Safe Water Initiative Portfolio Review

External Review of Rural Water Service Delivery Models

AGUA CONSULT

CONRAD N. Hilton FOUNDATION

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Acronyms and Abbreviations

ASP	Area Service Provider (Uganda)
CapEx	Capital expenditure
CapManEx	Capital maintenance expenditure
CBM	Community based management
CBMS	Community-based management system (Uganda)
CWSA	Community Water and Sanitation Agency (Ghana)
IFI	International Funding Institution
JMP	Joint Monitoring Programme (WHO/UNICEF)
MMDA	Metropolitan, Municipal and District Assemblies (Ghana)
NWSC	National Water and Sewerage Corporation (Uganda)
ODA	Overseas Development Assistance
OECD	The Organisation for Economic Co-operation and Development
OpEx	Operational expenditure
SDG	Sustainable Development Goal
SDM	Service Delivery Model
SWE	Safe Water Enterprises
SWI	Safe Water Initiative
SWN	Safe Water Network
UWS	Umbrellas for Water and Sanitation (Uganda)
NWSC	National Water and Sanitation Corporation (Uganda)
WASHCOs	Water, sanitation and hygiene committees (Ethiopia)
WSMT	Water and sanitation management teams (Ghana)

Executive Summary

The Conrad N. Hilton Foundation funds the Safe Water Initiative, using the district as a unit of scale, focusing on system-strengthening and service delivery to ensure reliable and safely managed water to one million people in low-income households, health facilities, and schools in sub-Saharan Africa. As part of its five-year strategic plan, the Conrad N. Hilton Foundation commissioned a review of its investments and approaches in its target geographies of Ethiopia, Ghana, and Uganda. The primary aim of the review is to investigate the relevance, effectiveness, and sustainability of different Service Delivery Models (SDM), including community-based safe water management, publicly owned water utilities and private-sector approaches such as Safe Water Enterprises (SWE).

This component of the review builds on findings from a detailed analysis of the Conrad N. Hilton Foundation grant portfolio identifying funding trends, including approaches, entry points and funding flows to grantees. The purpose of this report is to assess the SWI portfolio in the context of the wider, global evolution of approaches to rural water service delivery, management arrangements and key innovations in the recent past, as well as in the three focus countries. The report also seeks to assess the extent to which the Conrad N. Hilton Foundation aligns with these global and country-specific trends as well as the approaches of other funders operating in the rural water sector.

Findings

The Conrad N. Hilton Foundation is a well-regarded funder and its investment portfolio, at just under USD 65 million over a five-year period, makes it one of the largest philanthropic donors to rural water across the three target countries. Several clear trends in the development of the rural water sector can be identified globally, which are, to a greater or lesser extent, reflected in each of the three Conrad N. Hilton Foundation target countries. Progress along these trends is varied, and countries are taking different pathways in terms of the development of specific SDMs, including a continued commitment to community-based management in Ethiopia, the expansion of public utilities in Uganda, and a mixed approach in Ghana, where private operators are also emerging as an important SDM. These trends, and the extent to which the Conrad N. Hilton Foundation's current strategy is well-aligned, are summarized as follows:

Key trend 1: Both development partner practitioners and donors are making a shift toward supporting system-strengthening efforts and are decreasing their (funding) support for direct service delivery.

Globally, the majority of development partners and donors are making a move away from direct investment in infrastructure (which

is seen as a national and local government responsibility) and toward supporting the capacity of actors and systems to deliver better and more sustainable services. This trend is referred to in different ways by different stakeholders, but essentially comprises the same transition, both in strategic approaches and in some cases actual funding patterns, particularly in the case of the major bilateral donors. Most approaches to system strengthening include some form of collective action, requiring a facilitator or 'hub' organization to play a coordination and learning role across and between stakeholders. National government partners have valued these interventions.

The Conrad N. Hilton Foundation's Strategy 25 response: The Conrad N. Hilton Foundation's investments have been increasingly strongly aligned with this trend. The Conrad N. Hilton Foundation has placed the majority of its funding behind efforts to strengthen WASH systems, both at decentralized, local levels and nationally, instead of pure infrastructure investment. Across Conrad N. Hilton Foundation's portfolio, 80% of funding is allocated to systems-strengthening activities, and this level is maintained across the three target countries. Within these allocations, more than half was allocated to interventions facilitating collective action and institutional strengthening and improving coordination (28% and 23%, respectively).

A further characteristic of the Conrad N. Hilton Foundation's support to system strengthening efforts that is well aligned with broader sector thinking is the unit of scale of service provision. Strategy 25 has an explicit focus on the district as the entry point and unit of scale, which has been identified as critical for efforts to improve decentralized service delivery. The Conrad N. Hilton Foundation has also recognized that this unit of scale is insufficient, on its own, to address some of the more systemic challenges and bottlenecks, which require concurrent action at the national sector level.

Key trend 2: The policy shift away from unsupported CBM to alternative management arrangements is leaving significant numbers of the rural population behind, particularly those relying on point sources fitted with hand pumps.

The policy shift away from CBM is happening across many countries, including the three target geographies of the Conrad N. Hilton Foundation; however, this transition will take many years to achieve in practice. As such, CBM remains in place in most countries and often serves the majority of the rural population reliant on point source supply (hand pump technologies). In both Ethiopia and Ghana, the CBM model relies on support from local government which has proven to be largely inadequate and chronically underfunded to date. And even though a new approach has been set out in policy in Uganda for professionalized support, this remains limited in its scale of application to date; for example, this model has not yet been established in one of the Conrad N. Hilton Foundation's target districts.

The Conrad N. Hilton Foundation's Strategy 25 response: Although the Conrad N. Hilton Foundation is actively supporting alternative management arrangements, it has invested relatively little to address the weaknesses of the CBM model, which will remain in place for the majority of rural consumers for the foreseeable future. Whilst CBM, and the systems supporting this model, have received funding in Ethiopia, it has very little investment support from the Conrad N. Hilton Foundation in Ghana and Uganda, receiving just 12% and less than 1% of the country portfolio, respectively. However, the Conrad N. Hilton Foundation has more recently supported indirect efforts to improve CBM by delegating maintenance functions to professionalized service providers and has made investments in the global platform Uptime, which provides

indirect support through a results-based financing mechanism for providers.

Key trend 3: There is a policy shift toward piped water supplies, with the ultimate aim of piped-on premises, that points to an increased involvement of utilities in rural areas, or 'utilitization' of rural water.

Globally, as well as in all three of the Conrad N. Hilton Foundation's target countries, sector policy and strategies have adopted ambitious goals for piped supply in rural sectors. This move is embedded in broader national development planning and is proceeding in different forms and at different speeds. In Ethiopia, the rural utilities tend to be smaller and more localized, serving the immediate surroundings of rural towns. In Uganda, there is a twin track with NWSC expanding from the 'top-down' and taking on the larger rural district growth centers and the UWS' serving more dispersed populations. In Ghana, the CWSA has been reformed to serve as a national utility, but this is a relatively very recent change, and there is some ambiguity as to how it will be scaled up.

The Conrad N. Hilton Foundation's Strategy 25 response: The Conrad N. Hilton Foundation's support is increasingly aligned with this trend, and it has made important investments in support of these changes. For example, in Uganda, 94% of its investments supporting service delivery models were to support public utilities, while in Ghana, it was just over 22% (as a result of a recent grant supporting CWSA). Public utility models receiving support include the Mid-Western Umbrella for Water and Sanitation (MW-UWS) in Uganda, Ghana's CWSA, and, to a lesser extent, in Ethiopia, through the rural utilities in its target districts. Funding has included capacity building and efforts to improve operational efficiencies.

The trajectory toward utility provision (public or private) more broadly is associated with the consolidation or aggregation of service areas across multiple districts, bringing increased economies of scale and operating efficiencies that are not possible within the context of only one district or administrative unit. Therefore, there is an inherent tension for the Conrad N. Hilton Foundation in continuing to support district-level system strengthening and, at the same time, SDMs which are regional or national in nature with service areas spanning across multiple districts (for example, applying to public utility SDMs in Uganda and Ghana, and also the private models in Ghana).

Key trend 4: Sector policy makers and development partners are actively promoting an increased role of the private sector, both to improve service delivery quality and to attract commercial investment.

In recent years, there have been significant reforms to the rural sub-sector aimed at stimulating private sector participation by adapting legislation and policy and aligning incentives to attract private operators. In Ethiopia, progress has been perhaps the most limited, with a focus on spare parts and small-scale, less formalized maintenance providers. In Uganda, a role for private operators has been established under the new ASP framework for delegated maintenance, but the government is focusing more on national and regional public utilities. In Ghana, there is a policy framework in place that enables the new rural utility to delegate O&M to private operators, but this is only currently applied for one scheme. Perhaps the most progress has been made through the expansion of SWEs in Ghana which have a strong track record of service delivery, but there is not yet a clear policy pathway for fully institutionalizing this approach.

The Conrad N. Hilton Foundation's Strategy 25 response: The Conrad N. Hilton Foundation has provided extensive direct support for the private SDMs (45% of all its investments in direct service delivery) with the majority of this going to support SWEs in Ghana (66%). SWEs in Ghana have proven capable of delivering high-quality services. However, to date, the Conrad N. Hilton Foundation's investment (as well as that from other donors) has not resulted in the arrangement having a clear pathway for operating at scale through being applied to publicly funded piped water supply facilities where CWSA is the asset holder. SWEs have introduced a range of vital innovations, increased revenue streams and made efficiency gains to increase the proportion of operational expenditures they are able to cover. However, none of the current private sector providers supported by the Conrad N. Hilton Foundation have been capable of accessing commercial financing at market rates and instead remain reliant on external aid.

Key trend 5: Funding gaps for both investment and recurrent costs in rural water are evident in many countries, and current sources will be inadequate to meet the SDGs. In response, there is a drive to (gradually) increase revenues from tariffs, whilst, at the same time, pushing down operational costs, and an increased emphasis on advocacy for greater public funding and efforts to access commercial lending.

The Conrad N. Hilton Foundation's target countries, in common with most others around the world, exhibit funding gaps for rural water, even though there have been (modest) increases in public funding in each of Ethiopia, Ghana and Uganda. For example, in Ethiopia, there is an annual WASH sector funding gap of roughly USD 790 million. Efforts have been made to increase the operational efficiency of both public and private utilities in Ghana and Uganda, but only NWSC in Uganda has been able to raise financing from commercial lenders. Funders interviewed for this review are increasingly working on strategies to attract private investments by both building capacity and the understanding of financing sector actors about water operators and de-risking investments.

The Conrad N. Hilton Foundation's Strategy 25 response: The Conrad N. Hilton Foundation has recognized this challenge and supported grantees who have carried out extensive advocacy efforts at the national level to promote greater public funding, as well as supporting extensive work on the development of district water plans (see box 7) to show the scale of the investment gap and the extent of financing required to support sustainable services. In some cases, the Conrad N. Hilton Foundation has also supported SDMs to gain greater operational efficiencies and cost savings. But, overall, there have been limited investments on the supply side of sector financing by building capacity for, and opening up, commercial lending opportunities for rural operators to leverage private investments. Interventions in support of addressing financing challenges have been limited to the expansion of loan products for integrated water solutions for households and businesses in Uganda and the development of a targeted water subsidy strategy in Ghana.

1. Introduction

The Conrad N. Hilton Foundation is committed to supporting philanthropic initiatives that improve the human condition worldwide. The Conrad N. Hilton Foundation recognizes that access to safe water is a critical component of global development, with far-reaching effects on health, education, and economic growth. As part of its mission, Conrad N. Hilton Foundation has invested in a range of projects in the water sector, which aim to enhance the health and well-being of millions of people.

The Safe Water Initiative (SWI), using the district as a unit of scale, focuses on system-strengthening and service delivery to ensure reliable, affordable, and safely managed water to one million people in low-income households, health facilities, and schools in sub-Saharan Africa. Strategy 25 runs from 2021 to 2025 with a budget of USD 88 million and has three central elements: i. Ensuring safe access to water supplies through supporting Service Delivery Models (SDMs), collaborative planning and innovation; ii. Promoting regional and national replication of approaches by advocating for national action and support to regional networks; and iii. Building a global safe water movement through funder collaboration. It also has a fourth, cross-cutting stream to promote research and evaluation.

As part of its five-year strategic plan for the SWI, the Conrad N. Hilton Foundation commissioned a review of its investments and approaches in its target geographies of Ethiopia, Ghana, and Uganda. The review is an opportunity to analyze the Conrad N. Hilton Foundation's investments in SDMs to date, including how these align with the broader context of rural water provision and funding trends. The primary aim of the review is to investigate the relevance, effectiveness, and sustainability of different SDM approaches used by the SWI, including community-based safe water management and self-supply in Ethiopia, Government provision of safe water through publicly owned water utilities in Uganda, and predominantly private-sector approaches (such as the safe water enterprises) in Ghana. The review seeks to answer three strategic questions:

i. Have Conrad N. Hilton Foundation investments been relevant to the challenges of delivering rural water services in the target districts and countries?
ii. To what extent are SDMs supported by the Conrad N. Hilton Foundation delivering safe water services? and
iii. Are SDMs supported by the Conrad N. Hilton Foundation sustainable?

The overall review is comprised of three main phases: an internal analysis of grantee interventions funded by the Conrad N. Hilton Foundation, an external review of global and national sector trends relating to rural water provision (this report), and survey work in the three target countries to assess both support to SDMs and broader system strengthening efforts. It is important to note that the review is not intended to assess individual grants or the performance of grantees but to focus on the complementarity of interventions and the combined contribution to improved service delivery and stronger local and national water systems.

1.1 Purpose of this Report and Structure

This component of the review was undertaken from January to March 2023 and builds on findings from the detailed analysis of the grant's portfolio, identifying trends and patterns of funding, including approaches, entry points and funding flows to grantees. This report presents the findings of one component of the overall review which contributes to answering the first of the three strategic questions and positions the SWI portfolio against broader state-of-the-art approaches, with the following objectives:

- To analyze the global evolution of rural water service delivery, management arrangements and key innovations in the recent past, globally as well as in the three focus countries;
- To describe trends and lessons related to funding rural water at sector and SDM levels; and
- To assess the extent to which the Conrad N. Hilton Foundation aligns with these global and country-specific trends as well as other funders operating in the rural water sector.

The SWI defines **Service Delivery Models** as the combination of the management arrangement and the technology (infrastructure) providing the water supply service. For this analysis, the **management arrangement** is used as the primary entry point defined as the combination of a service provider (or operator), a service authority (the entity legally mandated with ensuring services, which is often the local government), and the associated regulatory functions at the national level.

In developing this report, the review team carried out a desk review to research global trends in rural water provision and held consultations with philanthropic funders and bilateral and multilateral donors (see Annex 1). This document also draws on three country-level assessments of the rural water sector, policy and institutional frameworks, financing trends, and an assessment of government-sanctioned SDMs. The outputs of this component of the review are made up of the following: i. a global report, with separate chapters on the three Conrad N. Hilton Foundation focal countries (this report), and ii. three stand-alone country reports, for Ethiopia, Ghana, and Uganda, to be used for country engagement.

2. Global Evolution of Rural Water

2.1 Overview of the Rural Water Sector

Since the launch of the Millennium Development Goals in 2000, the lives of billions of people globally have benefited from first-time access to water supply, but rural populations have lagged behind. More recently over the first five years of the Sustainable Development Goal period, access to at least a basic water supply service in rural has increased from 79% to 82% globally. However, these data mask regional disparities with half of the 771 million people still lacking even a basic drinking water service in 2020 living in sub-Saharan Africa. More shockingly, 80 % of the 2 billion people without guaranteed access to safe drinking water are rural (JMP, 2021).

Management approaches to the delivery of rural water services in low-income countries in the Global South have also evolved over the past 20 to 30 years, with a trend away from community management and the emergence of alternative models, including private sector participation and public provision. A broad pattern is discernible in the way countries have tackled the challenge of expanding and improving rural water services following a trajectory with three key phases[1] :

i. A centrally driven and hardware-focused phase prior to the 1980s in which infrastructure was delivered by state institutions with little to no community or user consultation (Lockwood and Smits, 2011);
ii. Starting with the UN International Drinking Water and Sanitation Decade from 1980 to 1990, much greater emphasis was placed on the 'software' side of rural water, including the participation of users in the design, siting and construction of facilities and engendering a sense of community ownership. This approach was rolled out concurrently with the period of

Rural Water: A persistent global gap

In every country of the world, rates of access to water supply (and sanitation services) are lower in rural areas than in urban ones. Yet investments in rural areas are often compromised by low-quality construction and poor maintenance. As a result, water and sanitation infrastructure falls into disrepair, often only a few years after installation. These challenges must be addressed to achieve universal access and ensure water and sanitation security for rural populations.

[World Bank; 2022]

1 The content of chapter 2 of this document assessing global trends in the rural water sector and evolution in conceptual thinking draws upon an unpublished report produced under a Cooperative Agreement (No. 7200AA21CA00014) between the United States Agency for International Development (USAID) and The Aquaya Institute for the Rural Evidence and Learning for Water (REAL-Water) project. The authors of this report are drawn from the same staff of Aguaconsult that have drafted this component of the Hilton review (Harold Lockwood and Julia Boulenouar)

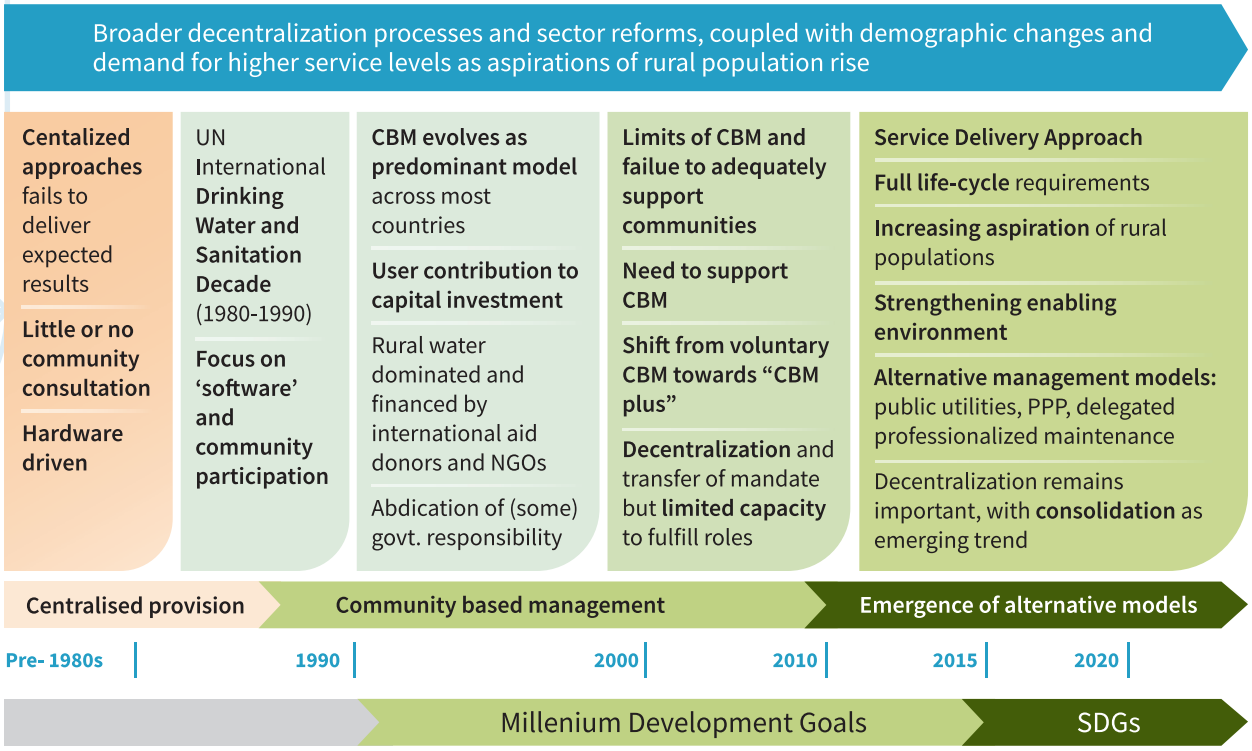
decentralization of many services, including rural water supply, to local government and the transfer of responsibility for day-to-day management to communities from the 1990s (Arlosoroff et al., 1984; Katz and Sara, 1997; Briscoe and Ferranti, 1988; van Koppen, Butterworth and Juma, 2005).

iii. Since the turn of the millennium and the early 2000s, when increasing questions were raised about the effectiveness of 'basic' or unsupported community-based management (CBM), there has been a drive to develop alternative approaches, with a higher level of scale (i.e., the district or sub-regional level). These processes have often involved an aggregation of service delivery through different management arrangements, including more systematically supported CDM, private sector engagement (either for maintenance services only or operation and maintenance and, in some cases, Build, Operate and Transfer) and the expansion of public utility service areas into rural populations (World Bank, 2017; Adank, van Lieshout and Ward, 2021); the latter sometimes being referred to as 'utilitization' of rural services (Franceys, 2019).

Each phase in this trend has been driven by different factors, often based on addressing shortcomings from the previous one, including limited coverage extension, insufficient cost recovery leading to inadequate maintenance and poor functionality, the inability of communities to effectively manage services, or the limited capacity of many local governments to ensure rural water service provision. The aggregation of service provision has also been driven by attempts to achieve greater financial viability for operators (i.e. saturation of an administrative jurisdiction such as a district to achieve economies of scale). Other important drivers include the ambition to achieve universal and sustainable services and broader developmental frameworks set by national governments and international development partners, including private sector participation (Adank, van Lieshout and Ward, 2021).

Other key drivers along this trajectory include ambitious national development plans or visions and the global aim for safely managed services supply with an improved source accessible on premises, which in most cases relies on piped supplies. These ambitious goals will be met largely through the provision of household-level piped supply and has important implications for public investment, management practices and technology innovation, particularly in sub-Saharan Africa, where population growth is occurring in rural growth centers and small towns (Armstrong et al., 2022). Many countries are adopting ambitious targets for higher levels of household connections, but of these, India is the most notable, with its target of tap connections for all rural households by 2030 under the Jal Javeen Mission or Water for Life (see **Box 1**).

Figure 1: Evolution of approaches to Rural Water Service Provision



Box 1: Government Commitment to Household Tap Connections in Rural Areas: the Jal Javeen Mission

In August 2019, the Government of India committed to providing a "functional household tap connection" to every rural household by 2024. The Jal Jeevan Mission was launched with a mandate to ensure that, in full alignment with SDG criteria for safely managed water supply, every rural household is served with potable water supply, in adequate quantity, and of prescribed quality, on a regular and long-term basis. This is to be achieved through household tap connections connected to locally managed village piped water supply infrastructure. This ambitious program is currently being implemented in partnership with state governments. Across all levels of government, more than US$ 65.6 billion in public sector funding has been committed. The Indian Government is driving a paradigm shift away from simply building water supply infrastructure to concentrating on providing water supply as an ongoing service. The focus is on establishing decentralized, demand-driven, community-managed water supply systems. Grassroots-level support is prioritized, and communities play a pivotal role in planning, implementing, operating, and maintaining their schemes. At the village level, the local government institutions, called Gram Panchayats, are empowered to commission construction work, operate and maintain infrastructure, collect community contributions, monitor water quality, and ensure source sustainability through water resource management.

[WHO, UNICEF, World Bank, 2022., pg 75]

2.2 Evolution of Conceptual Understanding of Rural Water

Alongside the transition in management approaches outlined above, the broader sector conception of rural water has also shifted from one of tackling first-time access to improved functionality, taking a Service Delivery Approach, and, finally, to systems-based approaches to tackling sustainable service delivery. The sustainability of rural water schemes has been a concern for many years and the mounting evidence of failure showed the difficulty of achieving the anticipated results in terms of expanding coverage only. The limitations of taking a largely infrastructure-focused approach have been recognized (Moriarty et al., 2013; Lockwood and Smits, 2011). The adoption of 'functionality' as the best measure of service delivery has also been questioned, with the argument that this simple binary condition is too blunt to characterize the nuanced functionality[2] of piped water schemes, the progressive failure of infrastructure, and an insufficient measure of service performance and likely sustainability (Lockwood and Le Gouais 2015; Carter and Ross, 2016).

Large research programs provided further evidence of failure and the need to move away from existing approaches, or "business as usual". Large-scale programs from the late 2000s, notably those funded by The Bill and Melinda Gates Foundation, the Conrad N. Hilton Foundation, USAID, and other donors (WASH-Cost, Sustainable Services at Scale or Triple-S[3], West Africa Water Supply, Sanitation and Hygiene Program or WAWASH[4], SusWASH[5], Sustainable Water Services[6]) were amongst the first large-scale initiatives to gather evidence of service failure and to develop ideas on approaches to sustainable access to safe water and sanitation through action research and advocacy. These programs, among others, articulated the need to move away from business as usual and adopt a paradigm shift to address several key aspects of the enabling environment, critical to long-term service provision to deliver services. Adopting a Service Delivery Approach was one of the most important shifts from this period, marking an explicit shift in conceptual thinking from a predominant focus on the funding and construction of rural water supply infrastructure projects to the need to support water as an indefinite service (Lockwood and Smits, 2011). This shift also set out the different elements of Service Delivery Models, which extend beyond the individual Service Provider (management arrangement for CBM, private or public), to include the Service Authority (the

2 Functionality is defined by national norms and varies between countries. For hand pump based-water supply technologies the definition can be binary (i.e., working at the time of inspection or not) but is more typically related to the provision of a set quantity of water at the time of inspection based on discharge tests and also may include elements of water quality and absence of downtime in a set period of time prior to inspection. For piped water supply technologies. functionality is more complex and is typically expressed as the aggregated result of an assessment of the physical condition and functioning of each individual component, including intake structures, conveyance, and storage infrastructure, captured as either being good, acceptable, deficient, or bad (World Bank, 2017. b).

3 Triple-S was operating in Ghana, Uganda, and globally from 2009 to 2014; see: https://www.ircwash.org/projects/triple-s

4 See: https://www.usaid.gov/sites/default/files/documents/1865/RI_WA_WASH_508.pdf

5 See: https://washmatters.wateraid.org/suswash

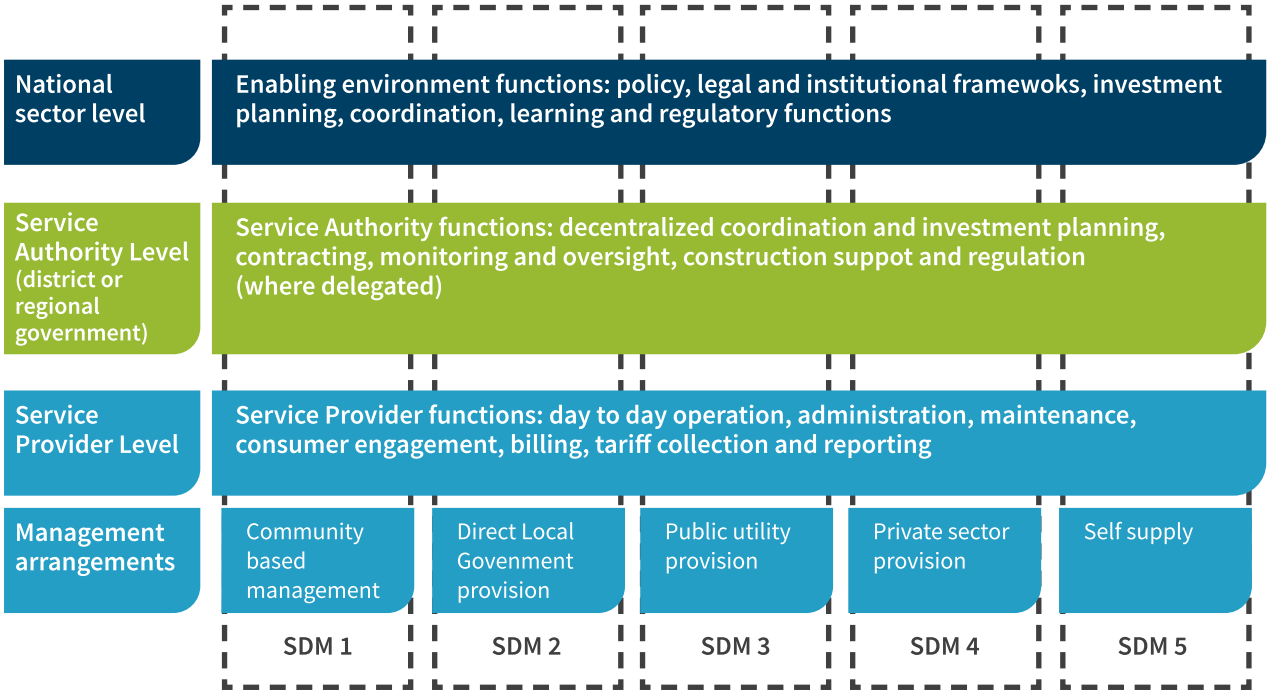
6 See: https://www.globalwaters.org/SWS/sustainable-wash-systems-sws-resources

entity legally mandated with ensuring services, which is often, but not always, the local government), and the associated functions carried out at the national level (see figure 2).

There has been a growing recognition of the need for systems-based approaches as the primary response to addressing the sustainability of rural water among development partner experts. Over the last five to eight years, systems thinking and the use of systems-based analytical tools have come to dominate the dialogue of the sector (Valcourt, Walters et al., 2020b; Valcourt et al., 2019; Valcourt, Javernick-Will et al., 2020; Marks et al., 2018; Huston et al., 2021; Huston, Moriarty and Lockwood, 2019; Miller et al., 2019; Walters and Javernick-Will, 2015; McAlister et al., 2022). This work has fed through to policy with a number of important bilateral donors citing strengthening of sector systems and processes as an important element of their support (Huston et al., 2019), along with a trend away from the financing of direct service delivery. Systems-based approaches, through the explicit acknowledgment of the need for a more holistic consideration of safe and universal service delivery, are designed to tackle critical bottlenecks in the broader service delivery system, such as regulation, financing, and political commitment to supporting service delivery in rural areas (Huston and Moriarty, 2021).

However, despite this major shift in the framing of the root causes of - and potential solutions to - rural water provision by accepting the need for systems-based approaches, some authors still question the extent to which this is a useful lens through which to frame all activities. For example, in his seminal book, Carter agrees that understanding rural water as a 'system' is clearly useful, but he remains doubtful whether the sector, in fact, represents a complex system and that some solutions remain relatively straightforward to address (Carter, 2021). It is also apparent that systems-based thinking has been driven by international development partners as a global concept and it is not yet explicitly embedded in sector policy or practice in the majority of countries in the Global South.

Figure 2: Components of Service Delivery Models for Rural Water



2.3 The Dominant Paradigm of Community-Based Management

Over the past three decades, community-based management has become the predominant model for managing rural water supply in low and middle-income countries. This is true in most parts of sub-Saharan Africa as well as most of Latin America, where there are around 80,000 operational community water boards in rural areas (de San Miguel et al., 2015; Schouten and Moriarty, 2002; Harvey and Reed, 2004; Lockwood and Smits, 2011). Community management is also central to rural water provision policy across Asia, including Bangladesh, Cambodia, China, and Indonesia (World Bank, 2017; Hope et al., 2021; Thapa, Farid, and Prevost, 2021). Several countries in the Organization for Economic Cooperation and Development (OECD) grouping also contain large and relatively dispersed rural populations that still rely on CBM. Many such small-scale providers face similar challenges of low revenue, lack of investment and poor service levels but receive significant levels of state support (McFarlane and Harris, 2018; Rickert et al., 2016; Hendry and Akoumianaki, 2016; WHO, 2020).

There have been extensive assessments of CBM approaches over the last 10 to 15 years, the vast majority of which point to the consistent failure of the model to deliver the expected levels of service, particularly where communities are un-supported. Much of the data reflecting poor performance and high levels of non-functionality has been gathered from studies looking at CBM arrangements. Evidence of high levels of non-functionality of water systems has been available for Sub-Saharan Africa since 2010 and, more recently, also for the Asia- Pacific region, and shows a wide range of non-functional water schemes across geographies, as shown in Annex 2. It is important to note that the studies have used different methodologies and framing for monitoring and presenting functionality rates, but these have been harmonized for the sake of clarity. It is also important to acknowledge that some practitioners argue that it is not the model that has failed but rather the implementation of the model and, particularly, the failure to provide consistent, structured support for community management entities (Carter, 2023).

In part as a response to these failures, there has been a move away from traditional forms of "unsupported" Community-based management to 'CBM Plus'. Whether due to fundamental limitations or inadequate implementation, there has been growing recognition in the water sector over the last decade that CBM had reached the limits of "what could be realistically achieved in an approach based on informality and voluntarism" (Moriarty et al., 2013). The classic, unsupported approach to CBM has been considered inadequate, particularly in the context of international imperatives to raise service levels and the increasing complexity of service provision, and external parties should be expected to play an extensive role in supporting communities (Lockwood, 2002; Baumann, 2006; Lockwood and Smits, 2011; Hutchings et al., 2015). This transition was labeled as a move to 'community management plus (CM+) in 2006 (Baumann, 2006). Although other terms have also been used, including 'post-construction support', direct support, or 'external support' (Schouten and Moriarty, 2002; Lockwood, 2002; Lockwood and Smits, 2011; Jansz, 2011). Regardless of labeling, the following dimensions of CBM plus have been widely recognized:

- **Professionalization** through improved training and accreditation, and understood as services run by professionals rather than untrained volunteers, with the possibility of outsourcing more complex tasks (Moriarty et al., 2013; Chowns, 2015; Lockwood and Le Gouais, 2015; World Bank, 2017; Franceys, 2019).

- **Long-term support to communities** and move away from "hand-over" of infrastructure to communities to take ownership and complete operation and maintenance duties to a more structured approach, often but not always provided by local government acting in the role of service authorities. Such support is provided at a higher unit of scale than individual rural communities (Lockwood, 2002; Baumann, 2006; Moriarty et al., 2013; Lockwood and Smits, 2011; Hutchings et al., 2015).

2.4 Emergence of Alternative Management Approaches

Based on the recognition of the limitations of CBM, governments have been increasingly designing, piloting and scaling up alternative approaches to rural water management. In recognition of these challenges and in response to growing demand and expectations of better water supply service, alternative approaches have been tested in many countries in recent years (Moriarty et al., 2013; Lockwood et al., 2021; Carter, 2021). These include efforts to formalize, support, and better regulate other modalities for service delivery (and ultimately, piped supply on premises). Alternative approaches include the promotion of private sector participation through small-scale operators, structured lease agreements with larger private companies, and the gradual expansion of public utilities into rural areas (World Bank, 2017; Franceys, 2019; Adank, van Lieshout and Ward, 2021).

Management based on public utility provision involves the expansion of utility reach into rural areas, either through directly connecting networks or aggregating management under an umbrella entity to achieve economies of scale and provide greater technical and managerial capacity to improve service provision. Uganda is a case in point, where the National Water and Sewerage Company (NWSC) has extended operations into rural areas and aims to provide 140,000 new household connections and 20,000 public standpipes in over 21% of rural communities in the country. In parallel with this, six regional public entities, or Umbrella Authorities, now manage direct service delivery for over 430 piped schemes previously under CBM and not being managed by the NWSC (Huston et al., 2021). Other examples include Ghana, where the Community Water and Sanitation Agency (CWSA) is in the process of transition from a facilitator or regulator of services to a national utility for rural water supply, and Zambia, where the country's 11 regional commercial utilities now include licensed operating areas in rural parts of the country (World Bank, 2017; NWASCO, 2018; Adank, van Lieshout and Ward, 2021).

Private sector participation in rural water service delivery is growing and applies in cases where private operators either own water assets and manage the services directly or have been delegated responsibility for carrying out certain functions. These can range from specific maintenance tasks or retailing water to wholesale O&M of publicly owned water systems through PPP arrangements. The latter are governed by management or lease contracts and are increasingly let by local governments, as is the case in Rwanda, where there are currently 46 private operators licensed by the national regulator operating under five-year leases signed with the district government authorities who own assets and receive a proportion of tariff revenue. Similar PPPs have been established at larger scales of operation, as is the case in Benin, where the government has signed 10-year lease contracts between its leasing company and a consortium of private operators to provide services to 6.7 million rural consumers over three concessionary regions.

Smaller retail operations, known collectively

as Safe Water Enterprises[7], operating along market-based principles have been present for well over a decade and more, often targeting a specific segment of the rural population and working most effectively in more densely populated rural areas. A study carried out in 2017 into 14 different water enterprises found that this approach has promise and often outperforms public or community management models in terms of both water quality and willingness to pay but has operated at a limited scale and relies on external subsidies from donors or philanthropic funders. At the time of the study, SWEs were estimated to serve some 3 million people globally but with the potential to scale significantly to serve between 1.4 and 3.8 billion people. Key barriers to the expansion of SWEs identified in this study include a "value asymmetry" between SWEs who promote the value of clean water versus a large proportion of customers who value convenience over quality but are unwilling to pay substantially extra. A further barrier identified in the study is the lack of recognition in sector policy and legislation to underpin the institutionalization and legitimacy of SWEs (Dalberg, 2017).

Unlike SWEs, which are often NGOs or social enterprises receiving subsidies, true local entrepreneurs who can survive financially without the support of external donors are rare in the rural water sector. One context in which there is some evidence of truly local private small-scale enterprises is Cambodia which has seen growth in this area, and the government is now moving to license these providers as they evolve from informal family-run entities into viable small businesses. There are currently estimated to be around 350 small-scale enterprises serving small towns and rural areas (with between 500 and 2,000 connections) to between 1.4 and 2.2 million people, with high functionality rates and improved water quality (1001Fontaines, 2022; Shantz, 2018).

A more recent development has been the piloting and scaling up of professionalized maintenance providers supporting existing CBM arrangements, with private providers signing performance-based contracts with communities and local governments. A number of such private maintenance provider models were identified and researched as part of USAID's Sustainable WASH Systems[8] partnership and other initiatives such as the global results-based model, Uptime[9] (Chintalapati et al., 2020; Lockwood et al., 2021; Harvey, 2021; Foster et al., 2022). These examples include social enterprises operating along commercial lines, such as FundiFix in Kenya and Whave in Uganda, both of which pool risks across a service area at sub-district or sub-county levels, signing annual contracts with communities, which are also monitored by local government. A recent study carried out by the REACH project identified 77 service providers delivering water services for around 5 million people across 28 countries that report on operational metrics that would be potentially suitable to use under similar results-based contracts (Nilsson et al. 2022). As in the case of the SWEs, many examples of professionalized maintenance are based on (highly) subsidized arrangements, whereby operators cannot cover the costs of service provision from tariff revenue alone and rely on international donors.

The emergence of alternative management

7 The term Safe Water Enterprise (SWEs) in this context is used to describe service providers that operate along market-based principles, supplying high quality (safe) potable water and engaging in a range of activities which could include the full water cycle (i.e., from production, storage to retail) and who may also make capital investments in new water supply schemes that they then own and operate. Although referred to as 'private' operators in the majority of cases, such SWEs rely in part on external funding to be financially viable

8 For further information on the SWS learning partnership, see: https://www.globalwaters.org/SWS

9 For further information on the Uptime initiative, see: https://www.uptimewater.org

arrangements has involved common trends and drivers across different country contexts, with development partners often playing a critical role, especially in piloting new approaches. New sector policies and changes to regulatory frameworks, including the promotion of private sector participation and legislation underpinning PPPs, have allowed, or encouraged, the adoption of alternative approaches, which are progressing at different levels of completeness and scale (Foster, 2012; World Bank (WSP) and AfDB, 2013; World Bank, 2017; Carter, 2021; Sutton and Butterworth, 2021; Adank, van Lieshout and Ward, 2021). The development and adoption of new approaches is normally a substantive and long-term process, requiring coordination and consensus building across a range of stakeholders and, in some instances, the passage of new legislation to create an agency or mandate the involvement of private sector actors. Although there are no clear pathways that are discernible from the literature, it is possible to identify some of the common scenarios through which management arrangements have evolved. Annex 3 provides details from a range of countries, which included piloting with donor or NGO support and the transformation of a state rural water entity into an operational utility; all of these scenarios include some response to the failure (perceived or actual) of preceding paradigms.

Some countries have introduced structured and more wholesale change, usually underpinned by a clear political vision or policy formulation toward a single form of management arrangement and a clear pathway to operationalization. For example, in cases of PPP models let through district or regional governments (e.g., in Rwanda, Senegal, and Benin), there was a significant, long-term investment to adjust the legal

Box 2: Development, testing, and roll-out of CBMS Plus as part of a broader shift away from community-based management.

The government of Uganda has made significant efforts to strengthen CBM by introducing Area Service Providers to provide professionalized maintenance in support of community entities. This approach, which the government terms "CBMS Plus" was in large part informed by the piloting and advocacy of a number of externally-funded organizations which had been testing delegated private maintenance providers over several years, in collaboration with the government. Under this approach, the District Water Authority through the Water Service Board, formally outsources the O&M function to an entity that can be a private provider, NGO, or other state entity with the requisite training, skills, and experience. The ASP takes responsibility for operating and maintaining all rural water facilities within the sub county, a cluster of sub counties, or a district or a cluster of districts and operates under a contract management arrangement with key performance indicators against which it is measured.

This re-structuring of CBMN has evolved through a series of phases and in parallel with broader efforts to extend service areas of the National Water and Sewerage Corporation for piped supplies to towns and rural growth centers and Umbrella Authority utilities for the other piped schemes in non-gazzetted areas. This latest reform was driven by the government's vision of consolidating service areas, achieving economies of scale and reducing overhead costs. Taken together, these developments in the sector are part of a concerted effort to move from CBM to professionalized management approaches at scale with the implication that the sector seeks to eventually transition away from community-based management altogether.

[MWE, 2020; Huston et al, 2021; Harvey 2021]

and institutional architecture of the sector (World Bank, 2022). Other countries have initiated progressive shifts, testing, and trialing before adopting a wholesale policy change or iteration as is the case in Uganda with the new National Framework for Operation and Maintenance of Rural Infrastructure with the aim to professionalize maintenance services (MWE, 2020). National and international NGOs, donors, and researchers often play a pivotal role in these pilots. Other approaches that have been pilots have been in response to broader government concerns as is the case of the 'Inspiring Water Entrepreneurship in Tigray' region or iWET program in Ethiopia which promoted the Private Local Sector Provider model (Lockwood, 2019; Koehler et al., 2021).

In still other cases, the rural sub-sector has taken lessons in a step-wise process from gains seen in urban water supply management arrangements, and introducing asset holding and regulatory functions in rural services areas, for example, the recently issued guidelines by the regulator WASREB in Kenya to regularize and expand service provision to rural areas or establishment of an asset holding entity in Mozambique for rural and small towns and the roll-out of commercial utilities in Zambia (WASREB, 2019; ESAWAS, 2022). There are a significant number of countries where multiple arrangements are being applied in the same geography, which can cause a degree of confusion on the ground when advances in policy development outstrip the operationalization of such policies, as has been the case in Ghana and specifically Uganda, where different public utility providers sit alongside the newly established Area Service Providers and CBM structures all serving different segments of the rural population (Huston et al., 2021).

The development of alternative SDMs and the emergence of supported CBM share a common effort to consolidate rural water services and increase the scale of operation. One of the commonly cited obstacles to improving service quality is the decentralized and fragmented nature of the rural water sector, which makes it difficult to engage with and efficiently regulate many thousands of service providers (Gerlach, 2019; ESAWAS, 2022). To overcome this challenge, one of the emerging approaches pursued by low- and lower-middle-income countries is to group together rural water supply schemes into larger service areas or to expand an existing service provider's responsibility across multiple service areas (Franceys, 2019; Renouf and Abidi, 2022). Consolidation of multiple schemes requires more managerial, financial and technical competency than operating individual small schemes, but can make rural water supply more attractive to both public finance and blended finance (World Bank (WSP) and AfDB, 2013). Consolidation is also an approach that has been adopted over many decades in OECD countries, although this still faces challenges in many contexts (Landes et al., 2021).

2.5 Evidence of Performance Across Different Management Approaches

Existing evidence of the performance of different management arrangements is mixed. Most studies focus on the unsupported CBM model and point to overall poor performance, as expressed in terms of functionality or sustainability, particularly for unsupported CBM in low-income countries (Thapa, Prevost, and Widjanarko, 2021; Lockwood et al., 2021; World Bank, 2017). There are some exceptions to these findings where specific conditions are seen to enable better performance, including deep boreholes in the context of freshwater scarcity (Whittingdon et al., 2009, IIED, 2014; Marks et al., 2018).

In cases where there is adequate long-term support and significant investment, either from public sources or via Overseas Development Assistance, the community management model can perform well, but these examples tend to be in the minority or from middle-income country examples. In some countries where greater levels of support can be provided either by the government or between communities via associations, the CBM model can be seen to work more effectively such as those identified in Morocco and Brazil (World Bank, 2017) and Perú which has significantly increased public investment and extended the reach of the sector regulator to rural service provision (WHO, UNICEF, World Bank, 2022). The example of the PAMSIMAS program from Indonesia is a case in point, where significant donor and government funding has yielded impressive results (see **box 3**).

Various assessments point to the high performance of the public utility model in serving rural populations, with strong technical and managerial capacity, but caveat that this option is most successful under certain operating contexts. This management approach is assessed to be viable where certain conditions are in place, including relatively high population densities and where consumers can afford water tariffs; conversely, challenges for the utility are commonly found in areas of billing, revenue collection, and monitoring (World Bank, 2017; Carter, 2021). A particularly strong example is from Morocco,

Box 3: PAMSIMAS Indonesia: Supported Community-based Management at Scale

PAMSIMAS is Indonesia's largest community-driven rural water program, launched in 2008 and spanning from Eastern Aceh to Western Papua with support from the World Bank and other partners, including Australia's Department for Foreign Affairs and Trade. The goal of the program is to support low-income communities in rural and peri-urban areas to increase sustained access to safe water, sanitation, and hygiene practices. Now entering its fourth phase, the program has provided a total of 24.7 million people with access to improved water facilities and 26 million with access to improved sanitation facilities in just under 36,000 villages out of a total of 74,960 communities nationwide.

The program has achieved impressive results, with functionality data from 2020 indicating that 85.4% of the PAMSIMAS water supply schemes were fully functioning, 9.1% were partially functioning, and only 5.5% were not functioning. These results show that household connections have a higher chance of being sustainable (99%) than communal or public connections (69%), which appears to be related to the level of payment of tariff, which is far higher for household connections (96.5% against only 40% of communal connections).

The next phase of PAMSIMAS will see a transition to public financing and will focus on three sectors at once: drinking water, domestic wastewater, and solid waste as three interrelated sectors, and mainstream climate resiliency. The program will also target changes from ODF and improved drinking water and sanitation access to safely managed drinking water and sanitation in rural areas and solid-waste management. Phase IV will see the utilization of regional and village government funding as WASH is already under the mandate of local and village governments.

[Directorate of Housing and Settlement, Ministry of National Development Planning, Government of Indonesia; 2023]

where, as of 2016, ONEE, the national utility[10], had extended water services through large, piped water schemes, supplying public stand posts and small village-level distribution systems in over 400 rural centers. Another promising example is one of the new public rural utilities from Uganda, the Mid-Western Umbrella Authority, which illustrates strong performance in terms of billing ratios, cost recovery (for O&M only) and more regular water testing (Renouf and Abidi, 2022). Generally, the option of local government direct provision is seen as not performing strongly, and apart from some important and notable exceptions (specifically India), this arrangement is not being actively pursued (World Bank, 2017).

The literature points to positive findings for private management arrangements, which are cited as achieving high levels of service delivery performance, management and efficiency gains under certain conditions but with operators in rural areas often requiring subsidies to be viable in the medium to long term. This model is documented as offering a promising and diverse set of arrangements. A recent study of almost 4,000 monthly revenue records across different service area archetypes indicates that the highest revenue rates are found in enterprise-led operations with more commercially orientated approaches (Armstrong et al., 2022). However, as with the case of public utilities, there is limited evidence of long-term financial viability in more dispersed rural settings, with the need for some form of (supply side) subsidy, including cross-subsidization from the urban sector (Kleemeier, 2010; Wilk, 2019; Kleemeier and Lockwood, 2015; Gia and Fugelsnes, 2010). When designed well and with the appropriate legislation in place, private operators can perform well and, in some cases, attract investment and commercial loans, although these are limited. For example, as found in the case of joint stock companies with public and private shareholders in Vietnam (Kleemeier, 2010; World Bank, 2017).

Professionalized maintenance providers, specifically operating under performance-based contracts in support of CBM service provision, have also resulted in high service levels but with a heavy reliance on external aid funding to subsidize operations. A study of five delegated maintenance providers working across four countries as part of the Uptime Consortium and serving over 1 million people documents very high levels of performance, with average functionality rates of over 94% as compared to regional averages of around 75%. The time to repair, in at least two of these cases provided along commercial lines by social entrepreneurs, is equally impressive at under two days. However, under both the social entrepreneur examples, tariff revenues still only account for a limited proportion of operational costs (approximately 25% and not accounting for capital maintenance or asset depreciation) and otherwise rely on donor aid funding (McNicholl, 2019). Other sources in the literature support these positive performance outcomes, citing important lessons for policy makers (Lockwood, 2019; Carter, 2021; Harvey, 2021, Nilsson et al., 2021; Foster et al., 2022).

There is one notable multi-country study comparing different management arrangements across 16 countries using a common framework; however, this study relied on secondary data and centered on sustainability outcomes rather than performance metrics. In 2016, the World Bank commissioned a study across a diverse spectrum of 16 countries based on socioeconomic development, wealth and regional representation. The results indicate that public utility provision appears the most promising, while private sector provision provides an opportunity to improve the sustainability of services, despite mixed country experiences and often the modest scale of such models in any country. Direct local government provision was found to perform poorly, especially in low-capacity environments. The report illustrated the need to tailor

10 ONEE is the Office National de Electricité et l'Eau Potable – National Office for Electricity and Drinking Water

interventions, depending on a country's appetite for reform and sector capacity, against the changing landscape of rural service delivery, as countries will see different population segments develop at different paces, namely i) remote dispersed populations, ii) rural villages and growth centers, and iii) peri-urban and rural small towns. The biggest leap for many lower and lower-middle-income country governments will be to respond to the demand for higher service levels from a growing middle class and the transition to metered household connections (World Bank, 2017).

2.6 Defining Service Delivery Models and Typologies

Various organizations have developed definitions of management arrangements and the Service Delivery Models within which these specific arrangements sit, including IRC Netherlands, UNICEF, USAID, WaterAid and the World Bank. Although these definitions vary, they share a common recognition of the importance of not only the management type (e.g., community or private, etc.) but also the role of Service Authorities and national-level entities in fulfilling critical functions that can enable water services to be delivered on the ground as set out in 2.2 above (Montangero, 2008; Lockwood and Smits, 2011; World Bank, 2017; RWSN, 2019; USAID, 2020). These various definitions result in a discernible typology that includes essentially four main types of SDMs:

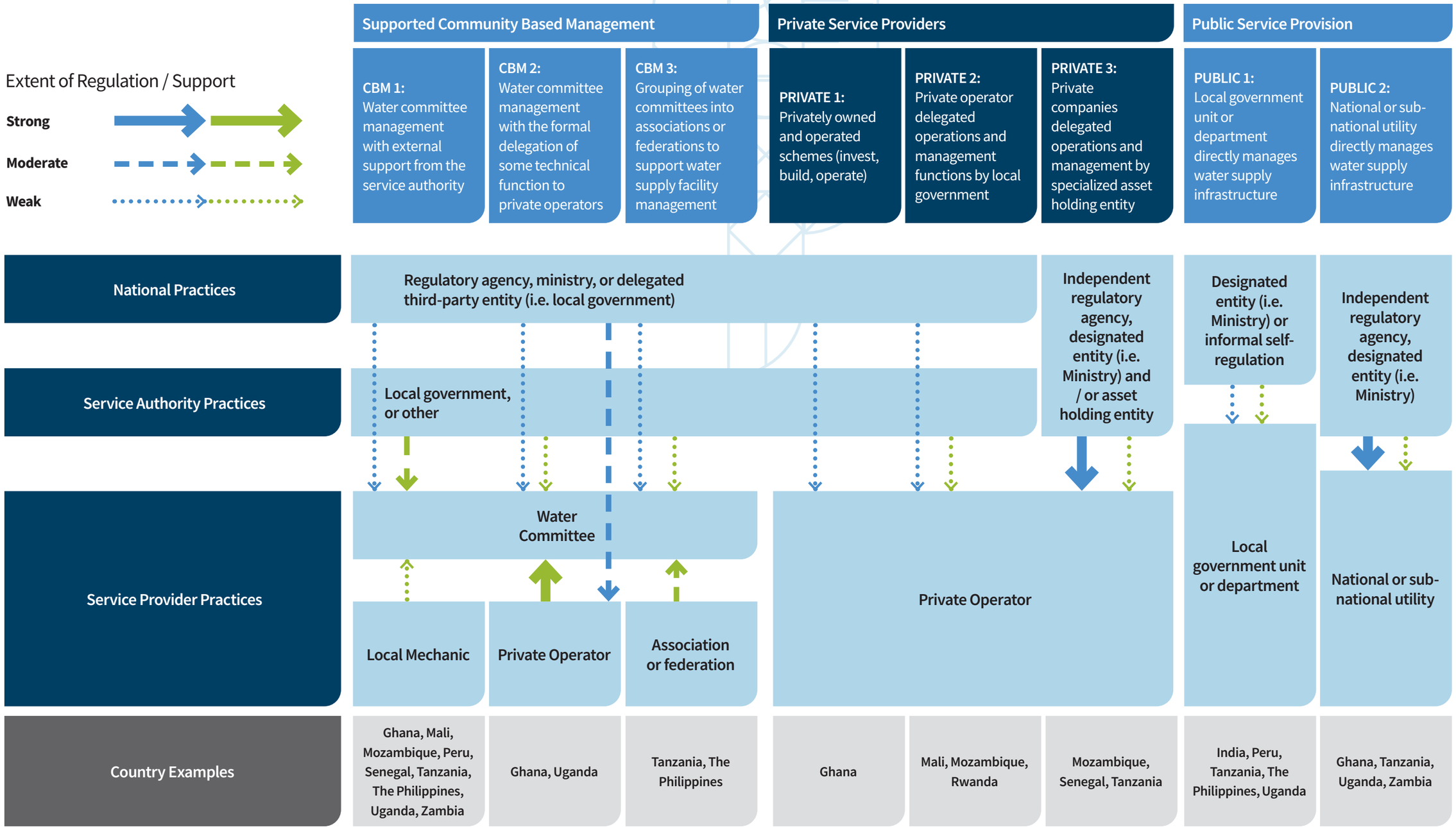
1. **Supported self-supply:** where households, or small clusters of households, provide their own solutions to water supply; this form of management is most typical in highly dispersed communities.
2. **Community-based management:** most definitions exclude basic or unsupported CBM, which is considered unwise to promote due to poor performance.
3. **Public service provision:** this includes both local government provision (also sometimes referred to as "direct municipal services", which may include other services, such as electricity) and parastatal or corporatized public utilities, which may operate within national, regional or more localized service areas.
4. **Private sector management:** in which operators either own water assets and manage the services or have been delegated responsibility for the operation and management of publicly owned water systems through public-private partnership (PPP) arrangements.

It is important to note that it is not uncommon to find a range of sub-variants and hybrids under each of these SDM typologies, particularly where private operators are delegated to perform services on behalf of national asset holders, local governments or even community entities; Figure 3 below illustrates some typical variations. Self-supply is a widespread solution, with the highest investments made by households in middle-income countries but is prevalent in all countries where universal coverage has yet to be achieved. Estimates are that over 7% of rural households in sub-Saharan Africa rely on a form of largely self-financed non-piped-on premises improved supply (Sutton and Butterworth, 2021). Although self-supply remains important, it is not always recognized formally in national policy and often remains without formalized or systemic support.

2.7 Financing of Rural Water Services

Economic and other conditions in rural areas in many countries present particular challenges to the financial viability of rural water provision and to attracting both public and private investments, particularly in less densely populated areas. Rural areas are

Figure 3: Generic Typology of Service Delivery Models and Main Variants with Country Examples



generally limited in terms of economies of scale (Armstrong et al., 2022), with less densely populated than urban areas, usually with significant pockets of remote, dispersed and hard-to-reach communities due to the natural conditions of geography and topography. Poor transport links and high transport costs are also important cost drivers hampering maintenance and business activities in rural areas.

Rural areas are also normally less of a political priority for key decision-makers, reflected in lower budget allocations, due to rural populations' often weak political voice and lack of agency compared to urban centers (Carter, 2021; Rickert et al., 2016). In cash-constrained economies, the rural water sector appears less economically attractive in terms of return on investments for central and local government. These challenges are coupled with the reality in many countries of often many thousands of small-scale, informal and low-capacity (community-managed) entities that are difficult to reach and engage with (Carter, 2021; World Bank, 2017). Despite the universally recognized importance of setting tariffs to cover (at least partly) the costs of service delivery, it is estimated that less than two in five rural households in Africa pay for water (Armstrong et al., 2022). The result is that for alternative private-sector management approaches, there is little, if any, in the way of true profit incentives to be had in taking on most rural water supply schemes, and some form of subsidies will normally be required (McNicholl et al., 2021; Chintalapati et al., 2021; Carter, 2021). These constraints have also been recognized in the case of small-scale operators in OECD settings (Hendry and Akoumianaki, 2016; WHO, 2020).

Financing trends for rural water services over the last ten years reflect a shift in focus and promotion of more innovative approaches, but significant challenges remain in operationalizing such new mechanisms at scale. The need to explore alternative mechanisms to meet the financing gap for the SDGs and diversify sources of financing beyond only public expenditure and tariff revenue has been recognized for some time (Batz et al., 2010). The adoption of more innovative approaches to financing rural water, such as microfinance loans, social impact investment, multi-donor trust funds, and blended finance has been slower than for other sectors, such as health and education (Pories et al., 2019). Foundational weaknesses in the sector need to be addressed to develop any kind of viable financing mechanism, whether public or private. These relate to systemic factors, including i. governance, institutional, policy, tariff and regulatory arrangements to ensure

Box 4: The Azure Initiative leveraging commercial investments in rural water supply in El Salvador

Catholic Relief Services in El Salvador works with rural banks and credit cooperatives, providing wholesale capital and guarantees on lending to rural communities to invest in their water supply schemes. In 2018, CRS and the Inter-American Development Bank's Multilateral Investment Fund launched the Azure Initiative, a blended finance facility catalyzing both investment and grant capital to improve water and sanitation services for under-served communities. To date, Azure has provided technical assistance to 83 water services providers, benefiting more than 63,000 families, and has raised over $10 million in capital, $3 million of which has been disbursed in loans for direct upgrades to water and sanitation systems or indirectly via local financing institutions.

Sources: Tkachenko and Mansour, 2021; CRS 2022

transparency, consistency and sustainability, ii. the technical and financial efficiency of service providers to increase absorption capacity and sustain creditworthiness, and iii. issues related to the supply of (wholesale) finance (Pories et al., 2019; Watts et al., 2021).

Historically, private sector investment in the sector has been low, particularly in sub-Saharan Africa, accounting for less than 1% of overall financing (Watts et al., 2021). Increasingly, sector policies are encouraging the pooling of individual community water supply infrastructure to attract larger, more competent operators. Establishing mechanisms that can support larger service areas also allows combining financing from both traditional sources (e.g., tariff revenue, public financing and grant aid transfers), as well as investment capital and philanthropic funding through blended financing. In this way, the use of Overseas Development Assistance (ODA), combined with public sources, has the potential of attracting commercial financing by de-risking investments into markets that many have historically seen as unknown and risky ventures (Wilk, 2019; Foster and Hope, 2017; Hope et al., 2020; Pories et al., 2019).

Recent attempts to scale service provision and establish mechanisms for combining sources of financing have been carried out for delegated maintenance provision in more localized cases, such as the Trust Funds associated with the FundiFix model in Kenya based on verifiable performance metrics. This approach provides a mechanism through which to deliver subsidies to providers as tariff revenue only covers around one third of local operational costs (Hope et al., 2015). Although this model is promising and results in strong service delivery performance, it is still operating at a small scale and has only attracted limited private financing to date, although there is the prospect of public sector funding (Foster et al., 2022; Chintalapati et al., 2021).

In spite of significant challenges, there have been efforts to facilitate access to commercial financing in some lower-middle-income countries, but initiatives also remain relatively limited in scale. Efforts to facilitate access to commercial finance have been documented in countries in Africa and other regions, including Latin America and Asia as part of attempts to unlock market-based financing, including with a pro-poor focus (Batz et al., 2010); see box 4. Although these represent promising examples, they all remain relatively limited in scale, reaching tens of thousands of households. In other contexts, where PSP is well-established or in more densely populated rural areas and small towns in middle-income countries, there is evidence that commercial finance can be mobilized at a greater scale, but only with support from government and development partners, as the case is in Cambodia (Tkachenko and Mansour, 2021; REAL-Water, 2023).

Other approaches at the community and, particularly household level, targeting solutions for self-supply include various forms of micro-financing for loans, insurance and savings vehicles, such as Village Savings and Loan Associations. Local micro-credit schemes are one of the most widespread vehicles and are viewed as an alternative channel for rural households to mobilize funds to invest in first-time access and maintain water facilities (Innovations for Poverty Action, 2011; Mengueze et al., 2014). The Water Credit Initiative promoted by Water.org is one of the largest micro-finance programs specifically targeting water (and sanitation), with over $3.7 billion disbursed across 10 million loans benefiting 45 million people and with high rates of repayment (cited at 98%)[11]. Although micro-financing is emerging as an important way of leveraging household investment (and, as such, contributing in part to funding the SDGs) it has been criticized in the literature for benefiting medium and higher-income

11 For further details on Water Credit initiative see: WaterCredit - A Microfinance Solution | Water.org

households disproportionately, thereby raising barriers to inclusivity (Mengueze et al., 2014).

Significant progress has been made in some countries in terms of wholesale institutional reforms to establish the conditions that make the use of existing funding sources more effective and efficient. Whilst prospects of attracting large-scale commercial finance or private capital to rural water may not be viable in the near term, other efforts, heavily supported by technical assistance, have successfully built the architecture to attract large volumes of financing from IFIs such as the World Bank and others. These initiatives take a long time to develop and typically involve aggregation through establishing large-scale service areas, separate asset holding entities and/or independent regulators as is the case in Senegal and Benin with the introduction of large-scale PPPs in the form of lease (affermage) contracts with private operators and clustering rural populations into zones based on technical, economic and geographic criteria (WASH-FIN, 2019; Sy, 2014; Diallo, 2015; Ministry Water and Mines Benin, 2022).

In challenging contexts, public development banks can provide finance at concessional rates, as is the case in the Viet Nam Social Policy Bank, which has a water and sanitation portfolio providing loans to households for storage tanks and connections. Public development banks have historically played, and continue to play, an important role in financing water investments in OECD countries, such as rural France, Italy and the Netherlands, and increasingly rural areas in Latin America (Fonseca et al. 2021).

Advances in smart technologies, such as the use of remote sensors, data storage and cashless payment systems, are helping to underpin new financing strategies and improve transparency, especially for performance-based funding, but the scale of application in the rural sector is still limited. In parallel with developments in financing approaches, the growth of mobile communications networks, the use of mobile or digital money and other innovations in recent years, such as performance monitoring with technologically advanced sensors, have all been cited as supporting improved service delivery outcomes and the transparent application of subsidies (McNicholl et al., 2021; Harvey, 2021; Thomson, 2021; Hope et al., 2011; UDUMA, 2017). The literature cites reliable and timely flows of monitoring data as a foundational tenet of performance-based financing, and a number of pilots to test the use of such data for contractual models in rural water have been tested in recent years (McNicholl et al., 2019; Hope et al., 2020); see Box 3: Uptime Consortium using technology to improve management of rural water below.

2.8 Donor Responses to Global Trends in Rural Water

The global evolution in approaches to rural water service provision outlined above has been shaped by a combination of national governments in driving policy reforms across the sector, as well as the actions of international development partners, including both practitioners and funders. It is also important to acknowledge that these evolving approaches have taken place against a backdrop of much broader trends, including governance reforms, decentralization, economic growth, demographic trends (e.g., population growth, urbanization), and changes in the demands and expectations of rural populations. In short, the rural situation in the Global South today looks nothing like it did thirty, or even twenty, years ago. There are significant patterns of growth and the emergence of small towns as economic hubs, with customer bases in the tens of thousands which can support more commercial approaches to managing larger reticulated

water supply networks. Rural households are, by and large, also much better connected than ever through information and communications technologies and are aware of what services in more urban settings can achieve.

As such, the Conrad N. Hilton Foundation's SWI portfolio operates across a dynamic set of contexts. As a funder, it is not operating in isolation either and, to a greater or lesser extent, in all three countries is positioned in a 'crowded field' of funding organizations working in support of similar aims. The following section summarizes the outcome of a series of interviews held with different donor organizations (including bilateral and multilaterals and similar philanthropic foundations) to gauge how other funders currently approach their investments in rural water provision. This is intended as a snapshot of current approaches and thinking from a relatively small group of funders and should not be taken as an exhaustive analysis of all types of funders.

Funders are demonstrating a shift away from direct service provision toward greater emphasis on systems strengthening, with philanthropic funders being the most advanced in this trend. This transition in both strategy and investment support towards system strengthening and improving the enabling environment is also evident in bilateral government donor approaches, although there is still support for direct provision, particularly in the case of fragile states and humanitarian response interventions. In addition, the larger bilateral and multilateral actors articulate the importance of WASH system strengthening being linked to a broader context of water resources, nutrition, and poverty reduction.

Financing was frequently mentioned and emerges as a strong focus of many funders' conception of system strengthening. Financing was mentioned in different ways as a critical building block of systems approaches, including:

- Unlocking private investment both through improving the supply side of financing by i. supporting retail (e.g., micro-finance) and wholesale banks to better understand and engage with the water sector; ii. widen the provision of financial services on offer to water operators, and iii. de-risking capital for new financing partners who may see drinking water as a new and uncertain sector.
- Lobbying national governments for greater public investment for both new infrastructure and especially for long-term direct and indirect support to operators (at the district level).
- Engaging with IFIs to leverage both innovative approaches and financing opportunities for rural segments of the population (e.g., the Water Sector Fund established by the Netherlands government and the European Investment Bank Water).

An important element of support for system strengthening focuses on collective action and coordinating efforts around advocacy to balance government demands for hardware with investment in systems and building capacity. Several different funders, specifically the philanthropic organizations, mentioned the importance of Agenda For Change[12] working through platforms for collective action at the country level as a vehicle for engaging government stakeholders and holding them to account and for taking greater responsibility for service provision vis-à-vis only making capital investments. This is mirrored at the global level, where Agenda For Change, and its constituent members, are lobbying bi-lateral and multi-lateral funders for a greater focus on system

12 Agenda For Change is a collaboration of like-minded organizations ("Members") that have adopted a set of common principles and approaches. Members work collectively to advocate for, and support national and local governments in, strengthening the water, sanitation, and hygiene (WASH) systems required to deliver universal, sustained access; see: https://washagendaforchange.org/about-us/

strengthening (although this is sometimes referred to under different descriptors).

Most funders are explicit about aligning with government strategies and view their support to DMs as being properly anchored in the local system. The inference is that most funders, particularly the larger bilateral and multilaterals, are not looking to support alternative new approaches or models. Rather, they are by and large agnostic and will support what the government is doing, seeing their role to be one of 'filling the gaps' and improving what already exists. Within this context, some of the smaller philanthropic funders did express a bias toward private sector solutions (mainly SWEs in the context of Ghana, where this model is a sanctioned form of management arrangement) and explicitly target support to early-stage business models and technical innovations. At least part of this trend appears to be that these types of interventions with 'concrete R&D' opportunities may appeal to the boards of such organizations which have a technology or service provision history.

Although Community-based management is accepted as a legitimate, government-sanctioned SDM, a number of funders expressed reservations about this model, especially in light of the impact of climate change and the more limited technological and management resilience of this model. One donor explicitly stated that they actively disincentivize partners to adopt conventional (unsupported) CBM as a service delivery model solution. Other funders recognize the weakness of this SDM but remain committed to improving it through targeted country-level programming.

Clustering or aggregation of service provision areas is an important consideration for funding support to SDMs to achieve more (financially) viable outcomes operating at greater economies of scale. Several funders mentioned that this is part of their strategy, though not yet fully operationalized, and will vary depending on the SDM in question, including the professionalized maintenance approach for support to CBM, which is gaining traction. Support for consolidation is applied within the context of government-sanctioned models or innovations being developed as part of sector policy reforms and strategies.

Across stakeholders, there is a relatively broad and flexible interpretation of what constitutes innovation going beyond only technology or product development. Although one or two funders mentioned testing of technologies and solarization, most referred to innovation in terms of governance (i.e., how to innovate across existing public utility and private SDMs), business models and financing mechanisms, which were all cited as being more important than technological improvements. Other related examples included innovations around accountability mechanisms, increasing the role of women and aligning incentives for testing different interventions across different stakeholder groups. The extent and scope of innovation are dictated by context and depend on prevailing market conditions. One example cited by a funder working in the area of financing was the difference between operating in countries with very basic financial institutions and limited markets, as opposed to more advanced contexts (e.g., Kenya) where they are able to work with upstream wholesale banks who are more willing to lend to utilities and where the commercial sector is much further ahead and can support more innovative approaches.

In terms of the role of funders in supporting innovation, there was a consensus that it is generally easier for them as outsiders (executed through their grantees) to support testing as part of 'innovate, demonstrate and scale' than governments which have to focus on the core task of delivery of basic social services. Others related innovation to their efforts at learning and investing in research that can produce evidence about what works and be replicated either in the same country or new country contexts.

Across funders, there is a common recognition of the need to differentiate approaches to financing through market segmentation based on wealth and ability to pay. The majority of respondents acknowledged the continued need for subsidies for the poorest segments of the rural population and an increase in public investment both for capital and recurrent expenditures. There is strong support for broader sector reform agendas in light of the changing aid landscape. The position among the smaller philanthropic funders, however, is a focus on financing approaches for the more viable end of the spectrum, particularly for piped household levels of service, and a shift toward re-payable financing even on very soft terms. Although this is acknowledged as a more 'risky' approach, in the sense that operators may ultimately not be able to relay all or some of the loans.

There is a strong focus on market-based solutions and increasing engagement with financial sector stakeholders, including retail banks, finance ministries and regulators on wholesale financing arrangements. In part, this is driven by the recognition that public financing, and certainly aid funding, is – and will be - insufficient to meet the investment requirements underlining the SDGs. There is also a move toward more innovative financing and the use of repayable financing instead of purely granting money to operators (with repayment rates set much lower than retail banking rates but still including some element of interest). The aim is to both recycle funds and introduce more commercially or business-aligned incentive mechanisms to the everyday work of rural water providers. Several philanthropic funders commented that even very long and discounted repayment terms are better than no repayment at all and simply giving money away. Grant funding is also applied alongside repayable financing for capacity building and other non-commercial operational aspects.

There is a common consensus about the value of working with local partners and stakeholders to achieve lasting change and building capacity for post-investment. Some funders have more scope and flexibility to work with local organizations, including the government, and are more advanced in this process, whereas others are subject to internal restrictions and broader policies that dictate recipients of funding. For example, bilateral and multilaterals have greater restrictions, whereas foundations, in general, have far greater latitude to fund a broad range of grantees. At least one funder works with an umbrella approach and contracts a single partner to oversee, provide technical support and monitor progress alongside funding support to other recipients.

Funders report replication as happening in two different pathways; firstly, by directly supporting similar interventions across new geographies and secondly, through building permanent systems and capacities that can, in turn, support the scaling up of approaches. Several funders either look to expand to new geographies using their own funding and/or are actively engaging with larger counterparts, including the IFIs, to leverage new investments based on the successful piloting of new approaches. Some respondents, however, cited their limited size as a caveat for the extent of leverage that is possible. A second means to replication and leveraging investments is the explicit strategy of investing in the capacity of system actors to essentially do more. A specific example is from a funder that works with banks to build their capacity and understanding of new lending areas, such as rural water, to leverage new investments through expanding lending portfolios. Leveraging is also linked to the question of the scale of intervention with clustering or aggregation as a specific response to rural water service delivery. This includes either direct support to entities that are already operating at scale, for example, professional maintenance providers working across larger service areas, or through clustering of utilities to benefit from capacity building and support.

3. Country Trends

3.1 Introduction

The three focal countries supported by the Conrad N. Hilton Foundation's SWI – Ethiopia, Ghana, and Uganda – are illustrative of the broad global trends in rural water supply service provision outlined above. This section presents an overview of the context of the three countries, as well as key developments in the management and financing of rural water supply services.

3.2 Context

Socio-economic

Ethiopia, Ghana, and Uganda represent diverse socio-economic contexts, as presented in **Table 1**. Ghana has reached a higher stage of development than Ethiopia and Uganda in relation to income per capita, its Human Development Index score, and income status. Although the three countries are each rapidly urbanizing, Uganda and Ethiopia's populations are still predominantly rural (74% and 78%, respectively), while Ghana's population is predominantly urban (58%).

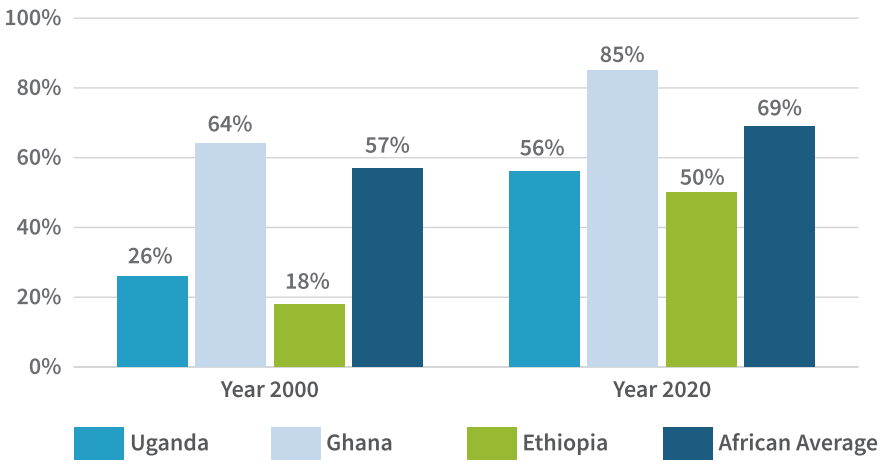
Status of rural water service delivery

Ghana, Uganda, and especially Ethiopia have made strong progress in expanding access to water supply services across all populations. Figure 4 details total access rates, i.e., in rural and urban areas, to at least 'basic' water supply services in Ethiopia, Ghana, and Uganda in 2000 and 2020, as well as across Africa. It highlights

Table 1: Socio-Economic Context – Ethiopia, Ghana, and Uganda

Indicator	Ethiopia	Ghana	Uganda
Total population (World Bank, 2021)	120,283,026	32,833,021	45,853,778
Rural population (% of the total, World Bank, 2021)	78%	42%	74%
Urbanization rate (annual %, World Bank, 2021)	4.8%	3.1%	4.5%
GNI/capita in USD (Atlas method; World Bank 2021)	$940	US$2,280	$760
Income status (World Bank)	LIC	LMIC	LIC
HDI score and ranking 2021 (UNDP 2022)	0.498 (175th out of 191)	0.632 (133rd of 191)	0.525 (166th out of 191)
Ease of Doing Business Ranking (World Bank 2020)	159th out of 190	118th out of 190	116th out of 190

Figure 4: Total access to an at Least 'Basic' Water Supply Service (2000-2020) – Ethiopia, Ghana, and Uganda (JMP, 2021)



that each country has made relatively good progress in expanding access to water supply services, with the percentage of the population accessing at least 'basic' water supply services more than doubling in two decades in Uganda and Ethiopia. Total access to at least basic water supply service is comparatively higher in Ghana, where access rates have always been higher than the average rate across Africa.

While there has been considerable progress, access rates are lower in rural areas compared to urban areas. Figure 5 presents access rates to at least 'basic' water supply services in rural areas of Ethiopia Ghana, and Uganda in 2000 and 2020. It highlights that access rates have improved considerably in the last two decades: access to at least 'basic' water supply service has more than doubled in Uganda and increased fivefold in Ethiopia. However, access rates in rural areas remain markedly below those in urban contexts.

Moreover, increased access rates have to be interpreted with some nuance with the rapid urbanization that puts pressure on the aging infrastructure that cannot meet the growing demand for water in rural areas. In Ethiopia, service expansion has only kept pace with population growth, and the absolute number of rural people without access remains unchanged or has even slightly increased.

Access rates to rural piped water supply services remain low in Ethiopia, Ghana, and Ethiopia. Figure 6 outlines access rates to piped water supply services in rural areas in 2000 and 2020. Although access to rural

Figure 5: Access to an at Least 'Basic' Water Supply Service in Rural Areas (2000-2020) – Ethiopia, Ghana and Uganda (JMP, 2021)

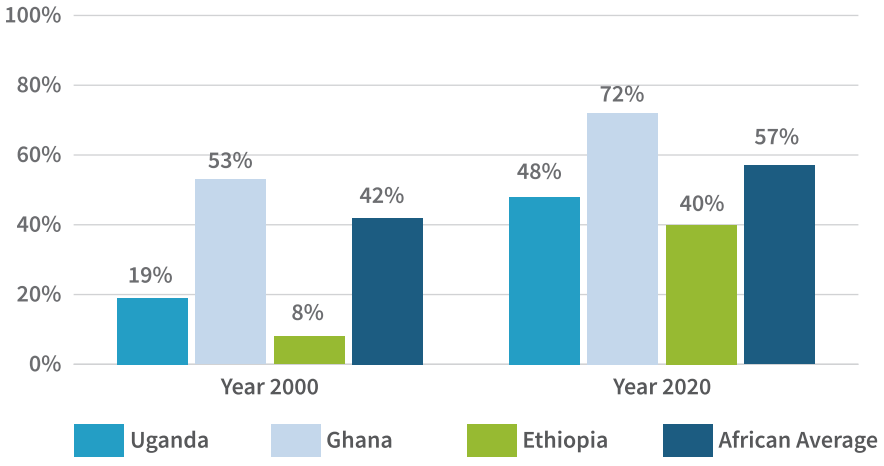
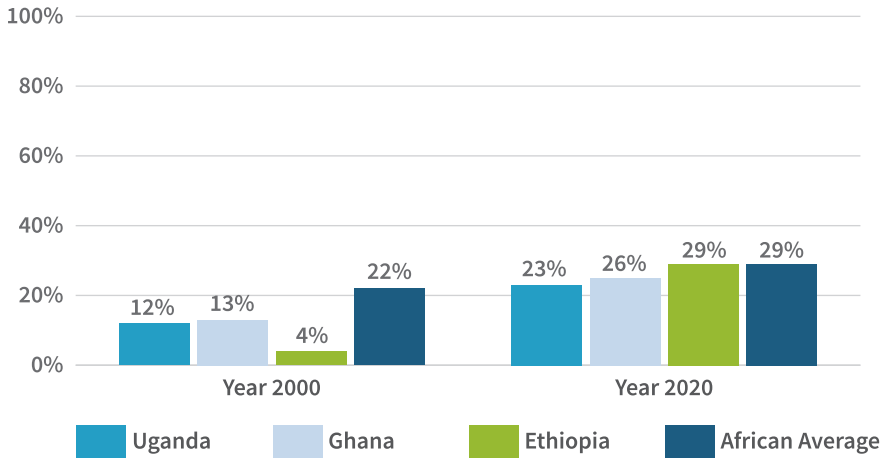


Figure 6: Access Piped Water Supply Service in Rural Areas (2000-2020) – Ethiopia, Ghana and Uganda (JMP, 2021)



piped water supply services doubled over the last two decades in Uganda and Ghana, current access rates remain low in both countries. While access to an at least 'basic' water supply service in rural areas is lowest in Ethiopia, Ethiopia has the highest access rate to a piped water supply service with a nearly sevenfold increase since 2000.

Ethiopia, Ghana, and Uganda have ambitious policy targets for expanding access to water supply services. The Government of Uganda's short-term goal is to achieve safe water supply services to 85% in rural areas and 100% in urban areas by 2025 as per the National Development Plan III 2020-2025 (National Planning Authority, 2020) and to achieve universal access through piped water supply by 2040 as per the Uganda Vision 2040 (National Planning Authority, 2013). The Government of Ghana's target is 100% water supply coverage for urban centers and small towns by 2025 (MSWR, 2023). The government of Ethiopia aims to achieve universal coverage by 2030. In rural areas, the main goal is to increase coverage by 25% with a minimum of 25l/person/day within 1 kilometer, including through 50% piped water schemes, as stipulated in the Growth and Transformation Plan II (National Planning Commission, 2016).

3.3 Managing and financing rural water services

Rural water management arrangements

Across Ethiopia, Ghana, and Uganda, a diverse set of government-sanctioned management arrangements are utilized for rural water service provision. The main categories of rural water supply management arrangements across the Conrad N. Hilton Foundation's three target countries include:

i. Community-Based Management provision
ii. Public utility provision
iii. Private Operator provision

Within these three headline categories, there are two main variations of CBM (e.g., water committee direct provision and water committee direct provision with technical function to maintenance service provider). There are also two primary forms of private operator provision: Safe Water Enterprise direct provision (as defined in section 2) and private operator delegated operations and management functions by a utility. Figure 7

sets out this taxonomy using these three main categories to classify the primary management arrangements applied in Ethiopia, Ghana, and Uganda, specifying headline roles and responsibilities. Some hybrid and legacy arrangements applied at a limited scale or not promoted for upscaling by the government of each country are not captured in this top-level classification. The sub-sections following Figure 7 provide further country-specific information on the primary management arrangements for rural water supply service provision.

Ethiopia

Community-based management remains the predominant SDM, but the Government of Ethiopia is upscaling direct provision through rural public utilities. CBM has been the guiding approach of rural water management in Ethiopia since 1994 in all sector policy, strategy, and O&M frameworks. It is prioritized in all regional proclamations, and water, sanitation and hygiene committees (WASHCOs) manage most rural piped water supply facilities and point water sources. However, since 2017, public-utility provision has been recognized as a complementary management arrangement to fill the gap between CBM in rural areas and urban water utilities to account for demographic growth and the increasing complexity of rural water technologies and improve service delivery performance. A manual to guide its implementation was adopted as part of the One WASH National Program in small towns.[13] The Government of Ethiopia is encouraging and strengthening this arrangement throughout the country, both through technical support to rural public utilities and upgrading WASHCOs to rural public utilities in various regions.

Ethiopia currently has two primary management arrangements, but several hybrid arrangements exist. Ethiopia's two primary management arrangements can be summarized as follows:

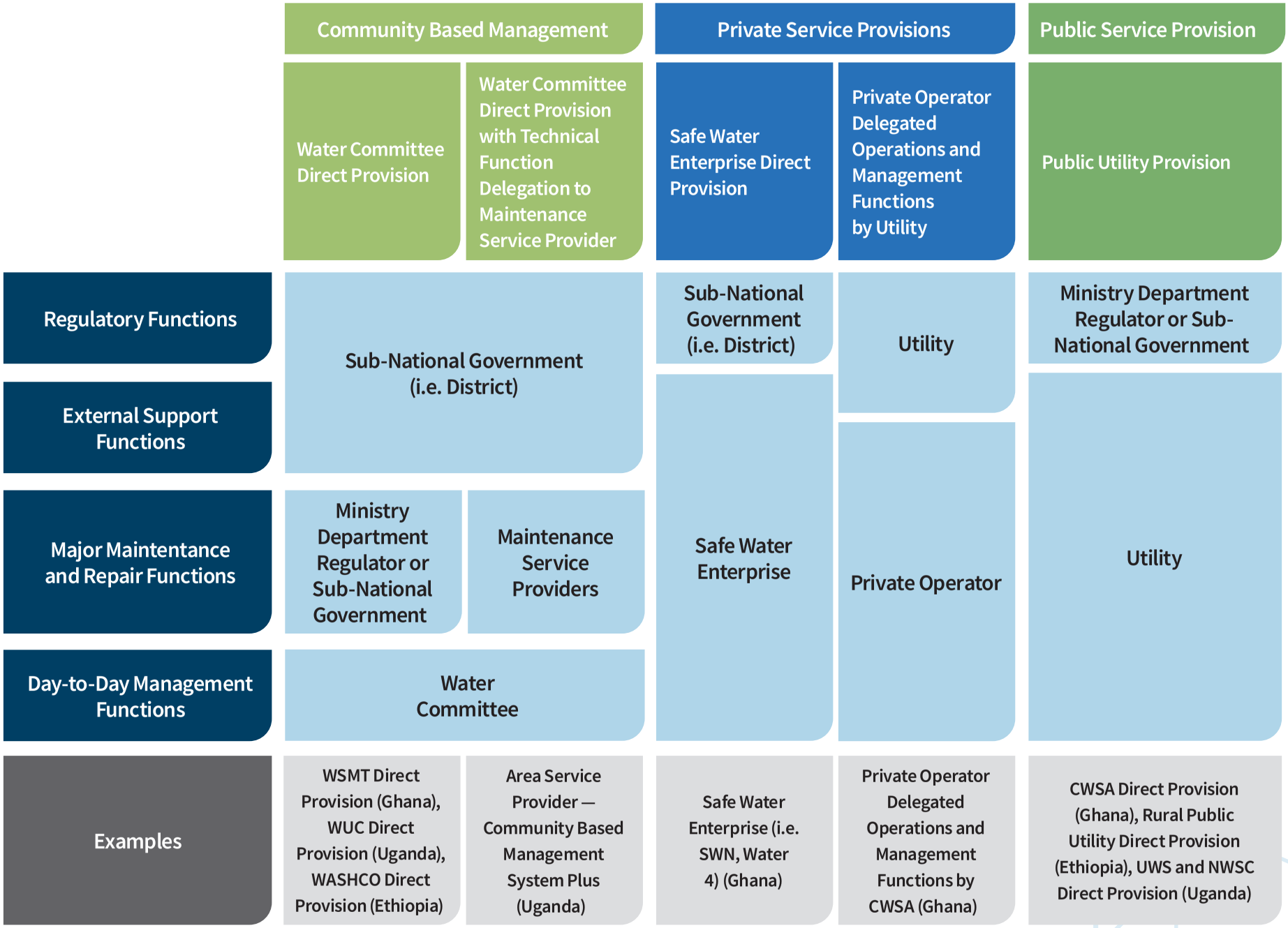
i. WASHCO Direct Provision. This is a conventional form of CBM where WASHCOs are responsible for day-to-day operations, revenue collection, and minor maintenance, and woredas and zonal and regional offices hold typical Service Authority functions (i.e., technical support, major maintenance, and monitoring) of point water sources and single village piped water schemes; and
ii. Rural Public Utility Direct Provision. Under this arrangement, public utilities manage multi-village piped schemes and are responsible for typical service provider functions (i.e., revenue generation, spare part procurement, minor and major maintenance, and repairs). Under sector policy, Woreda and zonal Water Offices are supposed to monitor, support and regulate the utilities.

Within these two primary SDMs, some noteworthy hybrid arrangements exist. Firstly, there have been efforts to formally delegate technical functions to maintenance service partners. Of note, the Wahis Mai model has been piloted since 2013 in Tigray, utilizing remote sensors to guide the work of a 'rapid response' technical maintenance team. Additionally, in Tigray Region, kebele-level government technicians have been established to assist WASHCOs with the performance of technical functions (Lockwood, 2019). Both these approaches have been severely affected by the recent conflict in Tigray. Finally, some urban public utilities (i.e., Harar) are performing maintenance and repairs on handpumps in rural areas.

Considerable efforts are required to achieve the Government of Ethiopia's vision for rural water supply management. The 2018 O&M framework confirms the above combination of approaches, centered on supported CBM and complemented by the public-utility provision (Ministry of Water, Irrigation, and Electricity,

13 Rural Public Utility Operation and Maintenance (O&M) Implementation Manual for Multi-Village Water Supply Schemes, 2022

Figure 7: Rural Water Supply Management Arrangements – Ethiopia, Ghana, and Uganda



2018). It also outlines a wide-ranging set of strategic objectives to support the effective management of rural water supply facilities under both these arrangements. However, considerable efforts – and funding - are now required to fulfill these ambitious aims. For example, the 2018 O&M framework acknowledges the need for greater private sector involvement (i.e., delegating functions to the private sector via structured public-private partnerships (PPPs) as well as in spare parts supply). However, the private sector is still nascent in the water sector and is not currently involved in directly managing services. The new water policy under development is expected to consolidate the above vision and introduce the need to establish an independent sector regulator.

Ghana

Ghana has a long track record of CBM but is shifting to more professionalized rural water supply service provision. Ghana first piloted its community-ownership and management concept over three decades ago and subsequently embraced CBM for rural piped water supply facilities and point water sources. However, Ghana's management arrangements for rural water supply service provision have undergone significant changes. In 2017, CWSA initiated reforms to transform itself into a public utility responsible for directly managing small-town piped water systems. CWSA is now the asset holder for all publicly funded small-town piped water supply facilities (numbering some 1,027) and directly manages 177 of these piped water supply facilities. Additionally, several safe water enterprises (SWEs) have operated in Ghana for up to 15 years and directly manage a growing number of water supply facilities, although this is still relatively limited in scale. CWSA is also looking to expand the role of private operators in managing water supply facilities through delegated contracting. These important developments remain ongoing and almost exclusively relate to piped water supply services; the overwhelming majority of Ghana's point water sources continue to be managed by water and sanitation management teams (WSMTs). In addition, there are an unknown number of informal, private

Table 2: Rural Water Supply Management Arrangement Background Information – Ethiopia

Management Arrangement	Scale of Application	Demographic Context Applied	Reliability	Water Quality
WASHCO Direct Provision	Applied nationally to an estimated 200,000 water supply facilities	Principally found in more dispersed rural settings	82% functionality rate (GoE, 2021)	Available data not disaggregated by management arrangement, but water quality challenges persist for piped and point water sources[14]
Rural Public Utility Direct Provision	Applied nation-wide with an estimated 80 main rural utilities	Principally rural growth centers and small towns	Management arrangement specific information not available	

14 Second National WASH inventory ad Management Information System (WASH MIS-II) indicates that among the reasons for non-functionality of on spot rural water supply schemes %7.9 is accrued from quality concerns. Among the reasons for non-functionality of rural piped systems, %10.3 is accrued from quality concerns.

operators, often with their own boreholes, retailing water to households in both peri-urban and some rural areas of the country.

Ghana employs a mixture of management arrangements for rural water supply service provision. Four core management arrangements are utilized for rural water supply service provision in Ghana:

i. **WSMT Direct Provision.** This is a conventional form of CBM that has been applied in Ghana for several decades. Under this arrangement, WSMTs are responsible for key service provider functions (i.e., day-to-day operations, revenue collection, minor maintenance), with assemblies holding typical service authority functions.
ii. **SWE Direct Provision.** SWEs are typically social enterprises that manage (and often own) water supply facilities in a prescribed service area. Each SWE functions a little differently but they typically operate under a Memorandum of Understanding with the respective assembly. SWEs perform a wide set of service provider functions, including revenue collection, operations and maintenance, water quality testing, spare part procurement, and repairs.
iii. **Private Operators Delegated Operations and Management Functions by CWSA.** Under this arrangement, CWSA is responsible for ensuring service provision but delegates operations and management responsibilities to a private operator. CWSA subsequently performs monitoring and oversight functions to ensure compliance with contractual provisions regarding water quality, tariffs, and asset management.
iv. **CWSA Direct Provision.** CWSA is a rural-focused utility that performs typical service provider functions such as revenue generation, day-to-day operations, maintenance and repairs and spare part procurement. Regulatory responsibilities are currently poorly defined; however, CWSA will fail under the regulatory purview of the Public Utilities Regulatory Commission when its Act is updated to reflect its new role as a rural-focused utility.

Table 3 provides background information on Ghana's main management arrangements for rural water supply services regarding their scale of operation, the demographic context applied, and the level of service provided (functionality, reliability).

Ghana's rural water supply sub-sector is undergoing ongoing reforms aimed at facilitating the shift to more professionalized arrangements, but several key ambiguities persist. Forward-looking reforms are at the center of the revised draft 2023 National Water Policy for the management of rural water supply services. A range of policy objectives and targets are detailed, including transitioning from CBM to the professionalized management of piped water supply schemes through utility management (CWSA direct provision) and the active participation of the private sector. Nevertheless, some key grey areas persist and remain without specific detail; these include:

- The optimal management arrangement for publicly funded piped water supply facilities not currently managed by CWSA is not defined, and the need for a further study is specified.
- The pace at which CWSA is expected to take over the management of publicly funded piped water supply facilities from community management service providers.
- Whether there is to be an expanded role for SWEs and a pathway for SWEs to take over the management of publicly funded facilities where CWSA is the asset holder.
- How WSMT direct provision will be strengthened for point water sources (i.e., hand pumps), given that they currently rely on inadequate support from the MMDAs in the majority of cases.

Uganda

Over the last two decades, Uganda has taken wide-ranging steps to strengthen CBM. The Government of Uganda has undertaken considerable efforts to strengthen a conventional form of CBM termed the community-based management system (CBMS). This included creating umbrella organizations in 2004 to support communities and promoting the establishment of Hand Pump Mechanics Associations starting in 2011 (Magara, 2013). However, despite these efforts, the technical and financial challenges common under CBM were not satisfactorily addressed, and pressing sustainability challenges persisted (Huston et al., 2021). In 2020, the government approved the National Framework for Operation and Maintenance of Rural Water Infrastructure in Uganda (MWE, 2020), institutionalizing an evolved form of CBM termed CBMS+ that centers on the delegation of key technical functions (preventive maintenance, repairs, spare part procurement) to Area Service Providers (ASPs).

Since 2017, there have been a parallel set of reforms to the management of rural water services, which center on transitioning to full public utility provision. In 2017, the Ministry of Water Environment transformed existing umbrella organizations into six rural-focused utilities termed Umbrellas for Water and Sanitation (UWS), which directly provide clustered rural piped water supply services (Huston et al., 2021). The National Water and Sanitation Corporation (NWSC), although its mandate is to serve gazetted towns, plays a growing role in serving small rural towns. Crucially, the six UWS and NWSC directly manage rural piped water supply services at a considerable scale, managing facilities

Table 3: Rural Water Supply Management Arrangement Background Information – Ghana

Management Arrangement	Scale of Application	Demographic Context Applied	Reliability	Water Quality
WSMT Direct Provision	Over 32,000 point water sources and 800 piped water supply schemes	Principally found in more dispersed rural settings	81% functionality rate, with 69% of facilities providing water 95% of the time	Consolidated data not available
SWE Direct Provision	Varies between SWE but typically applied at a modest scale serving 50-150 facilities	Principally small-town and rural growth centers	Highly reliable services with functionality rates of over 98%	Over 98% compliance with relevant E.coli and chlorine standards
Private Operators Delegated Functions by CWSA	1 piped water supply scheme (pilot) with concrete plans for upscaling	Principally small-town and rural growth centers	100% functionality rate (one scheme)	100% compliance (one scheme)
CWSA Direct Provision	An estimated 177 piped water supply facilities	Principally small-town and rural growth centers	100% functionality	Statistics not available from CWSA

serving 380 and 258 small towns (Nuwamanya, 2022; MWE, 2020), respectively. Although the private sector has played a role in the direct management of rural water supply, private operators are officially being phased out of the direct management of water supply facilities.

A combination of rural water supply management arrangements is currently utilized in Uganda. The following four core management arrangements are utilized for rural water supply service provision and sanctioned by the Government of Uganda:

i. **Water and Sanitation Committee (WSC) Direct Provision.** WSCs are responsible for the day-to-day operations, minor and major maintenance of hand pumps and a small number of piped water schemes under the oversight of the district. Some small-piped schemes are managed by scheme-specific Water Supply Sanitation Boards (WSSB).
ii. **Community-Based Management System Plus (CBMS+).** WSCs retain responsibility for day-to-day operations but with an Area Service Provider performing key technical functions (preventive maintenance, repairs, spare parts procurement) under a performance-based contract with the District Water Supply Sanitation Board for defined service provision areas.
iii. **UWS Direct Provision.** Six UWS directly manage piped water supply facilities and are responsible for the major maintenance, repairs, rehabilitation and expansion, amongst other service provider functions. The Ministry of Water and Environment's Water Utilities Regulatory Department regulates the UWS.
iv. **NWSC Direct provision.** A national public utility that serves gazetted urban areas and towns as well as an increasing number of adjacent rural areas and villages as it expands its service areas to smaller towns. The Ministry of Water and Environment's Water Utilities Regulatory Department regulates NWSC.

Table 4 provides background information on Uganda's main management arrangements for rural water supply services regarding their scale of operation, the demographic context applied, and the level of service provided (functionality, water quality).

Looking forward, the Government of Uganda has clear strategies and explicit guidelines for professionalizing rural water supply service delivery that it is seeking to operationalize. The Government of Uganda has articulated a clear vision for managing rural water supply services, both through expanding the role of utilities (UWS and NWSC) and upscaling a more professionalized variation of CBM (ASP-CBMS+). Despite the advantages of these alternative management arrangements, it is not yet clear how quickly it will be possible to implement these at scale and transition away from CBM, especially for point water sources. The CBMS+ model is still only at the piloting stage, with work ongoing to establish the necessary structures and build capacity at the district level. There is an open question as to whether districts have the capacity and resources to implement and support CBMS+, and this arrangement currently relies on significant external resources and funding. The six UWS have proven capable of providing more reliable and sustainable services than the service provider they replace (typically WSCs). However, these are nascent utilities and are dependent on the Government of Uganda and development partners in several key areas.

Financing rural water services

Ethiopia

There is a significant funding gap for WASH service provision in Ethiopia. As **Table 5** highlights, the Ethiopia WASH Ten-year National Strategic Development Plan (2021-2030) requires an investment of ETB 106

billion (USD 1.93 billion) annually to achieve WASH sector targets. However, the actual financial resources available for the WASH sector stand, on average, at ETB 62.5 billion per year (USD 1.14 billion), indicating a funding gap of ETB 42.2 billion (USD 767 million) per year (roughly 41%). The ongoing development of a sector finance strategy will provide concrete options for bridging the funding gap.

The Government of Ethiopia is the main sector funder. With an external-to-government funding ratio of 1:1, Ethiopia is less dependent on external support than many other countries in Sub-Saharan Africa (GLAAS, 2022). The latest WASH expenditure trend analysis revealed that 43% of the total WASH expenditure emanates from government taxes, followed by tariffs (11%), development partners (35%), and repayable finance.[15] Over the last decade years, ODA to the water and sanitation sector in Ethiopia has fluctuated between USD 49 million in 2021 and USD 98 million in 2014 (OECD, n.d..). The UK's Foreign Commonwealth Development Office and Finland were the largest bilateral donors, and the International Development Association was the largest multilateral donor investing in WASH, contributing 80% of the total bilateral and multilateral funds.

Table 4: Rural Water Supply Management Arrangement Background Information – Uganda

Management Arrangement	Scale of Application – Population Served	Demographic Context Applied	Functionality Rate	Water Quality
WSC Direct Provision / Scheme Specific WSSB	92,000 water points and some small, piped schemes (19 million people)	Dispersed rural setting outside gazetted areas.	85% (MWE, 2020)	59% of the samples collected were compliant with standards (MWE, 2020)
CBMS+	Cluster of hand pumps. Still rolling out (piloted in four districts in the last 3-4 years).	more dispersed rural settings.	No consolidated data, but a similar innovation achieved a 98% functionality rate (Whave, 2022)	59% of the samples collected were compliant with standards (MWE, 2020)
UWS Direct Provision	Piped water supply facilities serving 380 towns (Nuwamanya, 2022)	Small rural towns	94% (MWE, 2020)	96.3% of the samples collected were compliant with standards (MWE, 2020)
NWSC Direct Provision	Over 258 small town piped water systems (8.5% of rural population) (MWE, 2020)	Rural growth centers	81% (MWE, 2020)	98% of the samples collected were compliant with standards (MWE, 2020)

15 SCRS-WASH Ethiopia's Water Sanitation and Hygiene Finance Landscape, 2022 (unpublished)

16 There was a decline in performance compared to the 94.3% functionality for 2018/2019 because additional towns water supply schemes that were non-functional were gazetted and incorporated.

Table 5: Finance Gap of the Ten-year WASH Strategy

Total Required Resourced for -10Year WASH Strategy = ETB 1.07 trillion; US19.3$ billion						
Source of Finance	**Government**	**External Assistance**	**Community Contribution**	**Loan**	**Tariff**	**Total**
Estimated available finance for ten years (Ethiopian Birr and US dollar)	ETB 266 billion; USD 4.788 billion	ETB 196 billion; USD 3.53 billion	ETB 19 billion; USD 342 million	ETB 91 billion; USD 1.638 billion	ETB 54 billion; USD 972 million	ETB 624 billion; USD 11.23 billion
Total 10-Year Funding Gap	ETB 422 billion or USD 7.67 billion					

Critical challenges remain in the financial viability of WASHCO and public utility direct provision. Under WASHCO direct provision and public utility direct provision, there is the assumption that communities contribute to both initial investments (in-kind, cash and labor contributions) and OpEx, as well as CapManEx via tariff revenue. In practice, however, community contributions typically do not generate sufficient revenue to cover OpEx and CapManEx, resulting in poor asset management practices and service quality challenges and the local and regional government having to step in to cover expenditures (including OpEx). At the federal level, the Government of Ethiopia allocates a budget for supporting OpEx and CapManEx, but these are not always mirrored at the regional levels.

Ghana

There is insufficient comprehensive information on the financial resources required to achieve WASH sector targets. The last detailed analysis of the total financial resources allocated to rural water was conducted in 2016 and provided information for 2012/2013.[17] Moreover, while recent studies have detailed the resources required to achieve sector targets, these have focused on capital expenditures.[18] While up-to-date detailed information is not available, a recent (unpublished) IRC study highlighted an 83% gap between funding requirements to meet the targets contained in the Sector Medium Term Development Plan 2018-2021 and what was actually released.

Ghana has markedly increased budget allocations for WASH in recent years, and levels of ODA have significantly reduced in scale. Ghana budgeted GHS 558 million (USD 94.57 million) to WASH in 2021. This is above the allocations in 2019 (GHS 247 million and GHS 319.5 million, respectively); however, it remains markedly below the estimated GHS 1.75 billion required to provide universal access to basic services by 2025 (UNICEF, 2021). Figure 8 presents the level of ODA for water and

17 The latest TrackFin exercise (2016) estimated that the total financial resources allocated to rural water amounted to GHS 578,048,069 (then US$ 288,426,911) in 2013/2012. This figure includes both capital investments and OpEx (including those from users' tariffs).

18 The Ghana WASH Sector Development Programme 2030–2021 estimates that US50$ million and US320$ million are required annually to achieve universal access to at least 'basic' and safely managed services in rural areas, respectively. Additionally, using CWSA's unit costs for infrastructure development, a separate study estimates required CapEx to range between US$ 24 million (for constructing communal boreholes) to US$ 130 million per year (for safe water on-premises).

sanitation in Ghana, highlighting a significant reduction from just under USD 140 million in 2015 to under USD 50 million in 2021. While several development partners (i.e., USAID and the World Bank) continue to play a significant role in the rural water supply sub-sector, this limits progress towards headline coverage targets and impedes the transition to more professionalized management arrangements.

Financial viability remains a challenge for Ghana's main management arrangements; however, important progress has been made in recent years. To varying extents, Ghana's main management arrangements each rely on external financial support in the form of ODA, public funds or private investments to cover OpEx and CapManEx. Nevertheless, SWEs, CWSA, and the private operator delegated functions by CWSA have each made important progress in improving their financial viability. CWSA now covers 84% of its OpEx through revenue from the sale of water and is taking several measures to increase its operational efficiency and overall financial viability (CWSA, 2021). Moreover, SWN and 4ward Development both use revenue generated from tariffs to cover part of their OpEx, CapManEx, and expenditures on direct support. However, they continue to rely on ODA to cover elements of each of these life-cycle costs.

Uganda

Although the funding allocated to the water and environment sector has increased, a substantial gap remains. Approved budget allocations for Uganda's water and environment sector have increased from USD 38.2 million in 2017/2018 to USD 69.8 million in 2020/2021 (see Figure 9) (Ministry of Finance, Planning and Economic Development, 2021). Nevertheless,

Figure 8: ODA Disbursement to Water and Sanitation (USD Million) – Ghana (OECD, 2021)

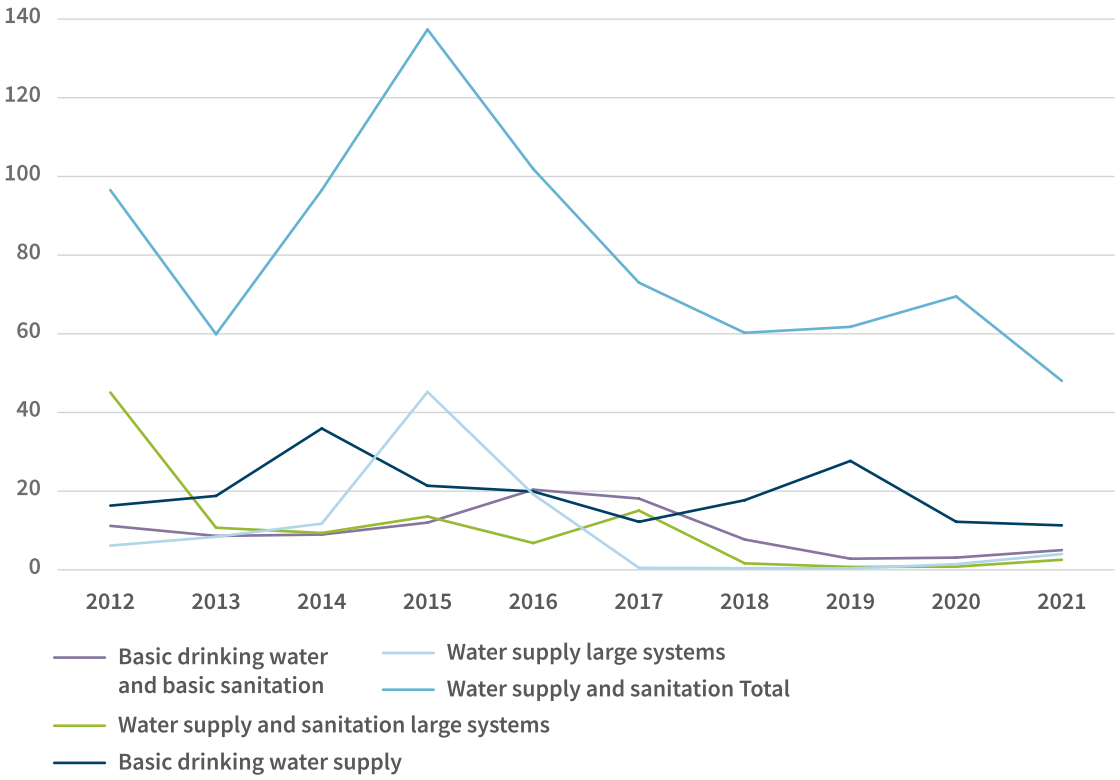
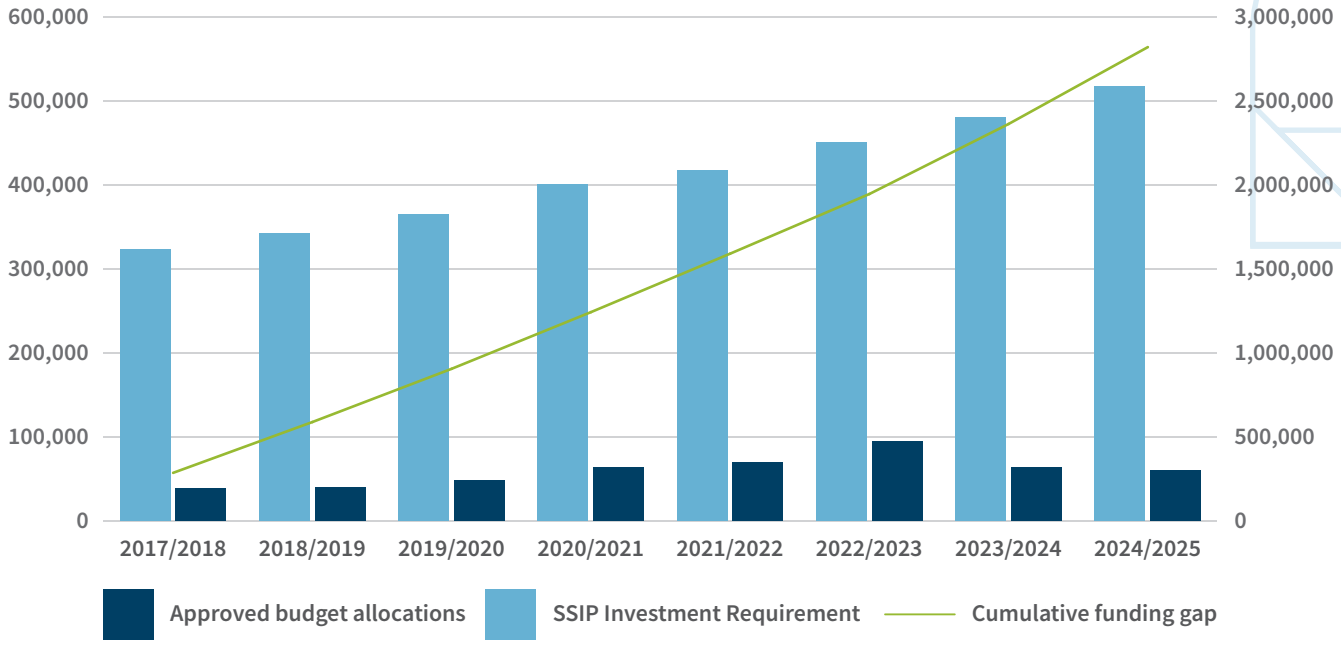


Figure 9: Funding Gap (USD 1,000) – Uganda



the Strategic Sector Investment Plan (SSIP) highlights that the rural water supply program will require an average investment of USD 310 million per year, and a significant funding gap persists (see Figure 8) (MWE, 2018). The overall funding gap is over USD 2.8 billion for the rural sub-sector (MWE, 2018). At this rate of progress, it is unlikely that the National Development III targets 2020-2025) will be achieved without major interventions.

The Government of Uganda and its development partners are the main actors supporting management arrangements for rural water supply in Uganda. The Government of Uganda, mainly through ODA funding and concessionary lending, provides financial resources to the districts for the planning and development of facilities, as well as subsidies to the six UWS and NWSC for capital expenditures. The Government of Uganda also covers deficits in O&M of UWS through subsidies. Uganda has received increasing external funding from 2010 to 2020 for water supply and sanitation development, totaling USD 1.73 billion, of which 36.7% was provided as ODA grants, while 61.7% was provided in the form of ODA loans. The largest amounts came from the International Development Association (USD 423 million), France (USD 317 million), and the African Development Fund (USD 247 million).

The financial viability of Uganda's main management arrangements varies across models. Except for NWSC, Uganda's primary management arrangements struggle to cover their OpEx. The six UWS have made important progress covering OpEx through tariff revenue since their inception in 2017 and are now generally able to cover 85-95% of their OpEx but rely on external assistance for CapEx and CapManEx (MWE, 2020). CBM through WSCs faces particularly acute challenges regarding financial viability. Because CBMS+ is still being established at any kind of scale, the financial viability of this SDM is yet to be established; however, existing studies suggest that revenue streams do not cover more than around one fifth to one quarter of operating expenses (Harvey, 2021).

Summary of management arrangements across Conrad N. Hilton Foundation target countries

Table 6 below provides a snapshot summary of the different management arrangements by country and by the five criteria assessed as part of this review. It uses a simple traffic light scoring to assess high, moderate or low strength or performance. It is important to caveat this as a qualitative assessment made on the basis of different sources of existing evidence and data. It is therefore not a rigorous scoring but intended to provide a rapid overview of the relative strength and weaknesses of different arrangements by country based on this review. The criteria used to assess management arrangements are as follows:

1. How well defined and established the arrangement is in sector policy, legislation or strategy documents (i. well defined; ii. defined but with ambiguity or lack of detail, or iii. not clearly defined).
2. The scale at which the management arrangement is being applied at the date of this review (i. widespread or nationwide; ii. moderately in terms of geographic or institutional spread; or iii. limited in its application to a small number of geographies or isolated cases).
3. The extent to which the management arrangement is financially viable (i. strong financial performance with the ability to cover at least all operating costs; ii. moderately viable and able to cover part of operating costs; or iii. Inadequate performance requiring heavy subsidies to be viable).
4. An assessment of the aggregate performance of the management arrangement as reflected in the level of service, functionality, and water quality (i. high service levels meeting most or all national standards; ii. delivering moderate service levels; or iii. unable to deliver against most or all national standards for service quality).

Table 6: Summary of management arrangements by country

Management arrangements in Rural Areas	Ethiopia		Ghana				Uganda			
	CBM (Direct)	Public Utility (Local)	CBM (Direct)	Private - SWEs	Private - delegated by public utility	Public Utility (National)	CBM (Direct)	CBM with delegated maintenance	Public Utility (Regional)	Public Utility (National)
Policy Definition										
Scale of Application										
Financial Viability										
Performance (Service Level)										

3.4 Conrad N. Hilton Foundation target countries: headline lessons

The rural water sub-sectors in all three of the Conrad N. Hilton Foundation's target countries are undergoing substantial reforms designed to professionalize aspects of rural water supply management. In many instances, these reforms reflect the key trends in the rural water sector globally, including the shift away from unsupported CBM, the expanded role of rural-focused utilities, increased private sector involvement and sector reforms. The following sub-sections provide headline lessons from across Ethiopia, Ghana, and Uganda regarding the scale, performance and effectiveness, and financing of rural water supply management arrangements.

Scale of management arrangements

CBM is the historical management arrangement for rural water supply service provision and remains dominant in all three countries. Ethiopia, Ghana, and Uganda each have a long track record with CBM dating back to the 1990s. In each country, national policy and strategy documents institutionalized CBM and promoted its application for both point water sources and piped water supply schemes. To varying extents, efforts to move away from CBM are at the heart of recent and ongoing sector reforms in all three countries. However, the reality is that these reforms are still in process and CBM remains the predominant management arrangement for rural water supply services in each country, especially for point water sources fitted with hand pumps.

Uganda has made the greatest progress in applying and institutionalizing a more professionalized form of CBM, but scaling up these approaches is occurring slower than envisioned. Uganda has taken vital steps to institutionalize a more professionalized form of CBM where preventive maintenance and guaranteed repair functions are delegated to a formalized service provider outside of the areas gazetted to the six UWS and NWSC. However, this new approach is still only applied on a modest scale and remains dependent on external support from development partners. In Ethiopia and Ghana, there is a recognition of the need to strengthen CBM but policies and strategies in these countries do not go beyond broad objectives and there is limited detail of how such consolidated approaches to strengthening CBM will be rolled out or financed.

The expanded role of rural utilities in service provision is a more recent development in each country, with Uganda making strong progress in scaling up utility direct provision. All three countries reflect a wider 'utilitization' trend in rural water supply management (Franceys, 2019), but each is progressing at different speeds. Uganda is at the forefront, with NWSC serving over 250 small towns and rural growth centers and the recently established UWS serving over 380 small towns and rural growth centers. A similar trend is occurring in Ghana, where CWSA began directly managing rural water supply services from 2017. In the same year in Ethiopia, public utility provision was recognized as a complementary management arrangement to WASCHO direct provision.

While some uncertainty persists in sector policies, public utility direct provision appears to have the clearest pathway for providing more professionalized services in each country. Several weaknesses, or

ambiguities, exist in sector policies regarding the mandate of utilities, including the process for adoption of physical infrastructure and asset ownership in all three countries, the overlapping mandates of different utility types (Uganda and Ghana), and the pace at which utilities are expected to take over the management of existing water supply facilities from other service providers (Ghana and Ethiopia). Despite these grey areas, progress has been made in each country toward institutionalizing the direct provision of services by utilities with key policy and legal reforms put in place to enable the comparatively rapid upscaling of utility direct provision. Looking forward, these recent reforms, the rapid upscaling of utilities' operations over the last five years, and progress in addressing financial viability all provide solid foundations for further upscaling these arrangements, particularly in Ghana and Uganda.

The role and scope of private operators in managing rural water supply services remain more limited. Private sector involvement, particularly in Ghana, in managing rural water supply services is expanding, in part as a response to government policy but also as a result of market expansion. This includes the direct management of facilities and performance of essential technical functions (i.e., preventive maintenance, repairs) as well as spare part provision. However, for the most part, the private sector's role remains comparatively limited and dependent on external development partner assistance and funding. For example, while Ghana benefits from several SWEs that operate at a modest scale (with plans to further expand their operations), a detailed strategy does not yet exist for these SWEs to take over the management of publicly funded piped water supply schemes where CWSA is the asset holder. Lack of clarity around PPP models and desired contracting arrangements are further constraining factors for expanding the SWE model. Although private sector entities are given a role as potential ASPs under the Uganda strategy for O&M for rural water services, the main government focus remains on public utility expansion.

Performance and effectiveness of management arrangements

CBM has largely resulted in unreliable and low-quality services in Ethiopia, Ghana, and Uganda. Although exceptions are always evident, most community-managed water committees in Ethiopia, Ghana, and Uganda typically struggle to perform vital technical and financial functions. In the absence of consistent and adequately funded external support or the delegation of technical functions, as is emerging in Uganda, direct provision of services under this modal has resulted in high non-functionality rates, lengthy downtimes, and poor water quality. In Ethiopia, for example, the Second National WASH Inventory and Management Information System report a functionality rate of 82% for WASHCO-managed facilities. Likewise, in Ghana, only 14% of WSMT-managed facilities meet requirements for providing a 'basic' level of service, with 21% non-functional, and 65% providing a sub-standard service (IRC, 2013).

Delegating maintenance and repair functions from water committees to private operators or social enterprises has significantly increased functionality rates and time to repair. Several examples of more professionalized delegated maintenance through service contracts exist across Ethiopia and Uganda. These arrangements have typically resulted in substantial improvements in hand pump reliability. In Uganda, a maintenance service provider operating at scale, which is comparable to the Area Service Provider CBMS+ arrangement, reports a 98% functionality rate (Whave, 2023). Likewise, in Ethiopia, the Wahis Mai model was piloted in Tigray

in 2013 and has achieved a functionality rate exceeding 90% (Lockwood, 2019).

While rural utilities still face challenges, this SDM has typically resulted in markedly improved services. Rural utilities face many common challenges, including a culture of under-payment of tariffs that meet even operating costs, the often-dilapidated state of infrastructure (on takeover), challenges recruiting experienced staff to remote areas, and the long distances between – and diversity of – water supply facilities. While these challenges remain, the respective rural utilities have improved service delivery in each of the three countries. In Uganda, the six UWS have achieved a 94% functionality rate and 96% compliance rate with national water quality standards (Ministry of Water Environment, 2023). Moreover, in Ghana, all 177 CWSA-managed facilities are functional.

SWEs have a strong track record of delivering high-quality services. Ghana has the largest number of SWEs, including Safe Water Network, 4Ward Development, WaterHealth Ghana, Project Maji, and Saha Global. All these enterprises have an impressive track record in ensuring high-quality service provision. Of note, Safe Water Network reports a 98% functionality rate and 95% station uptime, and internal and external water quality tests show that its facilities consistently meet sector standards for water quality. Additionally, 4Ward Development reports that 98% of water quality tests pass their Free Chlorine Analysis, and 91.2% of water points are technically fully functional and in use (8.8% are functional but inactive[19]).

Financial viability of rural water supply services

While public investment through government allocations has increased for rural water, considerable funding gaps remain in all three countries. Government allocations for the water and sanitation sector have increased markedly in Ethiopia, Ghana, and Uganda in recent years. Nevertheless, considerable funding gaps exist in each country. In Ethiopia, for example, an annual funding gap of roughly USD 767 million persists for the WASH sector. The importance of mobilizing private investment to fill such gaps is well-recognized; however, this currently only accounts for a very limited percentage of the financing that the rural water supply sub-sector receives. One noteworthy exception is NWSC in Uganda which is able to raise commercial finance (AA rated), which is rare for a water utility in sub-Saharan Africa and difficult to replicate across other providers.

Responsibilities for covering the life-cycle costs of rural water services are largely well-defined. Ethiopia, Ghana, and Uganda have each taken steps to develop policy, legal, strategy, and contractual documents related to rural water supply service provision. While some ambiguities persist, responsibilities for covering the different life-cycle costs under each country's primary management arrangements are relatively well defined. However, ongoing challenges with service providers' revenue generation and limited fiscal decentralization mean that these guidelines are often not abided by. Consequently, a range of stakeholders (i.e., development partners, national or regional governments) step in to cover the life-cycle costs, especially for CapManEx, or these costs are simply not met, resulting in deteriorating service levels.

In all three countries, the financial viability of CBM remains a pressing challenge. While detailed data could not be accessed, limited tariff revenue generation under this SDM is recognized as a critical challenge in all three countries. This impedes the performance of

19 Inactive in this case refers to a water point with no active vendor to manage the retail sale of water to customers.

vital O&M activities and results in CapManEx often having to be covered by other stakeholders (i.e., national or sub-national governments, development partners), being delayed or not met at all. Some progress has been made to increase tariff revenue mobilization under arrangements where water committees delegate technical functions to maintenance service providers; however, external financial assistance is still required for these approaches to function effectively.

Significant progress has been made to improve the financial viability of services under several arrangements; further efficiencies would help to lower operational costs. Rural contexts pose particular challenges to delivering financially viable services, including users' limited history of paying cost-reflective tariffs, long distances and travel times between water supply facilities, a sparsely populated customer base, and the often-poor condition of infrastructure. Considering these realities and the relatively nascent stage of many of the more professionalized management arrangements in the three countries, it is important to recognize that progress has still been made, particularly in the case of Ghana and Uganda. In Ghana, CWSA now covers 84% of its OpEx through revenue from the sale of water and is taking several measures to increase its operational efficiency and overall financial viability (CWSA, 2021), and SWEs have increased their revenue generation in recent years. Likewise, in Uganda, the six UWS typically cover 80-115% of their OpEx through generated revenue (Ministry of Water Environment, 2023).

4. Alignment of SWI strategy

4.1 Summary of Conrad N. Hilton Foundation investments

Since 1990, the Conrad N. Hilton Foundation has invested in a range of interventions in the rural water sector, which aim to enhance the health and well-being of millions of people. Since 2011, with the launch of Phase I of the Safe Water Initiative (SWI), the Conrad N. Hilton Foundation has gradually been refining its strategy. Phase II of the SWI, with a budget of USD 54.2 million, was launched in 2017, focusing on promoting sustainable water management practices, prioritizing system strengthening and testing different SDMs with the potential for replication and scale across several countries, including Burkina Faso, Ethiopia, Ghana, Mali, Niger, and Uganda. In 2021, SWI released "Strategy 25" (2021-2025), with a budget of USD 88 million, to strengthen water systems and improve service delivery to ensure access to affordable safe water services to 1 million people across seven target districts in Ethiopia, Ghana, and Uganda.

A review of the Conrad N. Hilton Foundation's portfolio[20], spanning 12 countries with a total amount of USD 91.9 million, reveals that 80% of the portfolio is allocated to system-strengthening interventions. Moreover, 70% of the Conrad N. Hilton Foundation's portfolio is allocated to Ghana, Ethiopia, and Uganda (i.e., USD 64 million) across three core focal areas: i. advocacy for national-level actions (4.15% of this 70%), ii. strengthening of WASH systems at the district level (30.67% of this 70%), and iii. direct support to service delivery models (65.19% of this 70%). Figure 10 reveals the allocation across these three core focal areas per country and indicates that Ghana receives the highest amount of investment among all three countries, specifically for direct support to SDMs. Relatively equal amounts were spent on advocating for national action, as well as improving WASH systems at the district level across all three countries.

The Conrad N. Hilton Foundation has invested in six areas or types of system-strengthening approaches at the district level that broadly align with the building blocks commonly adopted by NGOs working on system strengthening. Figures 11 and 12 show the overall share of funding to strengthen WASH systems at the district level per approaches. Figure 12 shows that the approaches taken at the district level for system strengthening vary across the three core countries, with more than half of funding allocated to interventions facilitating collective action and institutional strengthening and improving coordination (28% and 23%, respectively). A substantial share of the Conrad N. Hilton Foundation's investments was to enhance water resource management, exclusively in Ethiopia. Water quality monitoring accounts for 20% of the investments, with the majority of them allocated to Ghana and Uganda.

20 A separate report analyzing the CNHF portfolio is part of the portfolio review commissioned by the CNHF and covers 76 grants whose fiscal year was 2019 or after, as well as 11 additional grants that started before 2019, spanning 12 countries

Figure 10: Grants' focus per core country

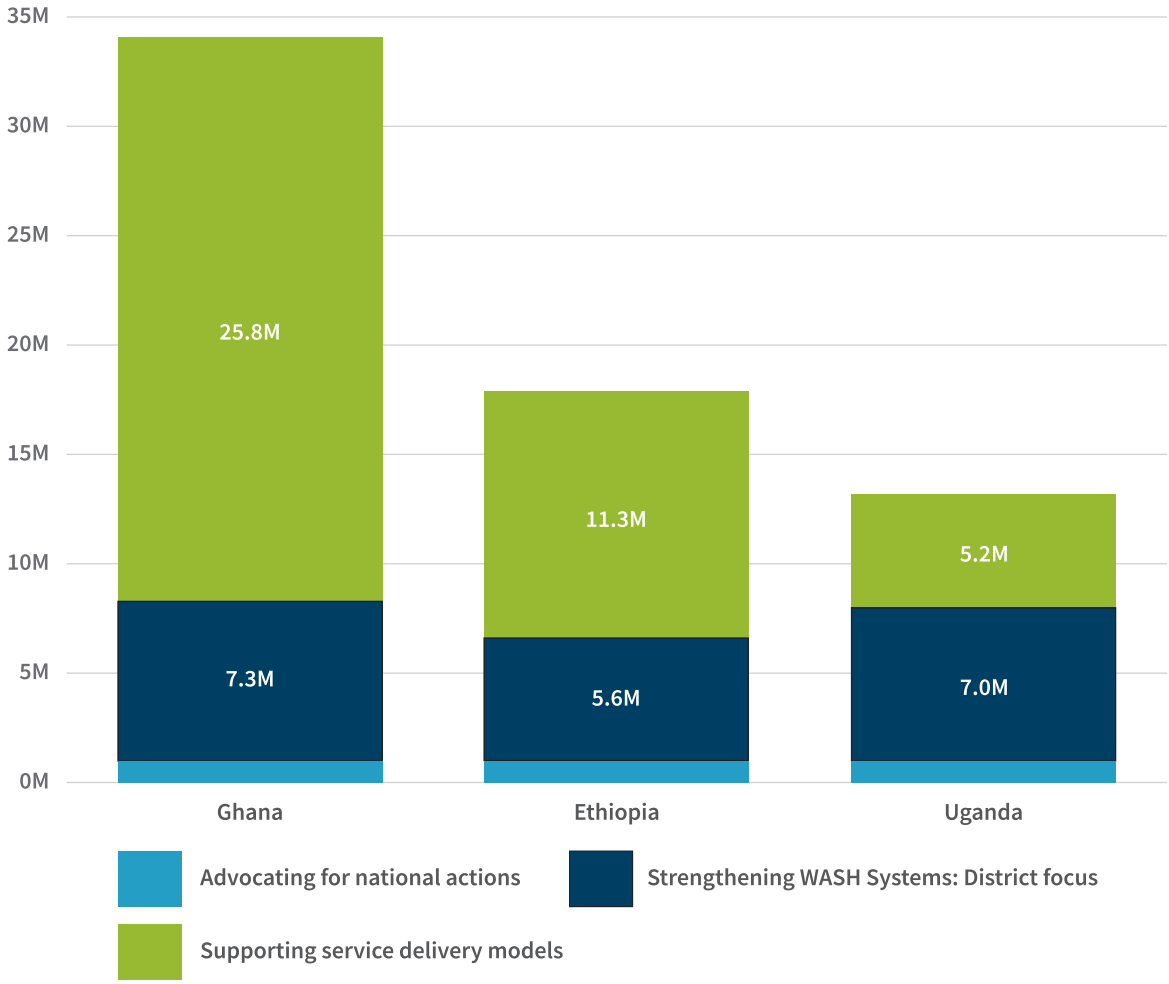


Figure 11: District-level system strengthening approaches across the three countries

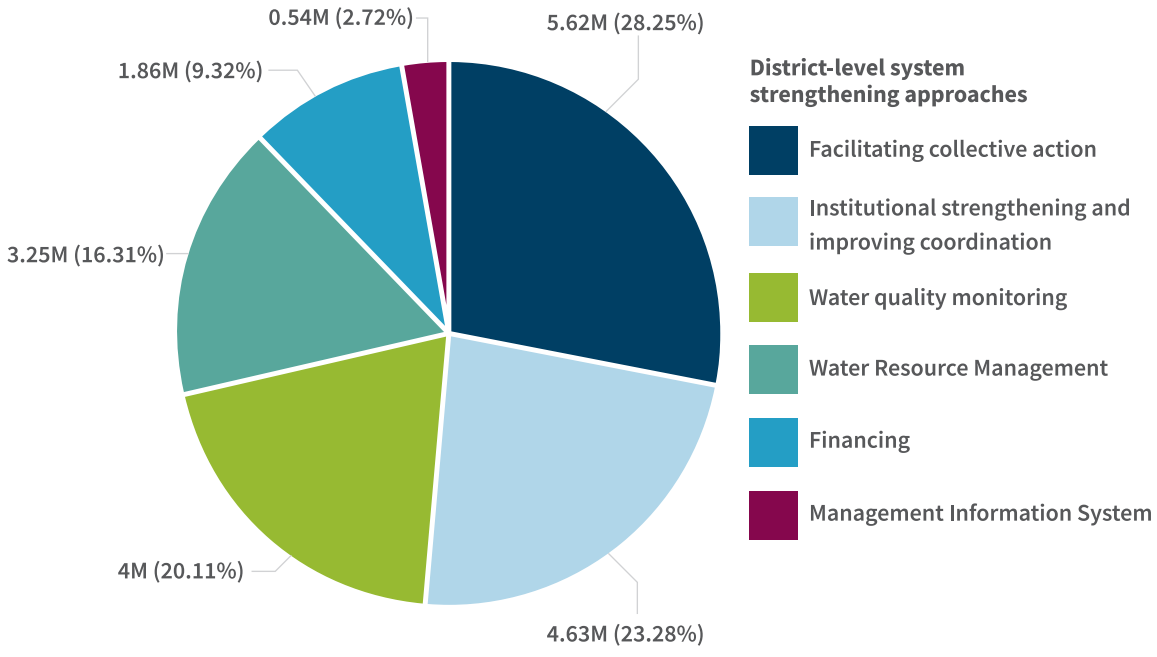


Figure 12: District-level system strengthening approaches per core country

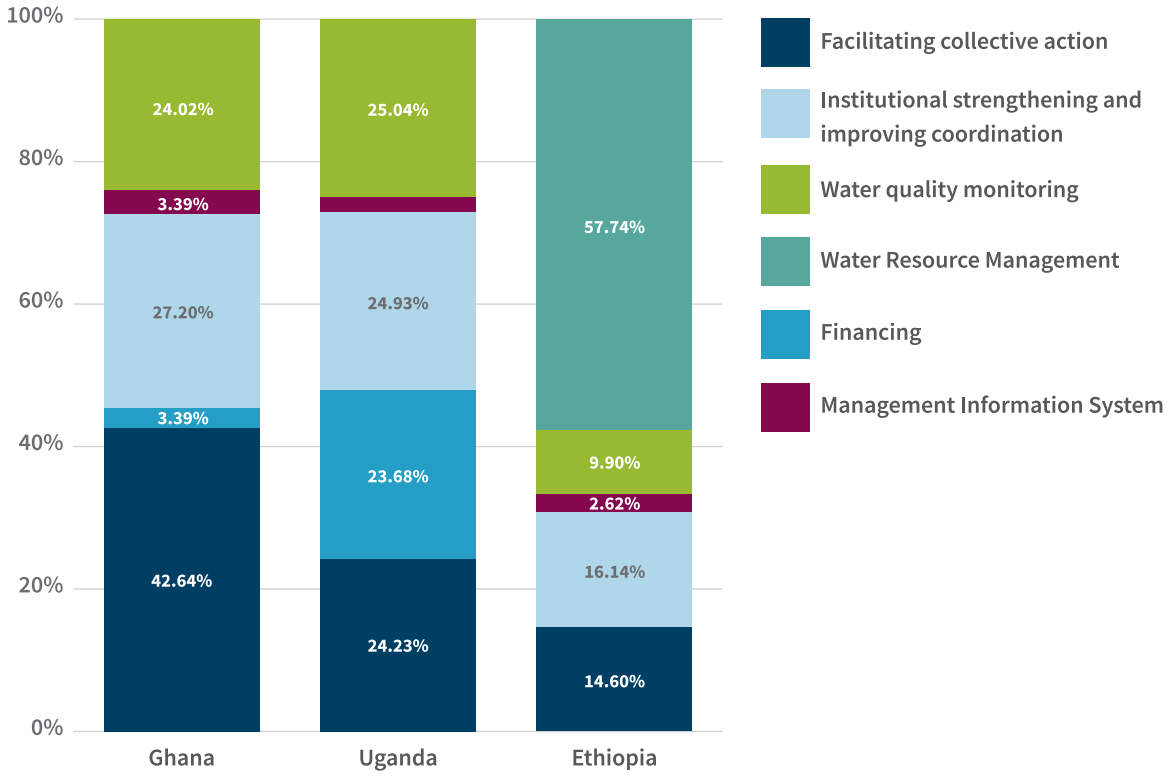


Figure 13: Direct support to service delivery models across the three countries

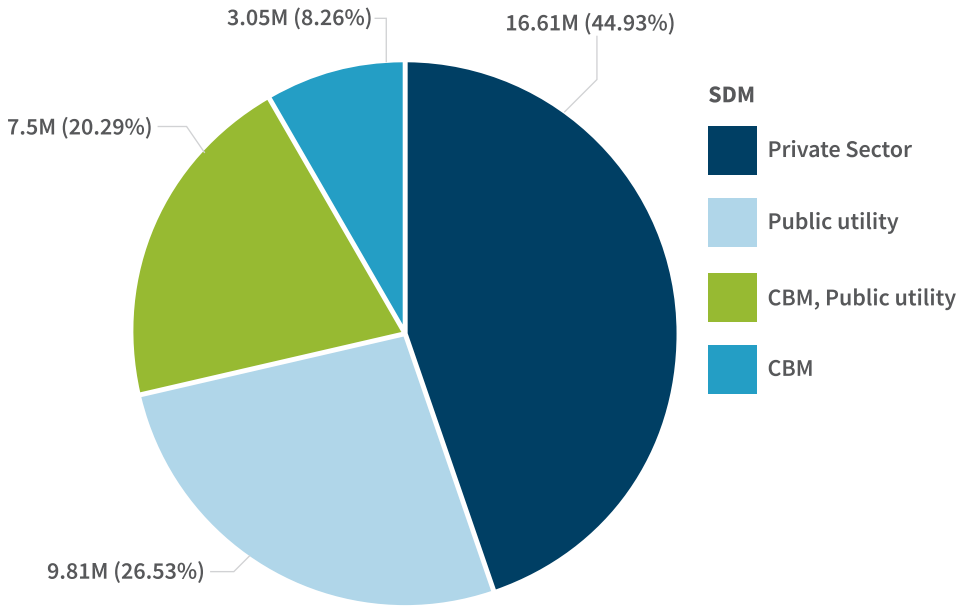
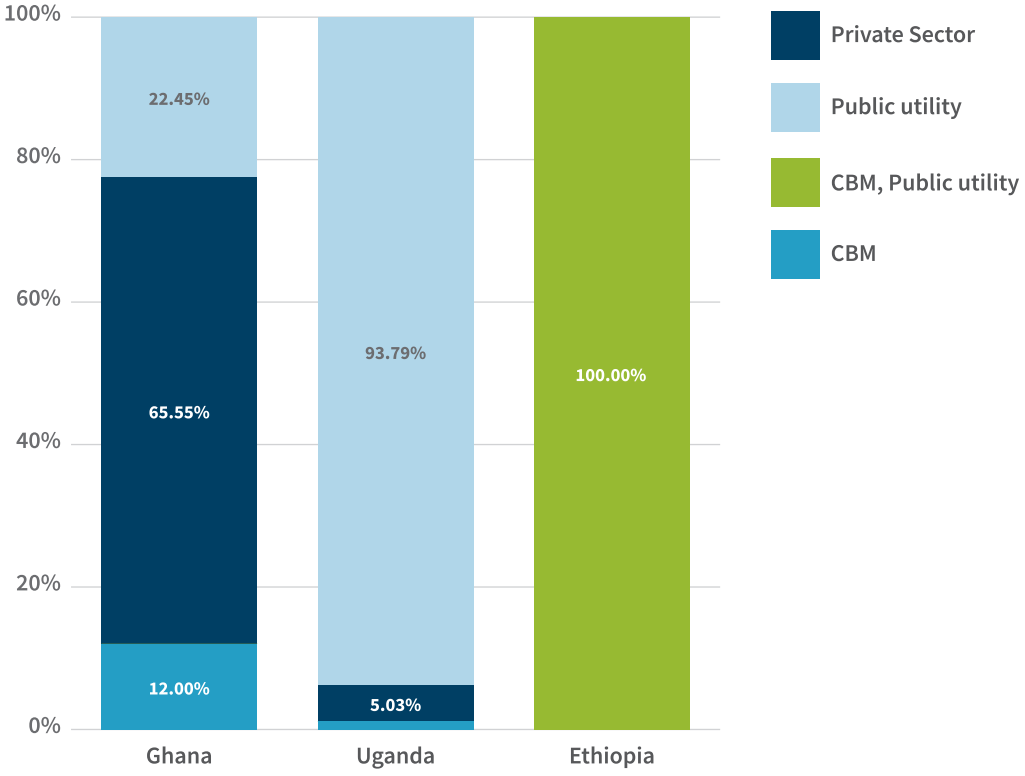


Figure 14: Direct support to service delivery models per core country



The Conrad N. Hilton Foundation's investments to directly support SDMs vary significantly across the three core countries. Figures 13 and **14** present the share of investments by SDM overall and across the three countries. A significant share of funding was invested to support private SDMs (45%), the majority of which was allocated to Ghana, whereas in Uganda, the vast majority of investments were in direct to support public utilities (94%), while in Ghana, it was just over 22%. In Ethiopia, investments were made to support public utilities and CBMs. A lack of available information makes it challenging to disaggregate investments per service delivery model.

4.2 Alignment with global and national sector trends

The Conrad N. Hilton Foundation is a well-regarded funder, and its portfolio of investment, at just under USD 65 million over a five-year period across the three target countries, makes it one the largest philanthropic donors to rural water other than the major bilateral or multilateral funders. The following section assesses the alignment of the Conrad N. Hilton Foundation's investment strategy in relation to the key sector trends identified both globally and country level for Ethiopia, Ghana and Uganda. The analyses draw on the preceding sections of this report and the internal portfolio review carried out as part of the same exercise. However, the limitations of the methodology employed for this external review should be recognized, being primarily desk-based and with limited stakeholder

consultations in-country. Further, detailed insights will be uncovered in the subsequent phase of the overall portfolio review, which includes operator and field surveys and in-depth consultations in all three countries with system actors at district and national levels.

Key trend 1: Both development partner practitioners and donors are making a shift toward supporting system-strengthening efforts and are decreasing their (funding) support for direct service delivery.

Globally, the majority of development partners and donors are making a move away from direct investment in infrastructure (which is seen as a national and local government responsibility) and toward supporting the capacity of actors and systems to deliver better and more sustainable services. This trend is referred to in different ways by different stakeholders but essentially comprises the same transition, both in strategic approaches and, in some cases, actual funding patterns, particularly in the case of the major bilateral donors. Some development partners, however, do not extend this approach when dealing with humanitarian responses or in fragile states where system strengthening can be challenging. Most approaches to system strengthening include some form of collective action, requiring a facilitator or 'hub' organization to play a coordination and learning role across and between stakeholders.

The Conrad N. Hilton Foundation's Strategy 25 response: The Conrad N. Hilton Foundation's investments have been increasingly strongly aligned with this trend. The Conrad N. Hilton Foundation has put the majority of its funding behind efforts to strengthen WASH systems, both at decentralized, local levels and nationally, instead of pure infrastructure investment. Across the Conrad N. Hilton Foundation's portfolio, 80% of funding is allocated to systems-strengthening activities, and this level is maintained across the three target countries. Within these allocations, more than half was allocated to interventions facilitating collective action, institutional strengthening, and improving coordination (28% and 23%, respectively); this work has been carried out mainly by IRC in Ghana and Uganda and MWA in Ethiopia (see **box 5**). Improving data availability and strengthening the capacity for water quality testing and improved water resource management (in Ethiopia only) are other key areas that address system strengthening.

A further characteristic of the Conrad N. Hilton Foundation's support to system strengthening efforts that is well aligned with broader sector thinking is the unit of scale of service provision. Strategy 25 has an explicit focus on the district as the entry point and unit of scale which has been identified as critical for efforts to improve decentralized service delivery. The Conrad N. Hilton Foundation has also recognized that this unit of scale is insufficient, on its own, to address some of the more systemic challenges and bottlenecks, which require concurrent action at the national sector level.

Key trend 2: The policy shift away from unsupported CBM to alternative management arrangements is leaving significant numbers of the rural population behind, particularly those relying on point sources fitted with hand pumps.

The policy shift away from CBM is happening across many countries, including the three target geographies of the Conrad N. Hilton Foundation's five-year program; however, this transition will take many years to achieve in practice. As such, CBM remains in place in most countries and often serves the majority of the rural population reliant on point

Box 5: Examples of interventions to improve collective action

In Ethiopia, the Conrad N. Hilton Foundation provided funding to MWA to strengthen its role as a hub. MWA collaborated with Whitten & Roy Partnership to identify communication gaps and designed three methods to improve stakeholder understanding of the hub's value proposition. MWA and its members were trained to use these tools with the aim of increasing demand for the hub's services among stakeholders in Ethiopia and globally. To further strengthen MWA, IRC WASH provided a supporting role and accompanied them during their initial district assessment. This collaboration between MWA and IRC WASH aimed to enhance MWA's capacity to provide effective and sustainable support to the district WASH system in Ethiopia.

In Uganda, IRC WASH continues to play the role of hub within the Conrad N. Hilton Foundation funding support to the sector. This involves facilitating progress reporting and promoting the adoption of innovative practices. In this role, IRC WASH continues to monitor progress against the goals and targets outlined in district Master Plans, document lessons learned from the implementation of these plans, and disseminate this knowledge to inform engagement within the sector. Additionally, IRC WASH supports districts in transferring these lessons to other districts and liaisons with national government.

source supply (hand pump technologies). In both Ethiopia and Ghana, the CBM model relies on support from local government which has proven to be largely inadequate and chronically underfunded to date. And even though a new approach has been set out in policy in Uganda for professionalized support, this remains limited in its scale of application to date (for example, the Area Service Provider framework has not yet been established in the target district of Kabarole).

The Conrad N. Hilton Foundation's Strategy 25 response: Although the Conrad N. Hilton Foundation is actively supporting alternative management arrangements (see key trends 3 and 4 below), it has invested relatively little to address the weaknesses of the CBM model, which will continue to in place for the majority of rural consumers for the foreseeable future. Whilst CBM, and the systems supporting this model, have received funding in Ethiopia, it has very little investment support from the Conrad N. Hilton Foundation in Ghana and Uganda, receiving just 12% and less than 1% of the country portfolio, respectively. However, the Conrad N. Hilton Foundation has more recently supported indirect efforts to improve CBM by delegating maintenance functions to professionalized service providers and has made investments in the global platform Uptime, which provides a results-based financing mechanism for such providers.

Key trend 3: There is a policy shift toward piped water supplies, with the ultimate aim of piped-on premises, that points to an increased involvement of utilities in rural areas, or 'utilitization' of rural water.

Globally, as well as in all three of the Conrad N. Hilton Foundation's target countries, sector policy and strategies have adopted ambitious goals for piped supply in rural sectors. This move is embedded in broader national development planning and is proceeding in different forms and at different speeds. In Ethiopia, the rural utilities tend to be smaller and more localized, serving the immediate surroundings of rural towns. In Uganda, there

is a twin track with NWSC expanding from the 'top-down' and taking on the larger rural district growth centers and the UWS' which serve somewhat more dispersed populations. In Ghana, the CWSA has been reformed to serve as a national utility, but this is a relatively very recent change, and there is some ambiguity as to how it will be scaled up.

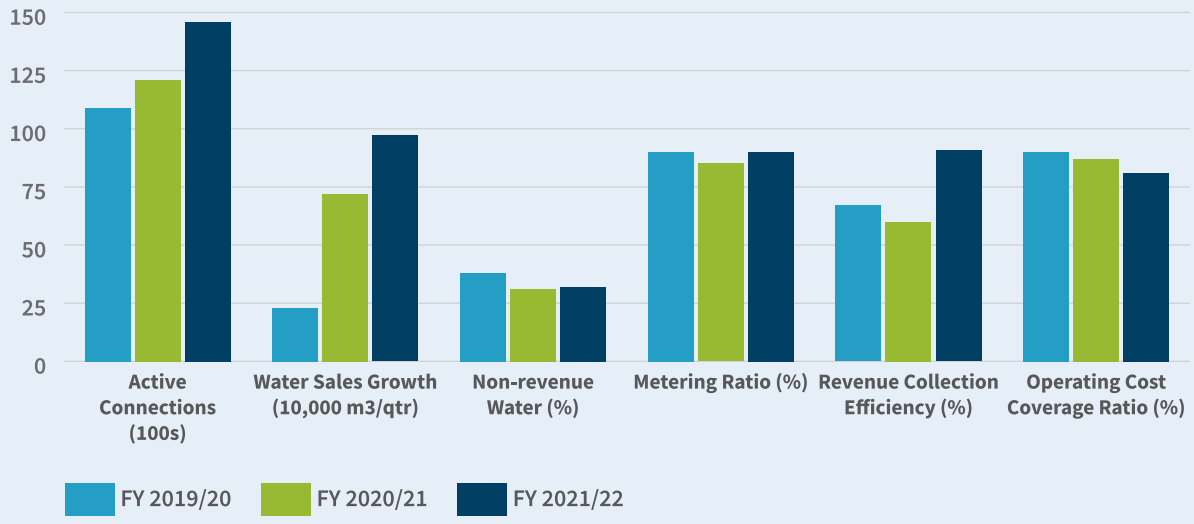
The Conrad N. Hilton Foundation's Strategy 25 response: The Conrad N. Hilton Foundation's support is increasingly aligned with this trend, and it has made important investments in support of these changes. For example, in Uganda, 94% of investments supporting service delivery models went to public utilities, while in Ghana, it was just over 22% (as a result of a recent grant supporting CWSA). Public utility models receiving support include the Mid-Western Umbrella for Water and Sanitation (MW-UWS) in Uganda, Ghana's CWSA, and in Ethiopia, to a lesser extent, through the rural utilities in its target districts. Funding has included capacity building and efforts to improve operational efficiencies (see **box 6**).

The trajectory toward utility provision (public or private) more broadly is also associated with the consolidation or aggregation of service areas across multiple districts, bringing increased economies of scale and operating efficiencies that are not possible within the context of only one district or administrative unit. Therefore, there is an inherent tension for

Box 6: The Conrad N. Hilton Foundation's support to the Mid-Western Umbrella for Water and Sanitation, Uganda

The Conrad N. Hilton Foundation has provided ongoing support to MW-UWS through WSUP Advisory, which offers technical support to MW-UWS, with a particular focus on supporting efforts to cover operations and maintenance costs, its operational autonomy, customer-centricity, operational efficiency, strategic planning, and the motivation and commitment of its workforce. The four-year program has supported a wide-ranging set of improvements. Of note, considerable progress has been made concerning several dimensions related to MW-UWS's financial viability from FY2019/20-FY2021/22 (see Figure 15 below). Over the same period, vital progress has also been made regarding the functionality of MW-UWS-managed facilities, as well as the hours of supply and quality of water provided by MW-UWS-managed facilities.

Figure 15: MW-UWS's Financial Viability – 2019/20-2021/22 (MWE, 2023)



the Conrad N. Hilton Foundation in supporting district-level system strengthening and, at the same time, management arrangements that are regional or national in nature and whose service areas span across multiple districts (for example, applying to the UWS in Uganda and the CWSA in Ghana).

Key trend 4: Sector policy makers and development partners are actively promoting an increased role of the private sector, both to improve service delivery quality and to attract commercial investment.

In recent years, there have been significant reforms to the rural sub-sector aimed at stimulating private sector participation by adapting legislation and policy and aligning incentives to attract private operators. In Ethiopia, progress has been perhaps the most limited, with a focus on spare parts and small-scale, less formalized maintenance providers. In Uganda, a role for private operators has been established under the new ASP framework for delegated maintenance, but the government is focusing more on national and regional public utilities. In Ghana, there is a policy framework in place that enables the new rural utility to delegate O&M to private operators, but this is only currently applied for one scheme. Perhaps the most progress has been made through the expansion of SWEs in Ghana, which have a strong track record of service delivery, but there is not yet a clear policy pathway for fully institutionalizing this approach.

The Conrad N. Hilton Foundation's Strategy 25 response: The Conrad N. Hilton Foundation has provided extensive direct support for the private SDMs (45% of all its investments in direct service delivery) with the majority of this going to support SWEs in Ghana (66%). SWEs in Ghana have proven capable of delivering high-quality services. However, to date, the Conrad N. Hilton Foundation's investment (as well as that from other donors), has not resulted in the arrangement having a clear pathway for operating at scale through being applied to publicly-funded piped water supply facilities where CWSA is an asset holder. SWEs have introduced a range of vital innovations, increased revenue streams and made efficiency gains to increase the proportion of operational expenditures they are able to cover. However, none of the current private sector providers supported by the Conrad N. Hilton Foundation have been capable of accessing commercial financing at market rates and instead remain reliant on external aid, particularly for CapEx and CapManEx.

Key trend 5: Funding gaps for both investment and recurrent costs in rural water are evident in many countries, and current sources will be inadequate to meet the SDGs. In response, there is a drive to (gradually) increase revenues from tariffs, whilst, at the same time, pushing down operational costs, an increased emphasis on advocacy for greater public funding, and efforts to access commercial lending.

The Conrad N. Hilton Foundation's target countries, in common with most others around the world, exhibit funding gaps for rural water, even though there have been (modest) increases in public funding in each of Ethiopia, Ghana and Uganda. For example, in Ethiopia, there is an annual WASH sector funding gap of roughly USD 790 million. Efforts have been made to increase the operational efficiency of both public and private utilities in Ghana and Uganda, but only NWSC in Uganda has been able to raise financing from commercial lenders. Funders interviewed for this review are increasingly working on strategies to attract private investments, by both building capacity and the understanding of financing sector actors about water operators and de-risking investments.

The Conrad N. Hilton Foundation's Strategy 25 response: The Conrad N. Hilton Foundation has recognized this challenge and supported grantees who have carried out extensive advocacy efforts at national level to promote greater public funding, as well as supporting extensive work on the development of district water plans (see **box 7**) to show the scale of the investment gap and the extent of financing required to support sustainable services. In some cases, the Conrad N. Hilton Foundation has also supported SDMs to gain greater operational efficiencies and cost savings. But, overall, there have been limited investments on the supply side of sector financing by building capacity and opening up commercial lending opportunities for rural operators to leverage private investments. Interventions in support of addressing financing challenges have been limited to the expansion of loan products for integrated water solutions for households and businesses in Uganda and the development of a targeted water subsidy strategy in Ghana.

Box 7: Strategic plan for North Mecha Woreda

The North Mecha Woreda has developed its 12-year WASH strategic plan to be implemented in 33 rural and 6 urban kebeles of the woreda, identifying the requirements for attaining full coverage by 2030 through a thorough Life Cycle Cost estimation of WASH facilities. The total budget planned for the program is USD 33,8 million; 93% of which should be allocated to water, 3.7% to sanitation and 0.5% to hygiene. The major share of the estimated budget is expected to come from the government (40.6%), the user communities (8%), NGOs and bilateral actors (51.4%) (IRC, 2018).

References

1001Fontaines. 2022. **'Achieving Universal Access to Safely Managed Water Services in Rural Cambodia: The Case for Complementarity of Water Supply Solutions'.** Cambodia: 1001fontaines.

Adank, M., van Lieshout, R. and Ward, R. 2021. **'Utility-Managed Rural Water Services: Models, Pathways, Drivers, Performance and Areas for Support. Thematic Overview Paper'.** The Hague, The Netherlands: IRC.

Arlosoroff, S., Tschanneri, G., Grey, D., Journey, W., Karp, A., Langenegger, O. and Roche, R. 1987. **Community water supply: the handpump option.** Washington, DC: World Bank.

Armstrong, A., Hope, R. and Koehler J. 2022. **Piped water revenue and investment strategies in rural Africa.** 2022 Environ. Res.: Infrastruct. Sustain. 2 035003

Baumann, E. 2006. **'Do Operation and Maintenance Pay?'** Waterlines 25 (1): 10–12. https://doi.org/10.3362/0262-8104.2006.033.

Batz, F.J., Lorek, S., Majewski, J. and Lassenberger, C. 2010. **'Pro-Poor Financial Services for Rural Water: Linking the Water Sector to Rural Finance'.** Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). https://www.icafrica.org/en/knowledge-hub/article/pro-poor-financial-services-for-rural-water-linking-water-sector-to-rural-finance-187/.

Briscoe, J., Ferranti, D.1988. **Water for Rural Communities.**

Carter, R. 2021. **Rural Community Water Supply: Sustainable Services for All.** Rugby, UK: Practical Action Publishing. https://doi.org/10.3362/9781788531689.

Carter, R. 2023. **'Professionalising Community Management of Rural Water Supply: Navigating the transition in sub-Saharan Africa'.** RWSN, Publication 2023-1. https://www.rural-water-supply.net/en/resources/details/1103

Carter, R., and Ross, I. 2016. **'Beyond "Functionality" of Handpump-Supplied Rural Water Services in Developing Countries'**. Waterlines 35 (1): 94–110. https://doi.org/10.3362/1756-3488.2016.008.

Chintalapati, P., Lockwood, H., Linden, K., Nyaga, C., Harvey, A., Lane, A., Jordan, E. and Lazarte, E. 2020. **'Maintenance Approaches to Improve the Sustainability of Rural Water Supplies'.** Research Brief. Boulder, Colorado: University of Colorado Boulder.

Chowns, E. 2015. **'Is Community Management an Efficient and Effective Model of Public Service Delivery? Lessons from the Rural Water Supply Sector in Malawi'.** Public Administration and Development 35 (4): 263–76. https://doi.org/10.1002/pad.1737.

CRS. 2022. **'The Azure Initiative Mobilizes Capital and Technical Knowledge to Improve and Expand Water Services for Communities Living in Poverty, in Rural and Peri-Urban Areas of Central America.'** Investing in Water, Investing in People. 2022. https://www.azurewater.org/#/.

Dalberg. 2017. **'The Untapped Potential of Decentralized Solutions to Provide Safe, Sustainable Drinking Water at Large Scale: The State of the Safe Water Enterprises Market'.**

Diallo, O. 2015. **'Levers of Change in Senegal's Rural Water Sector'.** Water and Sanitation Program. Water and Sanitation Program; World Bank.

ESAWAS. 2022. **'The Water Supply and Sanitation Regulatory Landscape Across Africa; Content Wide Synthesis Report'.** Eastern and Southern Africa Water and Sanitation Regulators Association. https://esawas.org/repository/Esawas_Report_2022.pdf.

Government of Ethiopia (GoE), 2021. **Federal Democratic Republic Of Ethiopia Water Development Commission Draft Report on National WaSH Inventory-II & MIS Jan 2021**, https://www.ircwash.org/sites/default/files/national_wash_invetory_2_and_mis_report.pdf

Fonseca, C., Mansour, G., Smits. F., and Rodriguez, R. 2021. **'The Role of National Public Development Banks in Financing the Water and Sanitation SDG 6, the Water Related Goals of the Paris Agreement and Biodiversity Protection.'** Finance in Common.

Foster, T. 2012. **'Private Sector Provision of Rural Water Services: A Desk Study for Water for People'.** Water for People.

Foster, T., and Hope, R. 2017. **'Evaluating Waterpoint Sustainability and Access Implications of Revenue Collection Approaches in Rural Kenya'.** Water Resources Research 53 (2): 1473–90. https://doi.org/10.1002/2016WR019634.

Foster, T., Hope, R., Nyaga, C., Koehler, J., Katuva, J., Thomson, P., and Gladstone, N. 2022. **'Investing in Professionalized Maintenance to Increase Social and Economic Returns from Drinking Water Infrastructure in Rural Kenya'**. Policy Brief.

Franceys, R. 2019. **'Utilitisation'.** The Hague.

Gerlach, E. 2019. **'Regulating Rural Water Supply Services: A Comparative Review of Existing and Emerging Approaches with a Focus on GIZ Partner Countries'.** Bonn, Germany: Gesellschaft für Internationale Zusammenarbeit (GIZ).

Gia, L.H, and Fugelsnes, T. 2010. **'Public-Private Partnerships for Small Piped Water Schemes - a Review of Progress in Seven African Countries'.** World Bank Water & Sanitation Program.

Harvey, A. 2021. **'Ten Factors for Viable Rural Water Services'. Research Report. Sustainable WASH Systems Learning Partnership.** Sustainable WASH Services program, USAID, 2021 https://www.globalwaters.org/sites/default/files/whave-_ten_factors_final.pdf

Harvey, P., and Reed, B. 2004. **Rural Water Supply in Africa: Building Blocks for Handpump Sustainability.** Water, Engineering and Development Centre Loughborough University. https://wedc-knowledge.lboro.ac.uk/resources/books/Rural_Water_Supply_in_Africa_-_Complete.pdf.

Hendry, S. and Akoumianaki I. 2016. **'Governance and Management of Small Rural Water Supplies: A Comparative Study'.** CREW – Scotland's Centre of Expertise for Waters. https://crew.ac.uk/publications

Hope, R., Goodall, S., Katilu, A., Koehler J., and Thomson, P. 2015. **'Financial Sustainability for Universal Rural Water Services - Evidence from Kyuso, Kenya'.** Working Paper 2. Water Programme. Kenya: University of Oxford. https://programme.worldwaterweek.org/Content/ProposalResources/allfile/ssee_waterprogramme_wp2_aug2015_1.pdf.

Hope, R, Thomson, P, Koehler J., and Foster, T. 2020. **'Rethinking the Economics of Rural Water in Africa'.** Oxford Review of Economic Policy 36 (1): 171–90. https://doi.org/10.1093/oxrep/grz036.

Hope, R., Fischer, A., Hoque, S.F., Alam, M.M., Charles, K., Ibrahim, M., Chowdhury, E.H., Salehin, M., Mahmud, Z.H., Akhter, T., Thomson, P., Johnston, D., Hakim, S.A., Islam, M.S., Hall, J.W., Roman, O., El Achi N., and Bradley, D. 2021. **Policy reform for safe drinking water service delivery in rural Bangladesh.** REACH Working Paper 9, University of Oxford, UK. https://reachwater.org.uk/wp-content/uploads/2021/06/Hope-et-al-2021-SafePani-report-MAIN.pdf

Huston, A., Moriarty, P., and Lockwood, H. 2019. **'All Systems Go! Background Note for the WASH Systems Symposium.'** The Hague, The Netherlands: IRC. https://www.ircwash.org/sites/default/files/084-201910background_symposium_extended.pdf.

Huston, A., Gaskin, S., Moriarty, P., and Watsisi, M. 2021. **'More Sustainable Systems Through Consolidation? The Changing Landscape of Rural Drinking Water Service Delivery in Uganda'.** Water Alternatives 14 (1): 248–70.

Huston, A., and Moriarty, P. 2018. **'Understanding the WASH System and Its Building Blocks'.** Working Paper. The Hague, The Netherlands: IRC International Water and Sanitation Centre.

Hutchings, P., Chan, M.Y., Cuadrado, L., Ezbakhe, F., Mesa, B., Tamekawa, C. and Franceys, R. 2015. **A systematic review of success factors in the community management of rural water supplies over the past 30 years.** Water Policy, 17(5), pp.963-983.

IIED, 2014. **Global Water Initiative Sustainability Assessment (2017 – 2012).** International Institute for Environment and Development, November 2014 https://www.iied.org/g03920

Innovations for Poverty Action. 2011. **'The Impact of Savings Groups on the Lives of the Rural Poor in Ghana, Malawi, and Uganda'.** Study Summary. Washington: CARE. https://www.poverty-action.org/printpdf/6221.

IRC. 2018. **North Mecha Woreda and Merawi Town 2019 to 2030 West Gojjam Zone,** Amhara National Regional State. https://www.ircwash.org/resources/north-mecha-woreda-and-merawi-town-2019-2030-west-gojjam-zone-amhara-national-regional

Jansz, S. 2011. **'A Study into Rural Water Supply Sustainability in Niassa Province'.** WaterAid. https://policycommons.net/artifacts/2331132/report/3091757/.

JMP(WHO/UNICEF), 2021. **Progress Household Drinking Water,** Sanitation and Hygiene 2000-2020

Katz, T., and Sara, J. 1997. **'Making Rural Water Supply Sustainable: Recommendations from a Global Study.'** Washington, D.C: UNDP-World Bank Water and Sanitation Program.

Koehler, J., Nyaga, C., Hope, R., Kiamba, P., Gladstone, N., Thomas, M., Mumma, A. and Trevett, A. 2021. Kleemeier, E., 2010. **Private operators and rural water supplies: a desk review of experience.** Water Unit, World Bank, Washington, DC, USA

Kleemeier, E., and Lockwood, H. 2015.

'Public-Private Partnerships for Rural Water Services'. The Hague, The Netherlands: IRC - Triple S Project.

Landes, L., LaRose, E., Buck, S., Ohle, N., Ted, S., Barnes, G., Sekhar, M., and Gerald, C. 2021. **'Regionalization: RCAP's Recommendations for Water and Wastewater Policy'.** Research Report. Rural Community Assistance Partnership (RCAP).

Lockwood, H. 2002. **'Institutional Support Mechanisms for Community-Managed Rural Water Supply and Sanitation Systems in Latin America. Ehp Strategic Paper No. 6'.** Strategic Report 6. Washington, DC: USAID, Bureau for Latin America and the Caribbean. http://www.bvsde.paho.org/bvsacg/fulltext/SR6mech.pdf.

Lockwood, H., and Le Gouais, A. 2015. **'Professionalising Community-Based Management for Rural Water Services'.** Briefing Note. IRC - Triple S Project.

Lockwood, H, and Smits S. 2011. **Supporting Rural Water Supply: Moving towards a Service Delivery Approach.** Warwickshire, UK: Practical Action Publishing. https://www.ircwash.org/sites/default/files/Lockwood-2011-Supporting.pdf.

Lockwood, 2019, **Sustaining Rural Water: A Comparative Study Of Maintenance Models For Community-Managed Schemes,** Sustainable WASH Systems Project, USAID July 2019. https://www.globalwaters.org/resources/assets/sws/sustaining-rural-water-comparative-study-maintenance-models-community-managed

Lockwood, H. Chintalapati, P. Cord C., and Libey A. 2021. **'A Roadmap for System Strengthening for Professionalized Rural Water Maintenance Services.'**

Magara, P. 2013. **The role of Hand Pump Mechanics Associations in improving the operation and maintenance of rural water and sanitation services - an update.** IRC Briefing note.

Marks, S.J., Kumpel, E., Guo, J., Bartram, J. and Davis, J. 2018. **Pathways to sustainability: A fuzzy-set qualitative comparative analysis of rural water supply programs.** Journal of Cleaner Production, 205, pp.789-798.

McAlister, M.M., Zhang, Q., Annis, J., Schweitzer, R.W., Guidotti, S. and Mihelcic, J.R. 2022. **Systems thinking for effective interventions in global environmental health.** Environmental Science & Technology, 56(2), pp.732-738.

McFarlane, K., and Harris, L.M. 2018. **'Small Systems, Big Challenges: Review of Small Drinking Water System Governance'.** Environmental Reviews 26 (4): 378–95. https://doi.org/10.1139/er-2018-0033.

McNicholl, D., Hope, R., Money, A., Lane, A., Armstrong, A., van der Wilk, N., Dupuis, M., Harvey, A., Nyaga, C., Womble, S., Favre, D., Allen, J., Katuva, J., Barbotte, T., Buhungiro, E., Thomson, P. and Koehler, J. (2019). **'Performance-based funding for reliable rural water services in Africa',** Uptime Consortium Working paper 1.

McNicholl, D., Hope, R., Money, A., Nyaga, C., Katuva, J., Koehler, J., Thomson, P., et al. 2021. **'Delivering Global Rural Water Services through Results-Based Contracts'.** Working Paper. UpTime.

Mengueze, S., Mbuvi, D., Dickin, S. and Schuster-Wallace, C., 2014. **A micro financing framework for rural water and sanitation provisioning in Sub-Saharan Africa.** United Nations University. https://doi.org/978-92-808-6041-2.

Miller, M., Cronk, R., Klug, T., Kelly, E.R., Behnke, N. and Bartram, J., 2019. **External support programs to improve rural drinking water service sustainability: A systematic review.** Science of the total environment, 670, pp.717-731.

Ministry of Finance, Planning and Economic Development, Uganda. 2021. **National Budget Framework Paper FY 2020/21 – FY 2024/25**

Ministry of Water, Irrigation and Energy. (2018). **RWS O&M Strategic Framework - CMP CoWASH Ethiopia** (cmpethiopia.org)

Ministry Water and Mines, Benin. 2022. **'Signing of Three (03) Leasing Contracts for Hydraulic Structures for Drinking Water Supply in Rural Areas'.** Ministry of Water and Mines of the Republic of Benin. 2022. https://eau-mines.gouv.bj/article/71/signature-trois-03-contrats-affermage-ouvrages-hydrauliques-alimentation-potable-milieu-rural/.

Ministry of Water and Environment. 2018. **Uganda's Water and Environment Sector Strategic Investment Plan 2018-2030.** https://www.mwe.go.ug/sites/default/files/library/2018%20UGANDA%20SSIP%20POPULAR%20VERSION_0.pdf

Ministry of Water and Environment (MWE). 2020. **'National Framework for Operation and Maintenance of Rural Water Infrastructure in Uganda'.** Republic of Uganda, Ministry of Water and Environment, Directorate of Water Development: Rural Water Supply and Sanitation.

Ministry of Sanitation and Water Resources (MSW) National Water Policy Revised 2022, Government of Ghana, Ministry of Sanitation and Water Resources, Unpublished. 2023

Montangero, A. 2008. **'Promising Management Models of Rural Water Supply Service'.** SDC in collaboration with Eawag/Sandec, Helvetas and Skat.

Moriarty, P., Smits, S., Butterworth, J. and Franceys, R., 2013. **Trends in rural water supply: Towards a service delivery approach.** Water alternatives, 6(3), p.329.

National Planning Authority. 2013. **Uganda vision 2040**

National Planning Authority. 2020. **National Development Plan III 2020-2025**

Nilsson, K., Hope, R., McNicholl, D., Nowicki, S., and Charles, K. 2021. **'Global Prospects to Deliver Safe Drinking Water Services for 100 Million Rural People by 2030'.** Working Paper. RWSN.

NWASCO. 2018. **'Rural Water Supply and Sanitation - Framework for Provision and Regulation in Zambia'.** Lusaka, Zambia: National Water Supply and Sanitation Council of Zambia.

Organisation for Economic Co-operation and Development. (n.d.). **Official Development Assistance (ODA) - Net disbursements - Total by recipient country [Data set].** OECD.Stat. https://stats.oecd.org/Index.aspx?DataSetCode=crs1

OFOR, Republic of Senegal. 2021. **"Gouvernance De L'eau Et Objectifs De Développement Durable: Avancées Et Défis À L'échelle Des Collectivités Territoriales Dans L'espace UEMOA."**

Pories, L., Fonseca, C., and Delmon, V. 2019. **'Mobilising Finance for WASH: Getting the CNHF Right'.** Working Paper. IRC.

REAL-Water, 2023. **Financial Innovations for Rural Water Supply in Low-Resource Settings.** United States Agency for International Development (USAID) Rural Evidence and Learning for Water.

Renouf, R., and Abidi, Y. 2022. **'The Challenge of Small Towns: Professionalising Piped Water Services in Western Uganda'.** Topic Brief. Uganda: Water & Sanitation for the Urban Poor (WSUP).

Rickert, B., Barrenberg, E., Schmoll, O., Weltgesundheitsorganisation, and Vereinte Nationen, eds. 2016. **Taking Policy Action to Improve Small-Scale Water Supply and Sanitation Systems: Tools and Good Practices from the Pan-European Region.** Kopenhagen: WHO Regional Office for Europe.

RWSN. 2019. **'The 2019 Rwsn Directory of Rural Water Supply Services, Tariffs, Management Models, and Life Cycle Costs'.** St. Gallen, Switzerland: RWSN.

de San, J.A.S.R., Flores, M.M.T., Vilchis, F.L., Tovar, L.A.R. and Pedraza, A.Y.B., 2015. **Community water management in Latin America and the Caribbean: Challenges for Mexico.** Journal of Sustainable Development, 8(3), p.102. https://doi.org/10.5539/jsd.v8n3p102.

Schouten, T., and Moriarty, P. 2002. **Community Water, Community Management: From System to Service in Rural Areas.** Practical Action Publishing.

Shantz, A. 2018. **'Rural Water Supply in Cambodia: A Consolidation of Data & Knowledge and Identification of Gaps & Research Needs'.** Technical Note. Phnom Penh, Cambodia. WaterAid.

Sutton, S. and Butterworth, J., 2021. **Self-supply: Filling the gaps in public water supply provision.** Practical Action Publishing. https://doi.org/10.3362/9781780448190.

Sy, J. 2014. **'Reforms and Public-Private Partnerships in Senegal's Rural Water Sector'.**

Thapa, D., Farid, M.N. and Prevost, C. 2021. **'Governance Drivers of Rural Water Sustainability: Collaboration in Frontline Service Delivery'.** Working Paper 9798. Policy Research. The World Bank. https://doi.org/10.1596/1813-9450-9798.

Thomson, P. 2021. **Remote Monitoring of Rural Water Systems: A Pathway to Improved Performance and Sustainability?** https://onlinelibrary.wiley.com/doi/10.1002/wat2.1502.

Tkachenko, O., and Mansour, G. 2021. **'Blended Finance in Water, Sanitation and Hygiene (WASH) Lessons for DFAT'.** International WaterCentre & Aguaconsult.

UDUMA. 2017. **'Investing in Essential Services in Rural Areas'.** https://www.uduma.net/wp-content/uploads/2019/07/UDUMA-investors-brochure.pdf.

UNICEF. 2021. **2021 WASH BUDGET BRIEF**

USAID. 2020. **'Rural Water Services'.** Technical Brief 1. Water and Development Technical Series. U.S. Agency for International Development. https://www.globalwaters.org/resources/assets/usaid-water-and-development-technical-series-rural-water-services.

Valcourt, N., Walters, J., Javernick-Will, A., Linden, K. and Hailegiorgis, B., 2020a. **Understanding rural water services as a complex system: An assessment of key factors as potential leverage points for improved service sustainability.** Sustainability, 12(3), p.1243.

Valcourt, N., Walters, J., Javernick-Will, A., Linden, K. and Hailegiorgis, B. 2020b. **'Understanding Rural Water Services as a Complex System: An Assessment of Key Factors as Potential Leverage Points for Improved Service Sustainability'.** Sustainability 12 (3): 1243. https://doi.org/10.3390/su12031243.

Valcourt, N., Walters, J., Javernic-Will, A., and Hollander, D. 2019. **'Factor Mapping for Rural Water and Small Town Sanitation Services'.** Research Report. Sustainable WASH Systems Learning Partnership.

Valcourt, N., Javernick-Will, A., Walters, J. and Linden, K., 2020. **System approaches to water, sanitation, and hygiene: a systematic literature review.** International Journal of Environmental Research and Public Health, 17(3), p.702.

van Koppen, B., Butterworth, J. and Juma, I., 2005. **African water laws: Plural legislative frameworks for rural water management in Africa: An international workshop,** Johannesburg, South Africa, 26-28 January 2005. International Water Management Institute.

WASREB. 2019. **'Guideline for Provision of Water and Sanitation Services in Rural and Underserved Areas in Kenya'.** Water Services Regulatory Board, Government of Kenya.

Walters, J. P., and Javernick-Will, A.N. 2015. **'Long-Term Functionality of Rural Water Services in Developing Countries: A System Dynamics Approach to Understanding the Dynamic Interaction of Factors'.** Environmental Science & Technology 49 (8): 5035–43. https://doi.org/10.1021/es505975h.

WASH-FIN. 2019. **'USAIDid Water, Sanitation and Hygiene Finance (USAID WASH-FIN) Senegal'.** USAID.

Watts, R., Walton D., and Knox, D. 2021. **Blueprint: financing a future of safe water, sanitation and hygiene for all.** WaterAid, May 2021

Whave. 2022. **Open Data**

Whittington, D., Davis, J., Prokopy, L., Komives, K., Thorsten, R., Lukacs, H., Bakalian, A. and Wakeman, W., 2009. **How well is the demand-driven, community management model for rural water supply systems doing? Evidence from Bolivia, Peru and Ghana.** Water Policy, 11(6), pp.696-718.

WHO, 2020. **Costing and financing of small-scale water supply and sanitation services.** Copenhagen: WHO Regional Office for Europe; 2020. Licence: CC BY-NC-SA 3.0 IGO.

WHO, UNICEF, World Bank. 2022. **"State of the world's drinking water: an urgent call to action to accelerate progress on ensuring safe drinking water for all".** Geneva: World Health Organization; 2022.

Wilk, van der, N. 2019. **'Conditions for Private Sector Involvement and Financing in Rural Water Supply'.** In All Systems Go! WASH Symposium. The Hague, The Netherlands: IRC.

World Bank (WSP) and AfDB. 2013. **'Professionalized Rural Service Areas: A Strategy: Volume 1 - Strategy Overview'.** World Bank WSP and the African Development Bank.

World Bank. 2017. **"Sustainability Assessment of Rural Water Service Delivery Models: Findings of a Multi-Country Review."** World Bank, Washington, DC. https://documents1.worldbank.org/curated/en/271221503692975915/pdf/Sustainability-assessment-of-rural-water-service-delivery-models-findings-of-a-multi-country-review.pdf

World Bank, 2017. **'Toward a Universal Measure of What Works on Rural Water Supply: Rural Water Metrics Global Framework'.** Water Global Practice Topic Brief, World Bank, 2017. https://openknowledge.worldbank.org/server/api/core/bitstreams/42a9968b-0ad0-5159-94ae-8f350d40e598/content

World Bank. 2022. **"GWSP 2022 Annual Report: 5 years of Working Together Toward a More Water Secure World".** Washington DC: The World Bank

World Bank Open data. 2022 https://data.worldbank.org/

Conrad N. Hilton Foundation: Safe Water Initiative

The Conrad N. Hilton Foundation's Safe Water Initiative, using the district as a unit of scale, focuses on system-strengthening and service delivery to ensure reliable, affordable, and safely managed water to one million people in low-income households, health facilities, and schools in sub-Saharan Africa. The Safe Water Initiative contributes to building local capacity, narrowing gaps between those living in disadvantage and others, and generating evidence to inform regional, national, and global actors—with the end goal of improved health and socioeconomic outcomes for all.

SafeWater-Strategy25-Summary.pdf (hiltonCNHF.org)

Annex 1: Donor Consultations

Consultations were held with the following donors and philanthropic organizations by the review team. Calls were recorded and annotated and the key insights and trends were identified to inform this report:

Stone Family Foundation
United Kingdom

Osprey Foundation
USA

Vitol Foundation
United Kingdom

Aqua for All
Netherlands

VOx Impuls
Netherlands

African Development Bank
Cote d'Ivoire

Foreign, Commonwealth & Development Office
United Kingdom

Department for Foreign Affairs and Trade
Australia

Ministry of Foreign Affairs, DGIS
Netherlands

United States Agency for International Development
USA

Annex 2: Functionality Data

Country or Region	Key Finding	Source
Sub-Saharan Africa	36% hand pump non-functionality	Small rural towns
	Country-level non-functionality ranging from 10% to 65%	RWSN, 2010
	40% hand pump non-functionality	Sutton, S., 2005
	35-50% water system non-functionality 5 years after construction	Improve International, 2015
	25% hand pump non-functionality	Foster et al. 2019
Cambodia	12% hand pumps non-functionality	Foster et al. 2018
Cameroon	32% of hand pumps non-functionality	Deal and Furey, 2019
	10- 60% of drinking water supply systems non-functionality	Mvongo and Defo, 2021
Ethiopia	38.6% water scheme non-functionality	Welle, K., Williams, J., 2014
	25.5% of water scheme non-functionality	National WASH inventory Office (NWI), 2013
Ghana	30% water scheme non-functionality	Adank, 2012
	29% rural point systems non-functionality	Nyarko et al, 2011
	20% wells non-functionality	World Vision US, 2014
Kenya	42% rural water sources non-functionality	Kenya Ministry of Water and Irrigation, 2009
Liberia	40% improved water points non-functionality	Government of Liberia, 2013
Madagascar	27% water systems non-functionality	Ryan, P. 2014
Malawi	69% hand pump non-functionality	
	51% gravity-flow scheme non-functionality	Baumann, E and Danert, K., 2008
	50%-60% water points non-functionality	Annis,J. 2013
	66% MALDA handpumps non-functionality	Ministry of Irrigation, 2011

Country or Region	Key Finding	Source
Mali	14%- 41% water points non-functionality	Stephen, J., 2013
Nepal	82% non or limited functionality of gravity flow schemes	Government of Nepal, 2013
Nigeria	50% water points and schemes non-functionality	World Bank, 2017
Sierra Leone	18.2% water point non-functionality	Foster, 2013
Tanzania	46% improved water points non-functionality	WaterAid, 2009
Uganda	29% water points non-functionality	World Bank, 2019
	17.9% water point non-functionality	Foster, 2013
	45% water point non-functionality	Owor et al, 2017
	77% water point non-performance (sufficient yield and reliability)	

Annex 3: Evolution of Alternative Management Arrangements

Country	Management Arrangement	Scale	Stage of Development	Drivers	Lead Institutions	Source
Central African Republic	Water for Good circuit rider model supporting CBM	Prefecture (9 of 16)	Well-established	Lack of government presence Humanitarian necessity Conflict and fragility	International NGO	Water For Good, 2022 Lockwood, 2019
Ethiopia (Tigray Province)	Piloting and scaling up of Private local service providers for professionalized maintenance to CBM-based iWET program in Tigray	Regional (with national interest)		Failure of existing approaches Federal policy on youth employment	International and local NGOs Devolved regional government Ministry of Micro and Small-Scale Enterprises	Lockwood, 2019
Ghana	Transition of functions of CWSA into rural utility actively operating and managing water piped facilities	National	Early stage of operationalization (not yet approved by Parliament)	Significant shifts or withdrawal of institutional funding Political influence	Water Ministry Parastatal	Huston et al, 2020 IRC, 2017
Kenya	New regulatory guidelines issued by WASREB for: Establishment of new County WSPs Regulation of existing County WSPs Delegation of O&M by County	National and devolved County	Not yet operationalized at scale	Policy influence Political decentralization	Regulator Water Ministry Devolved govts.	WASREB, 2019

Country	Management Arrangement	Scale	Stage of Development	Drivers	Lead Institutions	Source
Kenya	Piloting of professionalized performance-based maintenance provider supporting CBM; (FundiFix)	Sub-county (Kitui and Kwale Counties)	Proof of concept established	Research Donor support Policy influence	Social enterprise University	Koehler, Nyaga et al, 2021 FundiFix, 2022 Lockwood, 2019
Mali	Introduction of obligation of municipalities to delegate public service to associations or private operators	National (30 centers)	Well established	Limited progress, poor technical and financial performance Donor support	Ministry of Energy and Water	Ministry of Energy and Water, 2016
Rwanda	Introduction of private sector participation through PPP contracts let at district level and governed by national regulator	National	Well-established	Rationalization and increased performance of service providers	Regulator Water ministry Local govts.	Capacity Building Plan for RUWASA USAID, 2022
Senegal	Establishment of Rural Borehole Management Office, (*Office des Forages Ruraux*), a national asset holding agency responsible for managing, monitoring, and delegating rural water supply assets to enable PPP contracting.	National	Well-established	Policy influence Donor support	Ministry of Water	Evaluation of rural water reform, 2022
Tanzania	Establishment of RUWASA as rural water utility provider to rationalize and reform rural water service provision (water Supply Act No. 2019 ,5)	National (129 rural districts and 61 towns)	Recently established	Poor sector performance Limited technical and financial performance of COWSOs	Ministry of Water	USAID Tanzania, 2022

Country	Management Arrangement	Scale	Stage of Development	Drivers	Lead Institutions	Source
Uganda	Introduction of new National O&M Strategy to establish professionalized maintenance services for support to CBM through Area Service Providers	National	Not yet operationalized at scale	Failure of existing approaches Policy influence	Water ministry National and iNGOs Donors	MWE, 2020 Harvey, 2021 Lockwood, 2021
Zambia	Extension of Commercial Utility mandate to cover rural areas to delegate functions to private operators included in Framework for Provision and Regulation for Rural WSS services	National	Not yet operationalized at scale	Failure of existing approaches based on community-based management	Regulator Water ministry	NAWASCO, 2018 WaterAid, 2021