of *decentralized centralization* in which coordination lies with the centre whereas day-to-day activities are carried out by local water management entities.

Questo studio fornisce una panoramica sulla situazione dell'approvvigionamento idrico in area rurale nella regione di Iringa, Tanzania. I principali temi esplorati sono i cambiamenti nel quadro legislativo che regola il servizio idrico, le principali sfide e strategie nella gestione locale, il ruolo del settore privato e i piani di monitoraggio e supervisione. Rispetto alla politica nazionale e al quadro normativo, essi mirano a responsabilizzare le comunità locali decentralizzando la gestione delle risorse idriche attraverso l'istituzione delle Community Owned Water Supply Organizations (COWSO), uniche entità autorizzate a gestire, mantenere e possedere gli schemi idrici. Tuttavia, sono emerse diverse sfide a livello locale, tra cui insufficienti capacità tecniche e gestionali, mancanza di pezzi di ricambio e difficoltà nella riscossione delle entrate.

Le COWSO possono delegare parte dei propri compiti a soggetti privati, ma il quadro normativo per i partenariati pubblico-privato nella fornitura idrica rurale è incerto. È stata svolta un'analisi del recente Water Supply and Sanitation Act, approvato nel febbraio 2019, che ha istituito la nuova Rural Water Supply and Sanitation Agency (RUWASA) e ha attuato una redistribuzione generale delle competenze. Questo nuovo assetto istituzionale sembra creare una sorta di *centralizzazione decentrata* in cui le funzioni di coordinamento vengono esercitate a livello statale mentre le attività quotidiane sono svolte da enti gestori a livello locale.

Keywords

Community-based organizations, decentralization, rural water supply, water governance, water policy

Introduction

The paper aims to give an overview about the situation of rural water supply in Iringa region, with specific attention to Community Owned Water Supply Organizations (COWSO), the related implementation policy, their institutional and strategic role and the main challenges arising in the provision of water services for human consumption in rural areas. This topic has been explored in a composite way as it includes an assessment of the COWSO policy implementation in the region, the involvement of the private sector into water supply management, and the monitoring and supervision procedures carried out by both District's authorities and Management Entities (MEs) of the water schemes. Moreover, it provides an outlook over the latest news in the legislative framework regulating the sector.

The dynamics connected to the water management decentralization are particularly relevant to the Tanzanian context as they result in many challenges such as the transfer of all managing costs to local entities, the lack of know-how and training at the local level, the development of *elite capture* dynamics and the presence of a legal pluralism favouring the state law over customary, informal and religious laws (Nkonya, 2008). The decentralizing process needs to ensure the sustainability of rural water management also by constructing a supportive policy framework for the involvement of the private sector, by revising the cost-recovery policy to ensure that low-income households can benefit of the water services, and by putting in place a suitable Management Information System to monitor and supervise the whole process and intervene accordingly (Giné & Pérez-Foguet, 2008).

This study carries on a research project started in 2015 by two students from University of Turin in cooperation with the NGO Lay Volunteers International Association (LVIA), that conducted an empirical study on COWSO strategy implementation, private sector participation and monitoring systems in Dodoma Region (Fierro & Nelaj, 2015)¹. Investigating similar themes, this new research focuses on Iringa Region, in which LVIA has recently completed the SANI project². The study benefited from the long-term experience of LVIA in the water and sanitation sector, which dates to its first projects in 1967 in Kenya and then in Tanzania in 1986. Looking at the international cooperation framework, it is essential to underline the relation of the topic to the Sustainable Development Goals of the 2030 Agenda. Not only is rural water management relevant within the framework of the SDG 6, namely aimed at “*Ensuring availability and sustainable management of*

¹ Both of the researches were carried out within the Uni.Coo project promoted by the University of Turin in cooperation with several local NGOs such as LVIA

² The project, whose Italian acronym is SANI and full name is “MAISHANI - Maji na Lishe, *Integrated Project for the Right to Water, Health and Nutrition in Dodoma and Iringa Regions – Central Tanzania*”, is co-financed by the Italian Agency for Development Cooperation (AICS).

water and sanitation for all”, but the importance of good water management is also mentioned in several other Goals in which water is present in a transversal way (United Nations, 2019).

Legislative and policy framework

In this paragraph, some aspects of the policy context will be presented in order to provide a better understanding of the considerations following the data analysis and a clearer idea of the cornerstones of the subject matter. In the period 2015-2018, no significant changes have been introduced in terms of water policies; therefore, we will not reiterate the broad and deep analysis of the national policies and of the administrative set-up carried out in the 2015 study mentioned in the *Introduction*, which clearly depicts the situation and is still up-to-date (Fierro & Nelaj, 2015, p. 16). Attention will also be paid to the process of reform of the rural water supply sector initiated by the Government, whose reference regulation, the new Water Supply and Sanitation Act, no. 5 of 2019, was approved by the Parliament of Tanzania in February 2019. Clearly, it does not affect the object of our analysis as, at the time of data collection, the Water Supply and Sanitation Act, no. 12 of 2009, was the legally binding act regulating the sector.

The regulation of the private sector in rural water management

A field of the legislative and policy framework which deserves particular attention is the one regarding the relations between public and private actors in the rural water supply system. The starting point of a long reform process towards the current policy perspective is the 1991 *National Water Policy* (NAWAPo): here, the role of private actors is almost unrecognized (MOWI, 2018) and the Government is identified as the sole investor and manager of water projects and service delivery (Arvidson et al, 2006). Then, in 2002, the new NAWAPo introduced a different paradigm, according to which the Government would have played the role of the regulator, facilitator, and coordinator alongside other actors, including development partners and private sector, whose participation was emphasized and highly encouraged at all levels of water projects design and implementation and service delivery (Ministry of Water and Livestock Development, 2002, para 4.3).

In the same way, the *Water Sector Development Programme 2006-2025* (WSDP I) mentions private operators among the key actors to be involved in the implementation and management of water facilities and in some steps of the water supply chain (MOW, 2006, p. x). Also, the document recognizes the weakness of the private sector - especially in relation to rural settings - and its inexperience with the requirements and features of community management: thus, it calls for a

positive impulse in terms of capacity building and quality assurance of these partners (MOW, 2006, para. 1.4.7).

Later, in 2014, the WSDP II (2014-2019) presents the role of private operators in rural water supply sector: here, Public-Private Partnerships (PPP) are considered a viable tool to achieve sustainability and autonomy of water service, also because the private sector has been often found more able to collect revenues, gather funds and manage them. Nevertheless, the document recalls the lack of expertise underlined some years before in WSDP I. Moreover, the risk of excessive profiteering for private operators to the detriment of local communities is foreseen as possible.

As for the legislative framework, if we go through the main regulatory source of the sector, the 2009 Water Supply and Sanitation Act (WSSA 2009), we can find some references to the involvement of private operators. First, among the fundamental principles, the promotion of PPPs is mentioned for the provision of water supply and sanitation services (URT, 2009, s. 4(1)(f)). Then, the WSSA 2009 states the responsibilities of the central government in the implementation of such a prescription: on one hand, to the Prime Minister's Office – Regional Administration and Local Government (PMO-RALG) is assigned the role of creating “*a conducive environment for community and private sector participation in (...) water supply and sanitation services*” (URT, 2009, s. 6(d))³. On the other, in the performance of its responsibility to regulate COWSOs' activity, the Minister of Water and Irrigation (MOWI) has the precise duty to “*provide guidelines (...) for the arrangements for entering into agreements with the private sector as service providers*” (URT, 2009, s. 38(a)).

Overall, apart from some very general references to private sector involvement, we can observe the actual absence of an *ad hoc* regulatory framework with the related ancillary tools, such as specifically designed national guidelines for PPPs in rural water supply⁴.

³ A conducive or enabling environment can be defined as “*a set of interrelated conditions – legal, organisational, fiscal, regulatory, informational, political and cultural – that impact on the capacity of partners, including national governments, donors and NGOs to engage in developmental processes in a sustained and effective manner*”. Definition taken from Lockwood, H., Casey, V., & Tillet, W. (2018, October). *Management models for piped water supply services*, Aguaconsult & WaterAid. p. 55, (adapted from Thindwa, J., (2001), *Enabling environment for civil society in CDD projects*, Washington, DC: World Bank)

⁴ Note that a general regulatory framework for PPPs already exists; under the *National Public Private Partnership (PPP) Policy, 2009*, the *Public Private Partnership Act, 2010* (as amended in 2014 and 2018) and the connected *Regulations* (2011 and 2015) have been issued. Precisely, in the *Water Supply and Sanitation (Registration and Operations of Community Based Water Supply Organisations) Regulations, 2019*, s. 30(1), we find an indirect reference to Part X of the *Public Private Partnership Regulations, 2015*. Noteworthy, the *Water Supply and Sanitation (Registration and Operations of Community Based Water Supply Organisations) Regulations, 2019*, s. 30(2), envisage the possibility for the Rural Water Supply and Sanitation Agency, upon consultation with the MOWI, to “*develop a framework for appointment of service providers by a community organization*.”

The new Water Supply and Sanitation Act, 2019

As previously mentioned in the analysis of the legislative framework regulating rural water supply, in early 2019 the Parliament of Tanzania approved the new *Water Supply and Sanitation Act* (WSSA 2019), which replaces the homonymous Act in force since 2009 (WSSA 2009).

Thus, in the following paragraphs, the new legislation will be briefly presented, considering only those provisions linked to the topic of this research.

Rural Water Supply and Sanitation Agency (RUWASA)

The most striking innovation in the institutional setting is the creation of a new entity, the RUWASA, which will be responsible for the provision of

sustainable potable water in rural areas through resource mobilization, project implementation, capacity building and operation and maintenance of project with the active participation of major stakeholders (World Bank, 2009).

This Agency will be in charge of the development and sustainable management of rural water supply and sanitation projects and will perform several functions, such as carrying out the design and implementation of rural water supply projects, monitoring and evaluating the performance of community organizations (CO), providing financial and technical support to COs, advising the Minister on issues related to rural water supply and sanitation, facilitating training and capacity building to COs and so forth (URT, 2019, s. 43(2)).

With regard to the administrative structure of RUWASA, it will be managed by a Board of Directors, representative of various stakeholders involved in the rural water supply sector: besides the Director General, appointed by the MOWI after the recommendation of the Board of RUWASA, and the Chairman, appointed by the President of Tanzania, there will be six members from several institutions holding interests and competences in rural water supply (URT, 2019, III Schedule, s. 1(2)).

Then, it is relevant to underline that RUWASA is incorporated in the pre-existing institutional set-up and it is invested with several responsibilities, which were formerly given to other institutions. *Figure 1* below displays an essential representation of how RUWASA is included in the new set-up, compared with that outlined by WSSA 2009.

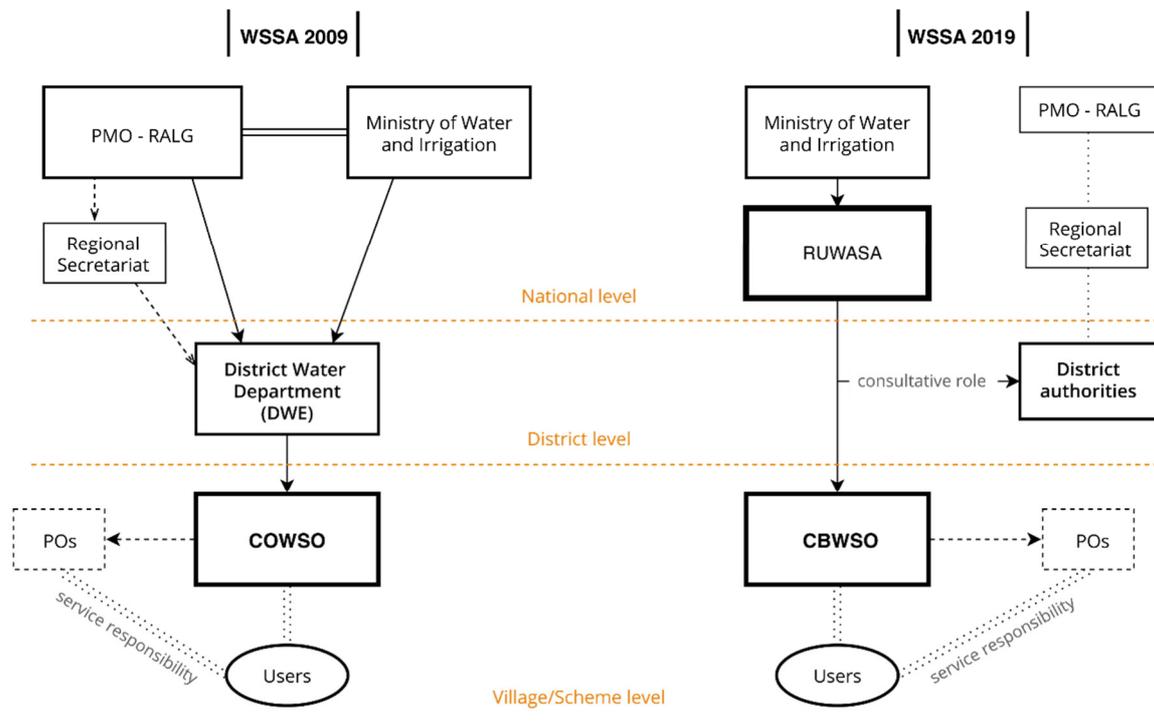


Figure 1. WSSA 2009/2019 Institutional framework

First of all, it assumes all the duties previously attributed to local government authorities (LGA) in relation to community organizations⁵, with the responsibility for RUWASA to submit plans and operational informative reports to full Councils and to Regional and District Administration forums (URT, 2019, ss. 48(h) and 49). Moreover, the new Agency will be responsible for carrying out monitoring and regulation of community organizations, while this function was previously vested in the Minister of Water and Irrigation; interestingly, among the various duties transferred to RUWASA, it is no longer present that of providing guidelines and approving tariffs chargeable for the provisions of water supply services, which disappears from the new Act^{6, 7}. On the other hand, the WSSA 2019 addresses the important issue of monitoring and regulation of COs, establishing that RUWASA shall provide guidelines for such purposes. Finally, the reporting system is also innovated as the executive organs of the community organizations will have to submit to the Agency reports regarding “performance of the scheme, functional and non-functional water points, major breakdowns and financial affairs of the community organizations” (URT, 2019, s. 34(5)).

⁵ See *WSSA 2019*, ss. 47-48, and *WSSA 2009*, ss. 39-40

⁶ See *WSSA 2009*, s. 38(1)(e), and *WSSA 2019*, s. 41(1)

⁷ Notwithstanding the fact that, apparently, the *WSSA 2019* does no longer provide any support or control in the determination of tariffs for rural water supply, these duties have been indirectly reintroduced and assigned to the RUWASA by the *Water Supply and Sanitation (Registration and Operations of Community Based Water Supply Organisations) Regulations, 2019*, s. 26: “(1) The community organisation shall propose water tariff and other charges in accordance with the guidelines for tariff setting developed by RUWASA. (2) Water tariffs and other charges shall be approved by the Board of RUWASA.”

RUWASA will also have a role in the establishment process of new community organizations, as it will replace the LGAs in the provision of assistance in drafting the Constitution or Memorandum of Agreement of the organization. Likewise, it will be responsible for the approval of the Constitution, whereas the LGA will only be consulted (URT, 2019, s. 34).

Furthermore, a completely new power will be vested in RUWASA, which will be entitled to evaluate the optimal size of community organizations and, where necessary, to cluster existing COs “in order to achieve efficiency and economies of scale” upon consultation with respective COs and other relevant authorities (URT, 2019, s. 36). In this regard, the nature of this new possibility is inherently connected to a top-down approach, as the initiative of this merger belongs entirely to the RUWASA (GOT, 2019, ss. 32-39).⁸

In conclusion, RUWASA will supervise the arrangements between COs and private service providers by approving the terms of any agreement and its subsequent amendments (URT, 2019, s. 37).

Similarly, the other relevant shift of responsibilities regarding rural water and sanitation services is that from the PMO-RALG to the Minister of Water and Irrigation: this change mirrors the new institutional set-up, according to which RUWASA will take over many functions previously given to local government authorities.⁹

New governance structure of COWSOs

Another significant innovation introduced by the new WSSA regards the Community Owned Water Supply Organizations.¹⁰ The governance structure has been redesigned as shown in *Figure 2*; the single governing body¹¹, executive organ of the community organization, will be replaced by two separate boards, the *Community Water Committee* and the *Community Water Management Team*.

⁸ It is important to underline that this provision is completely different from that of clustering the demand of services by cooperating among management entities: in that *bottom-up* process, the single ME retains its full autonomy in deciding to invest part of its funds for a more efficient service provision. For further details, see Mangione R., Pozzobon C., (2019), *Rural Water Supply Management: a focus on COWSO strategy implementation, private sector participation, monitoring systems and performance of the water schemes in Iringa Region – Tanzania*, p.27.

⁹ Compare WSSA 2009, ss. 5-8, and WSSA 2019, ss. 5-8

¹⁰ In WSSA 2019 they have been renamed as “community-based water supply organizations”

¹¹ In WSSA 2009, s. 33(3): “[Management] Board” or “Committee”

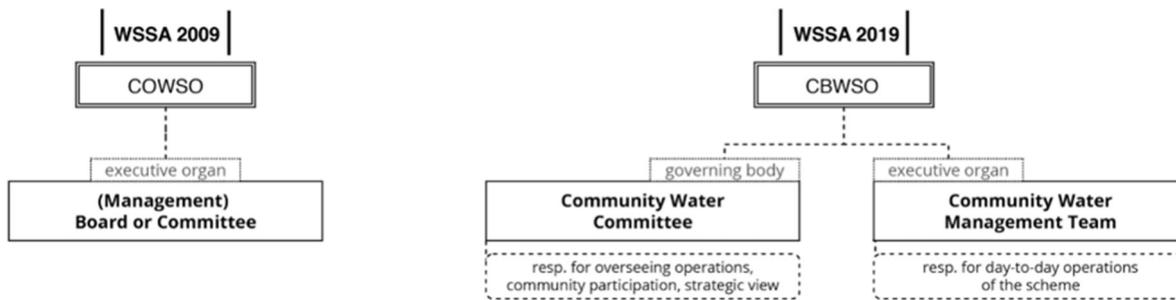


Figure 2: WSSA 2009/2019 COWSO management structure

The first is the governing body, responsible for overseeing its operations, mobilizing and sensitizing community participation in water management and, in general, determining actions aimed at facilitating the proper exercise of every function (URT, 2019, s. 34(3), and II Schedule, ss. 2(h) and 3(2)). It is composed by a Chairman and seven members, giving voice to various categories of stakeholders¹², elected by the members of the Organization, plus the Supervisor of the Organization, recruited on a competitive basis. Differently, the executive organ, responsible for day-to-day operations, will be the Community Water Management Team (URT, 2019, s. 34(4)), whose limited dimension and composition reflect its operative role of technical guidance of the water service provision. Its members are the Supervisor and the Treasurer - for each of which a standard minimum level of certified expertise has been clearly set – plus any other person belonging to the staff as the Organization deems necessary (URT, 2019, II Schedule, s. 4).

General remarks on the Water Supply and Sanitation Act 2019

We can observe that the reformed Act attempts to address some of the main challenges faced in the rural water supply.

First, the establishment of RUWASA and the rearrangement of competences aims to create a sort of *decentralized centralization*, in which supervision, coordination, and strategic planning lie with the centre, whereas day-to-day operation and service provision are carried out by community-based organizations. This model should allow overall better coordination of rural water services managed locally and supervised and supported by the national level. Such a framework hopefully overcomes the fragmentation determined by the previous conferral of many powers to local government authorities.

Then, the *two-tier* management model of community organizations – whose board is split into governance layer and executive layer – targets the issues of technical capacity of the members and

¹² Namely, educational and health institutions, Village and Ward Executive Officers, women, water users and one counsellor, see *WSSA 2019*, Second Schedule, s. 3(1)

representativeness of the various stakeholders of the water scheme area, mirroring the complexity of rural water supply sector with quite a simple management model. As regards the certified standard level of expertise required to become members of the Community Water Management Team, it can guarantee the presence of well-trained staff. Conversely, it may be not always easy to find such professional profiles for all the local schemes.

Finally, the newly adopted law targets the problem of the offences against waterworks and systems which undermine the service supply with a repressive approach, as the increased penalties are clearly aimed at discouraging misbehaviours.

Alongside the analysis of the policy and regulatory framework, a field research has been developed to understand to what extent and with which concrete actions those prescriptions have been implemented in Iringa Region. In the following sections, the methodology and some of the results of such study will be presented.

Methodology

In our research, we adopted an integrated methodological approach that joined together quantitative and qualitative aspects. The data collection was carried out between June and September 2018, whereas the analysis of the legislative sources considers all the documents released up to November 2019. The questionnaires used were drafted along the lines of the ones used in 2015 in the research investigating the same topics in Dodoma region. This choice was made together with LVIA in order to have comparable data and results.

These questionnaires were used to collect the data by conducting interviews and survey interviews at the two different administrative levels that are responsible for the implementation of the rural water supply policy. Interviews were carried out on one hand, with the representatives of the District Water Departments, which hold a coordination role, in Iringa, Kilolo and Mufindi Districts and in Mafinga and Iringa Municipalities. On the other, the local Management entities operating at Village level, where day-to-day operational activities are carried out, were interviewed.

The first questionnaire, which included 52 questions (39 closed-ended and 13 open-ended), targeted the District level; the main interlocutor was the District Water Engineer, often accompanied by another officer from the District Water Department (DWD) such as the DWE assistant or the technician of the DWD. The questionnaire was used as an outline for an interview with the DWE and the data were recorded in tables, which were prepared in advance. At the end of the planned set of questions, we left some space for an open discussion about the main challenges and the strategies that the District puts in place to face them. This questionnaire was divided into four sections:

COWSOs formation & registration, Private sector involvement in the water supply system, Monitoring and Supervision, Cooperation among management entities.

The second questionnaire, composed of 25 questions (19 close-ended and 6 open-ended), was submitted to the water management entities in the villages and to the water users. The first 20 questions were addressed to the members of the water management entities and were used as an outline for conducting survey interviews. The last 5 questions, on the other hand, directly targeted water users and they were handed out to random people met at the water distribution points (DPs). At the end of the survey interviews, some time was dedicated to the main challenges that the management entities face and the strategies they put in place to deal with them. This second questionnaire was structured around the features to be included in the construction of a performance indicator, which was one of the goals of the research.

This performance indicator was constructed as a monitoring tool by LVIA and the two students that carried out the research in Dodoma region in 2015. The indicator was built on three sub-indicators, investigating the *functionality* of the schemes to verify whether they are able to provide water, their *stability*, which assesses the long run sustainability of the water scheme, and the *satisfaction* of the water users coupled with the transparency in the *communication* of information about the water schemes to all the relevant stakeholders. Each sub-indicator was built with a composition of two elements that received different weight in the calculation of the final value; to give more weight, the value was multiplied by two.

In particular:

1. The *functionality* sub- indicator $[(DP)*2 + EM]$ included:
 - a. The percentage of functioning distribution points (DP) appropriately transformed on a continuous scale going from 1 to 5.
 - b. The existence of a bank account and/or bookkeeping activities for revenues and expenditures. This variable was called ‘Economic Management’ (EM) and took values 1 (no bank account nor bookkeeping), 2 (either bank account or bookkeeping) or 3 (both bank account and bookkeeping).
2. The *stability* sub-indicator $[(S)*2 + ME]$ was formed by:
 - a. The amount of saved money divided by the total number of DPs. This variable ‘Savings’ (S) was then appropriately transformed in a continuous variable going from 1 (the minimum amount in the sample) to 5 (the maximum amount in the sample).
 - b. The type of management entity. This value ‘Management Entity’ (ME) took values 1 (PO without contract or Village Water Council or Village Government), 2

(unregistered COWSO - in the process - or PO with a contract with VG/Water Committee) or 3 (registered COWSO or PO with a contract with COWSO).

3. The *satisfaction/communication* sub-indicator $\{[(\sum_{i=1}^n \text{Sat}_i)/n]*2 + I\}$ was composed by.
- The opinion of water users on the water supply. This variable ‘Satisfaction’ (Sat) was measured by asking the selected water users their evaluation of the service provided on a scale from 1 (very bad) to 5 (very good).
 - The sharing of the most important documents and information about the schemes’ performance among different administrative levels. The variable ‘Information sharing’ (I) takes value 1 (no sharing), 2 (either internal or external sharing) or value 3 (both internal and external sharing).
 - ‘n’ is the number of water users interviewed

These sub-indicators all resulted in a number between 0 (lowest level) and 10 (highest level) and this aspect allows them to be easily comparable. The final water schemes performance indicator is calculated by summing *functionality*, *stability* and *satisfaction/communication* sub-indicators and dividing the result by three (basically an average of the three sub-indicators).

Data analysis

In this chapter, space is dedicated to the elaboration and interpretation of the collected data both at the district and village levels. The following *Figure 3* shows the geographical location of the studied villages in the Iringa Region¹³. The sample was composed of 5 Management Entities (MEs) per district with the exception of Iringa Municipality, that is a mainly urban area, where 2 MEs were visited. As a matter of fact, in this administrative subdivision, there is an Agent per water scheme that acts on behalf of the Water Authority which is based in Iringa City and serves the whole municipality; this makes the relationship between the MEs and the communities not comparable to the rest of the sample.

As a whole, in the five districts of the Region, 22 Management Entities were visited for a total of 87 villages covered by the water schemes.

¹³ Please note that the names on the map are conventional. They can be the names of the villages in which the interviews were carried out, those where the offices of the Management Entities (ME) are placed, or the ones of the Wards of the MEs. DPs stands for “distribution points”.

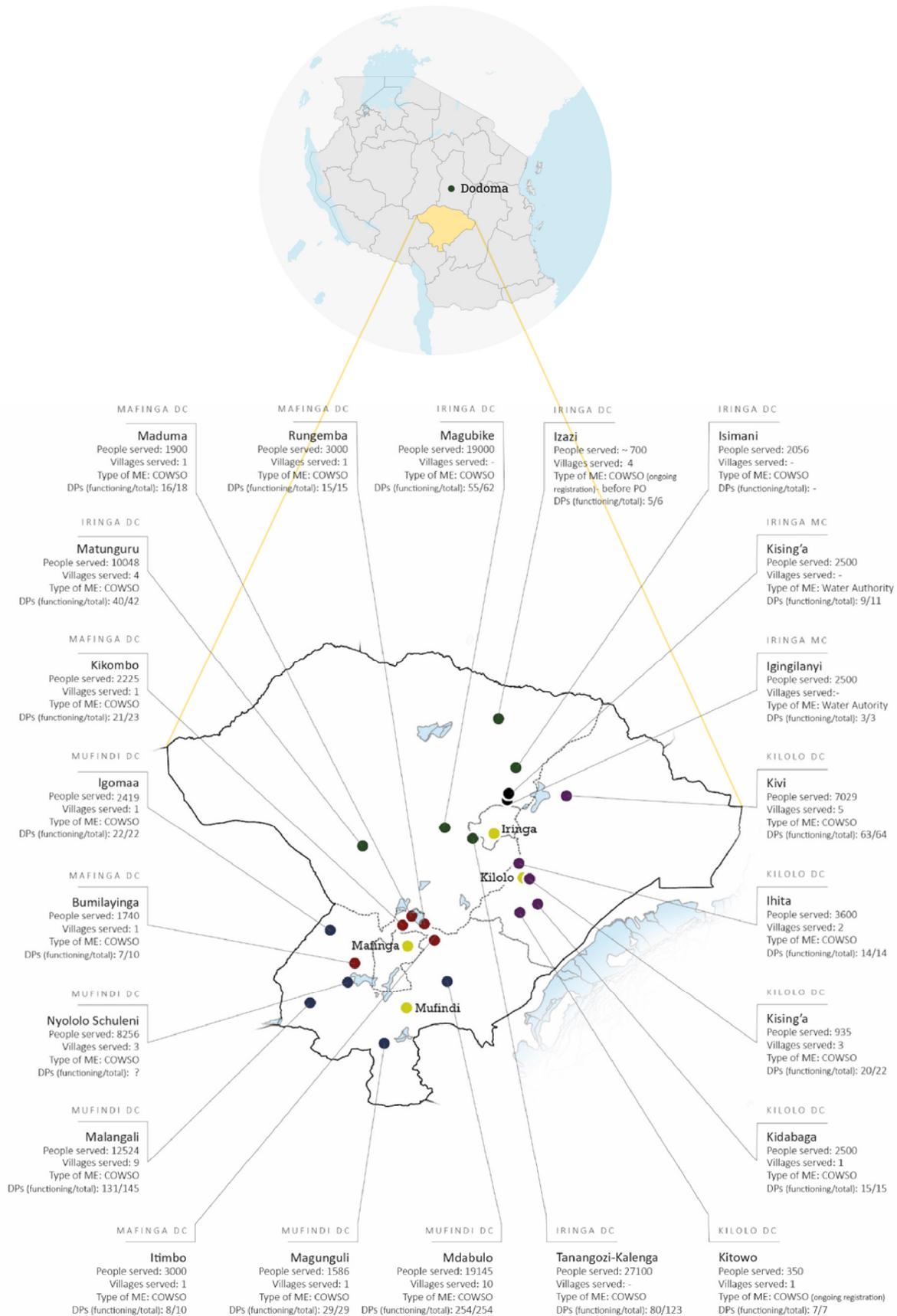


Figure 3. Geographical location of the sample

Looking at the main characteristics of Iringa region, it is located in the southern Highlands of the country bordering Dodoma, Mbeya, Morogoro, Njombe and Singida regions and its territory's elevation goes from a minimum of 900 m to a maximum of 2300 m above sea level. The overall availability of water resources in the region is quite high as it is home to the Mtera Dam and both the Little and Greater Ruaha Rivers and the large majority of water supply for human consumption is by gravity water schemes.

Moreover, Iringa presents a high percentage of fertile and arable land and agriculture accounts for 85% of the regional GDP. For this reason, it belongs to the Southern Agricultural Growth Corridor of Tanzania (SAGCOT), which represents the “food basket” of Tanzania (Chimilila, et al., 2017). Considering the demographic aspects of the region, according to the last national census of 2012, the people living in the region were 941238 and, even though Iringa is not the Tanzanian region with the highest rate of population growth, its population is growing at a rate of 1,2% annually and it is expected to double in the next 60 years. As far as the main economic activities characterizing Iringa region are concerned, as mentioned above agriculture is the most relevant sector (maize and beans and tea are the most cultivated products), followed by trade and repairs (contributing about 7,1% to the region GDP) and the livestock sector (consisting in 4,5% of the GDP). Administratively speaking, Iringa region is divided into three District Councils (Iringa District Council, Mufindi District Council and Kilolo District Council), one Municipal Council (Iringa Municipal Council.) and one town council (Mafinga Town Council). The Councils are further divided into urban wards, which are in turn subdivided into streets, and rural wards, which are composed of villages and hamlets (National Bureau of Statistics of Tanzania, 2013).

District data analysis

Main issues in COWSO policy implementation

All the District Water Engineers (DWE) underlined different problems hindering the successful implementation of the COWSO policy. First of all, the lack of financial resources; the allocated funds do not allow appropriate coverage of the costs that the District Water Department staff has to bear to reach the villages to follow and support the formation and registration process, as many are located in remote places. Also, the lack of well-trained staff and human resources is perceived as a major challenge.

As per the DWEs, another issue is the lack of awareness in some villages about the COWSO strategy and the negative local perception towards this alternative water management entity.

Villagers often do not understand the reason why they should establish a COWSO that would fix a price on water, while without it they can get water for free. Opposition from the Village Government, which does not want to give up on the control over water management, is also an issue. Lastly, a DWE underlined how this policy contains too many rules and technicalities that are too complicated for the villagers and so it is not welcomed favourably.

In order to face such problems and promote COWSO formation, the DWEs adopted different strategies, such as the provision of financial incentives, technical help or a new water scheme. Last, making sure to have a specific budget line for COWSO formation and registration, so that the resources are enough for the activity, is another strategy.

Private sector

As mentioned in the paragraph dedicated to the legal framework, the role of the private sector in the rural water supply is not thoroughly described or regulated. This fact also emerged during the data collection, as the majority of the DWEs (3 out of 4) showed to have little or no direct experience in dealing with private operators in rural water management. Nevertheless, all of them consider private involvement as a positive opportunity: they believe that private actors may guarantee better technical skills, faster decision-making processes, long-term sustainability (due to their business-oriented approach), and more effective revenue collection.

Monitoring and supervision

Through the analysis on the monitoring and supervision (M&S) plans and techniques put in place at the District level, our overall perception is that this dimension is not given adequate attention and funding. This topic was investigated by focusing on: the type of M&S (field monitoring, contact the schemes,...), the frequency of M&S activities, the kind of support provided to the single management entities, the reporting activities (from the ME to the District), and the sanctions and incentives connected to the report compliance. Only two of the four DWEs affirmed to have a monitoring plan at the district level, that include the obligation for every single water scheme to send periodic reports on the general condition of the scheme. However, such reports often fail to be prepared by the local water management bodies, resulting in poor overall M&S.

Field monitoring is the most commonly implemented form of M&S among the different district water offices (4 out of 4). On one hand, this choice is surprising as this modality of monitoring is quite costly both in terms of time and funds. In fact, it requires that the district officers physically

go to the villages' water schemes to check their conditions, problems and performance. On the other hand, a direct inspection of the sites by the district officers is the best way to verify their actual situation. Another form of monitoring detected within the area is to attend COWSO meetings and to invite their members to quarterly meetings at the district. Nevertheless, what emerged is that there are no overall standard procedures for monitoring as they are mostly carried out on scheme request or on an emergency basis. In fact, even the two DWEs who claimed to have pre-arranged monitoring plans affirmed that this activity depends much on the availability of funds, usually scarce. Focusing on the availability of funds for M&S activities, even if all the districts affirmed to dedicate a specific budget line to this aspect, not all of them proved to have pre-agreed criteria for the allocation of these funds. One interesting aspect is the way in which Iringa district manages these resources by following a Payment-by-Result (PbR) approach. Such a model aims at rewarding the best performing schemes with an incentivizing perspective. Within the M&S framework, the districts provide different types of support. All four districts carry out technical assistance to the schemes, three of them also give financial support and only one allocates specific funds for replacement material.

The DWEs were asked in an open-ended question to list three indicators of good management of the water schemes to investigate their awareness on what are the most important elements that make a water scheme function properly. Even though the other answers collected were all different, we organized them into three categories:

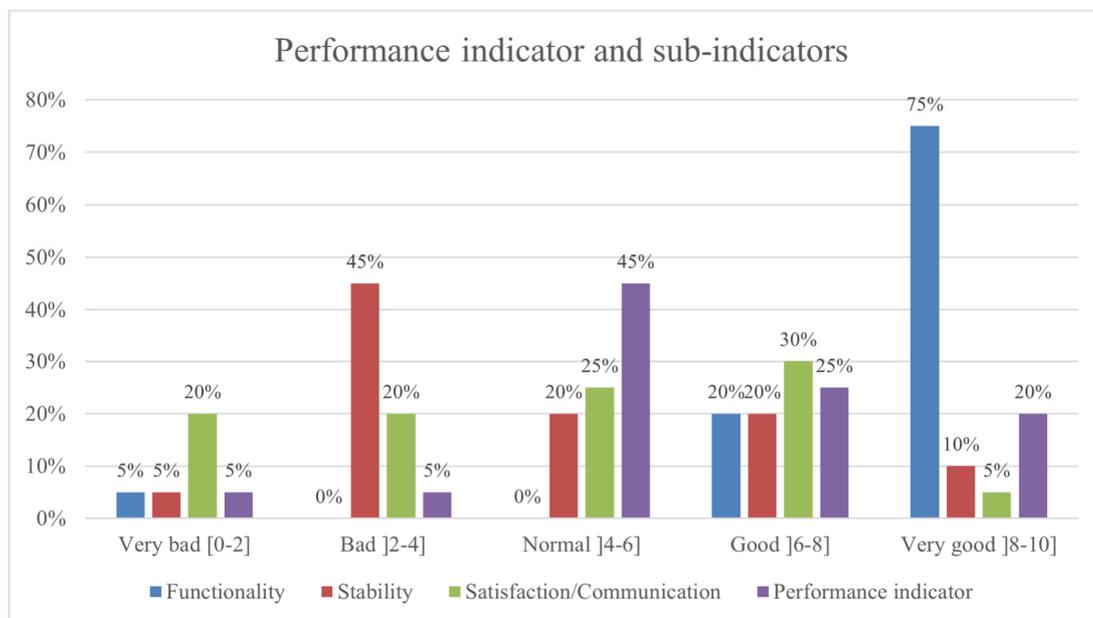
1. *Financial indicators*: having a bank account and implementing a good use of funds;
2. *Functionality indicators*: maintaining a good functionality of the scheme, having a skilled local technician and providing a satisfactory service to water users; and
3. *Participation indicators*: running the meetings both with the community and within the management entities in a proper way.

Such awareness showed that the problems in the planning and implementation of M&S activities are not linked to the lack of knowledge on the matter, rather to the absence or scarcity of financial, human and expertise resources to implement an effective M&S.

In conclusion, the monitoring and supervision approach that emerged in Iringa region resulted to be based on emergencies, losing its role of foreseeing and preventing major damages and problems of the water schemes in a long-term sustainability perspective. In fact, all the districts presented a systematic lack of standardized plans and consolidated procedures.

The data collected were used to calculate the performance sub-indicators and indicator (as explained in the *Methodology* section) and the results of the overall calculated performance of the

20 water schemes of the sample are shown in *Graph 1* together with the disaggregated data of the three sub-indicators.



Graph 1. Percentage frequency of the Performance indicator and sub-indicators of the sampled water schemes in Iringa region (20 water schemes)

What emerges is that 90% of the sampled schemes have a performance score which is “Normal” or higher, meaning that the majority of the observed local water management entities reach satisfactory levels of water supply management. However, only 20% of the schemes reach an optimal performance level, while the rest still present some critical aspects. These criticalities will be explored in the next paragraph, part of which is dedicated to the main challenges faced by the local water management entities.

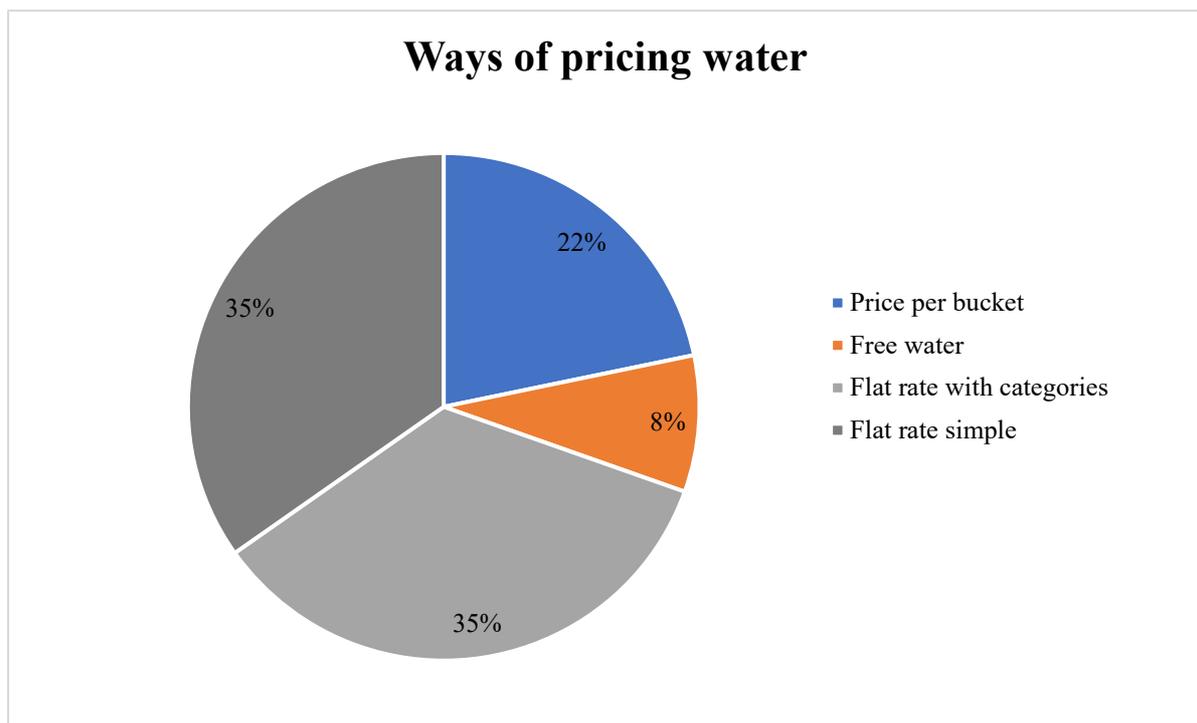
Data analysis at Village level

The collection of data at the Village level was mainly dedicated to gathering the information needed for the construction of the performance index. Nevertheless, we believe that there are three aspects that deserve to be reported and analysed in this research, as they contribute to enriching the understanding of the rural water supply system in the Iringa region. These three aspects that emerged during the interviews carried out with the 20 local water management entities are:

- the organization of the revenue collection in the villages;
- the main challenges faced by the local water management entities; and
- the strategies they adopt to solve them.

Pricing water: flat rate vs price per bucket

The field research detected two main ways of setting the price of water: on one side, there is the *price per bucket* method according to which the more water you use the more you pay. On the other, there is the *flat rate* system, namely a fixed amount of money that each water user pays on a specific time base (monthly, yearly,...) and so it leaves the users free to use different quantities of water for the same price. This second typology can be split into two sub-categories: on one side, there is a “*simple*” *flat rate*, which sets a single fixed amount of money for the village population. On the other side, there is the more complex *flat rate “with categories”*, which determines different tariffs for different types of users: for example, it can distinguish between public and private taps users, between people with different income, between the type of activity for which the water is used and more.



Graph 2. Ways of pricing water

Graph 2 shows that in Iringa region the majority of the schemes, 70% (green), adopt a flat rate system and only 22% (blue) use the price per bucket method. Looking at the average price of a bucket of water in the villages of the sample, we can see that it is 85,4 TZS, being the minimum price 20 TZS and the maximum price 500 TZS.

Then, there is an 8% (red) providing water for free and this percentage includes two water schemes: the first is run by an international NGO, which does not want the users to pay any money for water,

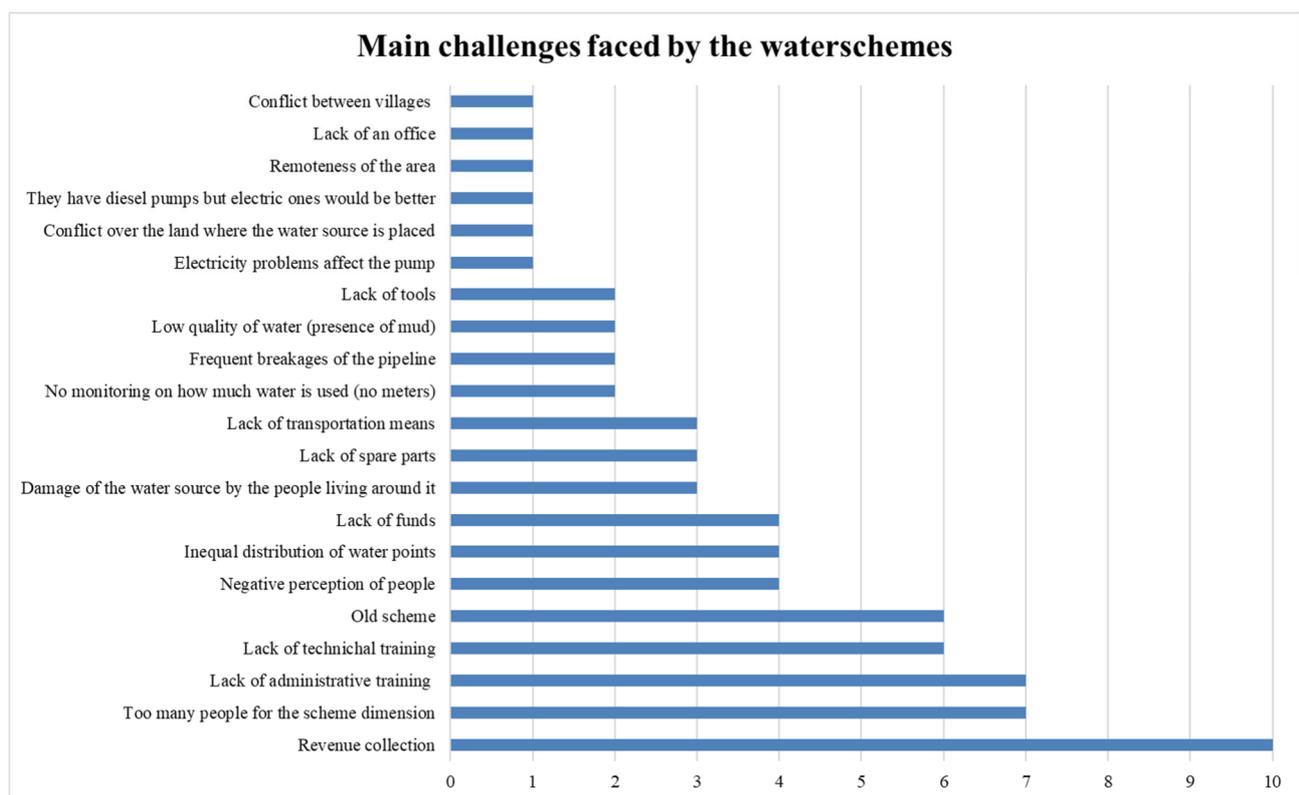
and the second was a very young COWSO, which was not yet sure about how to establish a fair price for water.

An example of a monthly flat rate with categories is that of Magunguli (Mufindi DC), where the tariffs are based on the type of economic activity that the users carry out; the more water is required for a specific activity, the more expensive is the rate.

Another interesting pricing model is that of Mdabulo (Mufindi DC) and Kising’ a (Kilolo DC), where tariffs are organized as a monthly flat rate with several categories, based on the expected capacity to contribute of the users (namely: households, persons unable to work, businesses, and institutions).

Main challenges faced by local water schemes

The main challenges in running the water schemes mentioned by the local management entities are shown in *Graph 3* below.



Graph 3. Main challenges faced by local water schemes (frequency)

In order to systematize the issues that the local management entities are more likely to face, we organized them into five categories.

First, a high number of entities cope with *financial problems* (a systematic lack of funds) mainly caused by the difficulty of carrying out an effective revenue collection. The main issue is that, as

before the establishment of the management entity people could access water for free from natural but often unsafe sources, people are now not willing to pay for water. In many villages, it is difficult to raise awareness about the importance of fetching water from secure sources and also about the necessary and unavoidable costs that are connected to the management of a water scheme which, in order to be sustainable over time, requires the contribution of everyone.

Secondly, scarce *training* has been frequently detected. On one hand, many water management entities stated that they do not have suitable knowledge in the administrative field (such as secretary and treasury skills). On the other, there is also poor technical expertise.

The third group of challenges is connected to the *structural problems* of the water scheme, which are sometimes very old and encounter frequent failures. Also, the dimension of the scheme is often not sufficient for the people living in the village and the water points are not equally distributed so that the distances to fetch water are depending on where the house is located. Another aspect is the inadequacy of the electric supply in the villages that hampers the normal functioning of the water pumps.

A further aspect is the one connected to the *technical issues* of the schemes. Frequently, there is a lack of spare parts and tools to be used in case of breakages and there is no way to monitor how much water is used as the water meters on the scheme are absent, not enough or not all functional.

Last, some management entities face challenges in dealing with the peculiar *geography* of the village and of the water source location, which are sometimes placed in remote and hardly accessible areas.

Solution strategies

An open-ended question was devoted to investigating whether the local water MEs have developed a set of strategies in order to solve the problems they face daily. Such solutions, which show the local ability to find creative answers in situations characterized by scarce resources, are:

1. The establishment of *fines and disciplinary actions* for those damaging and breaking the rules about water use and protection¹⁴.
2. *Education* of the village citizens on a series of matters connected to the rightful use of water. First, on the importance of using clean water for health and sanitary reasons. Secondly, on the raise of awareness on how the water management works and how it needs everyone to contribute to its functioning (especially in financial terms through revenues). Finally, on the

¹⁴ This aspect is often complicated, as the tightness of the interpersonal relations in the villages is very strong and so reporting, fining or punishing a member of the community becomes very costly in social terms.

environmental conservation and water source protection, to limit those human activities damaging the water sources.

3. *Encourage cooperation* among the villages served by the same scheme in terms of management and maintenance.
4. Attempt to *attract privates and donors* in investing in the water scheme.
5. Protection of the water source from human activities by *planting trees* around it.

Conclusions

The rural areas of the Iringa region can be overall considered a good gate for an understanding of several relevant features and critical aspects of rural water supply management in Tanzania.

As far as the legislative innovations carried by the new WSSA 2019 are concerned, such act introduces significant changes at all administrative levels involved in the water sector.

Clearly, the reform of the sector does not directly affect the object of this research, as it was approved some months after the data collection and the modifications described are currently being implemented. Nevertheless, it is important to acknowledge that the context observed is changing in terms of institutional set-up, responsibilities and powers of the actors involved, system of sanctions and so on. The relevance of the analysis of the legislative innovations, apart for giving an updated oversight of the legal framework as soon as it changes, lies in the fact that the reformed Act attempts to address some of the main challenges arising in rural water supply and seems to share some of the critical remarks of this research (e.g., as regards the issue of training or the lack of coordination and unitary vision over the sector).

Notably, the establishment of RUWASA renovates the institutional landscape and respective responsibilities of the various actors by introducing the model of *decentralized centralization* we previously discussed. Thus, it will require a strong commitment to making it reach all the entities operating at the margins of such a decentralized system but holding a key role in the national rural water policy. Similarly, it is clear that the deterrence measures, whose strength has been significantly increased in the newly adopted legislation, also require a set of actions aimed at improving awareness and a sense of responsibility to prevent the infringements of the rules adopted. This kind of approach implies that much attention must be devoted to fostering the sense of ownership of local communities over the water schemes so that social control can play its role in discouraging misbehaviours against such an essential common good.

Moving to the COWSO policy implementation strategy, this new management model introduced in 2009 to empower and involve communities in water supply management reached many rural areas

but with different degrees of success. Sometimes, the burden of bureaucracy and the lack of adequate resources can be a cause of the slow and uneven implementation of the COWSO model. Nevertheless, many local communities show a strong commitment to run water schemes independently regardless of the frequently adverse conditions and we encountered interesting ways of managing rural water supply, showing that community-based organizations can be effective.

Looking at the role of private actors, the actual absence of private operators in the Iringa rural areas offers the possibility to develop a system in which their potential can be harnessed for public welfare. The design of a flexible and clear regulatory framework together with the implementation of an effective control system and the provision of specific training to local COs could result in an involvement of the private sector able to safeguard the local communities and guarantee the public control over water resources and services.

Then, as far as monitoring and supervision plans and techniques are concerned, the higher administrative levels are well aware of their importance to guarantee the sustainability of the water schemes management. Nevertheless, little and discontinuous actions are undertaken in this regard, mainly because of a lack of human and financial resources. The same cannot be said about local MEs, which are not always aware of the importance of establishing M&S tools in the day-to-day operation of the schemes, as the DWEs affirmed that the reporting activity from the local management entities is very scarce or absent. Therefore, there is a need for stimulating the development and adoption of simple but efficient M&S practices, fostering an approach aimed at foreseeing and preventing technical and management problems. Generally speaking, more systematic guidance and the provision of even basic templates and training for monitoring activities are required.

As regards the main issues faced by the management entities, besides the overall chronic funding shortages, many of the difficulties stem from a lack of specific expertise that the activities require. In some cases, this limit was clearly and explicitly pointed out by the same members of the MEs, meaning that the sources of the recurring problems were clear, but the needed skills were not in place. So, this kind of awareness summed with a strong commitment to perform water management duties in the interest of the whole community can be a fertile ground to develop specific actions aimed at training and updating the knowledge of COWSO members.

In conclusion, this exploration of the rural water supply situation in the Iringa region shows a complex, multifaceted and evolving environment in a geographically restricted but significant area. We believe that many of the aspects we tried to give an overview of could be interestingly studied more in-depth in order to discover and identify innovative and effective ways to provide clean water for all.

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Acronyms

CO	Community Organization
COWSO	Community Owned Water Supply Organization
DC	District Council
DWD	District Water Department
DWE	District Water Engineer
GOT	Government of Tanzania
LGA	Local Government Authority
LVIA	Lay Volunteers International Association
M&S	Monitoring and Supervision
ME	Management Entity
MOW	Ministry of Water
MOWI	Ministry of Water and Irrigation
NAWAPO	National Water Policy
NGO	Non-Governmental organization
PBR	Payment by Result
PMO-RALG	Prime Minister Office for Regional Administration and Local Government
PO	Private Operator
PPP	Public-Private Partnership
RUWASA	Rural Water Supply and Sanitation Agency
UDOM	University of Dodoma
UNITO	Università degli studi di Torino
URT	United Republic of Tanzania
SAGCOT	Southern Agricultural Growth Corridor of Tanzania
TZS	Tanzanian Shilling
WSDP I	Water Supply Development Program - Phase I
WSDP II	Water Supply Development Program – Phase II
WSSA	Water Supply and Sanitation Act