

LOCKWOOD et al.

---

**40<sup>th</sup> WEDC International Conference, Loughborough, UK, 2017****LOCAL ACTION WITH INTERNATIONAL COOPERATION TO IMPROVE AND SUSTAIN WATER, SANITATION AND HYGIENE SERVICES****Global study on sustainable service delivery models for rural water: evidence from 16 countries***H. Lockwood & G. Mansour (UK), S. Smits & S. Smets (Netherlands)***PAPER 2583**

---

*An assessment of rural water supply sustainability was commissioned by the World Bank in 16 countries utilizing five building blocks and a taxonomy of prevailing service delivery models. Results show a mixed picture in progress towards establishing optimum conditions for sustainability. Institutional capacity has advanced most markedly. Financing and monitoring score second highest, with good examples in countries such as Nicaragua and the Philippines. Consistently lower scores are found for asset management and water resource management. Community-based management is still the predominant management model, often formalized in policy, but not systematically supported or regulated. A greater differentiation of other service delivery models is found, with a trend - especially in urbanizing, middle-income countries - towards the delivery of services by utilities, private operators and/or through the aggregation of multiple rural schemes under one management entity. Dispersed rural populations continue to rely on either poorly supported community-based management or self-supply.*

---

**Introduction and methodology**

In order to better understand how rural water service delivery is evolving, and where bottlenecks for sustainability lie, a global study across 16 countries was conducted in Bangladesh, Benin, Brazil, China, Ethiopia, Ghana, Haiti, India, Indonesia, Kyrgyzstan, Morocco, Nepal, Nicaragua, the Philippines, Tanzania and Vietnam. These countries all receive World Bank support through lending and/or technical assistance and represent a range of geographies, socio-economic indicators, water supply systems, and government-led approaches to rural water supply. The objective of the study is to examine experiences with sustainable service delivery, and to distil lessons and solutions for improving country programs and global dissemination.

The study is based on a desk review, using secondary data and reports, combined with in-country visits and interviews with key stakeholders for seven out of the 16 countries. An analytical framework building on previous analysis under the Sustainable Services at Scale programme (Lockwood and Smits, 2011) was used, with five key areas or 'building blocks' of sustainability, namely: Institutional Capacity; Financing; Asset Management; Water Resource Management and Security; and Monitoring and Regulation. It also examines the main Service Delivery Models (SDM) categorized as:

- Community-based management
- Direct local government provision
- Public utility provision
- Private sector provision
- Supported self-supply<sup>1</sup>

**Analytical framework and scoring**

The framework uses the building blocks as a lens for analysis, appreciating the different institutional levels from sector to service authority and service provider level. It accounts for aspects of sector governance, structure and overall country context, all of which are important when assessing the arrangements and performance of rural water service delivery. In order to assess and compare countries' progress in

establishing conditions for sustainable rural water services, a scoring is applied at two levels based on a set of questions pertaining to ideal conditions to be in place across the five building blocks.

Firstly, at **sector level** the assessment considers whether essential conditions for sustainability have been put in place across the five building blocks. Secondly, at **service delivery level** it assesses whether and how conditions for sustainability are effective for formally established Service Delivery Models in a country. For all 16 countries, each building block is scored using four questions that have been developed in accordance with the analytical framework of the study and represent some of the core elements of what may be expected in an ideal scenario for the delivery of sustainable water services. The actual scoring (zero, one and two) reflect three possible scenarios, which broadly equate to the following definitions:

- 0 = very limited conditions or elements in place, or no evidence of progress towards the building block
- 1 = partial conditions in place or some evidence of progress towards the building block
- 2 = most conditions or elements are in place and good evidence of progress towards the building block

The total possible score for each building block is eight. The scoring of the main SDMs is similar to that for the building blocks at sector level, but each model is assessed according to every building block with questions focusing on the key elements, conditions or capacities that should be in place at the level of the service provider. The ranges are the same with three main scenarios corresponding to a zero score (none or limited), a score of two (partial progress) or a three (mostly in place or all conditions met). The aggregate scores are therefore out of 40 with the following ranges: 0 -15 = red; 16 – 25 = yellow; and 26 – 40 = green.

Scores for each building block are aggregated for each country into a sector score and by SDM to allow for an analysis at global level and across management model to determine common strengths and weaknesses. For Brazil, China and India, the analysis was carried out in one or two states or provinces and scoring applies only to these subnational administrations, recognizing that some aspects reflect national policies and institutional arrangements.

## Country contexts

The study includes a range of demographic scenarios with both urbanizing countries (including small towns) and relatively low rural population growth (e.g. Bangladesh, Ghana, Haiti, India, Indonesia, Nicaragua and Vietnam); and countries where urbanization is slower and rural populations are still increasing in absolute terms (these include Benin, Ethiopia, Kyrgyzstan, Nepal, Philippines and Tanzania). Finally, urbanized countries with lower proportions of the population living in rural areas and/or low or negative rural population growth such as Brazil, China, and Morocco. These present scenarios of changing consumer demand and types of water supply schemes which are technically and financially feasible through, for example, cross-subsidies.

The range of 16 countries includes some of the poorest in the world to emerging leading economies such as China, Brazil and India, which are also home to most of the world's rural population and in theory have more public financing available to support rural services, including water supply. The upper-middle income countries such as Brazil and China, also have high levels of access to rural water services and high levels of access to piped services onto premises. The lower middle-income group, which includes Bangladesh, Ghana, Kyrgyzstan, Nicaragua, Philippines, Morocco, India, Indonesia and Vietnam all of which have low to medium levels of piped access of between approximately 5% to 40%. However, this group displays a high level of heterogeneity between countries, with some having relatively low GNI per capita, but good progress in terms of increased access (i.e. Kyrgyzstan and Nicaragua) or higher levels of GNI with little progress towards increasing access to improved services in rural areas. The third grouping consisting of Benin, Ethiopia, Haiti, Nepal and Tanzania, all of which have low access rates to piped supply (<5%), and a GNI of below USD 4,000 per capita.

Consideration of the economic context is important for a number of reasons; as countries develop economically and transition from grants to concessionary loans to fully repayable (market-based) finance, the capacity for public financing is often stretched and governments must prioritize sectors of investments (although it can also be argued that accessing loans actually increases the efficiency and capacity of public funding). At the other end of the spectrum for countries, such as Ethiopia and Haiti, which are still heavily dependent on aid across many different sectors, the challenge is to coordinate aid flows effectively and to harmonize the approaches promoted by different donors, as well as aligning with government priorities.

All of the countries in the study are characterized by administrative structures which are decentralized down to local government levels, with some functions further decentralized to lower levels including village

governments; for example, the Barangay in the Philippines and the Gram Panchyats in India. Some countries have made strong advances in terms of fiscal decentralization and make significant inter-governmental transfers to lower levels. China is particularly noteworthy in this regard and has one of the highest levels of spending authority assigned to sub-national governments globally, estimated at 74% (Chunli et al. 2012). There are also examples from lower income countries, where fiscal decentralization has progressed strongly, such as Ethiopia which allocates 20% and 25% of national budgets to Regional and Woreda governments respectively (World Bank, 2016). But even in cases where broader decentralization has been relatively successful, such as Kyrgyzstan which was among the first post-Soviet countries to take steps towards public administration reforms, the absolute level of public funding available means that local governments have limited resources. In short, strong fiscal decentralization only goes so far in a context of (highly) constrained public financing. The status and extent of decentralization, including fiscal transfers and decision-making authority, is relevant for rural water because in most countries responsibility to ensure service provision now rests with local government, especially for long-term support, monitoring and oversight (rather than the initial capital investment programs).

### **Access patterns in rural water**

While some countries have high levels of access to improved and piped supplies, others still face huge challenges in providing basic levels of service to a majority of the rural population (e.g. Tanzania, Haiti and Ethiopia, all of which are at under 50%; JMP; 2015). Several middle-income countries have made significant progress (including Brazil (87%), China (93%), Indonesia (79%), the Philippines (90%), and Vietnam (97%)). Interestingly, countries such as Ethiopia, Benin and Nepal have managed to increase access in the context of much slower economic growth, where GNI per capita has not exceeded USD 2,000. Tanzania stands out as a stark case where economic growth has not translated into improved rural water services, which have remained virtually static over the last 25 years. Haiti has experienced an actual decrease in access in the context of near-stagnant economic growth. These trends indicate that although increased wealth may play a significant role in increasing access to infrastructure, other factors, such as political prioritization, efficient policies and a country's geography, are likely to be key to understanding its pathway towards improved rural water services.

## **Findings from sixteen country study**

### **Sector level assessment**

Figure 1 shows a mixed picture of how far the building blocks for sustainability are progressively put in place across different countries. Each building block has a maximum score of 8 points. Scores are summed across all building blocks to give a country aggregate score with a maximum of 40. Aggregate scoring thresholds are 0 – 15 = red; 16 – 25 = yellow; 26 – 40 = green. Generally institutional capacity has advanced, consistently scoring the highest in all countries. Financing and monitoring building blocks score second highest, with good examples in countries such as Nicaragua and the Philippines. Consistently lower scores across the study sample, include asset management and water resource management, except for Morocco and Ceará state in Brazil, which are both water scarce regions with long experience in resource management. The low scores for asset management are not surprising, as this is a relatively new concept for rural water supply. Aggregate scores at sector level show high performers such as Brazil, China and Morocco, and countries that have advanced less in putting in place the building blocks for sustainability, such as Bangladesh, Haiti, Kyrgyzstan and Nepal.

This analysis highlights an important finding in that reaching high levels of access to improved water facilities is not necessarily associated with having strong conditions for sustainability at sector level in place, as evidenced by the building block scores. This is the case in Bangladesh, Indonesia, the Philippines, Nepal, Kyrgyzstan, Ghana and Vietnam, all of which have coverage levels of over 80%, but which score only moderately or low in terms of the building blocks. This re-confirms global experience that a push for increased infrastructure coverage does not necessarily result in favourable conditions for long-term sustainability.

Country	Institutional capacity	Financing	Asset Management	Water Resource Management	Monitoring and Regulation	Aggregate Score
Benin	6	4	5	5	3	23
Bangladesh	4	1	2	2	1	10
Brazil	6	5	5	8	5	29
China	5	5	6	5	7	28
Ethiopia	5	4	2	2	2	15
Ghana	3	5	5	2	4	19
Haiti	3	1	3	2	3	12
India	6	5	5	3	5	24
Indonesia	5	4	2	3	4	18
Kyrgyzstan	2	3	3	3	2	13
Morocco	7	5	5	7	5	29
Nepal	3	3	2	3	3	14
Nicaragua	5	4	5	4	6	24
Philippines	3	4	2	3	6	18
Tanzania	3	3	2	5	3	16
Vietnam	3	5	4	5	3	20

**Figure 1. Aggregated scores for sustainability building blocks by country**

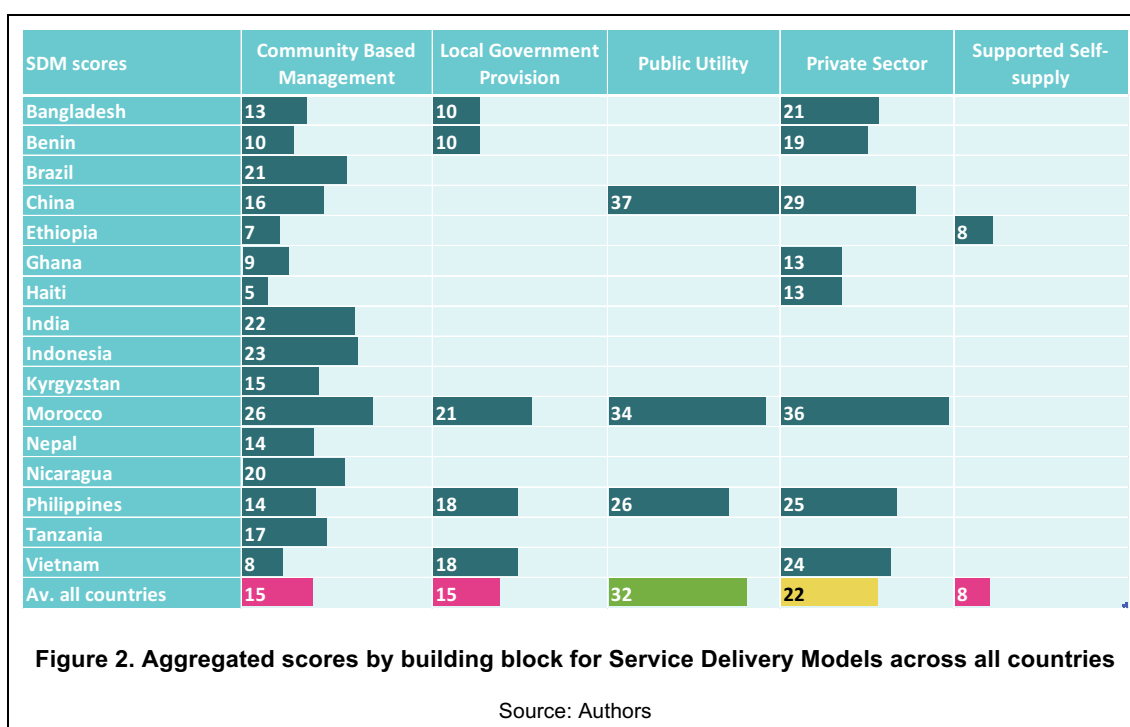
Source: Authors

### Service delivery level assessment

Community-based management models are present in all 16 countries. Five countries only have one main model, namely some form of community management, notably Indonesia, Nepal, Nicaragua, Kyrgyzstan and Tanzania, while Ethiopia, Morocco, the Philippines and Vietnam exhibit four or more different models. To be included, service delivery models should be formally recognized by government in policy, and/or being tested at significant scale with government endorsement. Therefore, it is possible that there are more types of models in the 16 countries, but they may have been discounted in the country studies.

Figure 2 below shows the aggregate scores of all five building blocks for each of the different SDMs in the study countries. A nuanced picture emerges when examining the different types of community management models, ranging from unsupported, loosely formed groups, to formalized entities, some of which contract private providers. Although many community management organizations are now formalized in sector policy and legally recognized, most variants of this model score low to moderate. This is because in the majority of cases these models are not systematically supported or regulated. In cases where there is a form of structural support, the models score better particularly in aspects relating to institutional capacity and financing. Such models are found principally through aggregation or federation of service providers and professional supervision. A good example of a professionalized community management is from Ceará in Brazil where associations carry out basic daily tasks, while activities that require economies of scale are carried out by federations of associations. Finally, the state water and sewerage company provides monitoring and supervision, handles complex tasks and takes care of new system development and major rehabilitation.

All examples of direct local government provision have low aggregate scores and are particularly weak in terms of institutional capacity and financing. This model is hindered by the fact that they are generally not corporatized entities and thus not able to operate along commercial lines ring-fencing their water revenues from general budgets within local government.



The public utility provision model was found only in three countries, China, Morocco and the Philippines, and overall has the best scores. The Water Affairs Companies in China perform strongly in almost all aspects of sustainability. However, the limited cost recovery for rural water supply puts a significant strain on the financial sustainability of these public utilities. Further, in China, public utilities of cities and counties are required by their shareholders to integrate rural communities within their service areas, with government allocating funds for investment and capital maintenance as a form of compensation and to support the utilities' viability.

Private sector provision models are found in eight countries including a range of contractual mechanisms from build-operate and transfer and/or operate, to joint stock companies and lease and concession contracts. These examples outperform other models with consistently higher scores for financing building block. It is important to note that all private sector models in the study receive public funds in one way or another: to facilitate their establishment, attract private sector, and/or through subsidies for capital investments. Experiments with private sector provision and the use of results-based financing instruments in countries such as Benin, Bangladesh, Brazil, China, Haiti and Vietnam have created a rich and mixed set of experiences, but in practice, opportunities remain limited in many countries by the absence of qualified private operators and commercial risks in rural areas.

Although the supported self-supply model occurs everywhere on a *de facto* informal basis, it is only formally recognized in Ethiopia which has a comprehensive programme of 'Accelerated Self Supply' seeks to invest in standardization of approaches and technologies, establishing local providers, communications, and learning networks.

### Future directions for rural water service provision and policy implications

Advanced economies such as China, Brazil, and India provide lessons for other countries as they move along the development spectrum and face new challenges. Perhaps the biggest leap for many countries in the low and lower-middle income group is the shift from point sources, commonly fitted with hand pumps, to piped networks that can provide much higher levels of service. The assessment indicates a relationship between the development, or relative maturity, of a sector and the strength of the service delivery models it employs. The assessment calls for greater emphasis on supporting service authorities, in many cases local governments, as well as service providers to ensure that central government policies are effectively translated into sustainable services across the five building blocks. A major weakness at service delivery level is the lack of adequate asset management. Going forward, as countries continue to improve service levels and rural water infrastructure transforms into larger, more complex schemes, asset management will

gain in importance, as will the need for more effective regulation. Strengthening monitoring capacity is key to inform and shape investment priorities and should be a priority area of focus going forward.

The findings indicate a greater differentiation of models with an emerging trend towards utilities (public or private) integrating peripheral rural populations into their service areas and aggregated management models, under which operators manage multi-village schemes or several stand-alone systems. This aggregation of rural service delivery is expected to result in economies of scale, scope and thus more professional provision. Successful examples of this approach are still mostly found in middle income countries, where large-scale operators are increasingly absorbing rural populations within, or nearby, their service areas. This transformation is facilitated in many cases by increases in public funding, for both capital maintenance and institutional support. Promising service delivery models for rural growth centres, including private sector business models, need to be further scaled up to meet the changing demand for better services in more densely populated rural areas. On the other end of the spectrum, remote and dispersed rural populations continue to rely on either poorly supported community-based management or unsupported self-supply.

The future policy challenge is how to better support a range of rural providers, such as with public-funded support programmes for dispersed communities, through introducing incentives for better performance, and by strengthening local governments to either support communities directly, or to delegate management functions to professional operators, such as the private sector or local utilities.

---

### Acknowledgements

The authors would like to extend thanks to Will Tillett of Aguaconsult who drafted two of the country case studies and the valuable contributions made by Smita Misra, Miguel Vargas-Ramirez, Lilian Pena Pereira Weiss and William Kingdom of the World Bank. The inputs of numerous government agencies, World Bank staff and consultants, as well as other country stakeholders are greatly acknowledged.

---

### References

- LOCKWOOD H. and SMITS, S. 2011 *Supporting Rural water supply: moving towards a Service Delivery Approach*. IRC- Aguaconsult, Practical Action Publishing, April 2011
- CHUNLI S. JING JIN AND HENG-FU (2012) Fiscal Decentralization in China: History, Impact, Challenges and Next Steps in *Annals of Economics and Finance* 13-1, 1–51 (2012)
- WORLD BANK (2016) “Ethiopia Public Expenditure Review 2015” Washington, DC: World Bank Group. License: Creative Commons Attribution CC BY 3.0 IGO.

---

### Note

<sup>1</sup> Supported self-supply is included as a Service Delivery model for countries where government proactively supports the actions taken by individual households or communities to provide for their own water supply services with the aim of reaching dispersed or difficult to access populations.

---

### Contact details

*Harold Lockwood is the Director of Aguaconsult with particular interest in institutional and policy reform and the sustainability of WASH services.*

Harold Lockwood  
Aguaconsult Ltd., Wivenhoe, UK  
Tel: + 44.1206.823329  
Email: h.lockwood@aguaconsult.co.uk  
www. Aguaconsult.co.uk