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Utility-managed rural water services

Models, pathways, drivers, performance and areas for support

Thematic Overview Paper

Marieke Adank, Rene van Lieshout and Richard Ward

Supporting water sanitation and hygiene services for life

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List of abbreviations

AFD	Agence Française de Developpement
ANRE	National Energy Regulatory Agency (Moldova)
ARSAE	State Water and Sanitation Agency (Brazil)
CBO	Community Based Organisation
CERWASS	National Centre for Rural Water Supply and Sanitation
COPANOR	Copasa Serviços de Saneamento Integrado do Norte e Nordeste de Minas Gerais (Brazil)
CPC	Commune People's Committee
CRA	Comisión Reguladora de Agua Potable y Saneamiento (Colombia)
CU	Commercial Utility (Zambia)
CWSA	Community Water and Sanitation Agency (Ghana)
DGIS	Directorate-General for International Cooperation (the Netherlands)
DFID	Department for International Development (UK), replaced by the Foreign, Commonwealth & Development Office (FCDO)
EWASCO	Embu Water and Sanitation Company
GLAAS	Global Analysis and Assessment of Sanitation and Drinking-Water
HIC	High Income country
IBNET	International benchmarking initiative
INGO	International non-governmental organisation
JMP	Joint Monitoring Programme
LIC	Low-income country
MIC	Middle-income county
MUWASCO	Limited and Murang'a Water and Sanitation Company (Kenya)
NRW	Non-revenue water
NRWSCL	Nakuru Rural Water and Sanitation Company Limited (Kenya)
NWASCO	National Water Supply and Sanitation Council (Zambia)
NWSC	National Water and Sewerage Corporation
OFOR	Office des Forages Ruraux (Senegal)
Ofwat	Water Services Regulation Authority (England and Wales)
ONEA	National Water and Sanitation Utility (Office National de L'Eau et de L'Assainissement, Burkina Faso)
PPC	Provincial People's Committee
PPP	Public-private partnership
RURA	Rwanda Utility Regulatory Authority (Rwanda)
S.A.S	Société par Actions Simplifiée (or simplified joint stock company)
SCAP-100	Service Coverage Acceleration Project (Uganda)
SDG	Sustainable Development Goal
SDM	Service Delivery Model
SEEG	Société d'Energie et d'Eau du Gabon (Gabon)
SEOH	Société d'Exploitation d'Ouvrages Hydrauliques (Senegal)
SONES	Societé National des Eaux de Senegal (national urban water company of Senegal)
SSPD	Superintendency of Residential Public Services (Colombia)
UDUMA	Water company for water services in remote areas in Sub-Saharan Africa
WASAC	Water and Sanitation Corporation (Rwanda)
WASREB	Water Services Regulatory Board (Kenya)
WOP	Water Operator Partnership
WRN	Water Regulatory of Namibia (Namibia)
WSP	Water Service Provider

Executive summary

Urban water services are generally provided by utilities. However, utilities are also increasingly providing water services in rural areas even in low- and middle-income country contexts. Apologising for the ugliness of the made-up word, Franceys (2019) introduced the concept of 'utilitisation' to describe the introduction of utility-managed water supply in rural areas. This paper discusses the different pathways under which the 'utilitisation' of rural water supply can take place, the factors that drive these processes, the strengths and weaknesses of the resulting models of utility-managed rural water supply, and possible areas for support.

In this paper, we define utilities as legally established corporate entities, with professional (paid) operational staff as well as professional (paid) executive management, managing revenues and expenditure autonomous from local government, responsible for direct provision of water services to clients, revenue collection, operation and maintenance, and possibly roles in asset development and replacement.

In order to understand the pathways and drivers of utilitisation of rural water supply, and strengths and weaknesses of utility-managed rural water supply, this study investigated 33 cases of utility-managed rural water supply that were identified from 22 countries in Europe, the Americas, Asia and Africa. The study reveals a wide variety of models of utility-managed rural water supply along the urban-rural continuum, including urban-focused utilities, which also provide rural services, mixed urban-rural utilities, and rural-focused utilities. Under these models, utilities were found to either serve a single service area (e.g., a town, with surrounding rural areas, a district, with a mix of rural and urban areas, or a predominantly rural area), or multiple service areas (e.g., a national utility serving multiple towns and their rural areas, a utility serving multiple mixed areas, or a rural utility serving multiple rural service areas).

The paper observes three main pathways for utilitisation of rural water supply: 1) expansion of single town, regional or national utilities into rural areas through the expansion of the physical water supply scheme and management responsibilities; 2) service delivery model change, with a regional, national or a dedicated rural utility taking over the management of existing schemes which used to be managed under other (often community- or municipal-managed) service delivery models; and 3) introduction of a new utility-management model, with the establishment of a new utility to manage newly constructed rural schemes, either rural utilities serving multiple rural communities, or privately-owned and operated water schemes, serving a single or small number of rural communities.

Examples of pathway 1 include town utilities in Kenya (e.g., in Embu county and Homa Bay county), Ethiopia (e.g. towns under the ONEWASH Plus programme), and Vietnam (e.g. Hua and Hai Duong). This pathway also includes examples of regional and national utilities expanding into rural areas, including NWSC in Uganda and ONEA in Burkina Faso.

Examples of pathway 2 include regional and national utilities taking over the responsibility for rural water supply from municipal, private and community management. It includes examples of dedicated rural utilities taking responsibility for rural water service provision, as has been the case in Senegal (SEOH), Uganda (Umbrella Water Authorities), Rwanda (Byumba Local PPP Model) and Vietnam (CERWASS).

Examples of pathway 3 include the emergence of rural utilities managing multi-village schemes in Ethiopia and the ongoing efforts in Vietnam to attract private capital for developing new schemes, which are to be managed by rural utilities. It also includes examples of privately owned-and-operated facilities found, for example, in Ghana and India.

The utilitisation of rural water supply can also evolve in a country through multiple, hybrid pathways, as has happened in many Western European countries. Utilitisation processes can go hand in hand with utility consolidation and aggregation processes.

Drivers for these processes include contextual drivers, like population growth and urbanisation, and sectoral drivers, like expectations related to the services that utilities provide (improved coverage and higher service levels); their performance (higher capacity and performance, including improved cost recovery and economies of scale); and their enabling

environment (especially access to funding and finance systems). Regulatory change, bulk water, and a supply-driven approach were also found to drive utilitisation. Utilitisation can be driven by development partners, utilities themselves and/or governments. In most cases, national governments play an important role in driving the utilitisation of rural water supply, either through mandates or through stimulating and supporting utilities. These require governments to have a clear vision on how rural water services are to be provided in the future and the role of utility management in doing so.

Utility-managed rural water supply is not always synonymous with safely managed water services. Utilities in Europe, South East Asia and Latin America now tend to provide safely managed services on premises in both urban and rural areas (although this was not always the case), while the African utilities tend to provide rural water services either through a mix of household connections (potentially safely managed) and public standpipes (potentially basic), or through public standpipes only.

The paper assesses utility performance in terms of non-revenue water and operational cost recovery. The aggregated and consolidated utilities in Western Europe were found to perform well, as did the urban utilities in Vietnam and the national utility (ONEA) in Burkina Faso, which had extended services into rural areas. Low performing utilities included the rural-focused utilities in Africa (e.g., Rwanda, Kenya, Uganda, Ethiopia) and Brazil (COPANOR) and the more recently introduced regional utility models in Colombia, Croatia and Zambia.

The paper assesses systems strength based on the presence and performance of policy, institutional, financial, monitoring, capacity development and regulatory systems related to utility-managed rural water supply. Overall, town utilities and multi-area rural utilities score low on the enabling environment. Some single-area rural utilities operate in moderate to high scoring enabling environments, while others operate under low scoring enabling environments. Most national and multi- and single-area regional utilities operate in relatively strong enabling environments that score moderate to high. In general, the mapped models for utility-managed rural water supply may have relatively strong policy and institutional frameworks, but many have weak systems for regulation and sector financing. These systems are stronger in the older and bigger regional utilities in Western Europe, where consolidation and aggregation processes have resulted in large utilities with strong finance and regulatory systems.

Processes of utilitisation of rural water supply are already underway and are likely to continue and shape the sector, especially in low- and middle-income countries, over the years to come. The study provides a framework to understand these utilitisation processes and the models for utility-managed rural water supply that emerge. It provides insights into how these processes and models can be strengthened and, where needed, adapted. It suggests a number of areas for support, including:

- strengthening performance of utilities providing rural water services, through capacity support, e.g., in the form of Water Operator Partnerships;
- strengthening of national and local (policy, institutional, financial, capacity building, planning and monitoring, and regulatory) systems that enable utility-managed rural water supply;
- stimulating and facilitating discussion at sector level about the place of emerging models for utility-managed rural water supply in the sector;
- supporting equitable access to utility-managed rural water services, e.g., through studies on understanding who is being left behind and through the creation of mechanisms to mitigate this; and,
- further deepening understanding on utilitisation processes in specific contexts and using this evidence to facilitate and guide sector dialogue and advocacy.

1. Introduction

In low- and middle-income countries, urban water supply is the domain of professional utilities, while volunteer-led community management has been the focus of most efforts by governments and their development partners to manage a rapid expansion in rural water supplies. However, we increasingly observe a trend of blurring of the boundaries between these domains, with expansion of urban utilities into rural areas, professionalisation of community management, emergence of rural utilities, and expansion of regional and area-based utilities which increasingly cover rural as well as urban areas. We are aware that this trend is not exclusive to low- and middle-income countries, with many high-income countries also having gone or still going through a process of increasing utility involvement in the management of water services in rural areas.

In the period 2015 to 2020, globally the proportion of people in rural areas using safely managed water services, with improved water supply on premises, available when needed and free from contamination, increased from 53% to 60%, while in urban areas it only increased from 85% to 86% (WHO/UNICEF, 2021). At national level, safely managed water service coverage increased by an average of 0.89 percentage points per year in rural areas, while the average increase in urban areas was 0.06 percentage points per year (WHO/UNICEF, 2021). As safely managed water services are often (though not uniquely) provided through piped schemes managed by utilities, these figures confirm the trend of increased utility-managed water supply in rural areas.

These figures raise many questions. Is the trend of increased utility-managed rural water supplies a positive one? What is driving this development? Is it mostly a controlled or an organic process? What are the factors that hinder or support scaling of utility-managed rural water supply? Are utilities contributing to improving rural water services? What are the challenges related to utility-managed water supply in rural areas? Are strong systems in place that enable utility-managed rural water supply? What can we (IRC and the sector as a whole) do in order to better understand this trend and to support and strengthen utility-managed rural water supply?

The objective of this Thematic Overview Paper is to provide answers to these questions by presenting a common conceptual framework and an overview of practical models and cases of utility-management in rural areas, the processes behind the emergence of these, the factors that drive these processes and the opportunities and challenges these bring. More specifically we:

- provide an overview of the different forms of utility-managed water services in rural areas, the main trends in their development, and understand the processes that are driving these;
- assess the strengths and weaknesses of the different models of utility-managed rural water supply and the wider systems (enabling environment) in which they operate and develop; and,
- define the areas of innovation and support that are needed to support such processes, both at the level of individual utilities, and at the level of the WASH system.

In doing so, the paper aims to catalyse critical reflection and discussion in the sector on models for utility-managed rural water supply and the processes that are driving the development and application of these models, and how these can be strengthened and supported, in order to move towards ensuring safely managed services for all.

The study's conceptual framework is described in section 2. Section 3 concentrates on the methodology: the mapping and analysis of 32 utility-managed rural water supply models. The results are presented in section 4 which also includes a short introduction to the mapped models. The models are categorised according to management type and ownership of assets and the utility, and the different 'utilitisation' pathways described and the strengths and weaknesses of utility-managed rural water services assessed. Section 5 presents the conclusions of the study, and section 6 suggests areas of support.

2. Conceptual framework: defining utility managed water service provision in rural contexts

This section defines the main concepts used in this paper. It also presents the basic elements for a typology of utilities providing rural water services, the processes and pathways through which they have been established, and the factors that drive these processes and pathways.

2.1 RURAL AREAS

Countries have different definitions of what is considered rural, commonly based on settlement population size, ranging from up to 200 (as in Denmark), 2,000 (Argentina), 5,000 (India), 50,000 (Japan) or even 100,000 inhabitants (China) (Dijkstra et al., 2020). Some countries do not designate rural areas based on settlement population size, but by administrative decision. In yet other countries, the sectoral employment or provision of infrastructure and services is used to determine whether settlements should be classified as urban or rural. In the water supply sector, for example, the distinction between urban and rural areas is sometimes made according to locations falling under the service areas of specific service providers. In Senegal for example, areas under the mandate of SONES, the national urban water company, are considered urban. Any city, regardless of its size, that falls outside SONES' scope is considered rural. In 2003, the state authorised the transfer of 10 medium-sized cities (5,000 to 30,000 inhabitants) previously considered rural to the purview of SONES, in effect reclassifying them as urban (Maiga, 2015).

To harmonise global definitions of urban and rural, a new method was endorsed at the 51st meeting of the UN Statistical Commission in March 2020. Called the 'Degree of Urbanisation' , it classifies countries into three classes: 1) cities, 2) towns and semi-dense areas and 3) rural areas, instead of the traditional urban–rural differentiation and adding nuance by showing the situation of people living in this middle 'small town' category[1]. The basis for the Degree of Urbanisation is a 1 km² population grid. Rural grid cells are cells that do not belong to an urban cluster (contiguous grid cells with a density of at least 300 inhabitants per km² with a population of at least 5,000 in the cluster). Most rural grid cells will have a density below 300 inhabitants per km². Some rural cells will have a higher density, but are not part of a cluster with a large enough population size to be classified as an urban cluster. An area is defined as a rural area if the local units have at least 50% of their population in rural grid cells (European Union et al., 2020).

Dijkstra et al. (2020) found that applying the Degree of Urbanisation method to the GHS-POP global population grid resulted in an estimated rural population share of 24% in 2015, which is considerably lower than the 46% based on national definitions. The main reason for this difference is that 12 large countries, including India and China, classify towns as rural areas. China's definition does not define towns and small cities as urban if they do not exceed the urban threshold of 100,000 inhabitants. India uses a threshold of 5,000 inhabitants but combines it with other criteria, which leads to most towns being classified as rural as per national definitions.

In this paper however, where applicable, we will refer to and use the national definitions of what is considered 'rural' (which is in line with how JMP differentiates between urban and rural).

2.2 UTILITIES

Utilities can be defined in different ways. Franceys (2019) finds that the Merriam Webster dictionary provides the most helpful definition of a public utility, defining it as '*a business organisation performing a public service and subject to special governmental regulation*'.

This definition covers both utilities providing bulk water supply to other water service providers and utilities providing direct ('retail') services to water

1. For more information on town water supply, see the Thematic Overview Paper 27 on Small Town Water Services, Trends, Challenges and Models, available from: https://www.ircwash.org/sites/default/files/small_towns_top27.pdf

users. In this paper, we recognise the role utilities play in providing bulk water supply to other service providers, (e.g. municipal or community-managed water service providers), but our focus is on utilities which are providing retail water services.

In this paper, we consider the following characteristics as essential in defining a water service utility.

- It is responsible for the direct provision of ('retail') water services to clients.
- It is responsible for operation and maintenance, and possibly asset development and replacement, and collects fees from users to pay for operation and maintenance at least.
- It has professional paid operational staff, as well as professional paid executive management referred to as 'corporate oversight' by Pilgrim et al., 2007.
- It is a legally established corporate entity, with management of revenues and expenditure autonomous from local government.

While in urban areas the utility model is the dominant model for water supply (next to municipal service providers), in rural areas utility management is typically one of several service delivery models (SDMs). Other main SDMs include community managed point sources, community-managed piped schemes, municipal-managed piped schemes and self-supply.

- Under the self-supply model, individual households (or small groups of households) rather than corporate entities are responsible for their water service provision through infrastructural development and service provision.
- Under the community-managed model, voluntary community committees are responsible for managing piped schemes and/or point sources like wells, handpumps and on-spot springs. These service providers are not set up as legal corporate entities and often lack professional operational and executive management staff.
- Under municipal management, local authorities (district, municipalities) are directly responsible for provision of water services, without revenues and expenditures autonomous from the municipal administration.

With increased professionalisation of community management and increasing delegation of local government tasks to the private sector, the conceptual boundary between community or municipal management, and utility management is becoming more blurred.

2.3 CATEGORISING UTILITIES SERVING RURAL AREAS

In this paper we categorise utilities according to the following attributes:

- ownership of the assets
- ownership of the utility
- type of management model
- type of scheme(s)

2.3.1 Asset and utility ownership

The infrastructure required for providing water services can be owned by public bodies, such as municipalities (or other local government units, like districts), central government, or publicly owned utilities. Assets can also be owned by private entities, such as privately owned utilities or owner-operators of small schemes. Asset ownership determines who is responsible for development and capital maintenance of the water scheme.

Utility ownership is determined by the status of the shareholders of the utility. Shareholders can include public entities such as national, provincial, regional or local government, or private entities such as investment groups and private citizens. It can also be a mix of public and private shareholders.

2.3.2 Management models

In this paper, we differentiate between utility management models, based on the focus (urban versus rural) and extent (single or multiple) of the service areas of a utility. Figure 1 illustrates that utility-managed water supply can be found along the urban-rural continuum, with

- urban service areas limited to covering urban areas,
- urban focused service areas mainly covering urban areas but also the surrounding rural areas,
- mixed service areas, covering both urban and rural areas, without an urban or rural focus,
- rural service areas, uniquely covering rural areas, with other service providers active in the urban areas.

Figure 1 also shows that utilities can cover a single service area or can cover multiple unconnected service areas.

This paper focuses on utility-managed rural water supply, and thus looks at the urban-focused, mixed and rural models.

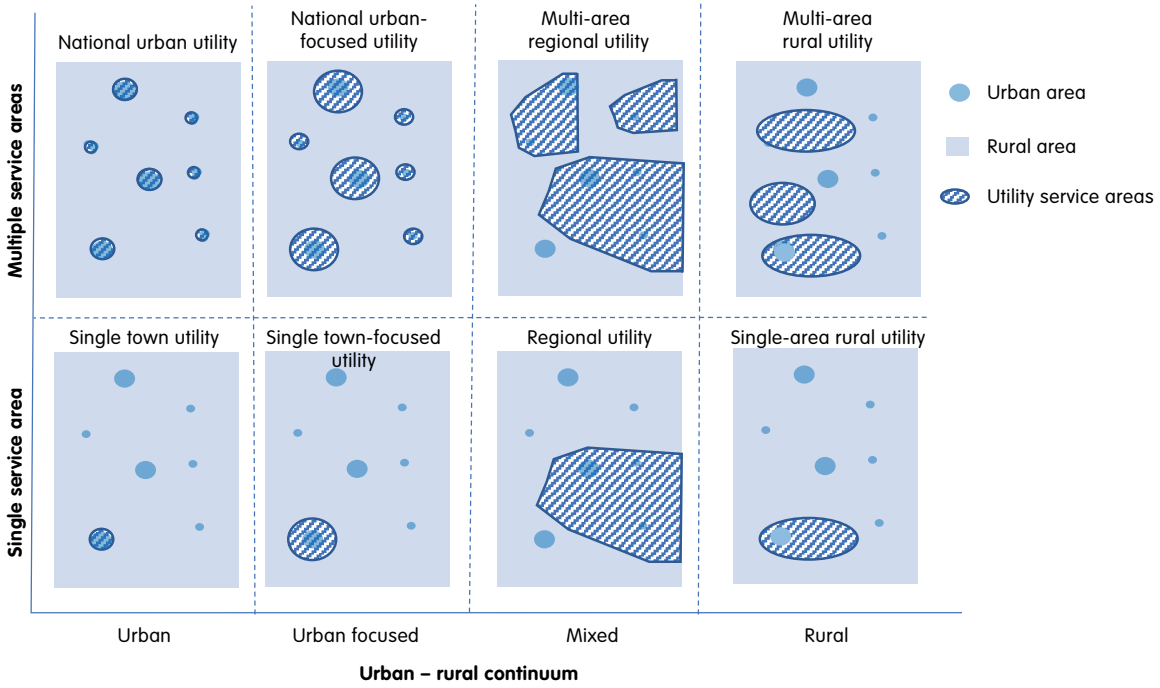


FIGURE 1: UTILITY MANAGEMENT MODELS

2.3.3 Scheme type

Utilities mostly provide water services through piped networks, with household connections and/or public standpipes or networked kiosks. However, utilities can also provide rural water services through on-site water kiosks or boreholes fitted with handpumps.

2.3.4 Service delivery models for utility-managed rural water supply

Combinations of the attributes described above result in different service delivery models of utility-managed rural water supply. Figure 2 shows possible combinations of characteristics of utility-managed service delivery models providing water services in rural areas.

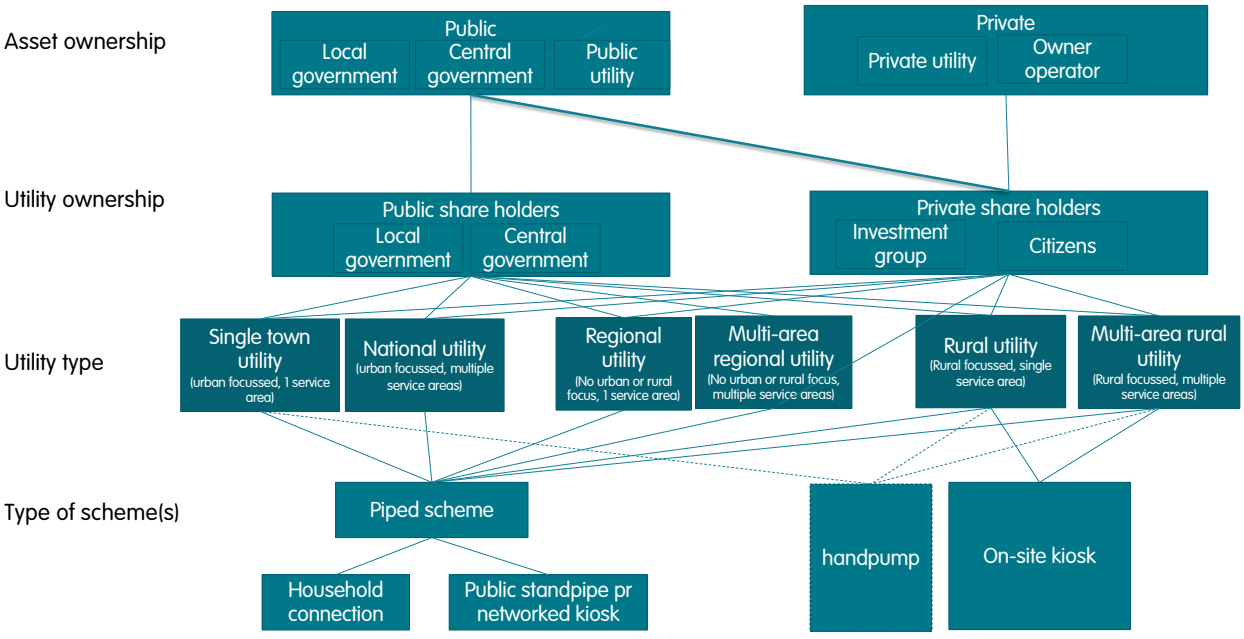


FIGURE 2: MAIN SERVICE DELIVERY MODELS FOR UTILITY-MANAGED RURAL WATER SUPPLY

2.4 'UTILITISATION' PATHWAYS

There are different pathways that lead towards utility-managed water supply. Apologising for the ugliness of the made-up word, Franceys (2019) introduced the concept of 'utilitisation' to describe the introduction or evolution of utility-managed water supply for serving rural areas.

In this paper, we conceptualise the 'utilitisation' pathways based on whether the introduction of a utility-managed water supply in rural areas involved creating a new infrastructure, and whether it involved the establishment of a new utility or not. An overview of these conceptual pathways is presented in Table 1 and described below.

Pathway 1: Scheme expansion into rural areas. Under this pathway, utility-managed water supply is introduced into rural areas through a process of expanding the service area of urban/town utilities involving expanding piped schemes or constructing (independent) piped schemes or water points (e.g. boreholes).

Pathway 2: SDM change. Under this pathway, the management of existing schemes in rural areas is transferred from community or municipal management to utility management. This transition can involve a management take-over by an existing utility, or the establishment of a new utility. A transition from community to utility management can take place through professionalising community management and its transition towards a newly established utility (as a legally established corporate entity with professional and paid operational and executive staff), or through a take-over of the management responsibilities of a community management body by an existing utility. A transition from municipal to utility management can involve a transition from a municipal department to a professional municipal water company with ring-fenced funding, or a transition from municipal management to utility management, for example when municipalities or groups of municipalities delegate management of water supply schemes to a utility.

Pathway 3: Introduction of a new SDM. Under this pathway, a new utility is set up to provide rural water services through a newly implemented scheme. This includes both the set-up of rural utilities for managing newly implemented piped water schemes, commonly covering multiple rural communities, as well as the introduction of privately-owned and operated water kiosks, with or without small-piped schemes, serving a single or small number of rural communities.

2.5 DRIVERS FOR UTILITISATION

In this paper, we consider the factors that have driven utilitisation in different contexts. These include both contextual and systemic (sector specific) factors related to the WASH sector. Different actors, like national governments, development partners and utilities themselves, may be key in driving utilitisation processes. Similar to utility aggregation processes as described by the World Bank (2017), utilitisation of rural water supply can be a result of a process that was mandated by government and/or development partners, either with or without financial support. It can also be the result of a voluntary process, with utilities themselves driving it. Governments and development partners can incentivise such voluntary processes by providing subsidies, funding, or technical assistance.

TABLE 1: SUMMARY OF PATHWAYS

Pathway	Description of pathway	Infrastructure construction	Establishment of a new utility
Pathway 1	**Scheme expansion** into rural areas	Yes - Expansion of existing scheme or construction of new schemes to be managed by existing utility	No
Pathway 2	**Service Delivery Model (SDM) change:** Set up of a new or introduction of an existing utility to manage existing rural water schemes	No (or limited to rehabilitation)	No
		No	Yes
Pathway 3	**Introduction of a new SDM:** Construction of rural scheme and establishment of a new utility	Yes - Construction of new scheme to be managed by new utility	Yes

3. Methodology: Mapping and assessing utility-managed rural water supply models

This section presents the methodology applied for describing and assessing models for utility-managed rural water supply and utilitisation processes.

In order to gain an understanding of the models, pathways, strengths and weaknesses of utility-managed rural water supplies, examples of utility-managed rural water supply models from different countries have been identified, mapped and assessed based on available secondary data and information.

The mapping focused on utility-managed rural water supply models which adhere to the definition of utility management as discussed in section 2. Models involving highly professionalised community management without either a legal corporate entity or professional and paid operational and executive staff (as for example observed in Paraguay and India), were excluded. Models of community management, supported by entrepreneurs providing professional maintenance (like the FundiFix and Whave models in Uganda), which are sometimes indicated as rural 'utilities' have also been excluded from this study as community-based organisations, rather than corporate entities, are responsible for water service provision to clients.

Secondary data and information were collected on each of these models in order to:

1. Categorise the models, based on the attributes introduced in section 2 (Asset ownership, Utility ownership, Management model, Type of scheme);
2. Identify the utilitisation pathways that resulted in the model; and
3. Identify the factors that drove the utilitisation which resulted in each of the models.

Secondary data was also used to assess each model in terms of:

1. scale of application;
2. level of service provided;
3. utility performance; and
4. strength of the related enabling environment.

To assess the **scale** at which the model has been applied, an estimate was made of the proportion of the rural population in each country served under each model.

The **level of service** provided under each mapped model was assessed according to the means through which water users access water services. This can be through household connections; public standpipes connected to piped schemes; point sources such as handpumps; non-networked water kiosks; or a mix of these.

To assess **utility performance** related to each model, we used the non-revenue water rate as a proxy for assessing operational and managerial capacity. In a poorly performing utility, the non-revenue water (NRW) ratio is likely to be high (Soppe et al., 2018), reflecting high physical and commercial losses. Furthermore, we assessed utility performance based on operational cost recovery of utilities under the models. Secondary data was collected and analysed according to these two key performance indicators and was scored as follows:

- Non-revenue water: Scored 3 when below 20%, scored 2 when between 20% and 40%, scored 1 when higher than 40%.
- Operational cost recovery ratio: Scored 3 when higher than 1.2, scored 2 when between 1 and 1.2 and scored 1 when lower than 1.

To assess the **enabling environment** related to each model, we used an assessment framework which includes the following building blocks of the system:

- Policies: Are there clear policies related to utility-managed rural water supply?
- Institutional: Are roles and responsibilities for rural water supply and the role of utilities in this clear and are they in place?
- Sector financing: Do utilities have access to funding and financing for ensuring rural water service provision?
- Planning, monitoring and review: Are frameworks in place for planning and performance monitoring of utility-managed rural water services?

- Capacity development: Are there systems and structures in place for ensuring capacity development of utility staff (related to the provision of rural water services)?
- Regulation: Are regulatory frameworks and systems in place for regulating utility-managed rural water services?

These assessments were based on data and information from case study examples (from secondary data sources and from the database of the international benchmarking initiative (IBNET)).

4 Results

This section presents the results of the mapping of models of utility-managed rural water supply. It describes the models mapped, the pathways followed and the factors that have driven these.

4.1 INTRODUCTION TO THE MAPPED MODELS

Table 2 introduces the models for utility-managed rural water services identified and mapped for this paper. The models were mainly identified through a review of sector literature. IRC country staff also played a vital role in identifying potentially interesting models. The mapped models are by no means an overview of all the models of utility-managed rural water supply in the world, but are believed to be a good overview of different types of models in different geographic locations.

In total, 33 models from 22 countries from different geographic regions (seven European, two South American, two Asian, and 11 African countries) were mapped and assessed. These countries include five high-income countries, six upper middle-income countries, six lower middle-income countries, and five low-income countries. As shown in the table, multiple models of utility-managed rural water supply can be found in some countries (e.g. Kenya, Vietnam, Ethiopia, North Macedonia).

TABLE 2: OVERVIEW OF CASES

Country	Model	Short description of the model
High income economies		
England and Wales	Private regional companies	10 private regional water and sewerage companies and 13 mostly smaller private 'water only' companies supplying service areas covering a mix of rural and urban areas.
Croatia	Multi-city and municipal companies	84 large multi-city companies and 55 small municipal companies, each group serving both towns and rural areas. Ongoing aggregation process, which is planned to culminate in aggregation of the local utility companies into around 20 regional providers, generally along county borders.
Netherlands	Public regional water companies	10 Public Limited Companies supplying urban and rural areas.
Portugal	(Multi-) Municipal companies under private law	Water companies established under private law, including multi-municipal companies majority-owned by Águas de Portugal and other municipal companies established under private law.
France	Inter-municipal utilities	12,400 municipalities and inter-municipal utilities delegating operations of urban and rural water supply to predominantly three large operators: Veolia, Suez and SAUR.
Upper middle-income economies		
Brazil	COPANOR	A rural subsidiary company of the urban state utility supplying 239 rural localities.
China	Sichuan Water Supply and Sanitation PPP	Sichuan Water Supply and Sanitation PPP Project plans to establish a modern water supply and sanitation utility through a 25 year performance-based investment and management contract.
Colombia	Regional companies	Public Service Companies provide public services, mostly in urban areas, with some expansion into rural areas. The goal is for regional companies to serve both urban and rural areas.

TABLE 2: OVERVIEW OF CASES

Country	Model	Short description of the model
Gabon	SEEG	Société d'Energie et d'Eau du Gabon (SEEG) is a national private operator, majority (51%) owned by Veolia, responsible for providing piped water services and electricity in two cities and 32 rural areas.[2]
Namibia	NAMWATER	Water company NAMWATER provides bulk water services to municipal-managed service providers and industries, but also increasingly to rural individual customers who are near their pipelines.
North Macedonia	Town water utilities	Extension of service areas of many of the approximately 70 public municipal utilities, originally constructed for specific cities or town, into rural areas.
	Regional utilities	Three regional water supply systems (Studencica, Lukar, Debar) serving towns and rural areas.
Lower middle-income economies		
Ghana	CWSA as rural utility	Transition of the Community Water and Sanitation Agency (CWSA) from a facilitator and regulator of rural water supply into the national utility for rural water supply, which will operate parallel to the Ghana Water Company Ltd, the national utility responsible for urban water supply in Ghana.
	Safe Water Enterprises	Construction and operation of rural water facilities by INGOs or social entrepreneurs. Examples are Safe Water Network water stations and Water Health water kiosks.
Kenya	Town WSPs	Town utilities expanding their services into rural areas e.g. Embu Water and Sanitation Company (EWASCO) Ltd and Murang'a Water and Sanitation Company (MUWASCO).
	Rural Water Company	Nakuru Rural Water and Sanitation Company Limited (NRWSCL) is a water service provider (WSP) which provides water services in rural areas as opposed to other WSPs which supply urban areas.
Moldova	Regionalised apa-canals	Three regionalised water service providers as a result of rural municipalities delegating the management of their water services to urban utilities as part of the regionalisation drive promoted by the Moldovan Government and its international partners, and with support from the Swiss ApaSan project.
Senegal	OFOR and SEOH	OFOR, as the asset holding company for rural water contracts operator SEOH, provides rural water services in several areas.
Vietnam	Town utility extension	Investment of town utilities in expanding services into rural areas e.g. Hai Duong and Hua utilities.
	Provincial branches of (CERWASS)	Provincial CERWASS (Centre for Rural Water Supply and Sanitation) branches act as investor and owner, operator, service provider, or communicator and advisor for rural piped schemes.
	Joint stock companies (Red River)	The World Bank funded Red River Delta Rural Water Supply and Sanitation Project piloted joint stock companies. Four companies were established. The original plan was that these companies would outsource operations to the private sector through five year operation and maintenance contracts. However, no bids were submitted by the private sector. As a result, the provincial companies themselves manage operations and maintenance.
	Private owner-operators	Entities that have invested private funds in a water system and own and/or operate the system under a formal or informal agreement with a Provincial People's Committee (PPC) or a Commune People's Committee (CPC).
Zambia	Regional commercial utilities (CU)	11 regional commercial utilities (CUs) primarily serving urban and peri-urban areas. Some of the CUs' licensed operating areas include rural areas (e.g. Manyinga in North-Western Province, Masaiti in Copperbelt Province and Mwense in Luapula Province).
Lower income economies		
Burkina Faso	ONEA	Office National de l'Eau et de l'Assainissement (ONEA) is an urban utility serving 43 cities and towns throughout the country, expanding its services into rural areas.
	UDUMA	A Société par Actions Simplifiée (S.A.S. or simplified joint stock company) which operates and manages manual pumps and small piped networks in rural areas. The UDUMA concept has been piloted in Burkina Faso in collaboration with UNICEF.
	Private rural utilities	Four private utilities with affermage contracts with municipalities serving 115 rural communities. Each utility manages a regional cluster of rural piped schemes.

2. In February 2018, the Government of Gabon terminated SEEG's public service concession.

TABLE 2: OVERVIEW OF CASES

Country	Model	Short description of the model
Ethiopia	Rural water supply by Harar utility	Utility of the Eastern Ethiopian city of Harar, which is responsible for serving both urban and rural people in one of the country's smallest regional states, the Harari People's National Regional State through a dedicated department responsible for implementing and maintaining water schemes (including handpumps) in rural areas.
	Small town extensions into rural areas	Town water utilities extending services into rural areas through public standpipes, as piloted under the ONEWASH Plus programme led by UNICEF (2014-2020) in six small towns.
	Rural utilities	Rural utilities for management of multi-village piped water schemes.
Mali	UDUMA	A Société par Actions Simplifiée (S.A.S. or simplified joint stock company) which operates and manages manual pumps and small piped networks in rural areas. UDUMA is implemented in Mali in collaboration with SNV, Agua for All and Akvo.
Rwanda	Byumba Local PPP Model	Local public-private partnerships with districts competitively bidding for and signing contracts with private service providers.
Uganda	NWSC	National urban utility with extension into rural areas, as implemented for example under its 100% Service Coverage Acceleration Project (SCAP-100) programme.
	Umbrella Water Authorities	Six regional public entities managing town and rural piped schemes not managed by the National Water and Sewerage Corporation (NWSC).

4.2 CATEGORISATION OF MODELS FOR UTILITY-MANAGED RURAL WATER SUPPLY

Based on their focus – urban versus rural – and extent of their service areas, the different models identified above can be categorised, as shown in Figure 3.

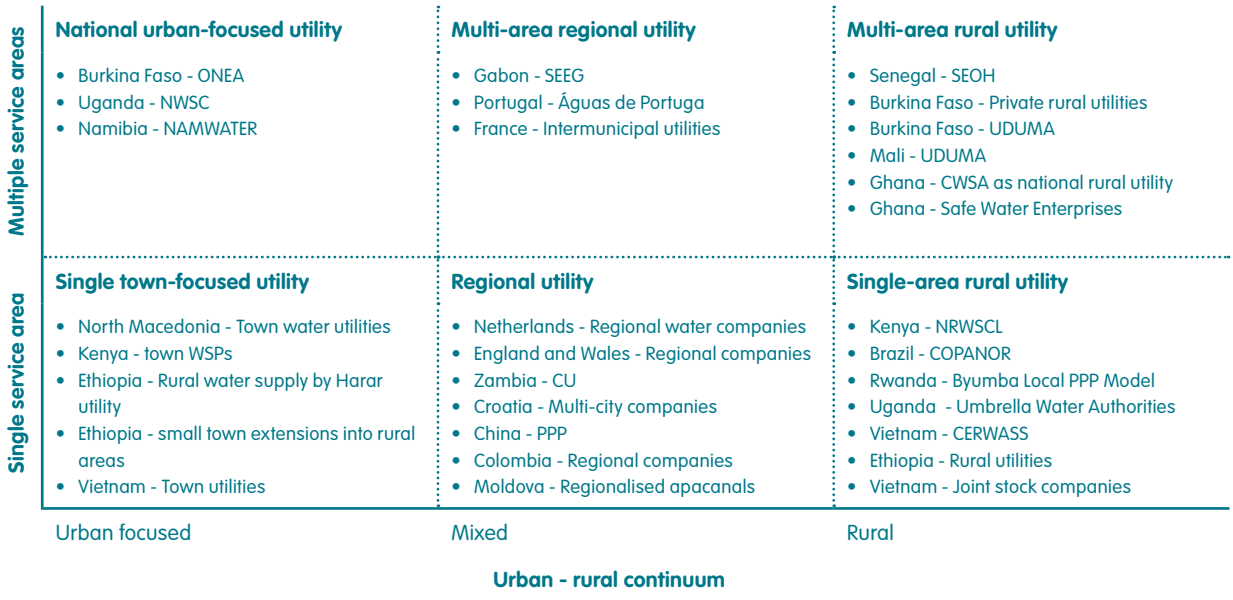


FIGURE 3: UTILITY-MANAGED RURAL WATER SUPPLY MANAGEMENT MODELS

4.3 ASSET AND UTILITY OWNERSHIP

In the majority of the mapped models, the **ownership of utility assets is in public hands**, i.e. central government, local government like municipalities, districts, regions or provinces, or publicly-owned utilities. Asset ownership by central government is mostly related to national or regional utilities, like the water companies under private law in **Portugal**, ONEA in **Burkina Faso**, and SEEG in **Gabon**. Asset ownership by local government can be related to different models, like the delegation model in **France**, the regionalised apa-canals in **Moldova**, the CWSA model in Ghana, the COPANOR model in **Brazil**, the Byumba Local PPP Model in **Rwanda** and the CERWASS model in **Vietnam**. Asset ownership by publicly owned utilities is mostly related to national or regional utilities, such as NWSC in **Uganda**, NAMWATER in **Namibia**, public regional water companies in **the Netherlands**, NRWSCL in **Kenya** and the SEOH model in **Senegal**, where assets are owned by the state utility OFAR (Office des Forages Ruraux).

In many cases where assets are publicly owned, **ownership of the utility itself is in public hands** as well. Utilities can be state owned, such as the Umbrella Water Authorities and NWSC in **Uganda**, ONEA in **Burkina Faso**, and the companies under private law in **Portugal**. They can also be owned by local government such as in **Zambia** where local authorities are the sole shareholders of the CUs and the WSPs in **Kenya**. In the case of public regional water companies in **the Netherlands**, shares are held by national, provincial and municipal governments. Public utility ownership can facilitate access to funds or banks that are only available to public sector actors. An example are Dutch utilities that access funds from the public NWB Bank (Netherlands Water Boards Bank).

Operational tasks can also be delegated to privately-owned entities through contractual arrangements. This is the case in **France**, where most municipalities and inter-municipalities delegate operational tasks of water supply to one of the three major private companies: Veolia, Suez or SAUR. Similarly, in **Rwanda**, local government engages the private sector operating small piped schemes. Private operators can be engaged for single or multiple schemes. For example, Aquavirunga Ltd (owned by AQUARWANDA Ltd (49%) and NV PWN Water Supply Company in the Dutch province of North Holland (51%) has PPP contracts with Rubavu, Musanze and Nyabihu districts. Under the UDUMA model, local government in **Burkina Faso** (on pilot basis) and **Mali** contract the private sector entity UDUMA to manage handpumps and small piped schemes in rural areas.

In **Vietnam**, various utilities providing urban and/or rural water services are set up as joint stock companies. In these cases, shareholders can include government, utility staff, customers, and private investors.

Assets and utility ownership can also both be fully private. The model in **England** and **Wales** is the only known example of fully privatised water supply. Here, assets are owned by a privately-owned utility. In the England and Wales model, the transfer of assets to the private utilities was only done after a long transition from individual local council services provision, with various steps of aggregation over time, to achieve ever more economies of scale along with access to major water resource developments. Privatisation has been seen as the key to ensuring additional investment and management capability to deliver ever improving service quality and efficiency. Strong regulatory systems and capacities, like the ones in place in England and Wales, are prerequisites for high levels of private sector involvement in public services.

In addition, private owner-operators own the assets they develop and operate. Examples of private owner-operators providing rural water services include the safe water enterprises in **Ghana** (and India), which supply rural areas through NGO funded onsite water kiosks (with or without small piped networks), and the private owner-operators of rural piped water schemes in **Vietnam**.

When asset ownership is not clearly defined, roles and responsibilities related to asset renewal and asset expansion into rural areas are not clear either. It can present challenges related to accessing financing. The 2016 audit report of the Embu Water and Sanitation Company Limited (EWASCO) states for example '*Water asset ownership has yet to be determined and this is a challenge to accounting and borrowing leverage*'.

4.4 UTILITISATION: PATHWAYS TOWARDS UTILITY-MANAGED WATER SUPPLY IN RURAL AREAS

Section 2 introduced three conceptual pathways for the utilitisation of rural water supply. This section describes and analyses the pathways taken by the mapped models of utility-managed rural water supply. Figure 4 provides an overview of pathways taken by different models and the scale at which they are applied, in terms of the proportion of the rural population served under the model.

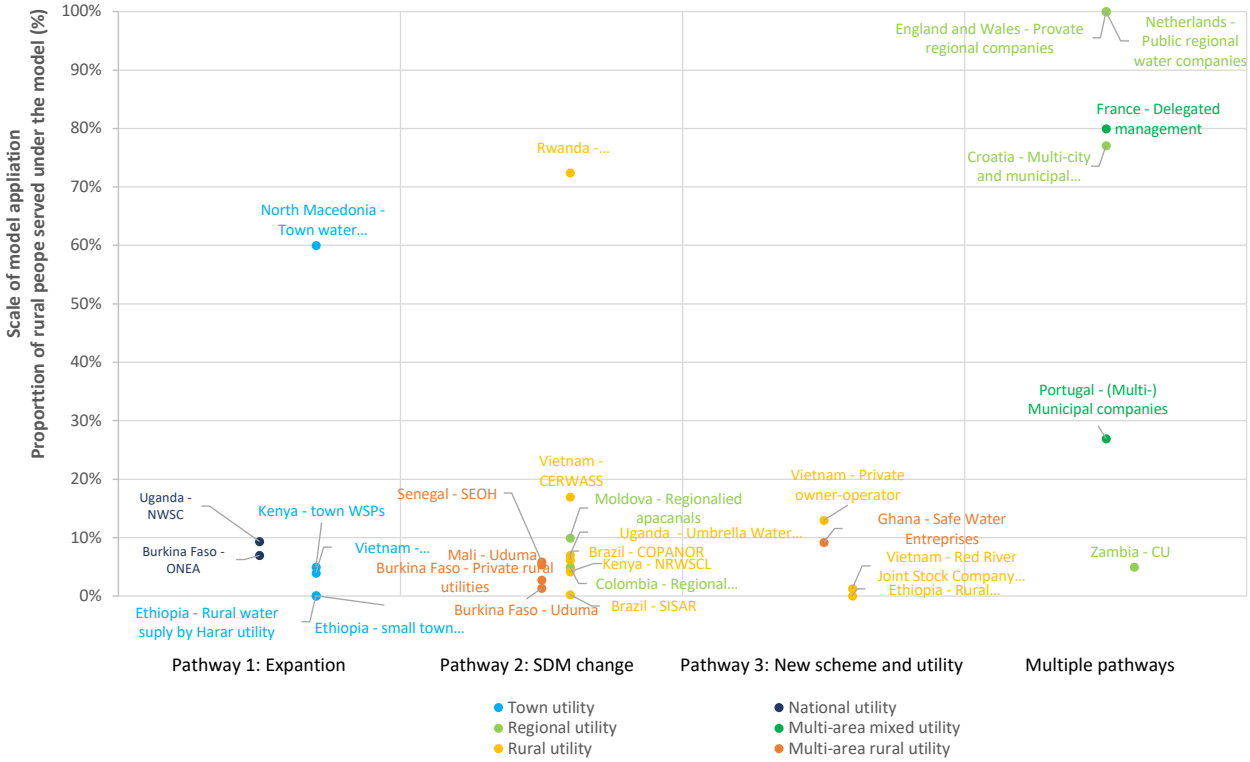


FIGURE 4: PATHWAYS, MODELS AND SCALE OF APPLICATION

4.4.1 Pathway 1

The first pathway concerns existing utilities which have expanded their traditional urban service areas to include rural areas. As shown in Figure 4, this pathway has been taken by national utilities as well as town water utilities.

National (urban-focused) utilities like ONEA in **Burkina Faso** and NWSC in **Uganda** have relatively recently started expanding services into the rural areas surrounding their urban service areas. This has not yet led to the application of the model at scale. In Burkina Faso, ONEA has mainly expanded its service area by providing bulk water supply, especially to the informal, peri-urban areas around the country's capital, Ouagadougou. Four private companies manage the water distribution. This model was introduced some 10 years ago and is currently being scaled up. In Uganda, NWSC expanded its services through its 100% Service Coverage Acceleration Project (SCAP-100) programme, in which it planned to supply 12,000 villages through installing an additional 140,000 new connections and 20,000 public standpipes between 2017 and 2020. In November 2020, NWSC tweeted that 5,509 new villages had been covered to date. Assuming that the utility reached an average of 570 people in every village (70 through household connections and 500 through public standpipes), the total number of additional rural people served with utility-managed water supply amounts to about 3.1 million, or 9% of the rural population.

Models of single-town water utilities which have started supplying their surrounding rural areas with water services include:

- town water service providers in **Kenya** (EWASCO in Embu county and HOMAWASCO in Homa Bay county as examples);
- town water utilities in **Ethiopia** which have started piloting connecting public water points to urban piped schemes to serve rural areas;
- cities in **Vietnam** such as the Hai Duong utility which used its own capital and commercial loans to invest in building schemes for nearly 20 rural communes in the area in 2012-2013.

However, these tend to be incidental cases which have not yet resulted in utility-managed rural water supply at scale. The utilities in these models serve less than 10% of their rural populations. An exception is **North Macedonia** where many of the 70 public municipal utilities, originally established for specific cities or towns, have extended their service areas to meet the water demands of the surrounding rural areas.

4.4.2 Pathway 2

The second pathway concerns service delivery model change, with existing or newly established utilities taking over the management of existing infrastructure originally managed by community-based entities or directly by local government.

Rural utilities serving a single service area which have been formed through this pathway include the following:

- The State Water Company COPANOR in **Brazil**. COPANOR was established in 2006 by the government of Minas Gerais as a subsidiary of the urban utility COPASA, to be in charge of rural water supply provision. As such it has taken over small rural systems previously run by local associations and local government. COPANOR is a unique case in Brazil. Its service area covers about 6% of the rural population of the state Minas Gerais and 1% of the country's rural population.
- The Nakuru Rural Water and Sanitation Company Limited in **Kenya**. NRWSCL is a unique case of a dedicated rural water utility in the country which was incorporated under the Company's Act Cap 486 in 2006.
- The six umbrella organisations in **Uganda**. These were formed in 2016, having evolved from the previous technical support system of regional umbrella organisations to local community and private service providers, into a system of regional umbrella water utilities which contract the service delivery to the same or new operators. They currently manage about 440 piped water supply schemes, serving about 2.5 million people (about 7% of the country's rural population).
- Utilities under the 'Byumba model' in **Rwanda**. This PPP model for rural water supply first emerged in Rwanda in Byumba Province in 2002 and has since become an important model for rural water supply nationwide. By 2015, the Water and Sanitation Corporation (WASAC) estimated that some 462 of the country's 638 rural water schemes (72%) were under PPPs, with variations ranging from simple operation and maintenance contracts between a district and a small company for one single water supply source, to complex lease agreements for extensive piped networks with international companies like Aquavirunga. (Balfour, 2015).
- The provincial branches of CERWASS in **Vietnam**. These were manly established in the 1990s and manage about 45% of rural piped schemes (SNV, 2010).

Rural utilities formed through pathway 2 which cover multiple service areas include the following:

- SEOH in **Senegal**. In 2015, SEOH took over the management of some 14 rural drinking water systems (13 surface water systems in the north and one ground water system in the middle of the country), which had previously been managed under community management. It provides water services to some 500,000 customers.
- UDUMA in **Burkina Faso** and **Mali**. UDUMA was created in 2015 as a subsidiary of the Odial Solutions Group. Piloting of the UDUMA concept started in Burkina Faso (with UNICEF funding) in 2016 and the model has been implemented in Mali since 2018. Under this model, UDUMA has entered into contracts with local government for the management of handpumps and small piped schemes in rural areas, which were previously under community management.
- Private operators for managing rural piped schemes in **Burkina Faso**. This model has been developing since 2005, when it was implemented with support from Agence Française de Developpement (AFD). Under this model, private operators are contracted by municipalities under affermage contracts to operate and maintain rural piped schemes. There are currently four private operators managing 115 of the country's 853 small rural piped schemes, most of which were previously under community management.

The SDM change pathway also resulted in regional utilities. Examples can be found in Moldova and Colombia.

- **Moldova**, where as part of the regionalisation drive promoted by the Moldovan Government and its international partners, the Swiss ApaSan project (2008-2019) supported the creation of three regionalised water service providers by supporting some rural municipalities in delegating the management of their water services to urban utilities.
- **Colombia**, where community management is still the main model for rural piped scheme management, but where a regionalisation process has been driving utilities to take over management responsibilities from community-based organisations since 2012.

Like the models which resulted from pathway 1, the ones resulting from pathway 2 have not fully gone to scale yet, with most models covering less than 10% of the rural population. One exception is the local PPP model in **Rwanda**, which started in 2002 with local government delegating operational tasks to private operators. Following that local experience, the

Government eventually abandoned its policy of community management and in 2004 decided to promote local PPPs in line with the 'Byumba model'.

4.4.3 Pathway 3

The third pathway concerns the construction of a new independent scheme managed by a utility. Figure 5 only shows a few examples of utilities having been established through this pathway. Examples include the following:

- The setting up of rural utilities to manage newly constructed multi-village schemes in Ethiopia, following the launch of the guideline for Rural Public Utilities for multi-village water supply in 2018 (currently in the pilot phase).
- The emergence of privately owned-and-operated rural schemes since the late 2000s.
  - Safe water enterprises found in **Ghana** and India. In Ghana, these include some 142 schemes implemented and managed by organisations like Safe Water Network, Water Health, and the Maji project that serve some 1.2 million people (about 9% of the country's rural population) (Safe Water Network, 2017).
  - Private owner-operators managing small-piped schemes in rural **Vietnam** serving 13% of rural water supply systems (Directorate of Water Resources, 2018, in Grant et al., 2020).

This pathway has so far not resulted in utility-managed models supplying rural areas at scale.

4.4.4 Hybrid and mixed pathways

Under some of the mapped models, utility-managed water may have been the result of different pathways. In Vietnam for example, private owner-operators were encouraged by the Government to invest in and construct rural water facilities, especially piped water supply systems. This encouragement extended to taking over government and community-based schemes, as well as establishing new schemes in areas that are currently unserved (Grant et al., 2020).

In **Zambia**, the National Water Supply and Sanitation Council (NWASCO) amended the licence for Commercial Utilities to cover water supply for both rural and urban areas. This allows them to extend their schemes to rural areas (pathway 1) and/or take over the management of existing piped schemes (pathway 2). The framework for the provision and regulation of water supply and sanitation in Zambia (NWASC, 2018) proposes that management may continue under local authorities if putting them under CUs would compromise CU performance. A piped scheme that is assessed as being able to meet its operational and management costs may be put under a CU. However, as the regulatory change has occurred relatively recently, the current proportion of the rural population served by CUs is low.

In addition to the three main pathways, there is also a **hybrid pathway**, with both expansion of utility-managed urban schemes into rural areas (pathway 1) and the utility taking over existing schemes from other (non-utility) service providers (pathway 2). This hybrid pathway results in single- or multi-area regional utilities, generally operating at scale, with either a considerable part of or almost the entire rural population served under the model. Examples are:

- the three main operators providing water services to different rural (and urban) areas in **France**, delegated by local government;
- the water companies under private law in **Portugal**, which have resulted from expansion and SDM change;
- the regional utilities in **England** and **Wales**, **the Netherlands** and **Croatia**, which have developed through a mix of pathways, including the expansion of urban utilities into rural areas, and the take-over of management of existing community or municipal-managed schemes at different times.

4.4.5 Consolidation and aggregation

Utilitisation processes can go hand in hand with **consolidation and aggregation** processes. Pilgrim et al. (2007) differentiates between consolidation, under which a service provider expands its service into multiple service areas, and aggregation, under which several service areas are grouped together as one management unit. Consolidation tends to be driven by service providers (utilities) themselves, while aggregation tends to be driven by government. As per this definition, the **French** model of having several big utilities entering into contracts with different municipalities, and to some degree, the Portuguese **Águas de Portugal** model, can be considered a form of consolidation. The expansion of safe water enterprises into new areas, as for example observed in **Ghana**, can also be considered as a consolidation process.

As part of its study on utility aggregation, the World Bank (2017) defines aggregation as the process by which two or more service providers consolidate some or all their activities under a shared organisational structure, whether it implies physical infrastructure interconnection or not, and whether the original service providers continue to exist or not. Such

aggregation processes can involve pathway 2, with aggregated utilities taking over rural water schemes previously managed under other models, as has been the case in **Uganda** with the evolution of the Umbrella Organisations, or **Colombia** with the regionalisation of utilities. Aggregation processes can also follow utilitisation processes which have resulted in a relatively small number of regional utilities in a country serving both urban and rural areas, as has been the case in **England (see box 1)**, **the Netherlands** and is currently ongoing in **Croatia**.

4.5 DRIVER OF UTILITISATION

In this section, we present the factors and actors that have driven utilitisation processes. As introduced in section 2, we differentiate between contextual factors and systemic water, sanitation and hygiene factors driving utilitisation.

4.5.1 Context factors

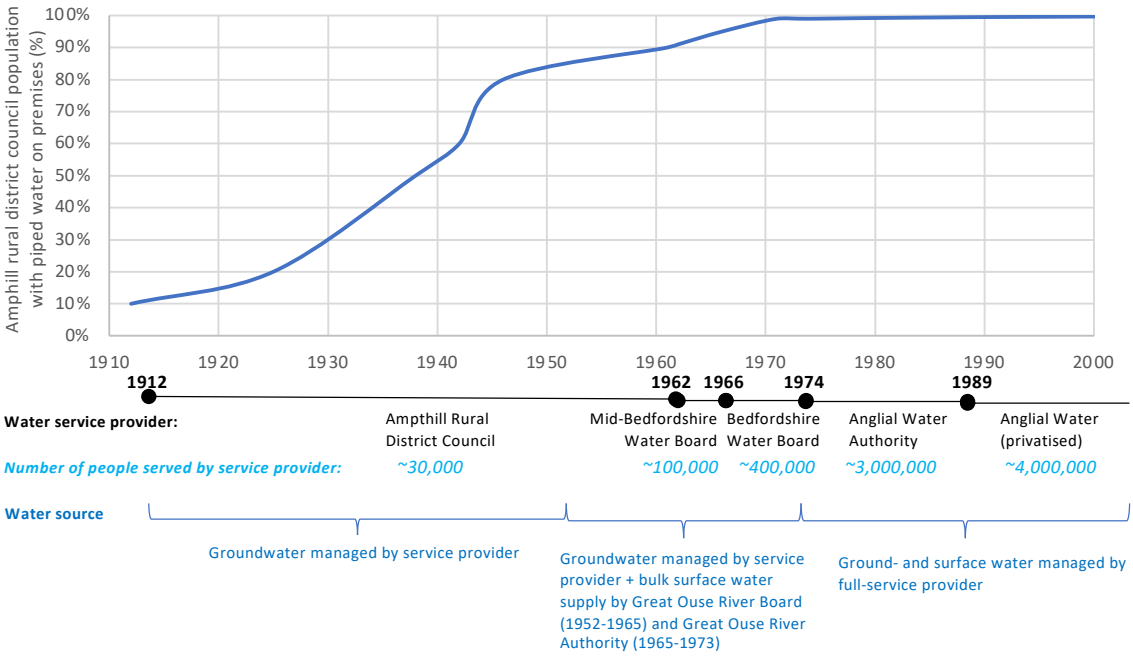
Contextual factors that drive utilitisation include population growth, economic development, and greater attention to rural areas.

Globally, **population growth** and **economic growth** drive increased demand for higher levels of water services, i.e. improved water services on premises, available when needed, free from contamination, in urban as well as in rural areas. Population growth also contributes to higher population densities in rural areas. This has increased the demand and the potential for utility management in rural areas.

Increased attention to rural areas has also sometimes driven utilitisation. In **Colombia** for example, the peace process also contributed to improved access and greater attention to rural development, which increased efforts to provide water services.

BOX 1: RURAL WATER SERVICE DEVELOPMENT AROUND AMPTHILL, ENGLAND

This box presents the case of rural water service development around Ampthill, England. Until 2012, parish councils supported households with developing and maintaining hand dug wells (supported self-supply and community management). Around 2012, Ampthill Rural District Council started the development and operation of two boreholes to supply water to some 25 rural villages, with a mix of standpipe and household connections. Over time, economic development and population growth have led to an increase in proportion of households with household connections. To satisfy the demand, bulk ground water supply, managed by the Great Ouse River Board, was introduced to supplement the water from the boreholes. Around 1962, the Mid Bedfordshire Water Board took over the management of the groundwater supply and distribution system from Ampthill Rural District Council and several other rural and urban district councils (pathway 2, going from 'municipal' management to utility management, with aggregation of services). In the years and decades that followed, further expansion (pathway 1) and aggregation of service providers took place. The result of this process was the development of the regulated full-service (ground and surface water) private utility Anglian Water, which serves the rural areas around Ampthill with water supply to this day.



Source: Based on 2021 analysis by Richard Franceys of Ampthill Rural District Council Annual reports of the Health and Public Health Office

In addition, more recently, the 'social distancing to prevent virus transmission rule' of the **Covid-19 crisis** has increased the need for and interest in a shift from water supply through communal water points like handpumps and shared standpipes to services through household connections and piped water schemes (OECD, 2021). It is too early, however, to assess if this is going to be a strong new driver for utilitisation.

4.5.2 Systemic factors

Different factors related to the water supply sector were found to drive utilitisation. These include expectations related to the services that utilities provide (improved coverage and higher service levels); their performance (higher capacity and performance, including improved cost recovery and economies of scale); and their enabling environment (especially access to funding and finance systems). Regulatory change, bulk water, and a supply-driven approach were also found to drive utilitisation. Table 3 gives an overview of the main drivers identified in the mapped cases where information on drivers was available, as per the followed utilitisation pathway.

Improving service levels and increasing coverage in rural areas have been important drivers for the utilitisation of rural water supplies. The desire to increase rural coverage has been an especially important driver for pathway 1 (extension of urban utility services into rural areas). This is often driven by national or local government. The Hai Duong utility in **Vietnam** for example was tasked by the Provincial People's Committee to invest in rural water supply. As a result, in the period 2012-2013, the utility used its own capital and commercial loans to invest in building clean industrial systems for nearly 20 rural communes. Utilitisation through pathway 2 (SDM change) is driven more by the desire to improve the level of service from limited and basic water services to safely managed services, on premises, available when needed and free from contamination, in line with Sustainable Development Goal (SDG) 6. Globally, SDG 6 has given a strong push to implement and extend piped water supply schemes, not just in urban, but also in rural areas. As community management is generally seen as not fit for providing safely managed water services, the utility model is gaining momentum, also in rural areas.

In addition to and often stimulated by the global SDG 6, many countries have set clear national goals for increased piped water supply on premises in rural areas. The 2019 Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) report (WHO, 2019) showed that 68% of the countries in Africa, Asia, Europe and the Americas assessed by GLAAS had set targets for at least basic plus water services (see Annex 1 for details). Basic plus water services means water from an improved source with a collection time not exceeding 30 minutes for a round trip, including queuing, and at least one but not all of the following: water is accessible on premises, or water is available when needed, or water supplied is free from contamination. Most countries with basic plus targets have set targets on the proportion of people with water supply on premises. More than a third (38%) of countries had set goals for the proportion of the rural population which is to be served in the medium to long term with safely managed water services. The GLAAS report includes data on 16 of the 23 countries for which utility-managed rural water supply models have been included in this paper. Of these 16 countries, all but one (**Senegal**) have set targets for at least basic plus water supply in rural areas, with four countries (**Kenya, Mali, the Netherlands** and **Vietnam**) having set targets for safely managed rural water supply. Examples of at least basic plus water supply in rural areas include **Uganda's** commitment in its Vision 2040 in which the

TABLE 3: SYSTEMIC DRIVERS FOR UTILITISATION OF RURAL WATER SUPPLY BASED ON ANALYSIS OF 30 CASES IN 21 COUNTRIES

	n	Expected:						Regulatory change	Bulk water	Supply driven
		Improve service levels	Increase coverage	Addressing capacity issues	Improve cost recovery	Increase investments	Economies of scale			
Pathway 1	8	50%	100%	0%	0%	0%	0%	0%	13%	0%
Pathway 2	12	58%	17%	58%	33%	8%	8%	8%	0%	0%
Pathway 3	3	67%	33%	67%	33%	0%	0%	0%	0%	67%
Hybrid pathway	7	14%	0%	43%	57%	29%	29%	14%	14%	0%
Total	**30**	**47%**	**37%**	**40%**	**30%**	**10%**	**10%**	**7%**	**7%**	**7%**

Government undertakes to construct and extend piped water supply and sanitation systems to all parts of the country; **Burkina Faso's** target to reach 80% of the rural population with piped water by 2030 (from 9% in 2015) and to have 100% of rural water supplied by professional private companies contracted by local authorities; and **Vietnam's** target to ensure 75% of the rural population uses a minimum of 60 litres per capita per day of clean water by 2020.

Development partners can also play a role in driving utilitisation by promoting increased rural coverage and improved service levels. Examples include the extension of town water utility schemes in **Ethiopia**, stimulated by UNICEF to ensure more climate resilient water supplies in the rural areas around the ONEWASH Plus programme towns; and the introduction of safe water enterprises in **Ghana**, stimulated, facilitated and funded by INGOs like Safe Water Network and Water Health.

Capacity and cost recovery issues related to community management and the expectation that these can be addressed through utility-management have been an important driver of utilitisation of rural water supply as well. They are particularly relevant in pathway 2 (SDM change) and pathway 3 (introduction of a new SDM). In many low- and lower-middle income countries, particularly in Africa, community management has been and often still is the dominant SDM for rural water supply. There is a common experience and frustration that the community management model lacks transparency (**Senegal**), lacks asset-management capacity (**Brazil, Senegal**), has low or no cost recovery at all (**Brazil, Mali, Rwanda, Vietnam**) and has weak management and operational capacities with volunteers often being responsible for the service provision (**Brazil, Colombia, Ghana, Mali, Rwanda, Uganda**). On top of this, these volunteer operators have little to fall back on in receiving technical and other support. Replacing community management with utility management is often seen as a way to overcome these challenges. This can take place through professionalising community management, as has, for example, happened in India (see box2), or through introducing an existing or new utility to manage the previously community-managed schemes.

Expectations of economies of scale, including the possibilities for cross-subsidising that utility-

BOX 2: THE DIRECT LOCAL GOVERNMENT SUPPLY MODEL OF INDIA

India has been making efforts to professionalise its rural water supply services for more than 20 years. Its pathway is not to create utilities (as per the definition used in this paper) to manage rural water supply, but to professionalise the community management model which often becomes a model of direct service delivery by local government, the Panchayats, with a limited role of the village water committee.

In 1998, India developed a national sector strategy for Rural Water Supply and Sanitation, which was widely discussed with the states and external support agencies (World Bank, DFID, DGIS). Soon after, the large central Government supported a rural drinking water and sanitation programme which was based on the demand-responsive principle, building on global experiences with the community management model. In essence, this programme aimed to empower the village communities and their institutions with a pivotal role for NGOs and CBOs to provide capacity support to people, community, and local government.

Since then, many states have developed their own programmes and institutions to decentralise rural water supply, which also means that there are quite some variations in the India model. For example, the Jalanidhi programme in Kerala created separate public bodies (societies) to provide water services and their users were members. It introduced long-term capacity strengthening of operators and management. Another model to decentralise services in Kerala entailed the local government requesting the Kerala Water Authority to develop new water schemes on behalf of communities, which are thereafter handed over to the beneficiaries. The local government employs technical support to the community for operation and maintenance. In this model the local government oversees multiple mini-schemes in its jurisdiction. In Gujarat, the state government created a separate support organisation, Water and Sanitation Management Organization, which supported all the villages in Gujarat to develop their own water supply schemes. Within a time span of six years, more than 10,000 villages (about 30% of the total) had joined the scheme. The biggest drive for the communities was to take service delivery into their own hands instead of depending on the state government agency and to have piped water supply on premises.

The professionalisation pathways in India have similar drivers as the utilitisation pathways. The demand for better (piped) services by the population was in line with India's commitment to deliver piped on premises supplies to all rural inhabitants by 2024 and the need to make service delivery more effective and efficient by decentralisation. The resulting community management plus models are struggling with the same challenges as the utility management for rural supply models. The challenges are related to service provider performance and capacity; revenue collection and cost recovery; the enabling environment, including challenges in support to service providers. There are also differences. Because it is a direct supply model by local government, there is no need for an independent regulator to monitor tens of thousands service providers in each state. The India model also has a stronger government funding backbone. This can be an advantage for financial sustainability, but does risk revenue collection sliding. The scaling of the model has clearly benefited from the central government drive for decentralisation.

managed rural water supply can offer, especially through regional utilities, are also an important driver for the utilitisation of rural water supply. This is especially the case for utilitisation processes involving the consolidation and regionalisation of utilities, as has been the case in many West European countries (**the Netherlands, Portugal, England** and **Wales**) and as is currently happening in several Danube (**Croatia, Moldova**) and Latin American (**Colombia**) countries. In **Rwanda**, under the local PPP model, clustering of many water supplies under one management contract was done because it allowed for cross-subsidising high operation and maintenance costs of pumped schemes with the relatively high profit margin on gravity schemes (Balfour, 2015).

The **expectation that utility-managed rural water supply would attract sources of funding and financing (for rural water supply)** has driven utilitisation in several cases. For several Danube countries for example, regionalisation of utilities as a condition for improved access to European Funds drove utilitisation and regionalisation processes. In **Croatia** for example, the 2010 Water Act (and a separate Water Financing Act) was passed as part of the country's harmonisation with the European Water Framework Directive and sub-directives. It created a legal basis for a significant regionalisation process, under which the more than 150 local utility companies would be aggregated into around 20 regional providers, generally along county borders. In Latin America, in **Colombia**, the idea that regional utilities could attract private capital is one of the drivers for utilitisation of rural water supply in the country.

Regulatory change has been observed to drive utilitisation processes in Zambia and Colombia. In **Zambia**, the amendment of the licence for CUs to cover water supplies for both rural and urban areas by the National Water Supply and Sanitation Council (NWASCO) gives the CUs the space to extend their schemes into rural areas (pathway 1) and/or to take over the management of existing piped schemes (pathway 2). In **Colombia**, dedicated instruments have been developed for facilitating regional utilities in an attempt to stimulate the regionalisation of water supply through regional utilities serving urban as well as rural areas.

In some cases, utilitisation of rural water supply has been driven by bulk water supply. In **Namibia** for example, the national utility, NAMWATER, which provides bulk water to municipalities, started supplying customers located in rural areas along the main pipelines.

Finally, utilitisation of rural water supply can be supply driven, especially in the case of private owner-operators implementing new SDMs in rural areas, like the private owner-operators in Vietnam and the Safe Water Enterprises in **Ghana**.

In addition to these factors that have driven the utilitisation of rural water supply, it has also been stimulated by **learning from practice and from others, and using learnings to adapt practice (and policy)**. An example of this is the case of the development and implementation of the Byumba model in **Rwanda**. In 2002, the local government in the Northern Byumba Province, inspired by similar experiences in neighbouring Uganda, contracted out service provision to the local private sector in the form of a public-private partnership. Following that local experience, the government eventually abandoned its policy of community management and decided in 2004 to promote local public-private partnerships following the 'Byumba model'. Since then, it abandoned its policy of community management in favour of the Byumba model and rolled out the model throughout the country, with some 72% of water schemes under PPP management by 2015. Another example is the **Uganda** Umbrella Organisation model which evolved from being a support network to a rural utility. This transition was driven by learnings from the old model of providing operational and management back-up support, which had been focused on 'firefighting', with no regulatory or enforcement mandate, poor revenue collection and high dependency on external aid.

4.5.3 Who is driving utilitisation?

Utilitisation processes with utilities taking over service provision responsibilities from community-based or municipal service providers (pathway 2) are often driven by central government. Government can do this by mandating service delivery model change, as has been the case with the emergence of the Umbrella Organisation in **Uganda**, SEOH in **Senegal**, and the PPP model in **Rwanda**. Government can also directly mandate utilities to expand services into rural areas. An example of this is Hai Duong utility in **Vietnam**, which was assigned by the Provincial People's Committee to expand services into rural areas in 2012-2013.

Central governments can also stimulate and support utilities to expand services into rural areas (pathway 1). This has for example been observed in NWSC in **Uganda**, where the expansion has been facilitated by the SCAP-100 programme and co-funded by the Government of Uganda and NWSC from tariff

revenues. In Burkina Faso, the push for ONEA to operate outside its official service area came from different sources, including national government that had set the ambitious target of having professional piped water supplies to at least 80% of the rural population by 2030. Other sources included national and local politicians in their search for reliable service providers to provide sustainable water services to their constituents, and development partners in their search for reliable and capable managers who would ensure that their capital investments would result in sustainable service provision.

Development partners can also stimulate the utilitisation of the rural water supply by providing financial and technical support to the supplying utilities. In **Ethiopia**, the expansion of town water schemes to rural areas was supported and facilitated under UNICEF's ONEWASH Plus programme. The introduction of new service delivery models (pathway 3) can also be driven and supported (financially and technically) by development partners, like the UNICEF supported introduction of rural utilities in **Ethiopia** and the emergence of safe water enterprises in **Ghana**.

4.6 STRENGTHS AND WEAKNESSES OF UTILITY-MANAGED RURAL WATER SERVICE PROVISION

The previous section discussed the drivers for utilitisation. These include the expectation that utility-managed water supply would help improve coverage, service levels, the general and management capacity of the service providers, cost recovery, and access to capital, and would bring economies of scale. In this section, we look at the strengths and weaknesses of utility-managed rural water services based on the mapped models of utility-managed water supply and analyse whether utilitisation has met or could indeed meet these expectations. It addresses the following issues:

- How is utility-managed rural water supply performing?
  i. In terms of service levels?
  ii. In terms of service provider performance?
- What are the most important elements of the enabling environment that need to be in place? Are these indeed in place? What are the main challenges for different models and pathways?

4.6.1 Coverage and service levels

An important driver for utilitisation is the expectation that utility-managed water services will increase coverage and service levels in rural areas. The expansion of utility-services into unserved rural areas through pathway 1 and the introduction of new SDMs through pathway 3 have helped increase coverage. However, ensuring equitable coverage can be a challenge. Utilities are more likely to first reach the easy to reach close to the main pipes (as has been the case in **Namibia**, with NAMWATER directly providing services to rural people close to its bulk water supply mains) and/or people who can afford the connection fee. This can lead to significant disparities between inhabitants of the same area and exclude the marginalised from utility-managed services. Transaction costs in reaching that part of the population which is physically or economically hard to reach, are high. This implies a need for a continuous range of service delivery models in the short term, especially in low-income (LIC) and middle-income (MIC) countries with a relatively high proportion of unserved rural population.

In addition to increasing coverage, utilitisation is expected to increase the level of water services provided, from sub-basic or basic to safely managed, on premises, available when needed and free from contamination. However, as shown by Adank et al. (2016) in their paper on water service levels in utility-managed small town schemes, having a utility-managed rural water supply is not synonymous with having a safely managed water supply. The mapping of utility-managed water service provision presented in this paper shows that utilities do not always provide safely managed services, especially in rural areas. Some of the mapped models of utility-managed rural water service provision were found to focus on providing basic services through communal off-premises facilities. These include:

- the UDUMA model in **Burkina** and **Mali**, which focuses on service provision through handpumps and public standpipes;
- the extension of town utilities with rural standpipes in **Ethiopia**; and,
- Harar utility's service provision in **Ethiopia**, mainly through handpumps.

Under these models, the introduction of utility management does not contribute to an increase in safely managed water services as services are not provided on premises, but it does intend to improve rural water coverage and reliability of basic water services.

In other models, utility-managed rural water services are provided in rural areas through a mix of public standpipes and household connections. The focus is, however, often still on rural water service provision

through standpipes, like the Byumba Local PPP Model in **Rwanda**, and the expansion of national utilities into rural areas like in **Uganda** (NWSC) and **Burkina Faso** (ONEA). Also Safe Water Enterprises in **Ghana** originally focused on providing basic water through water stations or kiosks, but have more recently started to increasingly include household connections.

Overall, the proportion of the rural population in LIC, like **Burkina Faso, Ethiopia, Rwanda** and **Uganda**, with access to improved water on premises is low (under 20%), as shown in Figure 5. Of the lower and upper middle-income countries, it is mostly sub-Saharan African countries that have a low proportion of the rural population with access to improved water services on premises[3]. This is because of a lack of penetration of piped schemes in rural areas, as well as the common use of public standpipes connected to piped schemes in rural areas in many of these countries, which cannot provide safely managed water on premises.

There are cases of utility-managed rural water supply on premises, but they do not meet at least one of the other criteria for safely managed water supply (available when needed or free from contamination). This is the case in **Moldova** where urban providers had reached high levels of service continuity with 23 hours per day in 2018, which almost doubled since the early 2000s, but where drinking water quality remained a major issue. Similarly, in **Vietnam**, private owner-operators were found to typically supply high standards in terms of quantity and accessibility and intermediate to high standards in terms of reliability, but the supply of acceptable water quality was unclear (Grant et al., 2020).

The regional utilities in Europe tend to provide safely managed services, both in urban and rural areas. In some countries, consolidation and regionalisation have contributed to ensuring high service levels. In **Portugal** for example, supra-municipal solutions, returning economies of scale and enabling greater levels of efficiency in the utilisation of resources, enabled the Águas de Portugal group to raise water quality standards. Portugal now ranks among the European Union countries that attain the highest levels of environmental performance.

4.6.2 Utility performance

As described above, the expectation that the utilitisation of the rural water supply can result in improved service provider performance, especially in terms of improved management capacity and cost recovery, is an important driver for utilitising rural water services. As it is difficult to assess management

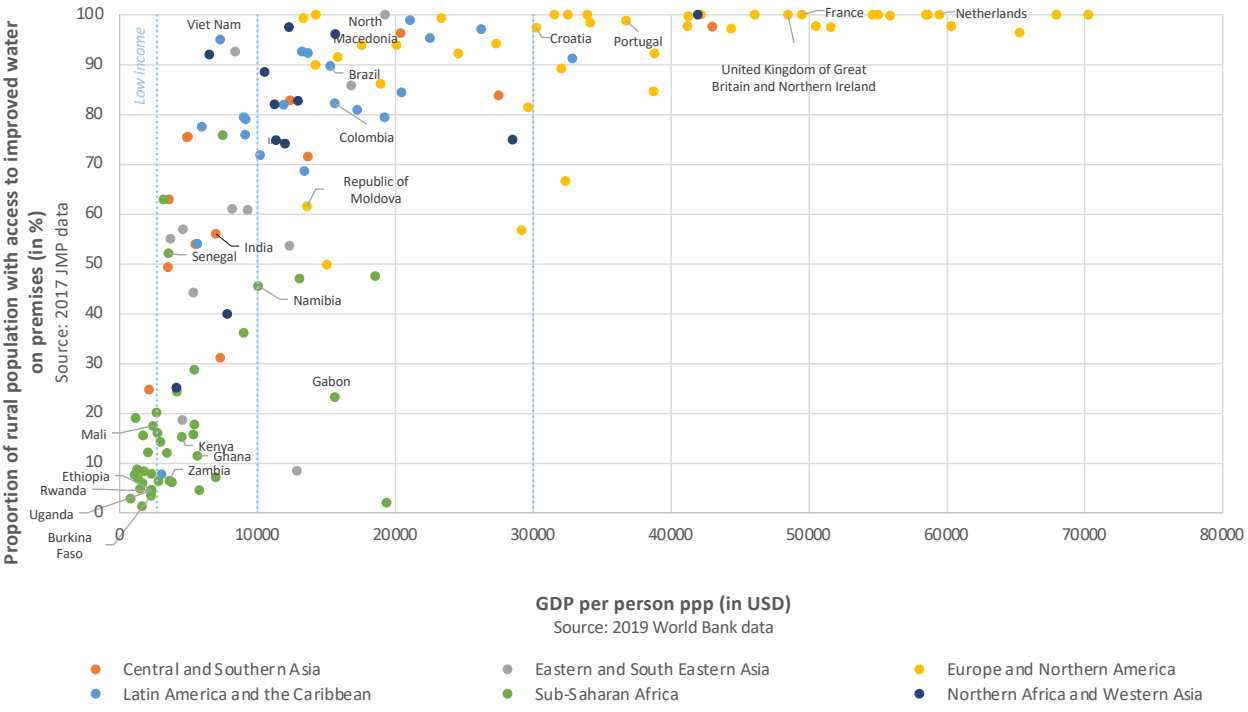


FIGURE 5: PROPORTION OF RURAL POPULATION WITH WATER ON PREMISES AND GDP

Source of data: 2017 JMP

3. The 2017 JMP data show that only the island states of Mauritius, Cabo Verde and the Comoros, the southern African countries of Botswana, South Africa, Namibia and Eswatini, and Senegal had a rural population of which at least 40% had access to water supply on premises.

capacity directly, we use non-revenue water as a proxy, which provides insights in the extent of physical and commercial water losses by the utility.

Figure 6 shows the performance of the mapped models in non-revenue water and operational cost recovery.

Regional utilities in **Western Europe**, the national utilities in **Burkina Faso** and **Gabon** and the town water utilities in **Vietnam** score **high on both indicators**.

However, many utilities under other mapped models perform **poorly on non-revenue water and operational cost recovery**. The NRWSCL in **Kenya**, for example, had non-revenue water rates ranging from 63% and 65% and operational cost coverage ranging from 0.79 to 0.96 between 2013 and 2017 (IBNET data). COPANOR in **Brazil** did not have water macro-metering and was unable to measure non-revenue water. Operational cost recovery had not been reached by 2016, when the company's results showed an operating cost coverage of under 1, with a tariff of US$ 0.51 per m3 or US$ 3.76 per connection per month that did not cover operational costs. The persistent deficit over the years had been covered by COPASA, the urban utility under which COPANOR was set up as a subsidiary (Dos Santos Rocha and Salvetti, 2017).

Under some models, utilities performed **poorly on non-revenue water, but moderately on operational cost recovery**. In **Colombia** for example, non-revenue water is still a major issue, with non-revenue water amounting to about 41% nationally without large differences between service providers. However, while small providers and CBOs are barely able to cover their operational costs, big utilities (more than 80,000 connections) have a low level of debt and, in spite of small margins, are able to make long term investments (REF KMT report). Likewise in Zambia, the average non-revenue water rates of CUs between 2013 and 2017 amounted to 49% (ranging from 47% to 51%), while average operational cost coverage amounted to 1.05 (ranging from 0.98 to 1.1) (REF IBNET).

The Umbrella Organisations in **Uganda** on the other hand performed **moderately on non-revenue water**, with an average non-revenue water rate of 31%, while the average operation cost coverage amounted to only 0.94. These umbrella organisations started operations relatively recently.

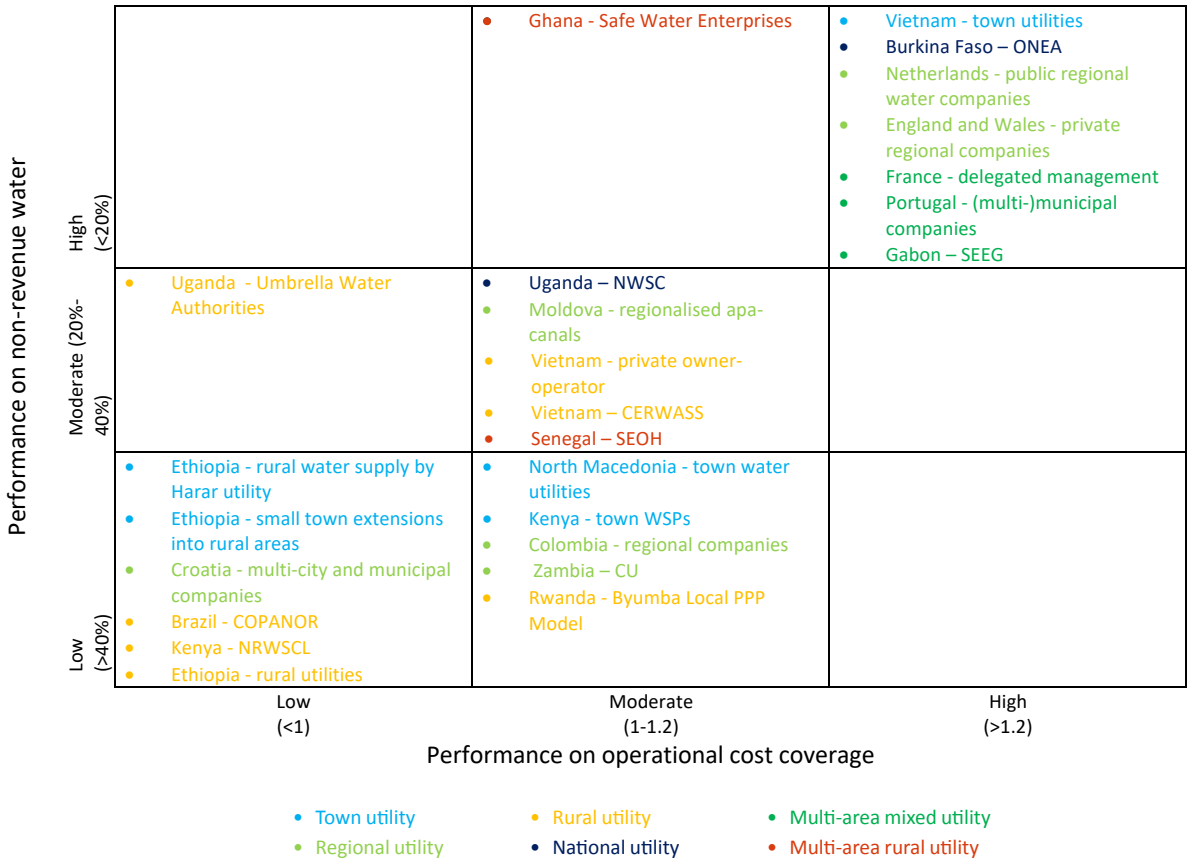


FIGURE 6: NON-REVENUE WATER AND OPERATIONAL COST RECOVERY

Safe water enterprises in **Ghana** score **moderately on cost recovery and high on non-revenue water** as they managed to bring down non-revenue water considerably by improving management through digitising records. This led to a decrease in non-revenue water from 44% for household connections and 42% for standpipes to 0% for household connections and 14% for standpipes (White, 2020). This model has a high level of capacity support, both in terms of human resources as well as in data and information systems, both of which support decision making. Cost recovery rates have so far been moderate rather than high, as water consumption, and hence revenues, is relatively low.

The above has shown that many utility-managed models for rural water supply incur challenges with operational cost coverage and non-revenue water. The utilities that perform better in non-revenue water and cost recovery are the larger, aggregated or consolidated regional utilities and the urban utilities with clear economies of scale. Smaller utilities, especially those located in rural areas, often struggle with capacity issues as they struggle to attract highly qualified professionals who tend to prefer bigger towns and cities with facilities and services related to education, health care, entertainment etc. above small towns or rural areas which do not offer these. Smaller utilities, like community management models, struggle with operational cost recovery because of low revenues related to low water use and issues with revenue collection.

4.6.3 Strength of the enabling environment

Utilities providing rural water services need a strong enabling environment related to policies, institutional, planning, monitoring, capacity building and support, regulatory and financial frameworks. In this section, we assess the strengths and weaknesses of the enabling environment of the mapped models.

The different elements of the enabling environment related to each mapped model have been scored. Figure 7 presents an overview of these scores.

Figure 7 shows that overall, town utilities and multi-area rural utilities score low on the enabling environment. In particular, the owner-operator case in **Ghana** and the town water utilities expanding services in rural areas case in **Ethiopia** lack an enabling and regulatory environment. Some single-area rural utilities operate in moderate to high scoring enabling environments (e.g., COPANOR in

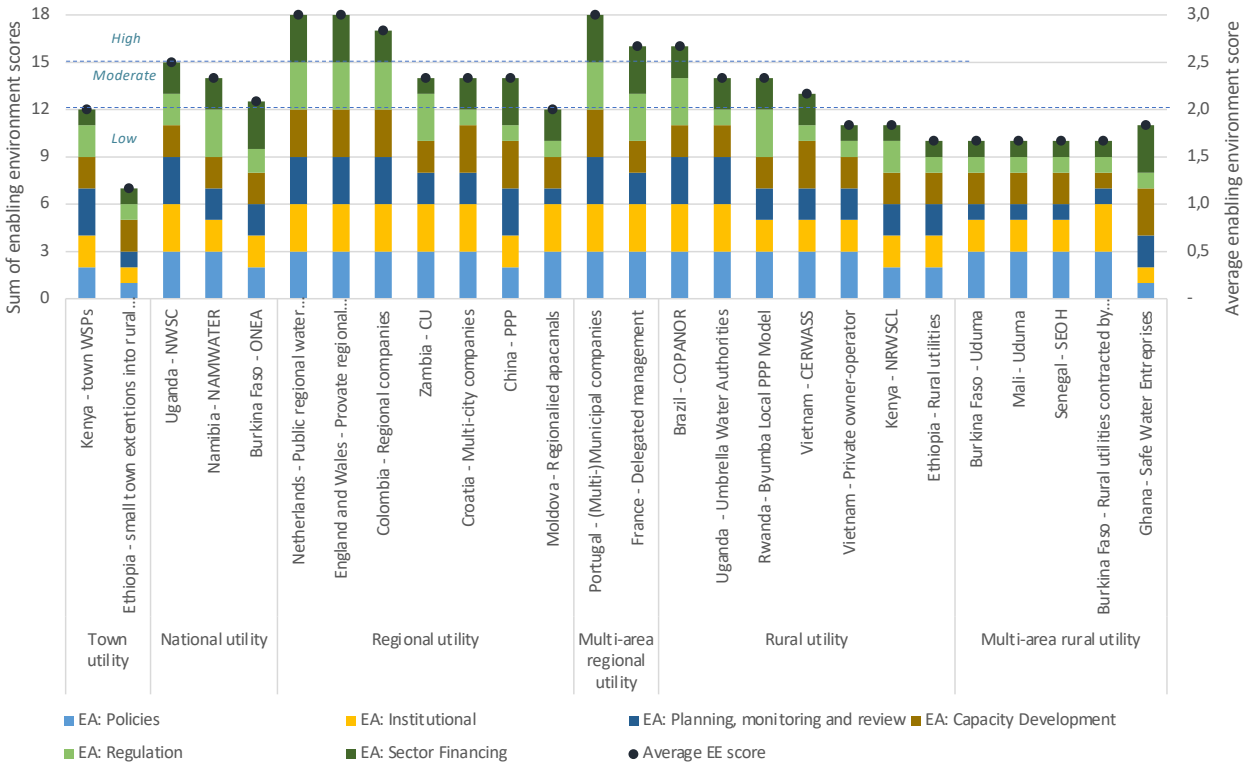


FIGURE 7: ENABLING ENVIRONMENT SCORES

Brazil, the umbrella utilities in **Uganda**, the utilities in the Byumba model in **Rwanda** and those under the CERWASS model in **Vietnam**), while others operate under low scoring enabling environments (e.g. the NRWSCL in **Kenya**, the private owner-operators in **Vietnam**, UDUMA in **Burkina Faso** and **Mali**, and the rural utilities in **Ethiopia**). National and multi- and single-area regional utilities operate in relatively strong enabling environments that score moderate to high, with the exception of the regional apa-canals in **Moldova**, which especially lack capacity building, regulation and planning and monitoring frameworks.

Policies and institutional frameworks are largely in place for the mapped models, with the exception of the owner-operator safe water enterprise case in **Ghana** and the expansion of town water schemes into rural areas in **Ethiopia**. Policies provide the basis for most of the building blocks of the water, sanitation and hygiene system. Without clear policies, it will be difficult to have clearly defined roles for institutions, standards for regulation and monitoring, what should be financed by who etc.

Section 4.6.2 showed that in some of the mapped models, the capacity of utilities to deal with physical and commercial losses was low, as evidenced by high non-revenue water rates. Strong frameworks are needed to ensure sustainable utility-managed water supply in rural areas and to enable building and sustaining utility capacity in operating and maintaining water schemes. They also create an environment for innovation, reaching the 'hardest to reach', improving service delivery and improving all round performance. Examples of strong **capacity building frameworks** for utility-managed water services can be found in several European countries, Colombia and Vietnam. In **the Netherlands**, joint research for the water companies is coordinated and conducted by a separate institute, the KWR Watercycle Research Institute (formerly Kiwa). In **Colombia**, the Colombian Association of Sanitary and Environmental Engineering and the National Association of Public Services and Communication Companies facilitate sector learning by organising technical meetings and fora, synthesising work from their members, and influencing policy dialogues. Furthermore, universities and vocational training institutes are well integrated in the water sector. SENA, the national vocational training institute, offers technical training for plant operators and plumbers, and certifies participants when they pass these courses (Smits, 2021) In **Vietnam**, the National Centre for Rural Water Supply and Environmental Sanitation supports its provincial branches to roll out piped schemes into rural areas.

Capacity support can also take the form of Water Operator Partnerships (WOPs), in which two or more water operators provide peer support on a not-for-profit basis. Through mentorship, WOPs progressively strengthen beneficiary utilities' capacity and performance at the management, financial and technical levels in implementing operational and organisational changes that lead to better and more sustainable services. There are programmes that receive support from development partners such as the Dutch Government (e.g. the WaterworX programme under which Dutch utilities provide support to utilities in 13 countries, including **Colombia, Ethiopia, Ghana, Kenya, Vietnam** and **Zambia**); the Australian Government (e.g. the Rural WUI Programme which partners three **Vietnamese** rural water utilities and three new Australian water utilities); and the Bill and Melinda Gates Foundation (e.g. South-South WOPs like one between eThekwini Metropolitan Municipality, Water and Sanitation and the Lusaka Water and Sewerage Company).

The physical distances, the logistics needed for **monitoring** dispersed rural water services and the cost implications are key challenges in monitoring rural water services (Gerlach, 2019). Monitoring of fewer and more centralised utilities providing rural water services is more efficient. In many countries, **planning** related to water service provision has been decentralised to local government. However, clear planning, monitoring and review frameworks are not in place for all mapped models. There are no frameworks in place for monitoring utility-managed rural water services provided by regional utilities in **Moldova**, by SEOH in **Senegal**, by private rural operators under affermage contracts in **Burkina Faso**, by UDUMA in **Burkina Faso** and **Mali**, by town water utilities which have extended services into rural areas in **Ethiopia**, and by safe water enterprises in **Ghana**.

As mentioned by Franceys (2018), rural water supply, particularly rural water for all, is costly and cannot be self-funding, let alone self-financing, at this stage of development. Strong **funding and financing systems** are thus essential for ensuring sustainable rural water supply. As mentioned in section 4.5, in some cases the expectation that utilities have better access to sources of financing has contributed to driving utilitisation. However, the assessment of the funding and financing systems related to different models of utility-managed rural water supply has shown that in many cases these systems are weak. This is especially the case in lower- and middle-income countries like **Ethiopia, Senegal, Kenya** and **North Macedonia**. The strength of funding and financing systems related to safe water

enterprises in **Ghana** was related to INGOs that supported these types of models. Finance and funding systems related to mapped rural utility-managed water supply models in Western European countries and **Colombia**, were found to be relatively strong. The main success factor for utilities in **the Netherlands**, where all capital investments are covered by tariffs while keeping the water fee relatively low (€ 1/m^3) and a non-revenue water (NRW) rate between 0% and 5%, has been the water utilities' access to cheap loans on the financial market over the last 60 years. The same has been the case for utilities in **England** and **Wales**, where the Government had set favourable conditions for attracting private capital (Green, 2010). Commercial financing is only an option for utilities that can ensure returns on the loans, which is challenging for many utilities providing rural services.

Regulation of utility-managed rural water services should involve water quality regulation, performance regulation, and tariff regulation. Regulatory frameworks may include the following (Mumssen, 2018):

- Regulation by agency
- Regulation by contract
- Self-regulation
- Municipal regulation

Table 4 shows the regulatory arrangements and the strength of these arrangements for the mapped cases.

TABLE 4: TYPE AND STRENGTH OF REGULATION OF UTILITY-MANAGED RURAL WATER MODELS

	Weak regulation	Moderate regulation	Strong regulation
By agency	• Croatia - multi-city and municipal companies, regulated by the Water Services Council • Moldova - regionalised apa-canals, regulated by ANRE (economic), the National Institute of Public Health (water quality), and local public authorities (performance) • Senegal – SEOH, regulated by OFOR • Uganda – umbrella authorities, regulated by Water Utility Regulation Department, through contract	• Kenya - town WSPs, regulated by WASREB • Kenya - NRWSCL, regulated by WASREB • Uganda – NWSC, regulated by Water Utility Regulation Department, through contract with Ministry of Water and the Environment	• England and Wales - private regional companies, regulated by Ofwat (economic), environmental agency (environmental issues), and district water inspectorate (water quality) • Portugal – multi municipal companies, regulated by The Water and Waste Services Regulation Authority • Brazil – COPANOR, regulated by ARSAE • Colombia - regional companies, regulated by CRA, which sets regulations and SSPD for performance regulation • Namibia – NAMWATER, regulated by WRN • Rwanda - Byumba Local PPP Model, with big schemes regulated by RURA and small ones by local government • Zambia – CU, regulated by NWASCO (performance) and Ministry of Health (water quality)
By contract	• Burkina Faso – private rural utilities, regulated under affermage contract with, often weak, municipalities	• Burkina Faso – ONEA, regulated though 'contract plan'	• France - delegated management, regulated through contract between local government and often large operators
Self-regulation			• Netherlands - public regional water companies
Municipal regulation	• Ethiopia - rural utilities • Ethiopia - small town extensions into rural areas • Ethiopia - rural water supply by Harar utility		
None/not clear	• Vietnam - private owner-operator • Vietnam - CERWASS • Burkina Faso - UDUMA • Mali – UDUMA • Ghana - Safe Water Enterprises		

The table shows that several of the mapped utility-managed rural water models are **regulated by an agency**. In some cases (e.g. **England, Zambia** and **Moldova**), different regulatory functions fall under different entities, as shown in Table 4. Many of the high and upper middle-income counties have strong regulatory systems in place which cover both the urban and the rural sector. Some other countries have weak regulatory frameworks. In **Senegal** by 2018, OFOR, that is responsible for regulating rural utilities, had built capacity in planning and implementing rural water supplies, but still lacked adequate tools to manage the sub-sector's assets and effectively monitor both the delivery of services by private operators and the execution of their contractual obligations (World Bank, 2018b). In **Uganda**, utility water services are regulated by the Water Utility Regulation Department. Huston et al. (2021) found this regulatory framework to be stronger for NWSC, the national utility, than for the rural umbrella utilities. They suggest that as the umbrella model in its current form is less than five years old, it has had less time to develop and adapt than the NWSC model and is therefore weaker. In **Croatia**, despite the well-developed legal and regulatory framework, the Water Service Council, which is responsible for regulating water services, is still in the process of fully deploying its regulatory reach. It has developed regulatory instruments, including specific by-laws on performance standards, but these have not yet been widely applied and regulation still needs to be strengthened in terms of human and financial resources (World Bank, 2015). In **Moldova**, different entities are involved in regulating water services by utilities, including ANRE (for tariff regulation), the National Institute of Public Health (for water quality regulation), and local public authorities (for performance regulation). However, in practice, ANRE has so far acted in its role as the national regulator in ensuring cost-recovery tariff. Further, utility performance is neither assessed by the utility nor monitored by the local public authority and limited information, on water quality for example, is provided to consumers (Andronic, 2018).

Regulation through contracts is more common in Francophone countries. **France** has a strong regulatory system related to rural water supply, through contracts between local government and, often large, operators. In **Burkina Faso**, the Government implements three-year contract plans with ONEA with 20 to 30 key performance indicators for technical, financial, and commercial performance. These plans include investment commitments to expand access (Mumssen, 2018) and so far have mainly focused on expanding services to informal settlements and peri-urban areas. Municipalities in Burkina Faso have also contracted rural utilities through affermage contracts. However, these municipalities are often too weak to supervise and regulate the utilities according to the contract.

Self-regulation can be found in **the Netherlands**, where a system of naming and shaming and competition across the utilities is in place, stimulating high utility performance. This is managed by Vewin, the association of water utilities that defines the rules and standards for all Dutch water utilities. Self-regulation is only a viable option when resources and capacity are available at utility level. For many utilities providing rural water services in low-income countries this is not the case (Mumssen, 2018).

Municipal regulation in **Ethiopia**, where Water Boards are supposed to be set up to regulate town and rural utilities, is weak. Although performance contracts are supposed to be in place, this is rarely the case.

In **Vietnam**, regulatory frameworks related to both owner-operators supplying rural water and to CERWASS are either not in place or are unclear. Similarly, regulatory frameworks related to the UDUMA model in **Burkina Faso** and **Mali** and the safe water enterprises in **Ghana** do not seem to be in place either.

So **in general**, the mapped models for utility-managed rural water supply may have relatively strong policy and institutional frameworks, but many have weak systems for regulation and sector financing. These systems are stronger in the older and bigger regional utilities in Western Europe, where consolidation and aggregation processes have resulted in large utilities with strong finance and regulatory systems.

4.6.4 Utility performance and enabling environment

Figure 8 shows the mapped models according to the strength of the enabling environment and utility performance.

Overall, Figure 8 shows a correlation between systems strength and utility performance, as could be expected. The West European regional utilities have high performance and operate in a strong enabling environment, while the town and rural utilities in Ethiopia and the NRWSCL regional utility in Kenya operate in a low enabling environment and have low performance.

The safe water enterprises model in countries like Ghana and the private owner-operators in Vietnam are performing relatively well, despite a fairly weak enabling environment. Regulatory systems are not yet in place for these emerging models.

On the other hand, COPANOR in Brazil, the umbrella organisations in Uganda, the local PPP model in Rwanda and the CUs in Zambia are operating in relatively strong enabling environments but only score low in terms of utility performance. This is likely to be due to capacity challenges.

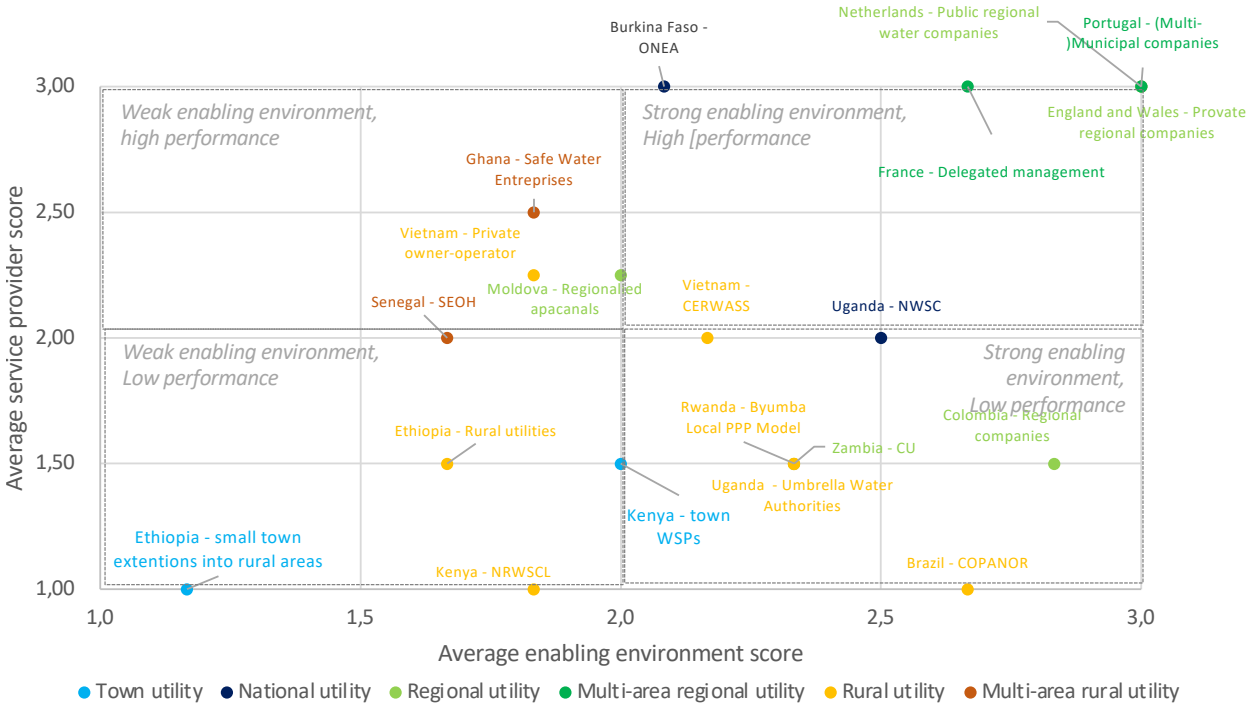


FIGURE 8: UTILITY PERFORMANCE AND ENABLING ENVIRONMENT

5. Conclusions

The utilitisation of rural water supply is an observable trend in many places in the world. Some have historical roots, especially in high-income countries (HICs), and some were initiated more recently. We argue that it is now an important feature in the transformation of water, sanitation and hygiene systems in LICs and MICs, and is a critically important way to achieve safely managed services and to professionalise rural water services.

We have conceptualised and described three main pathways through which the utilitisation of rural water services takes place: the expansion pathway, the SDM change pathway, and the 'new SDM' pathway. The 'SDM change' pathway requires the most deliberate governance change and choice by the sector for rural utilitisation, whereas the pathways 'expansion' and 'new SDM' can evolve more organically and from local initiatives. The 'expansion' and 'SDM change' pathways occur more frequently than the 'new SDM' pathway, which relies more on private or donor driven initiatives. Utilitisation in a country can occur either through a specific pathway or through multiple pathways at the same time or consecutively. In the countries where utilitisation has happened through hybrid pathways, it has gone to scale.

Below are our conclusions on the questions posed in the Introduction, based on the findings in this paper.

Is the trend of increased utility-managed rural water supply a positive one?

Looking at the findings in this paper, this might not be the right question to still be asking. The process of utilitisation of rural water supply is already underway and is likely to continue and shape the sector, especially in LICs and MICs, in the years to come. We believe the question should be on how to best understand the utilitisation process and the models for utility-managed rural water supply that emerge, and how these processes and models can be strengthened and, where needed, adapted.

Which actors and factors are driving the observed utilitisation processes?

Utilitisation is driven by contextual factors such as population growth and economic development, and the resulting increasing demand for higher levels of water services. It is also driven by systemic sectoral drivers such as regulatory change, the supply of new service delivery models, and the expectation that utilities can provide higher service levels, perform better and have a better enabling environment than traditional rural service providers. Utilitisation can be driven by development partners, utilities themselves and/or governments. In most cases, national governments play an important role in driving the utilitisation of rural water supply, either through mandates or through stimulating and supporting utilities. These require governments to have a clear vision on how rural water services are to be provided in the future and the role of utility-management in doing so.

Does utilitisation improve rural water services?

Our analysis has found that utilitisation does increase coverage and improve service levels. However, challenges remain. Utility-managed rural water supply is not synonymous with safely managed water services. In several models, utilities struggle to provide rural areas with continuous water supply which is free from contamination and on premises. This is especially so in African countries where utilities often provide water off-premises through public standpipes. Further, equity issues remain, with utilities unable or unwilling to reach certain people, especially in hard and expensive to reach rural areas with low population densities.

What are the challenges related to utility-managed water supply in rural areas?

Many utilities serving rural areas face similar financial and capacity challenges as service providers in the community management model, including difficulties in attracting qualified staff to work in predominantly rural areas, low consumption rates and revenue collection. In general, the larger, aggregated or consolidated regional utilities provide better services and perform better than the smaller utilities as they benefit from economies of scale and are better positioned to deal with the capacity gap. Capacity issues can also be addressed through national capacity building mechanisms, platforms and organisations, or through WOPs.

Are strong national and local systems in place to enable utility-managed rural water supply?

Many of the utility-managed rural water supply models assessed, especially those that have emerged more recently, have relatively strong policy and institutional frameworks, but weak regulatory and financing systems. The lack of strong regulatory systems is an issue particularly in cases with strong private sector involvement, like the emerging safe water enterprises in Ghana or private owner-operators in Vietnam. In general, financing and regulatory systems are stronger among the older and more established regional utilities which have been formed through consolidation and aggregation processes.

6. Areas for support

This section reflects on the last question posed in the introduction: '*What can we (IRC and the sector as a whole) do in order to better understand this trend and to support and strengthen utility-managed rural water supply*?'. We look at where we can provide support and how we can help strengthen utilities' ability to provide rural water services and the enabling environment for utility-managed rural water supply. We would like to see greater understanding of and support for utilitisation pathways among all actors in the sector and thus ensure equitable service provision.

6.1 SYSTEMS STRENGTHENING AROUND POORLY PERFORMING UTILITIES

The lower left quadrant of Figure 8 shows models of poorly performing utilities in weak enabling environments with weak national and local systems. Support here requires addressing the sector's underlying systemic challenges that hinder good performance of utilities supplying rural areas and their expansion. National leadership and a strong national system are crucial. There are several ways in which the enabling environment for utility-managed rural water supply can be strengthened:

- Document and facilitate discussions on service delivery models. Documenting different service delivery models relevant for rural water service provision in a country and their relevance in reaching households is a good first step towards stimulating a sector wide discussion on the models. This should lead to agreement on the place and role of these models in the sector.
- Support governments to create a strategic vision on the role of different service delivery models and support the transition process needed for the evolution of rural water services.
- Strengthen national and local systems in enabling utility-managed rural water supply. Support national and local governments to put in place and strengthen the policy, institutional, planning, monitoring, capacity building, financial and regulatory systems needed to enable and support utility-managed rural water supply. This also includes a learning strategy for exchanging experiences between districts within a country and with other countries.
- Support service authorities in creating demand for piped services and raising citizens' awareness of their role in bringing about good quality services.

6.2 SUPPORTING UTILITIES IN PERFORMANCE IMPROVEMENT

Some utilities are struggling with their operations, but operate in a relatively strong enabling environment (models in the lower right quadrant of Figure 8). For dedicated rural utilities especially, capacity challenges related to both managerial and technical skills, result in poorly performing utilities.

Support to poorly performing utilities that supply rural water services which could be supplied by more experienced urban utilities in the country, or by urban or regional utilities from abroad. WOPs are a popular mechanism for utilities to provide professional support to others. Partners (including IRC country offices) can play a hub role, facilitating and supporting WOPs.

Another area of support is the role of consumers and the communication between providers and consumers. Consumers play a role in ensuring the sustainability of water supply schemes. They can play a role in keeping schemes and their environments clean and protected, ensuring that no illegal connections are made, and raising awareness of the importance of paying water fees. Empowering consumers to be responsible consumers will improve utility performance and service provision. This can be done directly by strengthening civil society, or by supporting service authorities and providers, and building their capacities and skills for good communication with the consumers.

6.3 SYSTEMS STRENGTHENING IN CASES OF UTILITIES THAT PERFORM WELL

The models in the upper left quadrant of Figure 8 are models of utilities that perform well in a weak enabling environment, with weak national and local systems for enabling water service provision by the utilities. These are mostly innovative or emerging models, often initiated by NGOs or the private sector.

Support to these models can include:

- stimulating and facilitating discussion at sector level about the place of these models within the sector;
- strengthening national and local water, sanitation and hygiene systems to enable these models. Supporting national and local governments to put in place and strengthen the policy, institutional,

planning, monitoring, capacity building, financial and regulatory systems needed to enable and support these models.

6.4 PARTNERING UTILITIES THAT CAN EXPAND THEIR SERVICES AND COVERAGE IN RURAL AREAS AUTONOMOUSLY

The models shown in the upper right quadrant of Figure 8 are models of high performing utilities operating in strong enabling environments, with strong policies and planning, monitoring, regulatory and financial systems enabling utility-managed water supply in rural areas. These are mostly well-established models or utilities in HICs, but also include models adopted at national level in lower middle-income countries. Examples are the model of national urban utilities expanding into rural areas, as found in Burkina Faso and Uganda, and CERWASS in Vietnam. The utilities in these models have proven to be well positioned to expand their services into rural areas, and are able to find and generate the support they may need. These models present useful cases for deepening the utilitisation of rural water supply. The utilities in these models can be useful partners (e.g. through WOPs) for other, less strong utilities.

6.5 SUPPORTING EQUITABLE ACCESS TO UTILITY-MANAGED RURAL WATER SERVICES

As mentioned in section 4.6.1, utilities tend to be biased towards first serving the 'low hanging fruit', the people who are willing and able to pay for connection costs and water tariffs. Addressing this issue to ensure equitable access to utility-managed rural water services, might include:

- carrying out studies to gain understanding on who is left behind and how they can be reached;
- creating mechanisms to enable utilities to expand connections (e.g. through connection subsidies or micro-finance options);
- supporting service providers and authorities in setting and monitoring targets related to access to water services for all within a service area;
- supporting service authorities (especially at district level) in developing strategic long-term master plans for reaching everyone, and guiding the discussion of the role of utilities in this.

6.6 UNDERSTANDING AND SUPPORTING UTILITISATION PATHWAYS

This Thematic Overview Paper has shared conceptual and practical insights in utility-managed rural water supply, its pathways and its weaknesses and strengths. However, further work is needed to deepen understanding and use it to engage in sector dialogue and support. This can include the following:

- In-depth studies to better understand the effects of particular utilitisation processes on: water services in rural areas; service provider performance; and the enabling environment over time.
- Developing and deepening understanding of models for utility-managed rural water supply, their strengths and weaknesses, and the operational and systemic changes needed to strengthen them. This understanding could be used to facilitate and guide sector dialogue and advocacy.

BOX 3: POSSIBLE WAYS OF SUPPORTING UTILITISATION PATHWAYS IN IRC FOCUS COUNTRIES

In **Burkina Faso** it could include facilitating and guiding a discussion on how to achieve the Government's goal of having 80% of its rural population served with professionally managed piped water supply by 2030 and the role ONEA can play in this (e.g., in supporting private rural utilities).

In **Uganda**, it could include similar work around the Government's 2040 vision of having piped water supply for all. It could emphasise strengthening the umbrella model and the role of NWSA.

In **Ghana**, it could include engaging in and supporting the change process related to CWSA's goal of transitioning into a national rural utility in the country. It could also contribute to the discussion on the role of safe water enterprises in the sector and strengthening institutional and regulatory systems related to such models.

In **Ethiopia**, it could include engaging in and supporting the development of rural water utilities, including the development and strengthening of enabling regulatory and financial systems related to utility-managed rural water supply, and systems for ensuring the capacity development of rural utilities.

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Annex 1: Countries which have set national safely managed water targets for rural areas

Region	Proportion of countries which have set national rural safely managed water services for rural areas
Northern Africa and Western Asia (n=9)	67%
Eastern and South-Eastern Asia (n=11)	64%
Europe and Northern America (n=9)	33%
Latin America and the Caribbean (n=18)	33%
Sub-Saharan Africa (n=38)	32%
Central and Southern Asia (n=10)	20%
Grand Total (n=95)	**38%**

Source of data: WHO, 2019

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