

# Management models for piped water supply services



A decision-making resource for rural and small-town contexts

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## Acronyms

<b>A-GMFs</b>	Association of Water User Groups (Timor Leste)
<b>ASSA</b>	Salvadorian Water Services Association
<b>ASUFOR</b>	Water Users Associations (Senegal)
<b>AWU</b>	Association of Water Users (Madagascar)
<b>BDS</b>	Business Development Support
<b>CAPS</b>	Drinking Water and Sanitation Committees (Nicaragua)
<b>CBM</b>	Community Based Management
<b>COWSO</b>	Community Owned Water Supply Organisation (Tanzania)
<b>DAS/DNA</b>	Water and Sanitation Department/National Water Directorate (Mozambique)
<b>GMF</b>	Water User Group (Timor Leste)
<b>HRBA</b>	Human Rights Based Approach
<b>KPI</b>	Key Performance Indicator
<b>LG</b>	Local Government
<b>MMDA</b>	Metropolitan and Municipal District Assembly (Ghana)
<b>NGO</b>	Non-Governmental Organisation
<b>ODA</b>	Official Development Assistance
<b>O&amp;M</b>	Operation & Maintenance
<b>PPP</b>	Public Private Partnership
<b>SDG</b>	Sustainable Development Goal
<b>WPC</b>	Water Point Committee (Madagascar)
<b>WSMT</b>	Water and Sanitation Management Team (Ghana)
<b>WSP</b>	Water Service Providers (Cambodia)
<b>WSUC</b>	Water and Sanitation User Committee (Nepal)

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Picture credit: WaterAid/ James Kiyimba

## 1. Introduction and purpose of this resource for selection of management models



The adoption of the Sustainable Development Goals (SDGs), and specifically Goal 6.1, means that governments around the world have committed to achieving universal and equitable access to safe and affordable drinking water for all by 2030. This means closing gaps in access such as those between urban and rural populations, as well as addressing equity gaps for poorer and more marginalised groups in society. It also means delivering higher levels of service in terms of quality, accessibility, and reliability as well as a shift towards the goal of on-premise supply, which can normally better be achieved via piped networks.

Economic growth, rapid urbanisation – including the trend towards rural growth centres – and greater connectivity between populations is fuelling demand for better services across the global south. The implication of these trends is that countries must develop differentiated strategies to meet the demands of different population groups. A blanket approach of providing the entire rural population with services that depend upon only

one management model – often based on community voluntarism – is no longer fit for purpose.

Countries are increasingly adopting medium- to long-term visions for water supply which encourage a shift from point sources that are mostly fitted with handpumps, to reticulated, piped supplies that are considered to provide improved levels of service. In reality, as with handpumps, many reticulated piped systems can provide a poor level of service because of inadequate attention to management arrangements. Whilst the ‘basic’ community management model may demonstrate small islands of success, there is a need to strengthen management arrangements for piped systems and address the broader factors that enable effective management.

At WaterAid our **Everyone, Everywhere 2030** strategy, recognises these trends and associated challenges as we work with governments, civil society and local private sector partners to test and scale-up viable solutions for water supply in the SDG era. We understand that as water supply schemes grow in size and complexity, the conventional

‘one size fits all’ ‘basic’ community-based management (CBM) model is not always – or even usually – capable of effectively managing such schemes. Accordingly, there is a need for more appropriate management models as part of broader investment in programmes. However, management models for piped water supply in rural and small-town contexts do not just exist in isolation. To understand and make informed choices about which management model would be most appropriate in any given context, we have to understand the broader enabling environment and the elements in place that can either support such management models and help them work effectively, or that may constrain and undermine them. In short, we need to recognise the choice of management model as being part of our broader systems strengthening work in any district or town and indeed at national level. Only by paying attention to these broader considerations and elements such as financing, regulation and monitoring, will we be able to address the long-standing sustainability<sup>1</sup> challenge, which sits at the core of our WaterAid strategy. Considerations around equity, gender and inclusion

1. By sustainability we refer to water services that continue to deliver benefits over time and which meet agreed upon service levels; see glossary at the end of this document



cut across all considerations, as critical factors affecting the management arrangements of water supply services. We also have to be pragmatic and show flexibility in responding to context; for example, within the same one country where WaterAid works we may well find substantial differences in water resources, population densities, transport links and economic development, so as to warrant a number of different management models to be considered.

## **Purpose, audience and structure of this resource**

**This resource has been developed primarily for WaterAid staff and partners to help in the selection of management models for piped water supply systems in rural and small-town contexts.** It is also being made available as an external resource for other organisations, including national governments and development partners. It is intended to be a globally applicable, generic guide, and is therefore not meant to prescribe or champion any specific model in any

given context, as there will always be particular issues and concerns to take into consideration; as such working with government to support and align with existing national management models, approaches and systems will always be a necessary first step.

This resource consists of four sections and two associated posters. The next section (section two) describes the major elements affecting the sustainability of piped water supply service provision and the implications for management models. Section three provides an overview of the ten management models applicable to rural and small-town contexts grouped under four primary typologies (CBM, Local Government, Public Utility and Private), using real life examples some of which are from WaterAid's own experiences. Section four provides a practical guide for the selection of management models by considering a number of programming perspectives, including:

- Commercial viability and economies of scale

- Technical complexity, connectedness and local capacity
- Sector policy, financing legislation and norms regarding management models
- Regulation and accountability mechanisms

The two posters have been created that are designed to be used in conjunction with this resource. These present:

- i. A set of case studies of the different management models illustrating the typologies, using real examples and a breakdown of the enabling environment elements, including factors that have constrained or supported the given model;
- ii. A decision aid to help in selecting appropriate management models for specific contexts, which explores aspects of the four main considerations outlined above.



Picture credit: WaterAid/ Chileshe Chanda

## 2. Major elements affecting sustainability of service provision

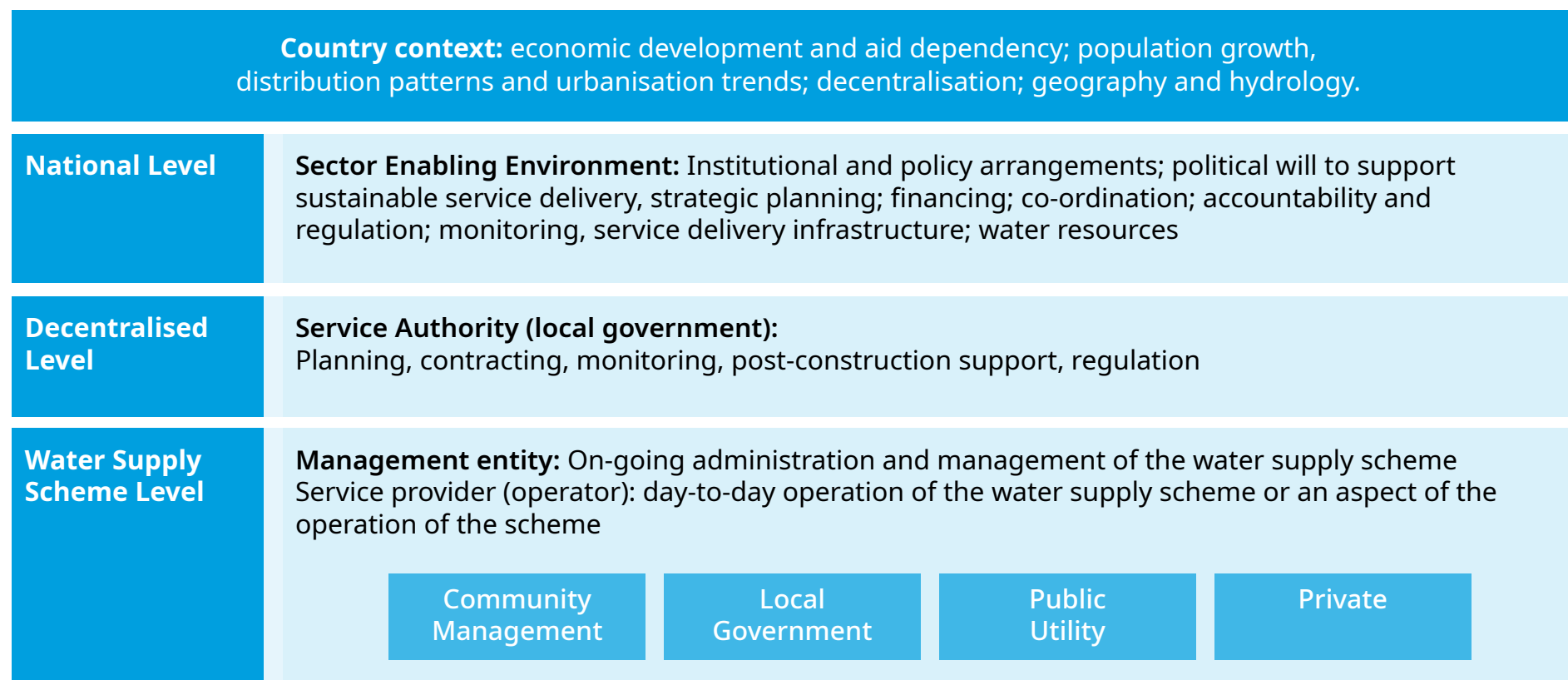


The drinking water sub-sector never exists in isolation; it both reflects – and is shaped by – the broader factors influencing the country in which it is located. Such country context considerations include socio-political, economic, institutional and physical dimensions, such as the extent to

which governments are willing to ensure that ongoing aspects of service provision are adequately supported, levels of economic growth, levels of external aid funding for the rural water sub-sector, population distribution and urbanisation trends, the environment for private sector

participation, the extent and maturity of decentralisation processes (political, administrative and fiscal) and specific geographical, topographical and hydrogeological conditions. All of these will be important determinants of how water services may be organised and structured in any given country.

**Figure 1: Country context, sector enabling environment and water supply management models**



Adapted from Lockwood H. and Smits, Supporting Rural water supply: moving towards a Service Delivery Approach. IRC- Aguaconsult, Practical Action Publishing, April 2011



In addition to the country context, there are a range of more specific elements of any water sector that are crucial to consider when selecting the most appropriate management model(s). These are part of the 'enabling environment' of the sector and are often referred to as factors, areas or building blocks for sustainable service provision; in this resource guide we refer to them as elements affecting sustainability of service provision. Such elements of a water sector include financing, monitoring and institutional arrangements among others and it is important to consider these at national and decentralised levels. Over the past several years a significant amount of work and research has been done to understand these elements of a water sector, as well as how they fit together as part of a 'system'; in WaterAid we have developed experience across a range of countries in analysing the political economy of WASH sectors, which is part of understanding the broader environment in which our programmes operate.

## Terminology

In order to avoid potential confusion, it is necessary to briefly specify some of the terminology used in this report when we refer to different actors and functions in the provision of rural water supply services:

- **Service authorities** are the institution(s) with the legal mandate to ensure that water services are planned and delivered. Service authorities are normally, but not always, local government, and are not necessarily involved in direct service delivery themselves;
- **Service providers** are the actor (which could be an individual, community committee, local government, public utility or private operator) that is responsible for performing day-to-day operations of a rural water supply scheme or an aspect of the operation of the scheme;
- **Management entities** are the actor (which could be community committee, community board, an association, umbrella, local government or private or public operator) that is responsible for the

on-going management of the rural water supply scheme, including strategic decision-making; the management entity may also carry out the day-to-day functions of service provider, or may only oversee the actions of the service provider;

- **Management model** refers to the combination of management entity, service provider, service authority and the associated enabling environment factors that support – or undermine – the functioning of the management entity and service provider (e.g. regulatory capacity, policy frameworks, monitoring etc.).

It is important to note that there are often overlaps in the roles and mandates between service authorities, management entities and service providers. For instance, under direct local government provision of rural water services, the local government authority is the service authority, the management entity and may house the service provider. Another example of overlap, which is far more common, is where community organisations (for example, WASH Committees) and public utilities are both management entities and service providers.

The following sub-sections are organised around a number of important elements of the enabling environment and introduce each one, what they entail and why they are important to sustaining piped water supply service provision as well as implications for the proper functioning of management models. The following text provides an introduction; however, this should be read as a summary only and it is not intended to be an exhaustive resource.



## Institutional arrangements

Effective service delivery 'on the ground' starts with strong institutional arrangements and clearly defined and implemented policies, strategies and the effective demarcation of roles and functions. This also implies, if necessary, that the right legislation is in place, for example, to recognise and support

community management entities, or to allow private entities to enter into the market. Sector policies should clearly specify which type of organisations are permitted to function as management entities for the operation and maintenance of schemes and how they are monitored and regulated. The mechanisms and extent of regulation may vary according to different contexts and typically there are more demanding regulatory regimes for urban supply than for rural or small-towns, but regulation of some form is still important.

Other key aspects include, (legal) clarity around asset ownership, the authority to delegate operation and maintenance contracts and responsibility to pay for and carry out capital maintenance tasks. If these elements are not in place and clearly established, there are no 'rules of the game' and this has major implications for the type of management model under consideration; for example, if ownership of the underlying water supply assets is unclear, this then makes effective delegation arrangements very challenging. Equally, without legal recognition, it is unrealistic to expect community management groups to

have anything more than a very basic role in operation and maintenance. Of particular concern for piped water supply is the capacity of decentralised actors, which are usually but not always local governments – also referred to as the service authority - to provide oversight and support to community-based service providers, which has been demonstrated as a key success factor in what has been termed 'community management plus'. This type of capacity is often referred to as post-construction support; it involves structured, systematic help, monitoring and advice across a range of areas including specialised technical assistance for complex repairs, refresher training, help with tariff setting and conflict resolution. The engagement of the private sector has now become significant in some rural and small-town contexts and as the demand for increased service levels continues, there is the commensurate requirement to raise standards in the operation and administration of piped water supply schemes. This in turn calls for the provision of support to private operators themselves, through what is often referred to as Business Development Support (BDS) aimed at capacity building in technical, commercial and financial

management fields. In short, there needs to be adequate institutional capacity to fulfil institutional mandates, with support for operators from both national and provincial institutions and service authorities, which are normally local government entities. Beyond such capacity – technical skills, but also staffing adequacy, resources (financial and equipment), and systems and protocols to undertake mandated functions, institutional and individual staff motivation and incentives to perform and excel are critically important. In turn these are driven by the existence and effectiveness of performance monitoring and regulation measures.



## Strategic Planning

The old adage that ‘failing to plan is planning to fail’ holds true in rural water supply service delivery. At

the level of the scheme operator, operational business plans which can project factors such as demand, water resource supply, costs and revenues are required to professionally and strategically manage water services – particularly when moving from handpumps to more complex and larger piped water supply schemes. However, in practice such operational plans are rarely developed, or are not informed by adequate data, particularly for more ‘basic’ community managed schemes. As scheme design becomes more complex in terms of number of users, distribution of supply, technology, service levels and water resource demands, the need for better planning becomes equally more pressing; this in turn is a major consideration for the selection of management model.

At more aggregated levels of planning (local government, regional and national levels), strategic WASH plans need to focus not only on expanding WASH first time access, but on sustaining service levels by ensuring continued investment in asset maintenance and adequate management regimes. However, this balance is often not achieved, in part

due to the political economy around financial resource allocations. There can often be a disconnect between strategic planning and budgeting/budget allocation processes in government, and an inadequate link between monitoring and planning, or between planning for new or improved water services and projections of water resource availability. Strategic plans at the sector or local government level aim to achieve sector targets, and help to mobilise resources and align stakeholders around a common vision and implementation approaches. However, due in part to weak coordination, such strategic plans can become obsolete if they are not operationalised or where progress is not monitored, or stakeholders are not bound to align with such planning. Common challenges are found across many different countries in terms of weak or absent government leadership and development partners – donors, multi-laterals and NGOs – who choose to work around, rather than align and support government processes and systems. To overcome these constraints more effective strategic planning is required at different levels of the service chain and this planning must link with budgeting, monitoring, coordination, and water resource allocation, all of

which become more important as we move from point supplies to higher service levels and ultimately household connections.



## Financing

The availability of adequate financing is critical to the sustainable provision of water services. Financing is essential to cover investments, as well as support costs, i.e. for building and sustaining institutional capacity, policy development, regulation and monitoring as well as other key sector activities. Whilst it is often the case in countries where WaterAid works that donors and the government fund capital investments, and service providers (through tariffs) are expected to fund operation and maintenance costs, there is often a lack of clarity around who finances capital maintenance and expansion costs. With such ambiguity,

and in the absence of adequate planning, breakdowns and technical faults can soon lead to lengthy supply outages. Therefore, planning for financial investments and balancing all life-cycle costs with different sources of funding is essential at both the macro- or the sector-level, and for each individual piped water supply scheme. Adequate financing is critical at the level of the individual water supply scheme, and a sustainable service means that all sources of financing must on aggregate meet all of the true life-cycle costs, including initial capital investment and on-going operation, minor maintenance and major repairs and replacement. Financing for water services can come from a variety of sources, including what is commonly referred to as the “3Ts”, which are defined as:

- **“Tariffs”** are funds contributed by users of water services for obtaining the services. Tariffs may include an element of cross-subsidies for more vulnerable individuals within a community, or indeed across communities in cases where services are managed across a wider population;
- **“Taxes”** refer to funds originating from domestic (locally or nationally collected) taxation which are then channelled to the sector from all levels of government, including national, regional or local; taxes are also included here when referring to re-payable loans taken by governments from financing institutions. Such funds would typically be provided as subsidies, for capital investment, operations and institutional capacity. There are also “hidden” forms of subsidies, which include tax rebates, soft loans (i.e. subsidised interest rates) or subsidised services (such as subsidised electricity supplies for certain uses).
- **“Transfers”** refer to funds from Official Development Assistance (ODA), i.e. from international donors and charitable foundations (including NGOs, decentralised cooperation’s or local civil society organisations) originating in foreign countries.

In most contexts where WaterAid works funding is largely based on non re-payable finance and comes from international aid or grants and technical assistance; sometimes it is used to secure guarantees for domestic



financial institutions to on-lend lines of credit to operators, making access to such credit more affordable. Re-payable finance in the form of commercial loans is not commonly applied in the context of rural piped water supply. Understanding the financial landscape as well as the types and extent of funding sources is critical to selecting the most appropriate management model. For example, where taxes and transfers are insufficient to provide external support for community management, it is likely that only a basic form can be expected to function. Equally where tariffs or transfers are adequate to support a more commercial arrangement, then a private operator may be considered.

For piped schemes, tariff setting should be more advanced than for handpump schemes, as there is the potential to consider volumetric tariffs and differentiated tariffs between service levels (e.g. between domestic connection and community standpipe), as well as the need for internal subsidies for poorer households. Revenue collection efficiency and financial (mis)management of tariff revenues can undermine the

commercial viability of water supply services, as can the availability of alternative water sources – a common challenge where installing piped schemes where shallow groundwater means many households have family wells, or in wetter climates where demand and payment for piped water reduces in the rainy season. Tariff setting is often based more on willingness to pay or charge, than on a rigorous calculation of the costs of an agreed service level and can be subject to political interference to keep tariff levels artificially low. Finally, there is also an increasing ‘solarisation’ of piped schemes, often with an objective of replacing expensive-to-run diesel pumped schemes with solar powered units. Whilst this often brings down operational costs considerably, the capital maintenance costs are high and there have been many examples of communities reducing their tariffs when switching to solar, but then being unable to meet the costs of large-scale repairs.



## Coordination

Effective coordination entails all actors – national and local government, donors, lending banks, NGOs and other water sector stakeholders – recognising and adhering to common principles and approaches when supporting piped water supplies. It includes the principles of ‘aid effectiveness’, meaning especially that external actors better coordinate amongst themselves and align behind a recipient country’s national policies, priorities, and systems. It means implementing programmes (at the local level) should follow nationally-set guidelines and standards, both for technical design and construction and in the type of management model, and align behind local (e.g. district) development plans for WASH services. Although innovation and piloting can lead to positive improvements, it is also necessary to be mindful of and respect the formally recognised and

sanctioned management models in any given country. Without formal recognition certain management models may not be fully supported or even legally recognised, which may store up problems for their future viability.



## Accountability and regulation

Accountability in water service provision is derived from one of the core principles of human rights, which includes compliance with all normative values of human rights (accessibility, acceptability, availability, affordability, quality and safety). These normative values should be integrated into every stage of service provision (planning, design, implementation, on-going service delivery monitoring and evaluation, and redesign), however, there is very little enforcement of these values. Effective and robust monitoring frameworks are an important foundation for regulating

the sector, which relies on reliable data in order to assess compliance. Regulation entails economic regulation (related to tariffs, service levels, and competition and consumer protection), environmental regulation (regulation of water abstractions and charges) and public health regulation (related to water quality). The disjointed nature of the oversight or checking on compliance makes it cumbersome for service providers and usually does not provide users with a one-stop complaints mechanism to remedy failure. The existing accountability mechanisms often have an urban bias and rural water provision is under-represented so although regulation is critical to ensuring that the interests of the public sector, operators' and users' are met, unlike for urban utilities, in most rural and small-town contexts, no independent regulatory body or institution exists, or they are only in the very nascent stages in most countries, although this is starting to change. In these cases, regulatory functions may be delegated to existing institutions, often local governments, although they do not always have the capacity or resources to fulfil these mandates. Service providers and more formal utility operators may also be subject

to accountability mechanisms, which involve citizens and users monitoring services and the use of tools such as score-cards, complaint 'hotlines' or the public sharing of information. Although there has been progress in building regulatory frameworks and capacity for urban services, rural areas and small-towns pose challenges both in terms of the capacity to enforce, but also because service providers are often very numerous and dispersed. Regulation in these areas often relies on the so-called 'short-route' of accountability, directly between household consumers and the operator, which leaves consumers in a weak negotiating position as the provider has an effective monopoly. The form and importance of accountability and regulation mechanisms will vary across different management models, with more formalised arrangements in place for (larger) private operators or public utilities. Such accountability measures are particularly important to ensure that services are provided to socially marginalised groups, such as female-headed households, the disabled or individual households from minority ethnic groups. In piped schemes, arguably more so than for point sources, there is considerable potential to increase the accountability

of operators through micro-metering and in certain contexts to apply improved IT-enabled systems of billing, mobile money payments and even 'water ATM's' that use pre-paid meters, all of which help to improve the ability to monitor and account for the balance between water production, consumption and tariff income, thereby reducing the opportunities for potential financial mis-management. In contrast, water theft through illegal connections can be common in piped schemes and accountability mechanisms also need to be in place to protect the activities and assets of the operators against abuse.



## Monitoring

Monitoring refers to on-going assessment of the performance of the sector at various levels; it is closely linked with the regulation of the sector and individual operators, setting rules for

managing water services and ensuring that operators comply with these rules. It also implies tracking sector progress such as increased access to WASH services, service levels (including water quality), and functionality. Monitoring functions are generally assumed at national and decentralised levels, as well as through 'self-monitoring' by operators who collect data on both technical performance and financial aspects such as water production, consumption, tariff payments and costs. To be successful such monitoring should ideally rely on a comprehensive and commonly agreed upon – and respected – framework being set out to identify, collect and analyse data. Although in many countries the focus of monitoring is on coverage or functionality of piped water supply, ideally it should extend to also include metrics relating to levels of service provided (in terms of quantity, quality, reliability), as well as ideally equity and the performance of management models, including financial viability. In larger utility-run schemes, there is often the application of 'key performance indicators' (KPIs) which set indicators and respective benchmarks that cover utility performance, efficiency and service provision quality. Whilst regulators may set such KPIs and

monitor against benchmarks, the concept of performance indicators is not widely applied to smaller rural schemes, but should be the aim as piped schemes evolve. Establishing clear and agreed on service levels is a critical starting point for monitoring and regulation, as well as the human right to water, as without such service levels in place it is very difficult to assess whether users are able to access adequate services; it also provides a benchmark to hold government and operators to account. Equally, robust monitoring frameworks allow for the assessment of whether the obligations of users are being met, for example through regular tariff payments. Auditing of operators strengthens transparency in financial management and can in turn encourage user payments. In addition to service provision monitoring, the quality of water provided, and the water resources themselves must be monitored to ensure an adequate and sustainable service.

The scope and sophistication of monitoring frameworks has a bearing on the management models under consideration; for example, it is reasonable to expect private sector operators or a public utility, which often have a natural monopoly in any given

location, to be subject to more rigorous and regular monitoring requirements than say a voluntary community-based organisation. Conversely, more and more complex self-reporting of data and metrics should be expected from more sophisticated management models.



## Gender and social inclusion

Women and men often have different interests, needs and roles in the use and governance of water resources; therefore, the type of management arrangements for piped water supply that is chosen will have different, even if only slightly, impacts on women than men and this must be assessed and understood in any choice made by WaterAid. Approaching this area of work in a gender-blind way risks reducing its impact for half the intended population and it is therefore critical to address the role of women and in management

arrangements and service design. Evidence produced by the Global Water Partnership shows that meaningful involvement of women in water resources development, management, and use can lead to effective solutions to water problems, helping governments avoid poor investments and expensive mistakes, making projects more sustainable, and ensuring that infrastructure development yields maximum social, economic, and environmental results and furthers sustainable development goals.

With piped water supplies, there are examples in which richer households may develop domestic connections and consume considerably higher volumes of water, at the expense of reducing service levels for poorer households, that may rely on tap stands. Piped water supplies open up the possibility to provide differing levels of service (e.g. standpipe or domestic connection) to different user groups, and consideration should be made to ensure all users can access at least a 'basic' and affordable level of service. This may for example require tariff designs with a 'lifeline' rising block tariff, providing accessible public standpipes selling water at a lower volumetric

cost than domestic connections and providing subsidies or financing mechanisms to help lower-income households to meet the capital cost of connections. Sufficient management capacity is therefore important to ensure such equity considerations in the design of tariffs and enforcement of payments.



## Service Delivery Infrastructure

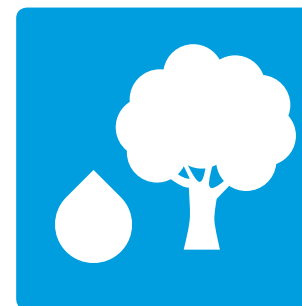
The technology choice and quality of initial construction of piped water supply infrastructure will have a considerable bearing on the prospects for the sustainability of schemes, as can the approaches towards maintenance and repairs. Construction standards are often prescribed by the sector but the quality of construction is closely linked with adequate supervision arrangements, which are not always in place. Technologies applied need to be



appropriate to the context, and at design phase, the selection of technologies and service levels need to be aligned to sector standards, the willingness and ability of the users to pay and to the hydrogeological environment. Too often handpump boreholes are upgraded to motorised pumping without any consideration of the ability of the borehole or aquifer to serve higher volumes of water. A further common challenge in many countries is that operators may only provide intermittent supply due partly to affordability constraints and in some cases to a lack of raw water. This daily switch from empty to full tanks can damage infrastructure and risk contaminant ingress when the system is at low or no pressure. Whilst many countries have undergone a process of standardisation of handpump technologies to ease maintenance and supply chain arrangements, piped water schemes may have more diverse scheme components meaning standardisation is more complex. For example, expansion of solar pumping technologies for rural piped schemes in some countries has outpaced the establishment of viable and affordable maintenance services and supply chains. Moving from point source schemes to larger piped water supply implies more complex technologies,

and often a larger customer base, with both pros (in terms of economies of scale) and cons (in terms of the need for more sophisticated management); this has implications for the selection of management and maintenance models, as outlined in section 4.

Asset management is a well-known term in urban utility water services, but it is often not widely understood or applied in rural or smaller town contexts. At the operator level it implies (among other things) a more strategic and planned approach to maintenance, shifting from 'fix on failure' to budgeting for scheme component depreciation and planning and budgeting for preventative maintenance and component replacement. At higher levels (e.g. for local government or deconcentrated central ministries) this implies having a systematic inventory of the asset base in the district, region or country and using this to strategically plan and budget the financing required for capital maintenance and expansion of support to service providers. Such asset inventories also provide the vital data against which to plan for viable maintenance and supply chain services.



## Water Resources and Environment

Absolute availability of water resources for piped water supply is obviously a critical factor in the sustainability of services; simply put, if there is an insufficient source of water there will be no (or an inadequate) service. A common mistake made by practitioners is to assume that adequate water resources exist for motorised pumping. This plays out when boreholes once fitted with handpumps are upgraded to motorised pumping without carrying out the necessary assessments to determine if the borehole and indeed the aquifer can provide the quantities of water needed. Such assessments are also needed when transitioning from public waterpoints to household connections as demand is likely to increase dramatically. Even though piped water supplies in rural areas and small towns generally use a relatively small amount of water

resources, they can often be significantly affected by other water users; particularly farmers pumping groundwater for irrigation. Measures to ensure access for domestic use range from giving priority to domestic water supplies in water allocation, to ensuring that domestic water users are represented in catchment management bodies or undertaking catchment protection works as part of project implementation. On-going attention to water security through water resource mapping and monitoring, clear allocation of water rights for specific sources and water and catchment conservation at the local level are critically important. However, in many countries there is little or no coordination between ministries responsible for water resources management or irrigation and those for drinking water.

The sustainability of piped water supply is also linked to issues of seasonality and the ability of infrastructure to accommodate seasonal variations in supply. Changes in land use, deforestation and increasing climatic variability matched with increasing pressures from growing population and industrial activities, all pose challenges to the perennial supply of water. At the operator level, it is important that

plans for service level improvements (e.g. moving from standpipes to domestic connections) and piped water scheme expansions, both of which imply increased consumption patterns, is matched with a clear understanding of the current and likely future yields from the water sources. Frequent hydrological monitoring of the water sources is key to building the information base on which to manage the piped water scheme. Yields and water quality can be preserved to an extent through catchment protection measures and water safety planning and leakage management initiatives, such as metering the system and undertaking water balances and leakage monitoring and response mechanisms, all of which can help maximise water resource available. The quality of the water resources is also a key issue for sustainability. For example, aggressive groundwater can corrode infrastructure if improper materials are used, and sources yielding water perceived to have issues of taste, appearance or health may limit usage and payment of user tariffs, all of which will impinge upon the ability of the management entity and the service provider to effectively function. High fluoride or arsenic can have significant health impacts and

their removal is complex and expensive for operators to manage in low income settings. Complex and challenging water resource environments may pose obstacles to management entities that have little resources or capacity to represent themselves and lobby for improved water source protection or treatment. Water supply infrastructure can often be affected by floods or landslides, meaning it is important to take risk mitigation and resilience measures into account in the design and siting of facilities for example.



Picture credit: WaterAid/ Chileshe Chanda

### 3. Typology of management models for rural and small-town piped water systems



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## Evolution of experience with management of rural and small-town water supply

There has been an evolution in the thinking around the management of water supplies in rural areas and small towns since the international decade on water and sanitation (1980-1990), during which community management was firmly established as the predominant approach (see figure 2 overleaf). In the mid to late 1990s and into the early 2000s on-going challenges with the sustainability of service provision led to the questioning of this 'one size fits all' approach and the recognition of the limitations of such voluntary community management arrangements. As a result, support to community management was identified as a key factor to ensure long-term sustainability and since the early 2000s, increasing emphasis has been placed on providing on-going support to rural service providers – this is commonly referred to as post-construction support and is often provided by various entities of government, but most commonly by local governments. The 2000s also witnessed the emergence of so-called

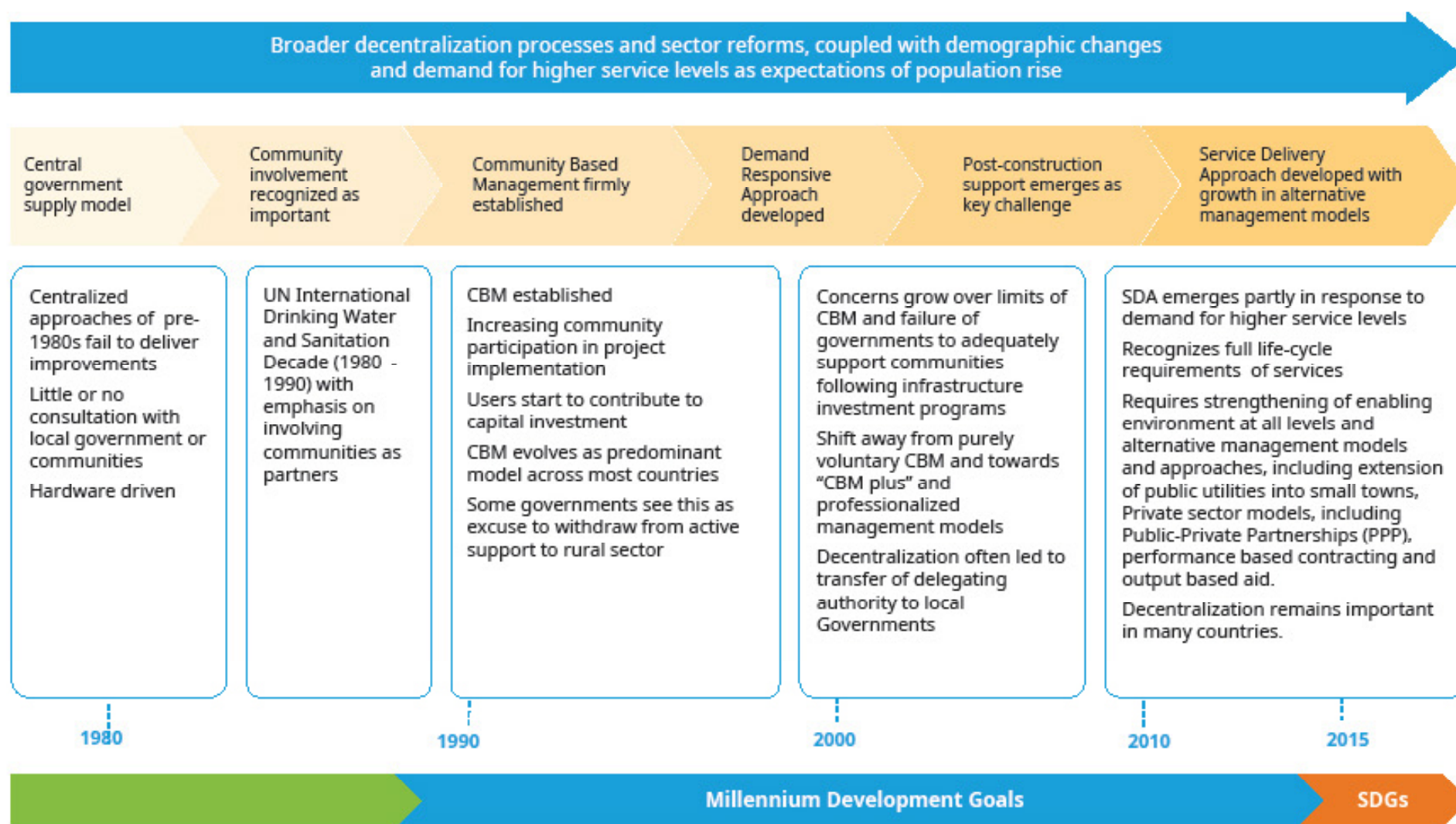
professionalised service delivery, moving away from solely voluntary-based community arrangements, to a diversification of management models, including various forms of private sector involvement in rural and small-town service delivery. In the 2010s we have seen the growth and piloting of more innovative maintenance contracts, including clustering of water points under a larger lease contract, payment by results and the emergence of Public Private Partnerships (PPPs), which seek to improve the management of piped water schemes in rural areas; these partnerships can involve different stakeholders who assume varying degrees of risk and responsibility for asset maintenance and (re-) investment. There has also been experimentation with performance-based contracts and output-based aid. With the increasing demand for higher service levels and the development of piped systems in rural areas, there is a recognition that governments' role encompasses a much wider range of responsibilities than infrastructure provision and support during the implementation phase.

## Introduction to management model typology

In many countries, the organisations responsible for the initial financial investment and construction of schemes in rural and small-town scenarios are often different from those that have the responsibility for managing the infrastructure over time. For example, it is typical for NGOs, bi-lateral aid or government investment programmes to pay for and construct schemes, and then hand these over to the community for on-going management and operation. Alternatively, central governments may invest in piped supply infrastructure and then local governments become responsible to ensure that it is managed properly by delegating management responsibility to a community or private operator, or in some cases local government may operate schemes directly. These distinctions between the responsibilities for construction and subsequent ongoing management, are vitally important, but in this document, we focus on the ongoing management and maintenance of the services post-construction. For the purposes of defining this typology of management models we consider important



**Figure 2:** Evolution of rural and small-town water supply paradigms and management models



Adapted from Lockwood H. and Smits, Supporting Rural water supply: moving towards a Service Delivery Approach. IRC- Aguaconsult, Practical Action Publishing, April 2011

functions and relationships between actors, including:

- Legal ownership of the water supply asset and the right to delegate management responsibility for the scheme;
- Share of risk in terms of control over income streams from tariffs and requirement to provide minor and capital maintenance;
- Strategic control and management oversight of the scheme; and
- Day to day responsibility for operating the scheme.

Table 1 overleaf presents an overview of the main typology of management models for rural and small-town water supplies developed for this resource which fall into four primary categories: i) Community-based Management, ii) Local Government; iii) Public Utility and iv) Private. We recognise that in reality management arrangements may be complex, there may be variations and even possible hybrids across the models; put another way, management models may not 'look the same' in all countries. But this typology has been developed to serve

as a general guidance or resource tool, so we expect some flexibility in its interpretation and use. For example, in some contexts we may find that communities retain ownership and overall management responsibility, but private sector companies are then contracted to carry out some or all aspects of operation; it is therefore sometimes difficult to place such a model in one or the other typology. There is also a trend towards adopting an approach developed for urban water supply in rural areas and small-towns, whereby an independent asset holding company or body is established, which then offers leases for management that include clauses for responsibility for maintenance, replacement and expansion of networks. When considering aggregation, we can also make a distinction between cases where multiple schemes are managed by a single management entity (e.g. an association) and multi-village single schemes, which aggregate management units of individual villages within one overall management entity (e.g. rural water boards). We understand that in some countries there may be an additional type, which is self-supply, but we do not give this a separate category, as even where

communities may have financed the construction of their own system, the on-going management is then actually a common responsibility (as opposed to household self-supply, which is outside the scope of this paper).

The schematic diagram shown in Figure 3 provides a generic overview of the actors and relationships typically involved in service provision, management functions and external support and oversight for all of the 10 types of management models included in this typology. It also illustrates the lines of regulatory oversight between different types of actors for each management model, and outlines how strong these are, bearing in mind that in many instances there will be no formal or independent regulator, but rather a set of regulatory functions delegated by central government to lower tiers of government or third-party entities. It is important to bear in mind that this schematic diagram represents a generic overview; we therefore recognise that different variations of each management model exist and have been applied with varying levels of success in different contexts and with different combinations of actors, functions and inter-relationships.

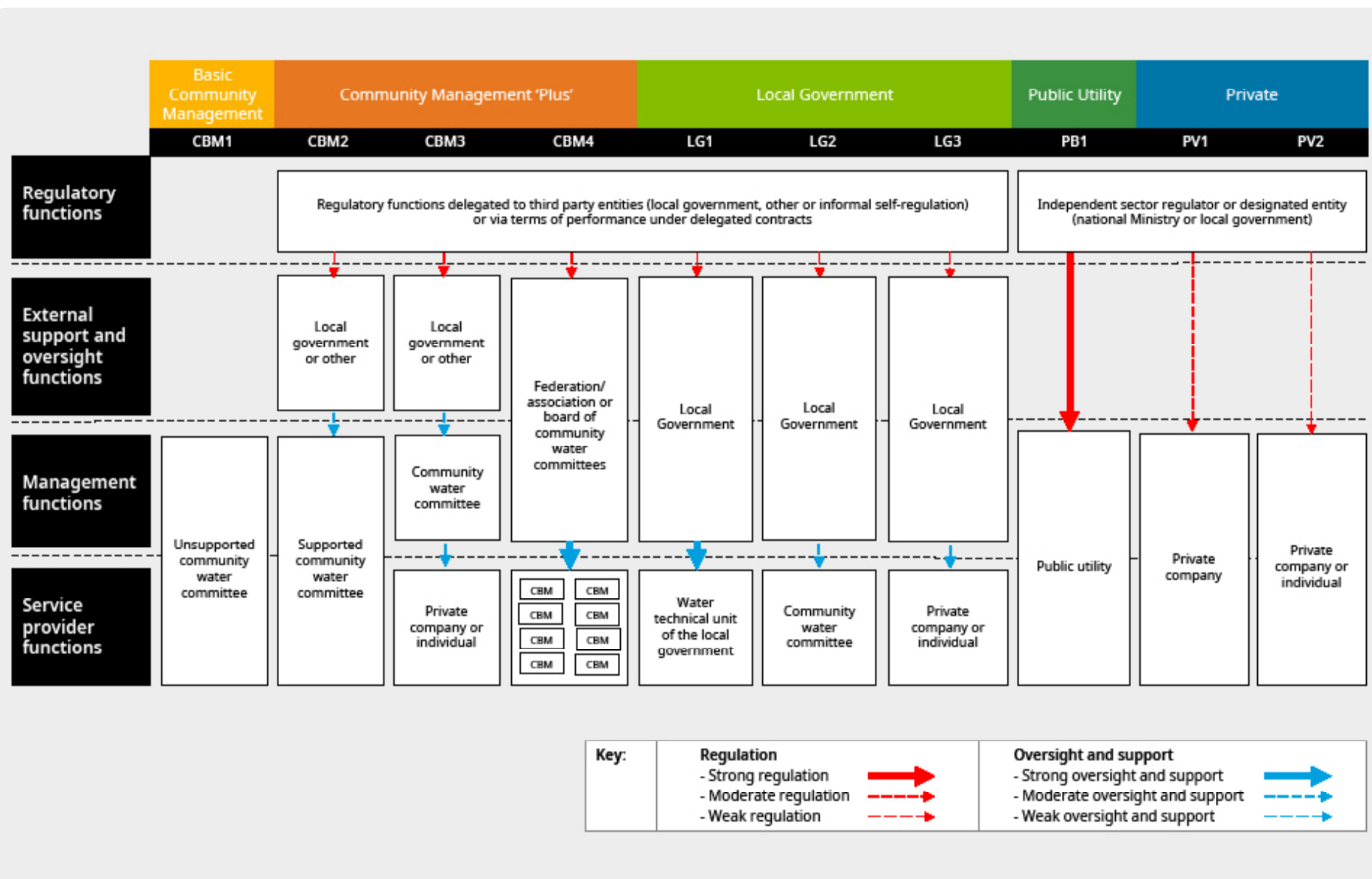
**Table 1:** Overview of piped water supply management model typology in rural and small-town settings (page 1 of 2)

	Basic Community Management	Community Management 'Plus'			Local Government			Public Utility	Private	
Typology	CBM.1: Community Management with minimal or no external support	CBM.2: Community Management with external support and some level of professionalism	CBM.3: Community management with delegation of some or all functions to private operator through a management contract	CBM.4: Grouping of Community Based Management Organisations into Associations or Federations to support the management of rural water supply schemes	LG.1: Direct management of schemes by Local Government	LG.2: Local Government delegation to community operators through management or lease type contracts	LG.3 Local Government delegation to private operators or maintenance companies through management or lease contracts	PB.1: Public Water Utility at town, district, state or national level manages the rural water supply scheme	PV.1: Ministry or asset holding entity delegates operation and/or maintenance responsibilities to a private company through management or lease type contracts	PV.2: Privately owned and operated schemes (invest, build and operate)
Case Study	Nepal, Water and Sanitation User Committees (WSUCs)	Madagascar, Water Point Committees (WPC) and community association with support from municipal WASH teams	Tanzania, Community Owned Water Supply Organisations (COWSOs)	Timor Leste, Association of Water User Groups (A-GMFs)	Bangladesh, Pourashava's (municipal authorities)	Ghana, Water and Sanitation Management Teams (WSMTs) – piped schemes	Uganda, Whave	Ethiopia, Small-town Utilities	Mozambique, Water & Sanitation Department (DAS/ DNA) of the Ministry of Public Works, Housing and Water Resources	Cambodia, independent private Water Service Providers (WSPs)
Scope	Model is national in scope and application	Model is national in scope and application	Model is national in scope, but not widely applied	Model is being piloted by WaterAid in two of the country's 12 municipalities	Model is national in scope, but limited application	Model is national in scope and application	Model is being piloted in 5 rural districts	Model is national in scope and application	National in scope and application, but limited role out to date	National in scope and application
Size of schemes	Schemes size varies significantly as this a national model, but typically serve small communities of 500 to 2,000	Scheme size varies significantly as this a national model, but typically serve small communities of 500 to 2,000	Scheme size varies significantly as this a national model, but typically serve small communities of 500 to 2,000	Predominantly small schemes in dispersed rural communities; average community size served by each GMF is between 300 and 600 households	Pourashava's manage schemes in secondary towns with populations of 10,000-60,000	The WSMT piped scheme model applies to large, villages, small-towns or peri-urban areas with populations of 2,000 – 10,000	Model applies in communities with populations up to 1,500, but also works in rural growth centres with populations from 1,500 – 5,000	The model supported by WaterAid works in centres with populations from 25,000 – 130,000 (with an average of 45,000)	Scheme size ranges from populations of 2,000 – 10,000, but to date DAS/ DNA has only delegated 19 rural water supply schemes	Schemes range from small schemes (<1,500 connections), to medium schemes (1,500-3,000) and large schemes (>3,000)

	Basic Community Management	Community Management 'Plus'			Local Government			Public Utility	Private	
Overview	<p>WSUCs are voluntary groups of 9 to 11 people, including one Village Maintenance Worker</p> <p>WSUCs organise community members' contributions and ensure effective O&amp;M of the water supply system with very minimal or no external post-construction support</p>	<p>Each standpipe has a WPC and each water supply scheme has an AWU</p> <p>During project implementation, capacity building sessions are conducted for WPCs and AWUs, including training and equipping of local technicians</p> <p>The community and the WPCs decide on the type of management of the water scheme, but final decisions must have Municipal approval</p> <p>Municipal WASH teams provide technical support and back-stopping to AWU's</p>	<p>Legislation enables COWSOs to contract private operators to manage water supply schemes</p> <p>Private sector participation ranges from revenue collection at single tap stands to full system O&amp;M</p> <p>More significant forms of private sector participation such as Build Own Operate (and transfer) are not widely evident</p>	<p>A-GMPs comprises of member community management entities (GMPs) that A-GMPs support to manage their schemes</p> <p>A-GMPs visit members periodically and spend about a day in each community, asking about challenges or issues, inspect the scheme and collect data that is shared with municipal authorities</p> <p>A-GMPs assist with more complicated repairs</p>	<p>Local Government Act 2009 authorised Pourashava's to produce and supply water and render related services to their citizens</p> <p>Each Pourashava has a 7 or 8-person water supply division responsible for all aspects of the scheme management</p> <p>Typically, Pourashava's lack capacity, however support from WaterAid has enabled Paikgachha Pourashava to function effectively</p>	<p>Metropolitan, Municipal and District Assemblies (MMDAs) can decide to adopt the WSMT piped scheme model</p> <p>MMDAs should establish formal delegation agreements with each WSMT that outline responsibilities and set performance benchmarks</p> <p>WSMT piped schemes are delegated responsibility to operate, maintain and manage schemes</p> <p>MMDAs should approve tariff regimes</p>	<p>Whave is a non-profit enterprise that provides preventive maintenance services</p> <p>District governments sign a Memorandum of Understanding with Whave that divides roles between themselves, Whave and Water and Sanitation Committees (WSCs)</p> <p>WSCs sign a preventive maintenance agreement with Whave</p>	<p>Each of Ethiopia's 980 towns has its own public water utility, which operates, manages and maintains their water supply systems</p> <p>Government units are supposed to support the water utilities; however, they are overstretched</p>	<p>Once a piped scheme is built or repaired (to a viable operational state), DAS delegates responsibility for operation and/or maintenance to a private operator under a lease agreement, typically for a three-year period</p> <p>Private operators sign the contracts at the Local Authority and the contracts receive the final approval of the provincial government</p>	<p>WSPs are private entrepreneurs, which operate, manage, rehabilitate and expand their own piped water networks that deliver water to households at the community level</p> <p>Private operators have to get signed authorisation from the commune (Local Government) as part of their licensing</p> <p>Not all WSP are licensed or monitored, but there are approximately 400 operating in semi-rural and rural areas serving a total population of about 1 million consumers</p>



**Figure 3:** Schematic diagram outlining different actors, functions and relationships across the ten management models in the WaterAid typology



## Description per management model with examples

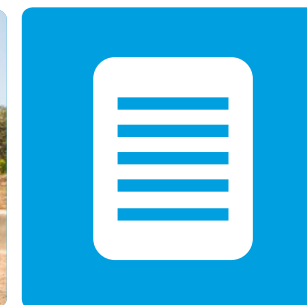
The following section includes a one-page overview for each of the ten management models identified in the typology. The overview of each management model is presented in a common format, which includes features of the model, the typical contexts in which it is applied, who is typically responsible for different aspects of maintenance and operation and how financing is usually set up. The overviews also contain a summary of the most prominent enabling factors for the success of the model, as well as important challenges. Each example includes reference to two or more case studies; further details of specific case studies are presented in the poster accompanying this guide.



Picture credit: WaterAid



Picture credit: WaterAid/ James Kiyinda



## CBM 1. Basic unsupported Community Management

### Introduction:

This is probably still the most common form of CBM, and it is the most problematic. Infrastructure investments are made through government, donor or NGO programmes, a voluntary committee is formed, given a basic one-off training and some spare parts, and then handed responsibility for the scheme. More significantly, over the long-term, there is typically limited or no post-construction support provided and communities are left to manage the schemes more or less alone. In most cases, piped water supply will continue for some time, but service levels are likely begin to deteriorate or some sections of the network will no longer receive any water. Technical, financial and social (conflict resolution) challenges are usually beyond the capacity of most voluntary committees to resolve without external support and guidance.

### Where and in what contexts is it applied?

Unsupported community management is very common in low-income countries, most commonly in smaller rural communities where gravity-fed piped networks are viable, but it can also be found in cases of larger rural schemes. It is typically the result of inadequate institutional support and a lack of funding for local government or central technical agencies – and in some cases private sector companies – to provide long-term support.

### How does it work?

- **Financing:** O&M is supposed to be met from tariff revenue, but this is often inadequate to meet even these basic costs. Capital maintenance or replacement costs are not systematically planned for and generally addressed by 'fix on failure' and rely on ad hoc financing by government or aid agencies.
- **Asset ownership and delegation:** de facto assumptions of community ownership, but asset ownership is often unclear or not clearly enforced or disputed. Informal voluntary committees may not have the legal mandate to take ownership of assets.
- **Operation and maintenance:** O&M tasks are carried out by voluntary committee members, who generally lack the technical capacity and tools to tackle complex repairs.
- **Support to the service provider:** by definition, under this model there is very limited, or no support, provided to service providers.
- **Monitoring, regulation and accountability:** depending on internal capacity, voluntary CBM committees may provide reports to community members. Reporting may also be done externally, but typically such communities will not be monitored or provided with support from the Service Authority (typically local government) or regulators.
- **Share of risk:** all risk for maintenance and investment lies with the community; conversely, where a tariff income surplus is generated the CBM may utilise this to reinvest, but the reality is that the vast majority of such models run at a financial loss.

### Key enabling factors:

- Functions as a de facto model for highly dispersed or remote communities where there is little prospect of support being provided on a regular basis. It is a self-reliance approach
- Having key management functions performed by women can strengthen the sustainability of management committees and ensure that services better meet the needs of women
- Strong social cohesion at the community level or through religious groups can be a powerful force for self-help and participatory/voluntary solutions
- Charismatic individuals and strong community leaders can galvanise communities to work well together.

### Case Studies:

- Nepal: Water and Sanitation User Committees (WSUCs)** are voluntary groups that consist of between 9 and 11 people (including one Village Maintenance Worker). They are responsible for organising community members' in kind and cash contributions as well as ensuring the effective O&M of the water supply scheme. District Development Committees are supposed to provide ongoing management and technical support to WSUCs, [however in reality WSUCs receive very little support](#).
- Nicaragua: Drinking Water and Sanitation Committees (CAPS)**, although attempts have been made to formalise/increase the support that Municipalities give to CAPS to manage their water supply schemes, the support CAPS receive remains minimal and Municipal governments are often limited to performing an administrative role in registering CAPS in the first instance.

### Common challenges:

- Lack of legal mandate can limit effectiveness of CBM entities
- Schemes often face financial constraints due to insufficient tariffs, lack of payment of tariffs and sometimes mis-management of funds by committee members with no/weak accountability
- A lack of financing and investment leads to a downward spiral of poor service levels and non-payment of tariffs.
- Voluntary members often have limited skills and knowledge to tackle more complex repairs or management challenges
- Local political interference in tariff calculation and (re)setting.

## CBM 2. professional CBM with external support

### Introduction:

This variation of the CBM model is often referred to as 'community management plus', whereby voluntary groups receive some form of external support on a reasonably regular basis and/or may have achieved a degree of professionalisation of functions through training and possible remuneration of one or more technical positions within the management structure. Some kind of post-construction support and follow-up is provided by external agencies, typically but not always local government or a dedicated technical agency. Such support and professionalisation can result in improved management performance and the capacity to better resolve technical and other challenges before they become critical; service levels are generally improved under this model.

### Where and in what contexts is it applied?

Professionalised community management with external support is found in low and middle income countries, typically in smaller rural communities where gravity-fed piped networks are viable, but also in larger rural schemes. There is a long history of supported community management in Latin America, where a number of countries have adopted aspects of the USA 'circuit rider' model developed in the 1980s by the [National Rural Water Association](#).

### How does it work?

- **Financing:** O&M is supposed to be met from tariff revenue, but this may still be inadequate to meet basic running costs. Some communities may be able to generate surplus income for capital maintenance but this is not widespread and financing generally relies on government or aid agencies.
- **Asset ownership and delegation:** de facto assumptions of community ownership, but asset ownership is often not clear or not clearly enforced or disputed. The "community" may not have legal mandate to take ownership
- **Operation and maintenance:** O&M tasks carried out by committee members, who have some technical capacity and tools to tackle common repairs.
- **Support to the service provider:** support functions are generally provided by local government, decentralised government technical agencies or third parties such as NGOs, or in some cases private companies. Financing for such post-construction support is often inadequate.
- **Monitoring, regulation and accountability:** committees provide regular reports to the community. Reporting may also be done externally, typically with help from external support entity as part of regular monitoring visits. Accountability mechanisms are limited, but conflicts maybe addressed through external support.
- **Share of risk:** all risk for maintenance and investment lies with the community; conversely, the CBM may utilise tariff income surplus where this is generated to reinvest, but many models run at a financial loss.

### Key enabling factors:

- Having well resourced and capacitated external support agencies in place, which are able to make regular visits to communities is the key to ensuring the success
- Such support costs vary but studies indicate that spending of much less than [US\\$1 per person per year](#) results in ineffective support
- Strong social cohesion at community level or through religious groups can be a powerful force for self-help and participatory/voluntary solutions
- Charismatic individuals and strong community leaders can galvanise communities to work well together
- Having key management functions performed by women can strengthen the sustainability of management committees and ensure that services better meet the needs of women.

### Common challenges:

- Lack of adequate financing to enable external post-construction support is the most critical challenge
- Unclear legal mandate can limit the effectiveness of CBM entities
- Schemes often face financial constraints due to insufficient tariffs, lack of payment of tariffs and sometimes mis-management of funds by committee members with no/weak accountability
- Even with on-going training and back up support knowledge, skills and capacity of service providers may remain limited for more complex repairs or resolving social conflicts
- Local political interference in tariff calculation and (re)setting
- Lack of clearly defined and respected tariff regimes.

### Case Studies:

- Madagascar: Water Point Committees (WPCs),** each standpipe has a WPC and each drinking water supply system at the village level has an Association of Water Users (AWU). WPCs receive training as well as some support from the AWU and the Local Government Authority, and the WPCs are responsible for O&M, collecting tariffs and minor repairs.
- El Salvador: Salvadorian Water Services Association (ASSA):** is a network of community-based service providers, employing six circuit riders to service some 170 communities; the initiative was set up with support from the International Rural Water Association (IRWA), a USA-based non-profit and provides regular support in areas such as bookkeeping, chlorination, pump operations and tariff settings; see: [www.ircwash.org/sites/default/files/084-201502triple-s\\_bn06defweb.pdf](http://www.ircwash.org/sites/default/files/084-201502triple-s_bn06defweb.pdf)



### CBM 3. CBM with delegation to private operators

#### Introduction:

Under this variation of CBM a recognised management entity formed by the community delegates out certain aspects of maintenance services, revenue collection or standpipe management; in some cases full management of all tasks relating to O&M and administration of a scheme may be contracted out under multi-year contracts, although this is less common. In these cases community management entities will retain strategic control and oversight for the scheme, but will have a less hands-on role in its operation and maintenance. These arrangements can lead to improvements in overall service levels, by employing more specialised and skilled individuals or by having discrete tasks carried out by a dedicated individual or company.

#### Where and in what contexts is it applied?

This model can be found in many different contexts and countries. Although it typically applies to larger and more sophisticated piped schemes, it can also be a feature of simpler and smaller schemes that rely, for example, on a limited number of communal standpipes, or kiosks which are each managed by an individual who maintains the kiosk, ensures security, bills and collects tariffs and is then paid based on a fixed fee or the volumetric sale of water.

#### How does it work?

- **Financing:** as with other forms of CBM, recurrent costs are met from tariff revenue; where there are financial incentives to ensure cost recovery, rates of payment may be higher than under basic CBM. Financing for capital maintenance usually cannot be met from tariff income and relies on government or aid agencies.
- **Asset ownership and delegation:** depending on the country context asset ownership may be clearly defined, but this model benefits from the ability of CBM entities to enter into contracts with private operators or suppliers.
- **Operation and maintenance:** some or all O&M tasks may be carried out by delegated technicians, who are likely to have more skill and experience.
- **Support to the operators:** support varies and as with other forms of CBM relies on an external entity for back up, which is usually either local government or a centralised technical agency.
- **Monitoring, regulation and accountability:** delegated operators will report to committees who then in turn provide regular reports to the community. Reporting may also be done externally, typically with help from an external support entity as part of regular monitoring visits. CBM entities monitor the performance of private operators.
- **Share of risk:** unless formalised, all risk for maintenance and investment still lies with the community; some examples exist where share of risk is shifted to local private operators.

#### Key enabling factors:

- Having clear institutional roles, mandates and supporting legislation giving legal authority for community entities to act as contracting authorities
- Improvements in service standards tends to drive up willingness to pay and efficiency of cost recovery
- Vibrant local private sector, which is able to support technical and other functions on a commercial basis to rural communities
- Clearly defined and respected tariff regime and mechanisms for (re)setting tariffs based on cost recovery principles
- Having key management functions performed by women can strengthen the sustainability of management arrangements and ensure that services better meet the needs of women.

#### Case Studies:

- Tanzania: Community Owned Water Supply Organisations (COWSOs).** legislation enables COWSOs to contract private providers to perform tasks relating to the management of their water supply schemes. [Various forms of private sector participation occur](#), ranging from revenue collection at single tap stands to full system O&M under multi-year contracts.
- Senegal: Water User Associations (ASUFORS),** ASUFORS have responsibility for rural piped schemes under ministry policy and some contract operations (pumping, kiosk operation, billing, payment collection) to [local private operators](#) who in turn hire pump and kiosk attendants, meter readers and plumbers.

#### Common challenges:

- Private operators non-existent in remote rural areas
- Lack of clarity around asset ownership and/or authority to set up contracts for private operators or other technical services
- Political interference within the community may limit the ability of CBM entities to set realistic tariff levels
- Limited capacity of CBM entities to understand and let contracts for maintenance
- Lack of adequate financing to enable external support for both CBM entity and contracted operators.



## CBM 4. Aggregated Community Based Management

### Introduction:

This variation of CBM is based on the grouping of individual community management committees under one higher-level management entity that is formed by member communities. Each CBM has representation, but the association will typically elect an executive board for governance functions and if required employ technical staff who provide support to members. This pyramid arrangement provides economies of scale, stronger representation (for commercial and political lobbying) and specialist functions and services to member CBMs. Aggregation can be achieved through associations, federations or community boards (managing multiple schemes or one large scheme) depending on the country context and legal options. It is important to clarify the distinction in this model between i) multiple schemes managed by a single management entity (e.g. Association) and multi-village single schemes, which aggregate management units of the individual communities within one overall management entity (e.g. Ethiopia's rural water board).

### Where and in what contexts is it applied?

Aggregated CBM models can be found in a range of countries, although the Association/Federation approach tends to be more common in Latin America. Typically this model is applied for piped schemes in rural communities where it is possible to generate some tariff surplus to pay towards membership of the higher-level management entity.

### How does it work?

- **Financing:** typically some element of tariff revenue is paid to the higher level management entity in return for goods and services to members. Minor operations and management costs are met through tariffs.
- **Asset ownership and delegation:** depends on the legal context, but in many cases individual communities retain ownership of assets rather than passing this on to the association.
- **Operation and maintenance:** day-to-day operation and minor maintenance tasks are carried out by individual CBMs; more complex repairs and replacements are either carried out by association technicians or with their oversight and guidance.
- **Support to the service provider:** technical support, monitoring, refresher training, oversight and conflict resolution is provided by the higher-level association.
- **Monitoring, regulation and accountability:** individual member CBMs may collect data and report internally to the community, but the Association has responsibility for collating data and reporting to the relevant Service Authority (typically local government) or regulators. Member CBMs can escalate performance concerns to the Association.
- **Share of risk:** where asset ownership rests with community, it assumes most risk; in some cases higher level association may assume some responsibility for asset replacement.

### Key enabling factors:

- Having supportive legislation in place to enable the formation of water user associations or cooperatives
- Improvements in service standards tend to drive up willingness to pay and efficiency of cost recovery
- Technical support from a competent and well-resourced higher-level association or federated body
- Clearly defined and respected tariff regime and mechanisms for (re)setting tariffs based on cost recovery principles.
- WaterAid's experience shows that when women hold key positions such as committee leader, treasurer and tapstand focal point then functionality and maintenance response rates are better.

### Case Studies:

- Timor Leste:** Association of Water User Groups, or *Grupu Manajamentu Facilidades* (A-GMFs), WaterAid has supported the establishment of two Associations of GMFs (Likisà municipality with 90 CBM members and Manufahi with 67 members) acting as umbrella organisations [supporting member GMFs](#) and to work with local government staff.
- Brazil, Ceará State:** *Sistema Integrado de Saneamento Rural* (Integrated Rural Sanitation System) is a three-tiered model with 729 members at community level acting as daily service providers, a federation with 8 regional units carrying out major maintenance, billing and water quality testing and a state utility new system construction, monitoring and training, laboratory services; [SISAR](#)
- Ethiopia:** Rural Water Boards, WaterAid has established water boards. Each community served by a large multi-village scheme has a [WASH Committee \(WASHCO\)](#), which nominates one representative to be a member of the Rural Water Board. The Rural Water Board appoints a full-time salaried manager for the water system, who appoints the (paid) team of the 'Water Office' who manage the system on a day-day basis.

### Common challenges:

- Political barriers to formation of associations or cooperatives which in some countries can be seen as (political) threat
- Lack of adequate tariff revenue or non-payments may make schemes financially un-viable
- Lack of technical and administrative capacity to effectively maintain and run schemes
- Lack of higher-level support and training
- Political interference in tariff calculation and (re)setting limits financial sustainability.

## LG 1. Local government direct provision

### Introduction:

Under this approach Local Government, which normally acts as the Service Authority, can also take on the role of the management of services directly. Typically the Local Government will establish a dedicated water unit to manage different aspects of administration and technical maintenance, but often the staff will have limited technical know-how and low levels of qualification. Depending on country context the LG service provider may receive support from a central ministry or technical agency or may associate to achieve economies of scale, for example through the mancomunidad structure, common in some parts of Latin America where several municipalities can associate to improve governance and service delivery.

### Where and in what contexts is it applied?

This model is found across the globe, both in the north and south, and is typically applied in larger rural communities, growth centers or small towns, which have a district or municipal center served by a piped scheme. In some countries this approach may be taken as an interim solution before establishing corporatised utilities or letting delegated management contracts to private operators.

### How does it work?

- **Financing:** tariff revenue should cover recurrent O&M costs, but unless this is ring-fenced it is commonly re-directed to meet the general administrative costs of Local Government. Few examples whereby surplus can be generated to finance capital investment needs.
- **Asset ownership and delegation:** depends on legal context, but typically Local Government will retain ownership of underlying assets.
- **Operation and maintenance:** minor O&M tasks carried out by dedicated staff in water units; more complex or specialist repairs and capital works may be contracted out or done by public works units of same Local Government.
- **Support to the service provider:** technical support is often missing, but may be provided by central government ministries or agencies.
- **Monitoring, regulation and accountability:** data collection and monitoring done internally by water units. Often limited regulation by independent third party entities, but Local Government administration may provide oversight of own service provider and offer consumer complaints service as part of broader consumer relations functions.
- **Share of risk:** where asset ownership lies with Local state or Government it also assumes commercial risk for asset maintenance and replacement.

### Key enabling factors:

- Supportive Local Government administration which is able to protect revenue generated from the sale of water and re-invest this into the running costs and capital maintenance fund of the water unit
- Ability to establish customer complaints mechanisms and ensure third-party accountability for service providers' performance and consumer protection
- Technical support from higher levels of government, either line ministries or dedicated support agencies
- Ability of Local Governments to associate and provide 'horizontal' support and economies of scale to members
- Clearly defined and respected tariff regime and mechanisms for (re)setting tariffs based on cost recovery principles
- Attention to gender and social inclusion.

### Case Studies:

- Bangladesh:** Pourashava's (municipal authorities) can opt to directly manage piped schemes via their internal water supply division on a non-profit making basis. Whilst Pourashava's normally lack capacity, support from WaterAid Bangladesh has enabled [Paikgachha Pourashava](#) to effectively manage its water supply scheme by establishing an progressive tariff regime and improving service delivery standards.
- Benin:** Communes, although Benin has made a significant push to increasing private sector participation in the management of rural water supply schemes, communes remain as service providers in a sizeable number of instances. The majority of communes that manage water schemes do so as [interim solution if there is a management vacuum](#).

### Common challenges:

- Lack of ring-fencing of tariff income, which is then siphoned off for other Local Government budget commitments making schemes financially unsustainable
- Low credit ratings of many Local Governments makes it difficult to raise financing for capital investments
- Lack of technical and administrative capacity to effectively maintain and run schemes
- Lack of higher-level support and training or technical assistance to set-up corporate municipal enterprises or joint stock companies
- Political interference may limit ability of LG and water units to set realistic tariff levels.

## LG 2. Local government delegation to community service providers

### Where and in what contexts is it applied?

This model is relatively common in that responsibility to ensure rural water services are provided has been decentralised to local government level in most countries in the world. In parallel, most countries also have CBM as the main model for rural water management, but it is often a de facto reality rather than being explicitly formalised through delegated contracting agreements. Local government delegation to community service providers can be applied in all types and sizes of rural communities where piped schemes exist.

### Introduction:

This is a specific variation of the Local Government PPP model, where in its capacity as Service Authority, the Local Government is able to delegate out responsibility for day-to-day operation and maintenance of piped schemes to CBM entities. Under this scenario Local Governments should draw up some form of contract to sign with community entities setting out roles and responsibilities, for each side, including expected service standards, key performance indicators, reporting requirements and share of risk for repairs and replacement. In practice such agreements may be only informally recognised, or not fulfilled at all. In theory if the CBM entity is not performing its role as service provider to the required standards, Local Government may step in and re-gain control of the scheme and manage it directly, however this rarely happens in practice.

### How does it work?

- **Financing:** recurrent O&M costs should be covered from tariff revenue. Although surplus generated from tariff revenue can be saved for longer-term capital maintenance, and is sometimes stipulated by the contracting authority this rarely happens in practice.
- **Asset ownership and delegation:** LG retain ownership of underlying assets and are able to issue contracts to delegate to community entities.
- **Operation and maintenance:** minor O&M tasks carried out by a community service provider, but more complex repairs are usually beyond their capacity. Contracts should specify responsibility for major repairs, which may be carried out by Local Government, but this is not always made clear.
- **Support to the service provider:** technical support is normally provided by Local Government and should be stipulated, but often inadequate or irregular. Central technical agencies may also provide direct support.
- **Monitoring, regulation and accountability:** CBM committees responsible for data collection and community reporting, as well as on KPIs to Local Government. Regulation of performance by Local Government is then based on self-reporting by CBM. Complaints about service providers or services may be directed to Local Government.
- **Share of risk:** capital investment risk for asset remains with Local Government.

### Case Studies:

- Ghana:** Delegation of operation and management to community **Water and Sanitation Management Teams (WSMTs)** by Metropolitan, Municipal and District Assemblies. Formal delegation agreements established for each [WSMT to operate piped schemes](#); normally applied in large villages, small-towns or peri-urban areas with populations between 2,000 and 10,000
- Kyrgyz Republic Ayl-Okmotu village** Administrations are local self-government bodies responsible to ensure provision of rural water services to communities within their jurisdictions. AOs may draw up agreements to delegate the management and operation of individual schemes to third party entities, most commonly being [community based managers](#) or **Community Drinking Water User Unions**.

### Key enabling factors:

- Supportive legislation to enable Local Government to act as contracting authority and CBM groups to legally take on responsibility for operation and management of schemes
- Existence of customer complaints mechanisms and ensure third-party accountability for service provider performance and consumer protection
- Well resourced and technically competent LG which is able to monitor, provide support and advise CBM entities
- Clearly defined and respected tariff regime and mechanisms for (re)setting tariffs based on cost recovery principles
- Attention to gender and social inclusion.

### Common challenges:

- Lack of clarity in contracting arrangements and agreements, especially for share of responsibility for costs of minor and major repairs
- Inadequate legislation for establishment of legal CBM entities
- Lack of technical and administrative capacity of CBM entities to effectively maintain and run schemes
- Lack of higher-level support and training or technical assistance to set-up corporate municipal enterprises or joint stock companies
- Political interference may limit ability of CBM entities to set realistic tariff levels or build up cash reserves for capital maintenance.

## LG 3. Local government delegation to private operators

### Where and in what contexts is it applied?

This form of PPP is found globally and is emerging as a more effective alternative to (voluntary) community management, especially in ensuring financial sustainability. It is applied in a range of rural settings for piped schemes and increasingly for the aggregation of maintenance for point source supply (handpumps) where area-based contracts are established. It is particularly common in French-speaking West African countries, in part because of more favorable legal precedents. Whilst there are successful examples of PPP, this model also faces challenges and may require subsidies as an incentive for private operators to participate.

### Introduction:

This Public Private Partnership arrangement is increasingly common as an approach to managing piped water supply schemes in which LG acts as a contracting authority to delegate some or all aspects of O&M or management. Under this scenario Local Governments draw up contracts with private operators setting out service area, expected service standards, tariffs, key performance indicators, reporting requirements and share of risk for repairs and replacement. The type of contract can vary from a simple management contract for operation (with limited risk for the operator), to lease (or affermage) contracts and to concession contracts, where operators have investment responsibilities and therefore a greater share of the financial risk.

### How does it work?

- **Financing:** tariff revenue covers recurrent O&M costs and some profit margin for the operator. A fee or levy on percentage revenue may also be designed into contracts to cover future capital maintenance costs. Contracts also specify responsibility for financing of capital repairs and replacement. Where private operators are responsible for some capital expenditures, blended finance (concessional loans and guarantees) have been used to facilitate these investments
- **Asset ownership and delegation:** typically LG will retain ownership of underlying assets which enables them to act as contracting authority; responsibility for asset maintenance and/or replacement should be specified in contracts.
- **Operation and maintenance:** regular O&M tasks carried out by private operator. Contract should stipulate responsibility for carrying out more major repairs.
- **Support to the operators:** technical support may be provided by central government agencies or the operator may be part of a professional association which may provide on-going training.
- **Monitoring, regulation and accountability:** data collection on key performance indicators and financials is done by the operator as part of reporting requirements to contracting authority. Contracts should set approved tariffs and performance standards (e.g. continuity of supply, water quality, customer complaints measures). Local Government monitors achievement of service level standards.
- **Share of risk:** risk sharing for asset maintenance and investment and commercial profit profiles established under different forms of contract.

### Case Studies:

- Niger:** The *affermage* is focused on rural water supply and covers 55 rural (village) centres. The framework is in the form of Operator's Contracts for 51 Mini-Water Supply Systems (Contrats d'Exploitation de 51 Mini-AEP). The project is for 5 years from 2008. Each contract is between the LG (as asset owner), the local consumer association and the private operator. [Summaries in English, documents in French Language.](#)
- Madagascar:** The 1999 Water Code paved the way for PPPs by establishing communes (municipalities) as asset holders with the ability to delegate by means of management contracts. The model has proliferated slowly but steadily and by 2011 this model was the most successful for piped schemes serving [larger rural settlements of over 5,000 people.](#)

### Common challenges:

- Lack of or unclear legislation for PPP arrangements
- Lack of clarity in contracting agreements, especially for share of responsibility for costs of minor and major repairs
- Private operators non-existent in remote rural areas
- Lack of technical and administrative capacity of small-scale private operators to effectively maintain and run schemes
- Lack of higher-level support and training or technical assistance, particularly for small-scale private operators
- Political interference may limit ability of operators to set realistic tariff levels or build up cash reserves for capital maintenance.

### Key enabling factors:

- Supportive legislation to enable Local Government to act as contracting authority
- Enabling legislation for PPPs and establishment of private water operators
- Political will on part of local (and central) government to support the development of private sector participation
- Development of regulatory instruments, such as tariffs regime with mechanisms for tariffs review, contract template and performance standards
- Existence of customer complaints mechanisms and ensure third-party accountability for operator performance and consumer protection
- Attention to gender and social inclusion.

## PB 1 Public utility Operators

### Introduction:

The public utility model, whereby a publicly-owned company operates water assets, is not yet widely established for management of piped schemes in rural areas, but it is likely to become a more important option as populations grow and rural communities take on more urban characteristics and demand for higher service levels increases. Public utilities may manage large individual or multi-village piped water schemes, in small towns or in growing urban centres, where rural populations have been integrated into the urban public utility's service area. They tend to have more professional capacity to manage rural water assets, are staffed with more qualified personnel, have better financial capacity and access to funding, sometimes through commercial markets, and are more likely to be subject to monitoring and regulation. It is not uncommon to find that public utilities are mandated by central government to operate in rural areas, despite the fact that these may not be commercially viable; they may either be coerced to work in these areas and/or receive some kind of subsidy incentive.

### Where and in what contexts is it applied?

public utilities may operate at different levels from town or city to district, state or national level depending on the size and administrative set up of a country. The model is more prevalent lower-middle or middle income countries and works most effectively where rural populations are adjacent to larger towns or cities. Rural customers may be physically linked by extending piped networks or multiple smaller decentralised networks may be clustered under the management of a larger utility as part of an aggregation model.

### How does it work?

- **Financing:** tariff revenue should be designed to cover recurrent O&M costs and generate surplus for capital repairs and replacement; additional domestic funds (taxes or aid transfers) may be used for capital investment. If utility is creditworthy, maybe possible to access commercial loans.
- **Asset ownership and delegation:** typically the state will retain ownership of underlying assets either through central ministries or agencies of in some cases asset holding entities.
- **Operation and maintenance:** all aspects of technical maintenance, operation and repairs done by qualified utility staff. Large capital works may be contracted to provide sector companies.
- **Support to the service providers:** technical support and training provided by specialist private companies, larger utilities or through professional associations of utility operators providing member support.
- **Monitoring, regulation and accountability:** regular data collection and monitoring done by service providers as part of reporting requirements to regulator or government. Regulator or government ministry monitors service provider's performance on KPIs through performance contract; some form of ombudsman or customer complaints channels are normal. Further accountability for governance via utility boards.
- **Share of risk:** public sector entity retains full risk for asset ownership and maintenance.

### Case Studies:

- Ethiopia: Public Water Utilities** each of Ethiopia's 980 towns has a different [public water utility](#), which collects tariffs, conducts repairs and is responsible for the O&M of water supply schemes that serve 25,000 to 130,000 people.
- China: Public Utility, Hangzhou City District, Zhejiang:** The [Fuyang Water Affairs Company](#) was established by the district authority and operates in 4 separate sub-districts, 15 towns and six townships, serving a total population of 520,000. As part of its expansion over the past decade, it has commissioned several existing stand-alone rural schemes and extended its network to cover these rural communities; some 30% of its water by production volume goes to serving these rural populations.

### Key enabling factors:

- Neutral and supportive utility governance/boards to ensure good governance and (investment) decision-making that supports financial viability
- Existence of customer complaints mechanisms and ensure third-party accountability for service provider performance and consumer protection
- Clearly defined and respected performance indicators and tariff regime and mechanisms for (re)setting tariffs based on cost recovery principles
- Attention to gender and social inclusion.

### Common challenges:

- Political influence over governance/boards
- Limited incentives for performance if the utilities relies on public subsidies
- Lack of capacity in utility to engage with poor/informal households
- Lack of higher-level support and training or technical assistance
- Political interference may limit ability of service providers to set realistic tariff levels or build up cash reserves for capital maintenance
- Lack of or limited regulatory oversight.



## PV 1. National public entity delegation to private operators

### Where and in what contexts is it applied?

This form of PPP is found globally and is emerging as a more effective alternative to (voluntary) community management, especially in ensuring financial sustainability and potentially raising private finance. It is applied in a range of rural settings for piped schemes, but works best in areas with higher population densities and greater possibilities for economies of scale. It can also be applied for the aggregation of maintenance for point source supply (handpumps) where area-based contracts are established.

### Introduction:

This form of Public Private Partnership arrangement is a common approach to managing urban piped water supply schemes and is increasingly applied in rural contexts. A central ministry or asset holding entity acting as the contracting authority delegates some or all aspects of O&M or management to a private operator. Under this scenario different forms of contracts are entered into setting out roles and responsibilities, including expected service standards, key performance indicators, reporting requirements and share of risk for repairs and replacement. The type of contract can vary from a simple management contract for operation (with limited risk for the operator), to lease (or affermage) contracts and to concession contracts with investment responsibilities for the private operator and therefore an increasing level of risk transferred from the asset holder to the private operator.

### How does it work?

- **Financing:** tariff revenue should cover recurrent O&M costs and some profit margin for the operator. A fee or levy on percentage revenue may also be designed into contracts to cover capital maintenance costs, which should also specify responsibility for financing of capital repairs and replacement. Commercial loans may be accessed if operators are creditworthy.
- **Asset ownership and delegation:** public entity or asset holder will retain ownership of underlying assets which enables them to act as contracting authority; responsibility for asset maintenance and/or replacement specified in contracts.
- **Operation and maintenance:** regular O&M tasks carried out by private operator. Contract should stipulate responsibility for carrying out more major repairs.
- **Support to the operators:** technical support may be provided by central government agencies or the operator may be part of a professional association which may provide on-going training.
- **Monitoring, regulation and accountability:** data collection and monitoring done by operator as part of reporting requirements to contracting authority. Contracts should set tariffs and performance standards. Contract terms should be monitored by the delegating authority or a third party. Accountability mechanisms, such as customer complaints service or ombudsman, should also be in place.
- **Share of risk:** risk sharing for asset maintenance and investment and commercial profit profiles established under different forms of contract but typically rests with contracting authority.

### Case Studies:

- Mozambique:** The Water and Sanitation Department (DAS/DNA) of the Ministry of Public Works, Housing and Resources is responsible for the rural water sector and has recently started a programme of [delegating contracts to private operators](#) for the management of piped schemes in rural growth centres, typically with populations of 2,000-10,000. The programme is still in initial phase covering some 19 schemes to date.
- China:** [private community enterprises](#) established by county government's Water Resource Bureau retains ownership of the physical assets and sets performance and reporting standards for each company, which are expected to cover their operating expenses and to retain a small quota (¥0.20 or US\$0.03) on each cubic meter of water sold as a reserve fund to pay for future capital maintenance.

### Key enabling factors:

- Supportive legislation to enable national entities to act as contracting authority and establishment of asset holding companies
- Enabling legislation for PPPs and establishment of private water operators
- Existence of regulator and customer accountability mechanisms and ensure third-party accountability for operator performance and consumer protection
- Clearly defined and respected tariff regime and mechanisms for (re)setting tariffs based on cost recovery principles
- Attention to gender and social inclusion.

### Common challenges:

- Lack of commercial viability in rural areas is one of the most critical barriers to this model
- Lack of clarity in contracting agreements, especially for share of responsibility for costs of minor and major repairs
- Lack of technical and administrative capacity of small-scale private operators to effectively maintain and run schemes
- Lack of higher-level support and training or technical assistance, particularly for small-scale private operators
- Political interference may limit ability of operators to set realistic tariff levels or build up cash reserves for capital maintenance
- Lack of or limited regulatory oversight.

## PV 2. privately owned and operated schemes

### Introduction:

In this management model a private company (or individual) will invest in a water supply scheme and effectively act as the owner-operator taking on all the operating risk and the potential reward in terms of tariff revenue. A distinguishing feature is that operators will invest their own capital, or borrow funds, for constructing the piped networks and look for a return on this investment over time. Larger and more formalised companies may pay dividends to shareholders and take out loans to cover the cost of investment in networks. Such models still operate at a small scale in some countries and face challenges in scaling up in terms of financing and the lengthy return on capital investment. Control of such private operators can be limited, often through a licensing process with a public entity; environmental and economic regulation and consumer protection is also a challenge, especially where there are a large number of small operators.

### Where and in what contexts is it applied?

This model is applied in a range of rural settings for piped schemes, but works best in areas with higher population densities and greater possibilities for economies of scale. Some regions and countries have more experience with this approach, including [Cambodia](#) and [Paraguay](#). The model works in contexts favorable to private sector provision of rural water services, where consumers and local governments are comfortable with the model.

### How does it work?

- **Financing:** tariff revenue covers recurrent O&M costs and some profit margin for the operator. Access to credit at affordable rates is often problematic; some cases of applying blended finance (concessional line of credit, grant funding and guarantees) to successfully expand access to sources of affordable financing.
- **Asset ownership and delegation:** as principle investor the operator retains asset ownership and responsibility for maintenance; to access some types of loans or credit some capital assets may have to be put up as collateral.
- **Operation and maintenance:** regular O&M and major repairs/expansion of networks carried out by private operator.
- **Support to the operators:** technical support may be provided by central government agencies or the operator may be part of an association which may provide on-going support or training.
- **Monitoring, regulation and accountability:** data collection and monitoring done by operator but external reporting requirements may vary according to licensing arrangements and if there is regulatory oversight. Owner operators have an effective monopoly in their service area, therefore regulatory arrangements, including licensing regimes, service levels monitoring, consumer representation and accountability are critical.
- **Share of risk:** all risk rests with private operator.

### Key enabling factors:

- Relatively concentrated rural populations for commercial viability and economies of scale
- Existence of regulator and customer accountability mechanisms and ensure third-party accountability for operator performance and consumer protection
- Clearly defined and respected tariff regime and mechanisms for (re)setting tariffs based on cost recovery principles
- Attention to gender and social inclusion.

### Case Studies:

- A. **Vietnam:** Individual entrepreneurs act as [private operators](#) and operate, manage and maintain a number of rural water systems across Vietnam through long-term concession type contracts. Research has found that compared to the other management models used for rural water supply systems in Vietnam, the systems managed by private operators collect more tariffs and score significantly higher across a range of quality and customer satisfaction indicators.
- B. **Cambodia: Water Service Providers:** The government and development partners have been supporting small-scale operators since the early 2000s through a variety of financing and technical assistance approaches to [overcome limited access to financing](#) and the need for collateral. Through various financial tools totalling some US\$24.2 million, the project has supported small private operators serving some 45,000 households and 18,000 new household connections, of which some 45% are classified as poor. A recent study in Cambodia's Chum Kiri District found that the operational performance of [privately-managed systems was better than communally managed systems](#).

### Common challenges:

- Lack of commercial viability in rural areas is one of the most critical barriers to this model
- Limited access to affordable finance for expansion and improvement of services
- Lack of technical and administrative capacity of small-scale private operators to effectively maintain and run schemes
- Lack of higher-level support and training or technical assistance, particularly for small-scale private operators
- Lack of or limited regulatory oversight mechanisms, with insecurities around tariff levels, service area, licensing among others.



Picture credit: WaterAid/ Chileshe Chanda

## 4. Factors to consider in the selection of management models



## Introduction

This section summarises the factors which commonly have a strong bearing on the selection of management models, but we recognise that it is not possible to capture all factors or issues specific to any given local context, which will need to be understood and considered when using this guidance document. In addition, within any given country - and particularly for large countries (e.g. Ethiopia, India, Mozambique etc.) - contextual factors such as population patterns, scheme size, commercial viability and water resource availability will vary significantly from area to area, meaning that selection of management models should not assume that one solution will be appropriate for the entire country. The inclusion of women, vulnerable and marginalised community members in service provision and management arrangements, including decision-making processes, is an important aspect and is captured within the four general categories of factors influencing the model selection. These issues are also critical factors to consider once the management model is selected and while the service

provider is being established and service norms are being defined, including performance indicators for contracting if appropriate.

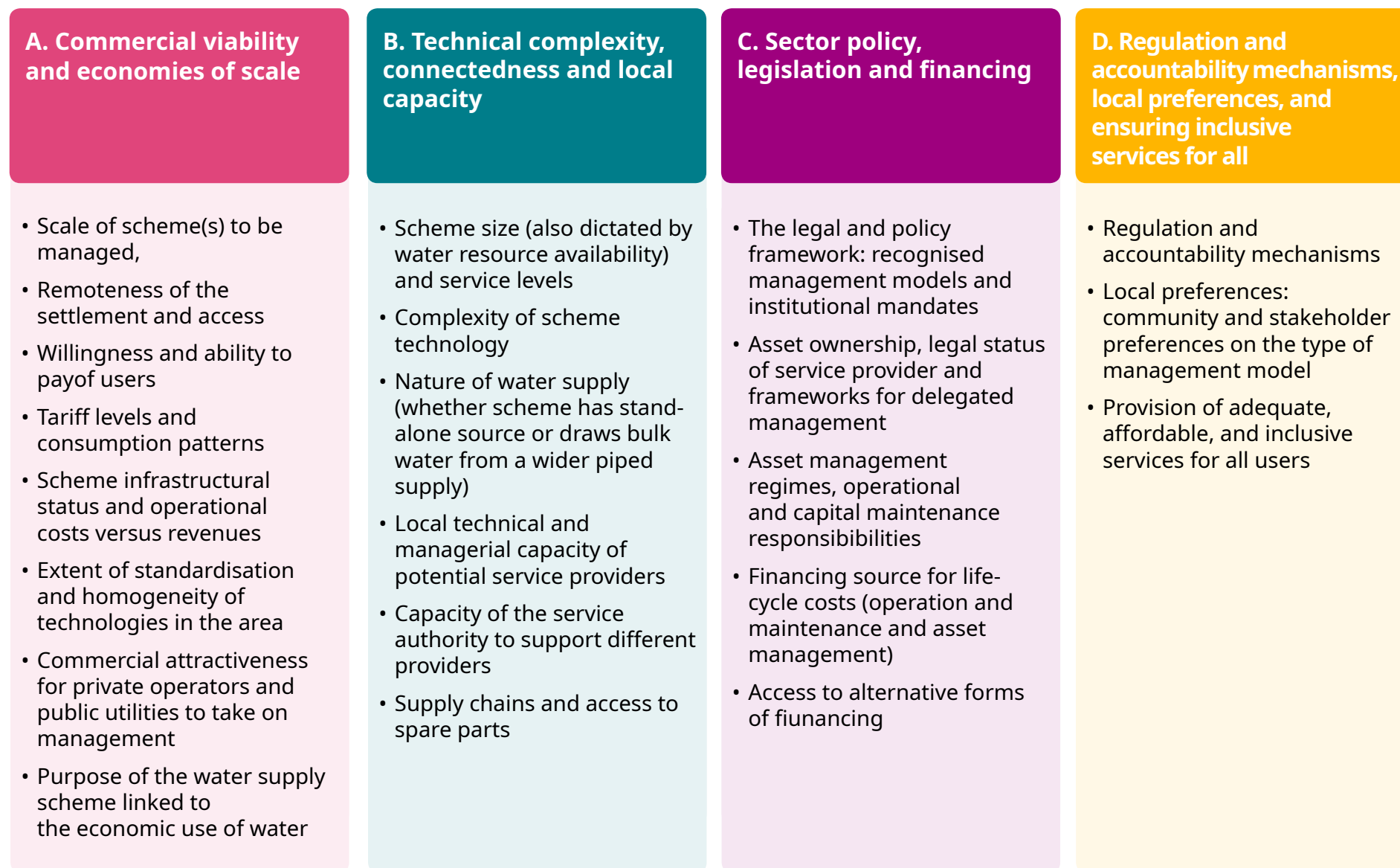
The various generic factors influencing selection are structured across four categories which are important for the decision-making processes at a tactical level, as summarised in Figure 4 overleaf and explained in detail in the following pages. Broadly speaking, the selection of management model will depend on commercial viability and economies of scale; scheme complexity matched with local capacities; sector policy and legislation and financing; and regulatory and accountability measures and the extent which the model can provide affordable and equitable services for all users. These main factors or determinants in the selection of management models are not listed in any order of priority as they are all important to consider and closely inter-related, but the relative significance of each one will inevitably vary by context. Finally, it is important to stress that WaterAid is agnostic about the type of management model which is applied, however, the final decision for selection of the model

should bear in mind a number of key principles that underpin the more technical selection process; these are:

- The selection of management model(s) should be in alignment and confirm with national government policy and recognised approaches, including any government sanctioned piloting to test the viability of new models;
- The selection of management model(s) should ensure, as far as possible, that services will be inclusive and affordable to all users of the scheme within a community and across a district or region;
- The selection of management model(s) should provide the best possible outcomes in terms of service levels and standards for consumers, that are commensurate with the water resources available and the carrying capacity of the community;
- The selection of management model(s) should as far as possible seek to 'future proof' service provision bearing in mind likely population growth and aspirational demands of users.



**Figure 4:** Decision-making factors for the selection of management models for rural and small-town piped water supply schemes





## A. Commercial viability and economies of scale

Regardless of the management model, tariff revenues will form a vital component of operating income and represent a critical determinant of commercial viability; this is particularly the case for private operators who are less dependent on external subsidies for operation and maintenance. Therefore, assessment of the most appropriate models will be strongly dependent on the commercial viability of the scheme(s) to be managed. In turn commercial viability is influenced by factors such as user willingness and ability to pay; tariff levels versus operational costs; the distribution and number of users of the scheme; and the potential to aggregate management or maintenance contracts across multiple schemes in the area (thus achieving greater economies of scale). All of these factors will have a strong influence on the appetite and readiness of private operators or larger utilities to enter the market and run schemes on the behalf of community or local government.

### Scale of scheme(s) to be managed, remoteness, and access:

**How remote is the scheme(s) to be managed?** As a general, simplified principle, the more dispersed, isolated and small (in terms of number of household users) the scheme is, the less likely it is to be commercially viable and therefore of 'interest' for utilities and the private sector. Schemes located close to urban areas may be more viable for urban utilities to consider expanding service areas to access new customers (as is being done in China for example), and the costs of reaching the schemes for management and maintenance tasks would be lower than servicing more remote and hard to reach communities. For more remote schemes, the costs of reaching the schemes by utilities or private service providers may be prohibitively expensive relative to local willingness and ability to pay for tariffs. In such circumstances, more decentralised service providers may be appropriate, such as community management or CBM combined with delegation to locally based operators.

**What is the scale of operation the scheme(s)?** Larger single size schemes or schemes that aggregate multiple communities and serve tens of thousands of people, provide greater economies of scale in terms of users, operations and revenues, and thereby enable the hiring of permanent skilled staff or the delegation of aspects of management to private operators to run the schemes on the community or local authorities' behalf; this is the case with the rural water board model in Ethiopia. Economies of scale can be achieved in two broad ways. The first is simply where the piped scheme itself is large (in terms of number of users). The second is through aggregation, or 'bundling' the management or maintenance of multiple schemes within one service provider's remit. This can take the form of associations or federations, or through the bundling of schemes which are delegated by the local authority (or communities) to private operators. An assessment of scheme size must also account for future population growth (both organic and through in-migration) to account for 'future proofing' the management model selection.

### **Are there opportunities or incentives to manage multiple schemes?**

Bundling management of water supply across numerous schemes in a locality not only increases the economy of scale and therefore the potential professionalism of management arrangements, but it also allows the potential for cross-subsidies between schemes that have varying degrees of commercial viability, or to support specific segments of the population who may require individual subsidies. For example, the United Kingdom has regional water utilities, which are mandated to serve all rural and urban communities across their geographical service areas, thereby allowing the lower per-capita operating costs in urban areas to subsidize operating costs in more dispersed rural communities, whilst maintaining a common tariff structure across all consumers. In contrast, a common challenge in many countries that are selecting areas of operation for public utilities and private sector delegation, is that only the commercially viable schemes are selected (e.g. towns of a significant size), leaving the less commercially viable smaller schemes

without the opportunity to benefit from cross-subsidies within the same management model (often referred to as 'cherry picking'). Decisions around appropriate management models should therefore consider not only appropriate models for the scheme in question, but how schemes in the surrounding areas could be managed, and what detrimental effects there may be if the 'profitable' scheme is outsourced.

**Key Messages:** Select management models that are appropriate to the current – and future – sizing and conditions of the piped scheme and community to ensure that potential revenues and economies of scale are matched with the commensurate capacity; where private operators and/or public utilities have incentives to take on management roles, ensure that there are mechanisms in place to allow for cross-subsidies to support poorer individuals and less commercially viable communities within the same service area.

### **Willingness and ability to pay of users, tariff levels, consumption patterns, infrastructure status and scheme running costs:**

Another aspect of commercial viability, which influences the likelihood or readiness of private operators or utilities to take on the management of scheme(s) is potential profitability. In short, unless there is some form of reliable external subsidy, utilities and private operators are unlikely to take on management (unless contractually obliged within a wider multi-scheme 'bundle'), if they are unlikely to break-even or earn a profit from operating the scheme. The potential profitability of a scheme(s) can be influenced by factors such as:

**What is the willingness to pay, and willingness to charge?** The willingness to pay of users is complex, affected (and undermined) by factors such as local political influence (for example pronouncements of free water or artificially suppressing tariff increases below the true operating costs of production); the availability of free

or more convenient alternative water sources (such as open sources, or even sachet or bottled drinking water); a culture of non or low payment for water services in the area (often a challenge in more remote rural areas); and issues of 'free-riders' in the community who are stealing water, not paying for bills or extracting larger amounts for uses such as livestock watering. Poor levels of service and poor customer relations can also create a downward spiral of deteriorating willingness to pay, which in turn means less revenue to maintain the scheme. There are also some cases where customers are more willing (or compliant) to pay if the scheme is managed by 'trusted' service providers; for example, in some countries where confidence in public (e.g. local council) services is low, people may be unwilling to pay for local government-run schemes, but rather feel more accountable to local community management entities.

**Do tariff structure and average consumption levels allow profitability, whilst ensuring affordability?** Tariffs are determined differently in different contexts, and

the potential to generate a surplus between revenues and operational costs is likely to be critical, particularly for the viability of privately operated schemes. In some countries, tariffs are set 'externally', for example by a state regulator or a formula for tariff calculation is detailed in sector guidelines. In other countries, tariffs may be calculated scheme-by-scheme based on strategic business plans and an understanding of life-cycle costings. However, most commonly tariffs are set without a clear understanding of costs and largely on internal agreement by the community based on its willingness to pay, which is often the lowest option. Local politicians may promise to keep tariffs low for electoral gain, rather than being based on a clear understanding of the revenues required to operate and sustain the scheme. The potential for commercial viability will therefore depend on adequate tariffs that exceed O&M costs, and (if applicable) include savings for capital maintenance and replacement costs. The ability to modify and increase tariffs in the future based on inflation or the increasing cost of inputs, is critical for sustaining

a scheme. It may be challenging to entice private operators or utilities to manage a scheme if this is not an option. Volumetric tariff structures are often possible with piped schemes, for example with domestic metered connections or metered tapstands, where vendors sell water by container filled. However, where the tariff is determined volumetrically (rather than a flat household monthly rate), the level of consumption will impact revenues. When designing the scheme and considering management models, there should be a robust review of users' potential willingness and ability to pay, likely consumption patterns and the related O&M (also included where appropriate margins for private operators to reinvest) and likely capital maintenance costs. Finally, tariff setting must account for affordability for users, which is dependent on individual context, but as a rule the figure of 2% to 3% of average household income can be taken as a guideline for affordability.

**What is the scheme status and likely O&M costs?** The cost of running the scheme will influence the commercial viability and O&M costs are strongly

influenced by the status of the infrastructure. For example, if the infrastructure is in a poor condition, requiring excessive operation or maintenance costs, potential operators may be less inclined to assume management of the scheme. In such cases, external funds from government or NGO sources could be used to undertake rehabilitation or replacement works to the scheme prior to tendering or handing over the scheme to an operator. Alternatively, operators could be required to make capital investments in the scheme as part of a longer-term lease or concession agreement, however their readiness to do this may be limited unless they have a clear likelihood of return on investment, which is influenced by contract length and the issues of commercial viability outlined above. Technology choice also has a strong bearing on operational costs, which in turn affect commercial viability. For example, diesel-run pumped schemes generally incur much higher operating costs than solar powered schemes or (depending on power costs) mains electricity-fed schemes. Efforts to

reduce recurrent costs through up-front investments such as switching to lower cost technologies, or rehabilitation of schemes, can help to encourage 'external' service providers to operate the schemes.

**Key Message:** Certain management models will require greater likelihood of commercial viability and should be well understood; willingness to pay is complex and needs to be related to tariff levels, consumption patterns and affordability for the poorest. The physical status of a scheme and its operating costs are another critical factor in commercial viability. Management models, including private operators and public utilities will require some assurance of revenue to meet or exceed recurrent costs to be viable.

## **Extent of standardisation and homogeneity of technologies in the area**

**Are there other similar technologies in schemes in the area?** The viability of maintenance contracts can be influenced by the homogeneity of technologies between schemes in any given geographic area. For example, a maintenance contract that covers only one solarised piped scheme in a district, is likely to be more expensive per scheme than one which covers multiple solar schemes in the district, due to efficiency gains in transport costs, or the ability to have locally based engineers, for example.

## **Readiness of alternative operators to assume the responsibility of the scheme(s)**

**Who wants to manage the scheme(s)?** The readiness of service providers that are external to the community serviced by the scheme is closely linked to commercial viability. As outlined above and in general terms, rural households are an unattractive customer base,

especially when in more dispersed settings. For the majority of rural households, the reality of water supply scheme management is still one of community-based structures that are usually reliant on voluntary committee members. In cases where external operators – most likely to be some form of private operator or public utility – are not ready to engage (even with arrangements of bundled contracts to manage multiple schemes), then some form of community management is likely to continue, possibly replaced with direct local government management (although this is still comparatively limited). There are possibilities to increase efficiencies and make schemes more attractive for external service providers, but where these do not provide incentives, community management options can be assessed to determine the potential level of support and options for professionalising some key functions. These considerations are all essential to selecting the right model, that is appropriate for the context.

## **Purpose of the water supply scheme**

**What is the purpose of the scheme – for water supply only or for productive uses?** The purpose of the use of the water from the scheme(s) can also dictate which type of management models is most appropriate. For example, if the water supply infrastructure is also used for small-scale irrigation or livestock purposes, the management model may be linked with or assumed within the management arrangements for the irrigation scheme, for instance a Water Users Association. The possibility to link water consumption – and therefore increased tariff from revenues from productive use of water – is critical to viability, but will have a related implication for the volumes of water required and stress on the water source itself.

**Key Message:** Management model selection will be driven in part by the homogeneity of schemes in an area, the incentives to enter into management contracts and the potential to combine revenues from drinking water with alternative income from productive uses of water; in combination these determinants may point to the selection of a private management model



## B. Technical complexity, connectedness and local capacity

The technology type and size of the scheme influences the selection of management models, as does the availability and capacity of potential service providers (and the external support available to them) to manage the schemes. Put simply, the larger and more technically complex the scheme, the higher the required competency of the management entity and the service provider.

### Size, complexity and required service levels of the scheme(s) to be managed

**How technically complex is it to operate and maintain the scheme(s)?** It may be realistic to expect communities (and local caretakers or technicians with some training and support) to be able to manage small, gravity fed schemes in rural areas,

but it is generally unrealistic to expect this 'basic' CBM model to cope with larger and more technically complex schemes. Sadly, it is still often the case that relatively sophisticated piped schemes are handed over to poorly trained and ill-equipped community volunteers. Where the scheme includes more sophisticated technologies, for example, solar pumping, prepaid water meters, or water treatment facilities, then specialised expertise may be required to maintain the scheme properly and ensure service levels are maintained. This potentially could be 'in-house' expertise, for example operator staff with training and oversight, which can be realised through aggregated management arrangements, or by outsourcing for example through maintenance service contracts between the management entity (who could be the community or local authority) and a locally based firm. If the scheme is technically complex to maintain but relatively easy to operate, then a maintenance contract may suffice, with the community or local authority undertaking the daily management of the scheme. However, where the daily operation of the scheme is

also complex, a more qualified and experienced management model will be required. In addition to technological complexity, where service levels are required to be high (e.g. minimum standards for continuous pressure or water quality parameters), then the technical capacity of the management entity needs to be higher to monitor and ensure adherence to such performance standards.

### Local capacity of potential management entities and support agencies

**What is the capacity within the community and local area to manage the scheme(s)?** In addition to the interest and capacity of different potential providers to manage and operate a scheme it is important to match this with household and local stakeholder preferences in who they would prefer to manage the scheme; for example, is there a strong culture of self-help, or mis-trust of outside entities? This may already provide pointers as to the suitability of a community-based model over other forms. Even

where a private entity is considered as an option, there may simply not be adequately trained and qualified firms or individuals in the area to take on these tasks, or it may take many years to bring them up to the required levels; in general, the more remote a location is the more challenging it is to find locally based skills for the operation, maintenance and management of more complex schemes. It may also not be cost-effective or affordable for external private sector or utility operators to run such remote schemes. In this case, the option of aggregating multiple schemes under a single contract may be worth considering, to achieve economies of scale to have 'aggregated' community management. Where the capacity of the local private sector is low, the viability and effectiveness of private sector-led services should be carefully considered. Additional efforts could be made to strengthen local capacities, for example through Business Development Support initiatives such as technical and administrative training, business formalisation and increasing creditworthiness, and ensuring access to requisite equipment.

**What is the capacity of the service authority (local government) to provide support to service providers?** Where the capacity (technical knowledge, financial and human resources, and motivation) of local authorities is low, there is less likelihood for the provision of external support and back-up to community-management entities, which is part of the mandate of (most) local governments. Therefore, a model that has a stronger degree of self-help or autonomy from government support may be more appropriate, for example, community management with contracted expertise from maintenance service providers, or 'aggregated' community management. Private sector management may also be an option, however if the local authority capacity is weak, then this runs the risk of a lack of any form of regulatory oversight, however light-touch this may be. In contrast, where the service authority is able to provide a reliable and consistent level of external support to service providers, then a form of CBM plus may be appropriate. Poor local government capacity would clearly rule out direct provision and

also potentially delegation to private operators if the local authority lacks even the capacity to let and manage delegated contracts. Where local government capacity is weak, there are possibilities for central ministries to put in place capacity building and support programmes, but these are long-term endeavours.

**Key Message:** Identifying and matching the right management model for any given scheme requires a careful assessment of size, technical complexity and the availability of provider options in the local area. Above all, selection should align with national policies, but it should also avoid an unrealistic expectation that over-burdens (voluntary) and low skilled community management entities with complex and demanding technical and managerial tasks with no support. At the other end of the spectrum, private operators will require a minimum level of oversight and accountability from local government or any appropriate regulatory entity.

## Stand-alone scheme or drawing bulk water from another source

**Is the scheme physically connected or linked to a scheme operated by another provider?** In some instances, piped networks may rely on alternative sources of bulk water (i.e. when linked to another scheme but managed separately, or where bulk water is being transported from one area to another by a third party). The selection between these two arrangements will depend somewhat on the legal mandate of the 'main' service provider, affordability considerations, and the interest or readiness of that service provider to assume management of that scheme component. This scenario is more common where public utilities in urban or peri-urban areas extend into rural communities and establish water point or kiosk management entities, which essentially sell-on the bulk water to their retail customers. In other contexts, private investors may choose to undertake a 'Build, Operate, Own' (BOO) arrangement whereby they construct pipeline extensions or new kiosks, which they operate and own, again, buying bulk water from the main system provider.

## Supply chains and access to spare parts

**Are spare part chains established (for standardised technologies)?** Supply chain issues are a critical negative factor in the sustainability of rural water supply schemes and although this issue will not be solved by adopting one management model over another, the type of management entity can make a difference. For example, where more professionalised options or those with a degree of aggregation (through umbrella management or associations) are selected, they will often have much greater buying power and economies of scale to overcome limitations in obtaining spare parts from local markets or distribution points. Conversely, weaker, isolated CBM models, particularly those that receive limited or no support from an external entity, may struggle to overcome this critical barrier. Population densities and the robustness of local private sector markets will obviously have an influence on availability.

**Key Message:** When dealing with schemes that rely on a third-party supplier of bulk water, care is needed to understand the mandates and relationships between actors before selecting the management model. Poor access to spare parts and/or lack of spare part chains may be overcome, in part, by selecting a management model that can offer greater economies of scale and buying power.

## C. Sector policy, legislation and financing regarding management models

The broader enabling environment, in terms of the presence, status and application of policy, legislation, norms and financing mechanisms are all critical to the decision-making process for selecting the most appropriate management model. Having a clear understanding of these issues in the given country and local context is vitally important before making any final decision; one of the most important factors is the current status of formally sanctioned or recognised management models under national policy.

### The legal and policy framework: recognised management models and institutional mandates

**Which management models are recognised and allowed under sector policy and legislation?** Almost every country has a national water policy or strategy instrument that should formally set out sanctioned management models and how these are prioritised, normally making a distinction between rural and urban contexts. As well as these formally recognised models, the government may be interested in piloting new or adapted models. The selection of a management model should always align with such national policy. However, even where this is the case, further caution and research may be required before selecting the final model. For example, in most countries CBM is the predominant model, but legislation to support the legal formulation of community management entities may be unclear, inconsistent or not in place, all of which can undermine the efficacy of the model. Similarly, the likelihood of successfully introducing a private sector delegated model will be undermined in countries which lack existing legal frameworks that

underpin private sector participation and delegation. Conversely, where such policy frameworks and associated laws are clear and well established, these should be a factor in favour of selection of the model; for example, where sector legislation may provide a public utility or licenced service provider the legal mandate to provide water services across a given geographical area.

### Asset ownership, legal status of service provider and frameworks for delegated management

**Who owns the scheme(s)' infrastructural assets, and who is mandated to act as a contracting authority to establish delegated management contracts?** To work effectively it is important to determine some fundamental questions underpinning management model options. These include: who is the legal owner of the infrastructure assets; who can make decisions about how the scheme will be managed and is able to enter into management agreements (the contracting authority) and who is legally recognised to act as a service provider. These aspects are interrelated but are



often poorly defined due to inadequate sector legal frameworks and a lack of clarity in policy. For example, whilst there may be much focus in policy on the community and user 'ownership' of the water schemes, there may be ambiguity in sector legislation as to who is the legal owner or holder of the assets, which may not in fact be the community. Additionally, the reverse can also occur; community 'ownership' may not occur even when the scheme has been clearly handed over to the community to own and operate if the community feels that since the Government built scheme the Government is responsible for fixing it. In many countries, asset ownership may lie with central government (as an asset of the state) or local government. In principle, the legal owner of the assets has the authority to decide who can manage the scheme, although this ability may also be delegated (e.g. between central and local government). The asset holder then has the power to act as a contracting authority to delegate the management of the assets to potential service providers. Where the community management entity (e.g. WASH committee) is the

legal owner of the assets, they then also have the (legal) ability to delegate the operation for example to a local private operator. However, where such community WASH committees are not legally registered, their ability to legally outsource the assets is undermined. Where assets are held either by the local authorities, or national or sub-national asset holding companies, the local authority or asset holder may choose to run the schemes themselves, or allocate the rights to operate the scheme to community or private operators. In some cases, the sector regulator may have the mandate to issue licenses for service providers to run scheme assets. Regardless of the legal framework for delegation (which is often poorly defined), in practice, there are examples where central ministries, national utilities or local authorities may 'decide' on behalf of communities or local authorities on management arrangements. Therefore, it is important to understand delegation arrangements both in policy and in practice.

## **Asset management regimes, operational and capital maintenance responsibilities**

**Who is responsible for asset management, is there a culture of asset management and do management entities and supporting institutions have the skills and tools to carry this out?** Responsibility often

lies with the asset holder, or with the delegated management entity, but this is often not clearly outlined or the distinction between what constitutes – and who addresses – minor and major repairs remains a grey area. In more formalised arrangements, the responsibility should be spelled out clearly and can vary from a simple management contract for operation (with limited risk for the service provider), to lease (or affermage) and concession contracts with investment responsibilities for the private operator, and therefore an increasing level of risk transferred from the asset holder to the private operator. In some countries asset management may exist in policy (and on paper) but there is little or no capacity, tools or resources ensure that this happens in practice. The selection

of management model should align with the status of asset ownership and should be appropriate.

**Key Message:** When selecting appropriate management models, it is critical to understand the policy framework and legislation of formally sanctioned options and the status of asset ownership and delegation mandates; this is critical to ensure that there is alignment between the (contractual) expectations for carrying out asset maintenance and the management entities' ability to fulfil these functions.

## **Financing sources for life-cycle costs (operation and maintenance and asset management)**

**How is financing organised and provided for at sector level?** The way in which financing is arranged at sector level, and the adequacy of the financing will have direct implications for the selection of a management model. In general sector planning should ensure that the different types of costs relating to rural water provision can be met through the three principal sources of financing (e.g. tariffs, taxes or transfers), including, for example, financing to ensure service authorities have the resources, capacity and wherewithal to support service providers. Where there is inadequate financing to support these decentralised functions, or where the funding is not pushed down from central to local government through condition grants or other mechanisms, it is unlikely that CBM models will receive the support they need. Similarly, if central government does not ensure that regulatory functions can be financed it is likely

that private operators will not be held as accountable. The way in which financing is organised also relates to the ability to apply subsidies or to allow for cross-subsidises between different sets of consumers to ensure more equitable access to services.

**Is there clarity around who pays for what, particularly for capital maintenance, rehabilitation and expansion of networks?** Under almost all scenarios it is expected that tariff revenue should cover the recurrent operational and minor maintenance costs of running a piped scheme. However, covering the capital maintenance costs is more uncertain. Even where asset management is specified in sector policy and/or delegated contracts, it is not always certain that money is available to pay for it as local government may have insufficient budgets from central government or local taxes to cover the cost of asset maintenance. The generation of a surplus to contribute to capital maintenance is possible, but not common in many rural piped schemes, however it is more likely to be the case where service areas are larger, and a

portion of tariff revenue can be ring-fenced, which points towards more professionalised CBM models or private operators.

**Are there alternative sources of financing being made available and are these affordable for operators?**

As an alternative to relying on tariff income, taxes or aid, some service providers may be able to access financing by taking out loans on the commercial market to invest in capital repairs or extension of networks to increase customer base. The main challenge with commercial credit for water operators is affordability and the need to show robust business planning or to make collateral available for the loans. Commercial lending is most likely to be available only to private operators and is less likely to be a consideration for more basic forms of CBM.

**Key Message:** The selection of management model should be informed by the flow of financing in the sector and the likelihood that core functions for external support, monitoring and regulation (amongst others) are likely to be met; in the absence of guaranteed funding, some management options may not be feasible or recommended. Being clear and realistic about how asset maintenance will be financed has an influence on the selection of management models. For example, public or privately-run utilities are more likely to be able to access loan financing and to raise capital through local financial markets, whereas CBM is often dependent on uncertain aid transfers or being bailed out by local government on an ad hoc basis to meet such costs.

## **D. Regulation and accountability mechanisms, local preferences and ensuring inclusive services for all**

Regulation is critical to ensuring that the interests of the public sector, service providers' and users' are met and where necessary protected. In an ideal world all management models should be subject to robust regulation, but for some, such as the private operator model, it is arguably more important. In most countries the focus is primarily on urban centres, often with ambiguity remaining around the regulatory mandates and protocols for rural and small-town schemes or for CBM. Independent regulatory bodies for rural provision rarely exist, rather regulatory functions may be delegated to lower levels of government or a third party. Accountability measures are also important across all management models to ensure that consumers have a channel for complaint or holding service providers to account. Different management options should

equally ensure inclusive services for all, regardless of gender, religion, social status, disability or land tenure. These are closely linked factors that may have an influence on the model selected.

### **Regulation and accountability mechanisms**

#### **What mechanisms are in place for monitoring and regulating the service provider?**

The selection of a management model should consider existing frameworks and local capacity to effectively monitor and regulate service provision and to ensure services are being provided in an affordable and inclusive manner, and according to the prescribed service level standards. It is important for such monitoring and regulation arrangements to be in place for any of the management models, however certain models are historically perceived as more 'risky' without robust regulation and accountability frameworks in place. These tend to be those associated with private sector management, as profit incentives may, in the absence of regulation, cause the private operator to propose

tariff increases above affordability levels, neglect scheme maintenance or reinvestment responsibilities, or prioritise services for richer households or areas to the detriment of services for the poor. However, in reality, such risks may confront any of the management models in the taxonomy. Other mechanisms to hold service providers to account include contracting clauses, reporting against benchmark performance indicators and in the case of private operators the need to re-apply for licencing. Other forms of accountability include the role of local government, which may intervene between consumers and service providers but this also depends on the capacity to do so and the robustness of (self-) reporting and monitoring.

#### **How robust are regulatory or accountability mechanisms in practice and are they enforced?**

Where services are to be delegated to private operators or utilities, this should only be undertaken where the regulatory framework is adequately robust, where the service provider's licenses or contracts clearly define service standards and tariff levels, and



where there is a realistic prospect for adequate monitoring and enforcement of such service standards and tariffs by the regulatory body (which could be the sector regulator, or the service authority (local government) with regulatory functions). These are less likely to be an issue with CBM models, although accountability to community members is still of central importance. Where WASH committees may, according to contractual provisions, theoretically be able to hold the delegated private providers to account, in reality, there may be barriers to this; for example, in cases where the CBM committee is contracting a larger firm for management or maintenance services they simply may not be able to hold them to account because of the asymmetrical balance of power and technical capacity.

**Are there informal modes of accountability which can be used, and are they robust?** User and local stakeholder acceptance of certain management models can be influenced by the question 'who would the service provider be accountable to, and can we hold them to account?'. In contexts

where there is strong governance and relatively high public confidence in local and national governments to monitor and ensure adequate and affordable services, then models which are oriented around 'upwards' accountability may be more accepted – such as aggregated models with accountability to an 'external' board, or local government delivered or delegated services. However, in contexts where there is less trust in the effectiveness of 'upwards' accountability, local preference may be for CBM-based models or options where the community can hold a meaningful role in the model's governance arrangements. Regardless of the model selected, there should be arrangements for accountability of the service provider to the users, through formal or informal means such as complaints mechanisms (to the service provider and to a 'third party' entity), user consultations and feedback processes, and transparency in issues such as financial management. Because of the lack of formalised regulatory frameworks in rural areas, many examples have emerged of alternative channels, including complaints hotlines,

consumer feedback boxes, community scorecards, as well as more informal community feedback meetings. It is also important to remember that accountability measures need to be two-way in the sense of ensuring that consumers are obliged to pay for services at the agreed tariff level.

**Key Message:** Understanding the formal regulatory frameworks, and how 'strong' regulation processes are, is essential when selecting a management model, as well as ensuring that more informal accountability or complaints mechanisms can be provided by the management entity to allow for feedback from consumers and community members. Selecting a management model that includes private or public sector options should be balanced by the presence of at least some basic form of regulation and oversight.

## **Local preferences: community and stakeholder preferences on the type of management model**

### **What are the preferences of the community and local stakeholders in terms of management models?**

Consultation with users and local stakeholders (including local leaders and politicians) is key to ensuring that the model is locally accepted, and that people are willing to cooperate with the service provider and undertake their respective mandated duties (including paying water bills regularly). Where user preference is not considered, it could lead to challenges in future. For example, with local politicians undermining the role of the appointed service provider, with users refusing to pay bills, or challenges in vandalism or water theft. Local preferences vary, and can be influenced by factors such as the success or challenges observed in nearby schemes, the trust of local or national authority-led services, and more concerns about the risks of the private sector running public services. Public consultation, allowing users to make informed decisions or contributions on the selection of the

management model(s), is therefore essential to gain insights into these more cultural issues.

### **The ability of the model to provide adequate, affordable, and inclusive services for all users**

**Can the identified management model provide adequate, sustainable and inclusive services for all?** One of the most important considerations for the selection of a management model, is to ensure that the model has the potential to efficiently and accountably provide water supply services, to agreed service levels, which are affordable and inclusive to all users. Regardless of the model selected, it is essential that mechanisms are in place to ensure the inclusion of women, the vulnerable, disabled and marginalised, including the means to cross-subsidise the poorest households (or poorer communities when the model is managing an aggregated grouping of schemes) within the service provision.

**Key Message:** The selection of management model should include an assessment of local (cultural) preferences and views to ensure there is not a strong reaction against certain forms of management arrangements which may jeopardise their successful implementation. Any selected management model should ensure inclusive and equitable access for all within the service area of the scheme.

## Glossary

**Asset:** Is any piece of infrastructure of the water supply system.

**Contracting authority:** A public body, or delegated actor, entitled to enter into contracts for services through onward delegation or management agreements for the operation of a rural water supply scheme or an aspect of the operation of a scheme

**Delegation:** Is the action or process of conferring responsibility for one or more components of the operation, management or maintenance of a water supply scheme.

**Enabling Environment** Is a set of interrelated conditions – legal, organisational, fiscal, regulatory, informational, political and cultural – that impact on the capacity of partners, including national governments, donors and NGOs to engage in developmental processes in a sustained and effective manner (adapted from Thindwa; 2001).

**Life cycle costs:** Represent the disaggregated costs of ensuring the delivery of an adequate, equitable and sustainable WASH service level to a population in a specified areas, including the following (from IRC 2011):

- i. **Capital Expenditure (CapEx):** The capital invested in constructing fixed assets such as concrete structures, pumps and pipes. Investments in fixed assets are occasional and 'lumpy', and include the costs of initial construction and system extension, enhancement and augmentation. CapEx software includes once-off work with stakeholders prior to construction or implementation, extension, enhancement and augmentation.
- ii. **Operating and minor maintenance expenditure (OpEx):** Expenditure on labour, fuel, chemicals, materials, regular purchases of any bulk water. Most cost estimates assume OpEx runs at between 5% and 20% of capital investments. Minor maintenance is routine maintenance needed to keep systems running at peak performance, but does not include major repairs.
- iii. **Capital maintenance expenditure (CapManEx):** Expenditure on asset renewal, replacement and rehabilitation costs, based upon serviceability and risk criteria. CapManEx covers the work that goes beyond routine maintenance to repair and replace equipment in order to keep systems running.

iv. **Direct support (DS):** The cost of support activities to operators, users or user groups, not directly related to initial construction (i.e. on-going training, monitoring support) that is critical to service sustainability.

v. **Indirect support (IDS):** The costs of macro-level support, planning, policy making and capacity building, including support provided to local governments.

vi. **Cost of Capital (CoC):** Costs of any interest payment on loans, micro finance and any other financing costs

**Management entity:** Refers to are the actor (which could be community committee, community board, an association, local government or private or public operator) that is responsible for the on-going management of the rural water supply scheme; the management entity may also carry out the day-to-day functions of service provider, or may only oversee the actions of the service provider

**Management models:** Management models refers to the combination of management entity, service provider, service authority and the associated enabling environment factors that support – or undermine - the functioning of the management entity and service provider (e.g. regulatory capacity, policy frameworks, monitoring etc.). At the operational level, there are a number of relatively common approaches, known as management models. Within each management model typology there can be variations and hybrids depending on context; the primary models identified in this study are:

- i. **Community-based management:** Where communities (i.e. users) have been delegated responsibility to operate and manage the water facilities; this option includes many variations from purely voluntary committees, to those with systematic support, to outsourcing of functions to individuals and even private companies, but where the community retains governance and oversight;
- ii. **Direct local government provision:** In which local governments are also service providers for rural communities and carry this out directly; this is also sometimes referred to as "municipal services";
- iii. **Public utility provision:** Under this scenario a specific, separate public entity is created, which may be at central, regional or local level to

provide management of services for communities and small towns in their immediate 'hinterland' of operations; this model may also apply in small (island) nations. This grouping would include utilities directly operated by the public sector and parastatal companies set up by a ministry but operating on a more commercial basis;

- iv. **Private sector management:** Where private operators either own water assets and manage the services, or have been delegated responsibility for operation and management of publicly-owned water systems through public private partnership (PPP) arrangements, increasingly with local governments. PPPs may or may not involve private capital investment to build or extend assets; and
- v. **Supported self-supply:** Where households, or small clusters of households, provide their own solutions to water supply; this form of management is most typical in highly dispersed communities (and is still a common option in many developed countries for remote rural populations), as well as in countries where state provision through other management models has not reached very far and/or services are perceived to be unsatisfactory.

**Rural water supply facility:** Refers to the physical infrastructure and its components (e.g. pipe networks, reservoir tanks, boreholes etc.).

**Rural water supply scheme:** Refers to the physical facility and the soft components such as management, administration and financing at the point of supply.

**Rural water service delivery:** Includes national definitions for both rural populations and the rural water sector. Rural water may therefore refer to supplies both in remote rural areas as well as growth centres and small towns that fall under rural service provision according to sector institutional arrangements.

**Service levels:** Refers to definitions and agreed norms regarding expected service levels, typically expressed as minimum quantities, by quality parameters, and aspects such as reliability, accessibility and in some cases affordability.

**Service Authority:** Refers to the institution(s) with the legal mandate to ensure that water services are planned and delivered. Service authorities are usually, but not always, equated with local government, and not necessarily involved in direct service delivery themselves (although they may in some cases).

**Service provider:** Refers to the actor (which could be an individual, community committee, local government, public utility or private operator) that is responsible for performing day-to-day operations of a rural water supply scheme or an aspect of the operation of the scheme

**Sustainability of services:** Refers to water services that are continuous over time and which meet agreed upon service levels. The definition made by WaterAid UK - which itself builds on an earlier one by Abrams (1998) - is useful and considers sustainability as: "whether or not (water services) continue to work and deliver benefits over time. No time limit is set on those continued services, behaviour changes and outcomes. In other words, sustainability is about lasting benefits achieved through the continued enjoyment of water supply (and other) practices." (adapted from WaterAid, 2011).

**Tariffs:** Funds contributed by users of WASH services for obtaining the services. In the OECD 3T typology, tariffs include two types of funding: Tariffs for service provided and households' out-of-pocket expenditure for self-supply

**Taxes:** Funds originating from domestic taxes which are channelled to the sector via transfers from all levels of government, including national, regional or local. Such funds would typically be provided as subsidies, for capital investment or operations. "Hidden" forms of subsidies may include tax rebates, concessionary loans (i.e. at a subsidised interest rate) or subsidised services (such as subsidised electricity).

**Transfers:** Funds from international donors and international charitable foundations (including NGOs, decentralised cooperation or local civil society organisations) that typically come from other countries. These funds can be contributed either in the form of grants, concessionary loans (i.e. through the grant element included in a concessionary loan, in the form of a subsidised interest rate or a grace period) or guarantees



## Resources

**Hybrid management models: blending community and private management.** Topic Brief, which examines the approaches used by WSUP in Nairobi, Kumasi and Antananarivo under the African Cities for the Future programme from the perspective of combining community and private management models. Practical guidance on this issue is also included for programme managers. Available at: [www.wsup.com/content/uploads/0201/07/TB009-ENGLISH-Hybrid-Management-Models.pdf](http://www.wsup.com/content/uploads/0201/07/TB009-ENGLISH-Hybrid-Management-Models.pdf)

**Improving access to and quality of water supply schemes in small-towns:** A series of guides that are based on the outcomes of the Concerted Municipal Strategies (CMS) action-research programme, which took place from 2007-2010. These resources provide practical information on a range of topics such as, 'how to analyse the demand of current and future users for water and sanitation services in towns and cities in Africa'. Available at: [www.pseau.org/en/our-reference-publications](http://www.pseau.org/en/our-reference-publications)

**Post-construction support to rural water service providers:** Briefing note on different forms of support for operators to improve performance provided by range of organisations including local government, association of service providers and NGOs that can help to improve the quality and sustainability of services (IRC; 2015) Available at: [www.ircwash.org/sites/default/files/084-201502triple-s\\_bn06defweb.pdf](http://www.ircwash.org/sites/default/files/084-201502triple-s_bn06defweb.pdf)

**Private Sector Participation in rural water supply:** Case studies and example contracts from a range of countries (including Benin, Mali, Niger, Burkina Faso, Kenya and Uganda) are encouraging private operators to both expand and improve the quality of water services in rural areas. It also highlights the key challenges that these countries are facing in adopting this management model; World Bank, Public Private Partnership Legal Resource Centre. Available at: [ppp.worldbank.org/public-private-partnership/ppp-sector/water-sanitation/small-water-providers](http://ppp.worldbank.org/public-private-partnership/ppp-sector/water-sanitation/small-water-providers)

**Professionalisation of community-based management for rural water services:** Briefing note on greater professionalisation of rural water provision as an effective means of improving performance with recommendations for governments, NGOs and donors (IRC, Aguaconsult; 2012). Available at: [www.ircwash.org/sites/default/files/084-201502triple-s\\_bn01defweb\\_1\\_0.pdf](http://www.ircwash.org/sites/default/files/084-201502triple-s_bn01defweb_1_0.pdf)

**Professionalising water supply management:** This series of webinars uses presentation and discussions of practical experience in Africa and elsewhere to explore six topics in professionalising water supply management in rural areas and small towns. (Water and Sanitation Program). Available at: [www.wsp.org/FeaturesEvents/Calendar/webinar-series-professionalizing-rural-and-small-town-water-supply-managemen](http://www.wsp.org/FeaturesEvents/Calendar/webinar-series-professionalizing-rural-and-small-town-water-supply-managemen)

**Public Private Partnerships:** Briefing note on the different types of PPPs for rural water services, how they have shown some success at a limited scale and key recommendations and considerations for enabling this management model to be successfully applied on a larger scale (IRC, Aguaconsult, World Bank; 2012). Available at: [documents.worldbank.org/curated/en/710821468162277350/Public-private-partnerships-for-rural-water-services](http://documents.worldbank.org/curated/en/710821468162277350/Public-private-partnerships-for-rural-water-services)

**Public Private Partnerships:** Guidance note offering practical, experience-based guidance to those considering or currently engaging in PPPs in the water sector, and provides a basic understanding of water PPPs and the PPP cycle to better inform dialogue with governments that are considering PPP arrangements (Water and Sanitation Programme, 2016). Available at: [www.rural-water-supply.net/ressources/documents/default/1-785-2-1502958999.pdf](http://www.rural-water-supply.net/ressources/documents/default/1-785-2-1502958999.pdf)

**Life-cycle Costs approach: costing sustainable services:** Working paper describing the components and application of a life-cycle costs approach as one solution that enables service providers to provide long-lasting WASH services (IRC; 2011). Available at: [www.ircwash.org/resources/briefing-note-1a-life-cycle-costs-approach-costing-sustainable-service](http://www.ircwash.org/resources/briefing-note-1a-life-cycle-costs-approach-costing-sustainable-service)

**Regulation of rural water services:** Briefing note on the emerging experiences with regulation of rural water operators with a range of

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