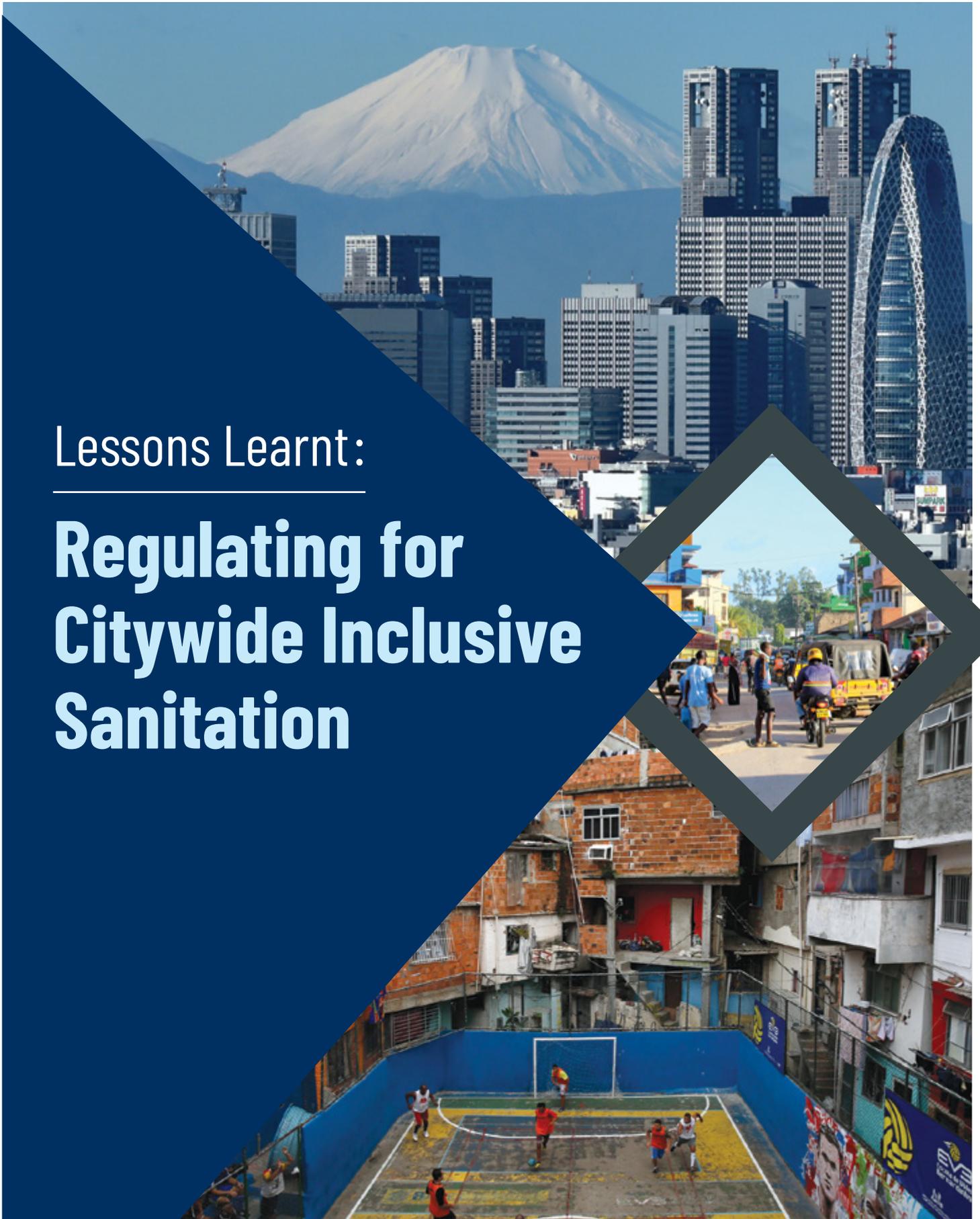


Lessons Learnt:

Regulating for Citywide Inclusive Sanitation



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Lessons Learnt:

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Regulating for Citywide Inclusive Sanitation: Summary of Lessons Learnt

Through the IWA initiative “Regulating for Citywide Inclusive Sanitation” and in collaboration with its partners, namely representatives from regulators and organisations across the globe, the International Water Association aims at identifying the needs, opportunities, and tools for action to support and inspire regulators in their contribution to achieving Citywide Inclusive Sanitation in the context of the Sustainable Development Goals.

This document presents the lessons learnt from IWA’s interaction with regulators of different types, both those who are members of the initiative’s Task Force or part of IWA’s wider network. Many of these regulators kindly responded to a questionnaire with follow-up correspondence and online interviews, some also shared their experience through a series of webinars. Task Force members themselves took part in regular meetings and discussions where experiences and insights were shared. This document contains quotations regarding the case studies based on the sources indicated. The original interviews and responses were gathered in **three compilations – ‘Starting the CWIS transition’, ‘Ensuring CWIS works’ and ‘Completing the CWIS journey’ – to facilitate preparation of this report.**

Citywide Inclusive Sanitation

Citywide inclusive sanitation (CWIS) is a public service approach to planning and implementing urban sanitation systems to achieve outcomes summarised in Sustainable Development Goal 6.2: safe, equitable and sustainable sanitation for all, irrespective of where people live within the city or what technologies are used to serve them.

‘Sanitation is defined as access to and use of facilities and services for the safe disposal of human urine and faeces’ (WHO & UNICEF, 2021)

The challenge is how to **‘square the circle’**, that is *‘doing something that is very difficult or impossible’*¹, of enabling delivery of safely managed sanitation for 2.1 billion urban dwellers, many of which are the poorest on the planet.

For example, householder’s willingness to pay [Nakuru, Kenya] was found to be less than 25% of the [capital] cost of a high-quality pour-flush toilet with a pit (Norman, 2019). Willingness to pay for emptying and safe disposal through a transport and treatment route in Kisumu [Kenya] corresponds to 23% of operational costs (Peletz *et al.*, 2020).

1. Cambridge Dictionary: dictionary.cambridge.org/dictionary/english/square-the-circle

It is important to also note the challenge of the informal settlements, the slums, the shanties, the favelas. The proportion of the urban population living in slums or informal settlements worldwide was estimated to be 66% in low-income countries (37% in lower-middle, and 24% in upper-middle-income countries), with the absolute number of people growing to over 1 billion (World Bank, 2021a).

Meeting the sanitation needs of informal settlement dwellers, ending open defecation, is a particular issue relating to affordability and accessibility, where conventional sewerage is even more difficult and expensive to install and where non-sewered service options require regular access to pits or tanks for desludging. This is in addition to possible institutional prohibitions in serving informal areas.

The primary choice of service approach is between sewered sanitation, that is a water-flushed pipe network, with wastewater treatment or a *'non-sewered sanitation system: [one] that is not connected to a networked sewer system, and collects, conveys, and fully treats the specific input to allow for safe reuse or disposal of the generated solid output and/or effluent'* (ISO, 2016).

As two reference points (different countries find different relative costs), a study of the cost of sewerage relative to non-sewered sanitation found that *'annualised [CAPEX & OPEX] per capita costs for the [Kampala, Uganda] sewage regime (USD186) are more than 13-fold those for the Faecal Sludge regime (USD14)'* (McConville, et.al., 2019). And in Dakar, Senegal *'a comparison of a parallel sewer-based system with activated sludge, and a faecal sludge management system (FSM) with onsite septic tanks, collection and transport trucks, and drying beds was conducted. The costs for a sewer-based system are almost entirely borne by the sanitation utility, with only 6% of the annualized cost borne by users of the system'*. It was found that *'sewered was 40 times more expensive to implement for the utility than trucked. However, the majority of FSM costs are borne at the household level and are inequitable. The results of the study illustrate that in low-income countries, vast improvements in sanitation can be affordable when employing FSM, whereas sewered systems are prohibitively expensive'* (Dodane et al., 2012).

Regulating for CWIS

Delivering CWIS needs regulators, because regulators have the expertise of finding the pragmatic balance between the policy and standards set by policymakers and legislatures, and the service providers, who need to access the funding (tariffs & taxes), repayable financing and human resources to deliver the service.

Regulators (and their equivalents) in a wide variety of contexts have shown that they can make a significant difference in nudging forwards the monopoly piped water supply sector, empowering service providers to improve their performance for the benefit of their customers, whilst challenging them through comparative competition, as well as penalising failures.

Now comes the bigger challenge of asking regulators, particularly in lower-income countries, to extend their art of compromising beyond overseeing limited monopoly piped sewer networks, with limited wastewater treatment, usually supported by subsidies from the water tariff. Regulatory oversight needs to be extended to the service providers of non-sewered sanitation' (NSS) in formal and informal housing areas, with NSS needing the on-site sanitation service chain of household containment, septic pit/tank emptying, safe transport, and necessary delivery to a public faecal sludge treatment & reuse plant.

For CWIS, the mandated service provider is expected to enable and oversee subcontracted elements of the total NSS service potentially delivered by private small and medium enterprises, community-based and non-governmental organisations as well as the public sector.

Every country has its own regulatory frameworks and structures which straddle a wide spectrum where power and priorities vary significantly, with no 'best approach'. The objective of this initiative is to support and inspire regulators to catalyse sanitation service delivery in their own context.

Definitions of Regulating

“Regulation is a policy intervention that aims to promote sector goals in the public interest – balancing the competing interests of the various stakeholders” (Mumssen et al., 2018).

A “Regulatory Authority, Regulatory Body or Regulator is a public authority responsible for applying and enforcing standards, criteria, rules or requirements – which have been politically, legally or contractually adopted – exercising autonomous authority over the Services, in a supervisory capacity” (IWA, 2015).

“Economic regulation is the set of rules and organizations that set, monitor, enforce, and change allowed tariffs and service standards for water [& sanitation] providers” (Groom et al., 2006).

Regulating can be undertaken by “Sector-Specific National or State Regulator; Multi-Sector Regulator; Self-Regulation at the Municipal Level; Government Department; Regulation by Contract” (Mumssen et al., 2018).

Regulating catalyses the progressive realisation of the human right to sanitation.

Lessons learnt by Regulators regarding Service Providers: bridging policymaking and service provision

Accelerating progress on sanitation delivers health benefits for individuals and the nation: child survival, higher utilisation of health services, elimination of cholera, eradication of polio, control of intestinal worms, less stunting in children, safety and mental health, food safety, environmental justice, decent work, and a clean environment for recreation (WHO & UNICEF, 2020).

The task of the regulator is to enable, empower and ensure the financeability of efficient service providers to accelerate the delivery of inclusive sanitation services.

To understand how regulators can assist with the delivery of CWIS, it is helpful to consider three particular aspects:

Roles and Responsibilities — that is the governance enabling environment, the range and roles and responsibilities of the various stakeholders, whether it be Ministries, Government Agencies, Service Providers, Citizen Households or supporting Community and Non-Governmental Organisations.

Regulations — the delivery of services requires standards to be met (for example wastewater treatment effluent, septic tank or emptiable pit design, standard operating procedures for sanitation workers) and many of these standards have to be codified as legal regulations, or ‘bye-laws’, usually established by the local authority or municipality, with responsibility for monitoring and enforcing also formalised.

Regulating — perhaps the key lesson learnt is that of passing regulations, stating that every household in an urban area must have adequate sanitation at a particular standard. Households, particularly low- and very-low-income households, need support in accessing sanitation and it is the role of the regulator in **regulating** to empower the delivery of services to all through a mixture of incentives and communications, in addition to penalties. It will not be possible to ‘square the circle’ of sanitation delivery by 2030 without creative, adaptive, and realistic regulating support to enabled service providers.

‘In their key areas of action, which include standard-setting, monitoring and ensuring accountability for service provision, regulatory actors are bound by the principle of progressive realization, but also by the immediate obligation of non-discrimination and the obligation to take steps towards the full realization of these rights.’

‘What is essential from a human rights perspective is that those who perform regulatory functions are immune from the pressures of any illegitimate interests and that the main objectives of regulation be aligned with the human rights to... sanitation.’

Léo Heller, ‘Service Regulation’ Report of the Special Rapporteur on the human rights to safe drinking water and sanitation, 2017

The case studies in this Lessons Learnt compilation address these issues to differing degrees. The cases have, to an extent, been self-selected by volunteers from the initiative’s Task Force, supported by some additions from the Advisory Board and the task consultants who saw the opportunity to bring in additional aspects.

There is a question as to how to address analysing lessons learnt across such a fascinating and diverse set of cases. Potentially it could be done by considering the type of regulation, that is whether regulating is undertaken by performance agreement, by contract with the provider, through a specific ‘economic regulator’, whether regulating is city-based, region-based or at national level? All these alternatives are represented in the cases below but seem to be of less relevance than focusing upon the extent of the sanitation challenge. This is the approach taken, where we have clustered the cases into three levels, based on the Joint Monitoring Program’s results of each country’s urban ‘basic’ and ‘safely managed’ sanitation percentages. These groups are given in Figure 1 relative to the proportion of seweraged and non-seweraged sanitation. An indication of the average national wealth per person of each group is also given because delivering safely managed sanitation is a costly business and the level of resources available undoubtedly affects the challenge of regulating in enabling service provision. Within each cluster, the order of cases reflects the average country GNI per person measured in USD at Purchasing Power Parity (World Bank, 2021b).

The three groups have been labelled **‘Starting the CWIS transition’**, **‘Ensuring CWIS works’** and **‘Completing the CWIS journey’** – with each of the phases of CWIS delivery posing varying regulatory challenges (see Figure 1). ‘Headline’ questions have also been suggested for each group, which will be used to reflect upon each group of cases in turn before summarising the lessons learnt as a conclusion.

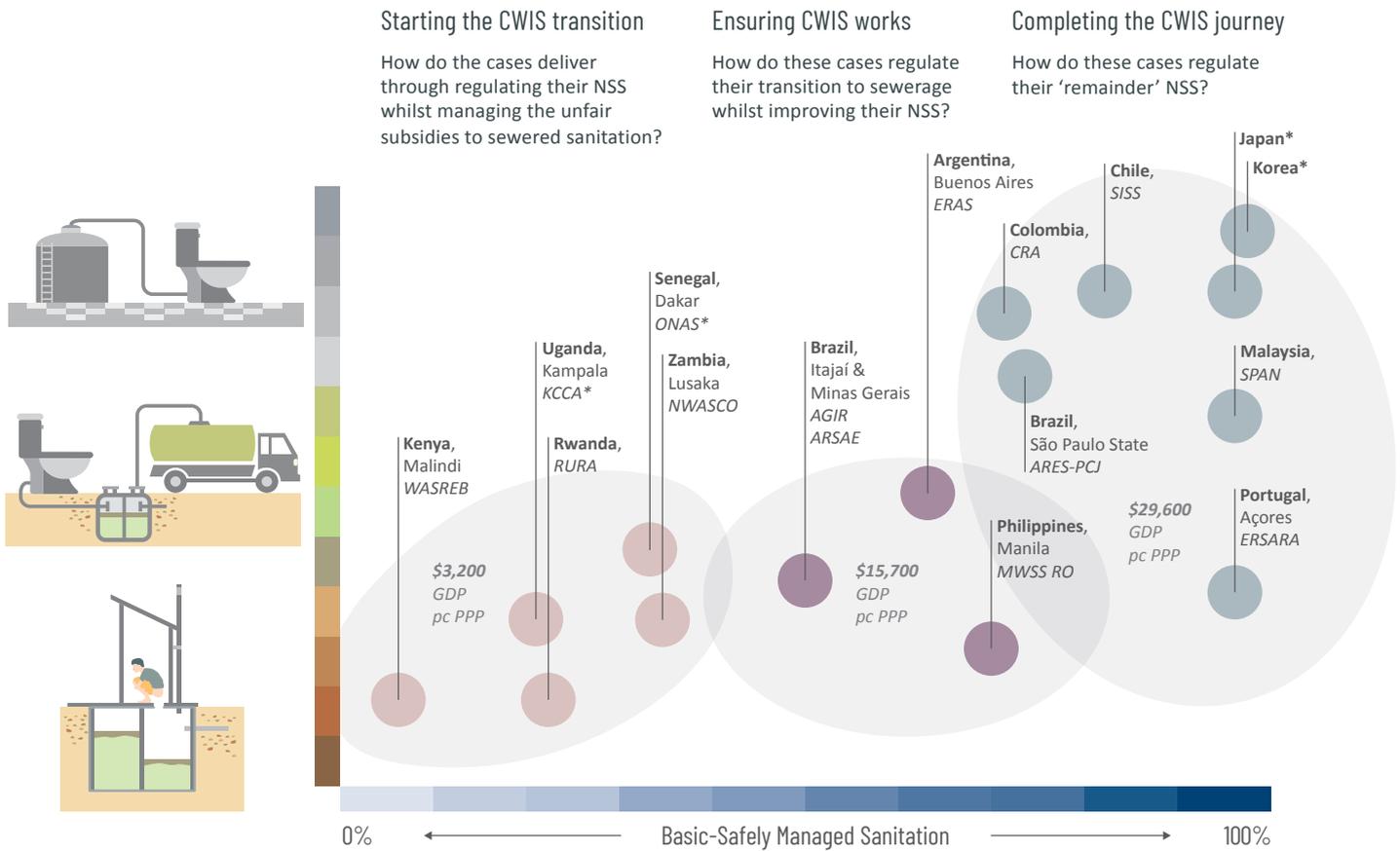


Figure 1. The case studies (* indicates indirect regulation). The GNI per capita figures are the average of the cases in each group, based on ‘Purchasing Power Parity’ (World Bank, 2021b).

‘Starting the CWIS transition’

How do these cases address delivering NSS through regulating whilst managing the ‘unfair’ subsidies to sewerage sanitation?

What can regulating say for these USD3,100 GNI per person average (at Purchasing Power Parity) countries regarding:

- *The delivery of an overwhelming service provider bias towards non-sewered sanitation as the only remotely affordable means of achieving SDG6.2*
- *Whilst managing the ‘unfair’ subsidies to the tiny proportion of the population who have access to a sewerage network*
- *When there is insufficient water available for sewerage sanitation, and*
- *What is the role, if any, of public community toilets to deliver more assured quality of service in very low-income areas?*

Uganda, Kampala

Lead source: Dr Najib Bateganya Lukooya, Kampala Capital City Authority (KCCA)

Urban ‘basic’ sanitation is at 26.1%, safely managed not scored. There is a small presence of sewerage and wastewater treatment in major cities. There is no regulator but there are performance agreements with Ministries; there are dual service delivery responsibilities – Kampala Capital City Authority (KCCA) for non-sewered sanitation, and National Water and Sewerage Corporation for sewerage (aiming for 30% domestic connections by 2030) and all wastewater treatment. The National Environment Management Agency (NEMA) ensures environmental compliance for the storage, transportation, and treatment stages of faecal sludge. There is an FSM steering committee for coordination. Delivery of CWIS to date has been through *‘a deliberate strategy to work with political leaders to mobilize communities, making the political leaders sanitation champions in their localities whilst involving the leaders in programme planning, budgeting and monitoring processes.’* Scheduling of sludge emptying services is being piloted, supported by improvements in low-cost toilet and emptying technologies linked to technological innovations such as a Call Centre and ICT tools (The Weyonje ‘App’, a mobile phone application, designed for waste management service providers in the capital Kampala to receive and manage work orders) to link the service providers (vacuum tanker operators) to the communities. Landlords are incentivised to upgrade toilet facilities through a partial subsidy for the medium-income communities along with full subsidy for the low income and vulnerable communities (both presently being piloted). KCCA is supporting the access of financial credit to the medium to well-off communities along with rewards and motivations for the outstanding landlords in sanitation. Overall, KCCA believes that *‘behaviour change campaigns are essential to achieve CWIS’* and that *‘private sector partnerships are required for efficient and affordable services.’*

Rwanda, Kigali – RURA

Lead source: Jacques Nzitonda, Director of Water and Sanitation at the Rwanda Utility Regulatory Agency (RURA)

Urban ‘basic’ sanitation is at 51.9%. There is no sewerage or wastewater treatment in Kigali yet. There are shared responsibilities for regulating, containment is regulated by the local authority, and the multi-sector regulator RURA oversees decentralised wastewater treatment (mandatory for new developments) and conveyance. RURA is taking the lead in mapping the responsibilities of key stakeholders, also developing clear NSS guidelines. There is only limited NSS desludging and no faecal sludge treatment at present. RURA expects water service provider WASAC to take over NSS management responsibility, issuing permits to private operators. RURA organises training for service providers and manages exchanges with other areas where stakeholder staff need more exposure, knowledge, and skills. RURA accepts that cost-reflective FSM charges are not really affordable for poor households, but the current policy is that households are responsible for the management of sanitation within the household. So, the regulator plans to learn from the experiences of other countries and share those concerns with the policymakers. The regulator wants the landlord to be responsible for paying the tariff for sanitation, *‘asking the tenants to pay will not lead to sustainable services because they’re often moving and not staying in one place for long’*.

Senegal, Dakar – ONAS

Lead source: Mouhamadou Gueye, ONAS

Urban ‘basic’ sanitation is at 65.0%, safely managed 21.9%. 17% sewered sanitation coverage and some wastewater treatment in major cities. The Office National de l’Assainissement du Sénégal (ONAS) is the asset holder for sanitation infrastructure and is responsible for all sanitation services in urban and rural areas, including stormwater drainage. It is regulated by a 3-year performance agreement under the Ministry of Water and Sanitation. ONAS realises that NSS must play a greater role and is delegating to the private sector, licensing and certifying (compliance with agreed standards) emptying contractors, organising a call centre to develop the market for pit emptying services and to promote more competitive pricing; mobile money can now pay for pit emptying. There has been a seven-year concession agreement with a Senegalese company to manage four wastewater treatment works in Dakar. The government is now exploring more formal regulatory options.

Zambia – NWASCO

Lead source: Chola Mbilima, National Water Supply and Sanitation Council (NWASCO)

Urban ‘basic’ sanitation is at 36.2%, safely managed not scored. Some sewerage and wastewater treatment in major cities. Regulator NWASCO is leading the way, developing sophisticated FSM Guidelines. Recognising that certain segments of sanitation were placed in different institutions, the Environmental Agency, the local authorities, the Ministry of Health all doing certain aspects, NWASCO has been bringing the stakeholders together in addition to supporting the Ministry through conceptualising the issues for policy development. Policy is now focused on water service providers taking on NSS responsibilities, acting as intermediary institutions to private sector suppliers. NWASCO has had 20 years of experience regulating/nudging the water service providers. It became imperative for NWASCO to depart from the traditional *‘unilateral command & control and incentive’* method of regulating, moving instead to a delegated and participative method that encouraged stakeholder partnerships and relationships. As part of this, they are assisting the companies to pilot the ESAWAS CWIS SAP tool (Services Assessment & Planning) as the basis for citywide sanitation business planning; also interacting with municipalities for sanitation data collection & benchmarking; promoting subsidies within the whole costing structure and pricing mechanism between the water consumers and the sanitation users. They have already developed a Sanitation Surcharge approach for funds generation (2.5% of a monthly water bill so far allowed for selected companies, 5% maximum allowable, funds ring-fenced for NWASCO approved investments). NWASCO summarises the key lessons: regulation is not a ‘one size fits all’; the traditional method of regulation may not be applicable; and regulators need to coordinate data collection and information management.

Kenya – WASREB

Lead sources: Priscillah Oluoch, Malindi Water and Sanitation Company (MAWASCO) and Richard Cheruyiot, WASREB Director for Monitoring and Enforcement

Urban ‘basic’ sanitation is at 34.7%, safely managed not scored. Some sewerage (17% where water services are supplied) and some wastewater treatment in major cities. *‘The key thing is the population is growing and we haven’t seen proportional growth in services to match; we have to rethink, we have to see that how we have done business before will not take us to what we want for the future.’* What about incentives for CWIS? There are the Constitution and international obligations, though it is recognised the current budget is less than 10% of what is needed. The challenge of a *‘pro-sewerage political disposition’* is evident nationally. There is an urgent need to disaggregate the cost of providing water services and the cost of sewerage and sanitation services; therefore WASREB wants empirical evidence of costs and present services, in order to plan for progressive realisation. *‘If we can’t measure where we are, we can’t fix it’.* Incentives: ‘Regulatory Guidelines for Non-Sewered Sanitation’ prepared; annual service provider

reporting and ranking by KPIs, including KPIs for sewerage, non-sewered and low-income areas services. High rate of return for the private sector, which delivers aspects of NSS but with no regulation. *‘There is a need to have regulation along the sanitation value chain.’* WASREB are now exploring the introduction of a sewerage/sanitation development levy. *‘More investments do not necessarily increase access – need for a technology paradigm shift and finding the right mix of sewerage and non-sewered’.* Service providers (Private/public) should have the mandate to provide services accompanied by the duty to give account for the results.

Reflecting the challenges faced by WASREB, Malindi, a city of 100,000, on the Kenyan Coast is starting from zero (1% ‘safely managed’). Service provider MWASCO confirms that CWIS is seen to be critical *‘and for that we need regulation’.* MWASCO is taking the lead in a multi-stakeholder CWIS committee *‘working across planning, health, roads, all under the County Government’*, so that *‘everyone knows what we are planning for Malindi, what solutions are there’.* WASREB is clearly teaching them well. *‘We are working with many other partners to understand business models and tariff models to determine what sort of tariff can be sustainable and affordable ... [we are] also looking at the County Environment bill and the need for the private sector to be working with the Company. It is a collaboration between us and regulator and the private sector.’*

Reflections on starting the CWIS transition

How do these cases address delivering NSS through regulating whilst managing the ‘unfair’ subsidies to sewerage sanitation?

It is apparent that the regulators have made an impressive start on their country’s CWIS journey. They are reporting detailed work on how the various stakeholders might work more effectively, individually and collectively, where any gaps might be, who is actually to be responsible. There is a strong assumption that the existing water and sewerage companies become water and sanitation service providers, responsible for sanitation at various levels (an approach agreed upon by regulators transnationally in the ESAWAS Guidelines), removing this task from the municipal government. Except for Kampala: no regulator there yet, where the city government is clearly willing and able to undertake the NSS task – their challenge remaining is as to who can best integrate overall planning with the sewerage utility’s functions – a task which, in some contexts, is found to be a useful responsibility of regulating or ‘refereeing’ (WSUP, 2020).

There has also been work, not directly reported in the cases, on formalising and improving standards, for example, WASREB’s work on Standard Operating Procedures for sanitation pit-emptying workers.

And the contribution to national sanitation policy development is significant. Kenya's WSS plan for example now has adjusted its 'sanitation by sewerage' target from 80% by 2030 to 40%. Even though some might argue that 40% sewerage is still too high at this stage, regulating is an iterative process, enabling policymakers and service providers to get to the right answer 'step by step'.

The cases do not report any role or standards for public community toilets to deliver more assurable quality of service in very low-income areas, which is perhaps as a result of the SDG6.2 criteria not accepting shared toilets as 'safely managed'. In the experience of many countries, good quality communal facilities have been a key, if transitional, component of improved sanitation, particularly in very low-income areas.

Overall, it could be suggested that the work reported in these cases, as done to date, has been vital and appropriate development, the building of the foundations of CWIS – next comes the significantly more difficult steps of regulating the hard choices to be made. When it comes to setting tariffs for sewerage at sustainable levels (minimum sustainable cost-reflective tariffs) will the inevitable tariff increases be allowed, socially or politically? Will the newly rebadged water and sanitation companies (excellent step but that, perhaps, is the easy part) appoint their best staff to make sanitation for all happen... or will the power in the utility remain with the revenue collecting water staff?

However independent the establishing legislation declares the regulators to be, and however impressively they have been using that independence to date, when the water tariff surcharges increase yet again to support scheduled pit-emptying, when the planning tools show that there should be no government-supported CAPEX for future sewerage, that all available funds have to go to faecal sludge treatment ponds and to subsidising accessible, emptiable, leaky pits... will that be acceptable to the lenders/donors or the government?

The following group of cases suggest that regulating the next steps will not be easy.

'Ensuring CWIS works'

How do these cases address regulating the transition to sewerage whilst improving their NSS?

What can regulating say for these USD15,750 GNI per person average (at Purchasing Power Parity) countries regarding:

- *The inequitable diversion of government funds and service provider charges to sewerage before ensuring adequate, and quality-assured, non-sewered sanitation for all*
- *Ensuring that where sewers are constructed then households are automatically connected*
- *Ensuring that used water can be recycled for reuse*
- *Promoting Integrated Urban Water Management – including rain stormwater drainage*

Philippines, Manila – MWSS RO

Lead source: Patrick Ty, Chief Regulator, Metropolitan Waterworks and Sewerage System Regulatory Office (MWSS RO)

Urban 'basic' sanitation is at 78.5%, safely managed 54%. Metropolitan Waterworks and Sewerage System Regulatory Office (MWSS RO) regulates through the contract with two concessionaires, responsible for water supply, sewerage (7% at 1997 start, 25% now) and desludging services. Most residents still rely on septic tanks which discharge directly to surface drainage systems and, eventually, into the receiving waters. But contracted expansion, with a 2009 deadline for full sewerage coverage, was not possible whilst maintaining affordable tariffs. A Supreme Court decision in 2011 required the concessionaires to fast-track the rollout of sewerage and wastewater treatment, but progress remains slow.

Tariff adjustments are the regulator's major instrument for incentivising performance. If unable to achieve their business plan CAPEX commitments, no tariff adjustments are allowed until they comply, similarly with meeting their desludging targets. To ensure accurate reporting, concessionaires' reports are verified and validated regularly using systematic procedures established by the regulator.

Households have proved to be unwilling to pay to connect to a sewer line – 'around 1% will connect'. The new approach is to focus on developing combined sewer systems that intercept wastewater discharged to surface drainage systems and treat it to an acceptable standard before it reaches the receiving waters. As part of this approach, sewer connection charges for residential users have been scrapped, a combined tariff for water and sanitation has been developed for residential users, whether connected to the sewer or not, which includes the cost of desludging the household septic tank once every five years.

The regulator requires the service providers to roll out information and awareness campaigns regarding the desludging service, emphasising that no further payment is required by the consumer, and by coordinating with local government, supporting the move to clean up Manila Bay.

The regulator concludes: *‘There is no magic bullet for achieving citywide inclusive sanitation. There must be cooperation among all stakeholders – local government, national government, the private sector, and so on – and everyone should understand each other’s limitations. It is a challenge for everyone, but we should be able to achieve it by working together.’*

Brazil

Lead sources: Jorge Werneck, Daniel Narzetti and Otávio Hamdan

Urban ‘basic’ sanitation is at 92.8%, safely managed 51.6%. In Brazil, each municipality is responsible for its own local water and sanitation policy in both urban and rural areas which is included in its Municipal Basic Sanitation Plan. Only 6% of these municipalities have more than one hundred thousand people, reducing the effects of economies of scale and scope and making cross-subsidy policies for WSS tariffs unfeasible.

In Brazil, the legal mandates for sanitation services are within the municipalities. So, the regulation mandate is defined by the municipality – the municipality may choose who will be their regulator, which is a very controversial model because the municipality can also create their own regulator, which will regulate their own service offering.

The Director of ADASA, the regulatory authority in Brasilia explains that *‘regulatory agencies are at the forefront of making sure citizens and industry have access to fundamental services. They operate in a context of increasing complexity, technological disruption and constrained resources and in these days water regulators work in a critical health area of our societies.’*

Narzetti and de Cunha’s analysis (2020) finds that the cross-subsidization model practised in Brazil is not just a subsidy for poor households but currently, it also includes transfer between municipalities, through revenue sharing – which is believed to be socially and financially unsustainable (a small number of rich municipalities and a large number of poor municipalities). They explain that this jeopardizes the investment plans of state service providers and municipalities and, consequently, the achievement of universal access for all WSS customers and the implementation of wastewater collection and treatment systems.

A bill currently being drafted by the Chamber of Deputies in Brazil creates a ‘Social Water and Sanitation Tariff’ which proposes, as a single criterion for the household to qualify as a beneficiary, a per capita income of up to half the minimum wage. However, this proposal does not define the subsidy model or a source of funds for these subsidies. *‘A major problem is that government refuses to face the real problem, which is the unavoidable lack*

of affordability Brazilian people in general face in paying the bill without jeopardizing other basic expenses (food, housing, etc.). Due to the large number of poor people in the country, this cannot be solved with any cross-subsidization scheme although obviously, it helps and should also be used to its maximum potential.'

European Valley in Santa Catarina State – AGIR

Lead source: Daniel Narzetti

AGIR is the 'inter-municipal' multi-sector regulatory agency for 16 municipalities for the European Valley in Santa Catarina in southern Brazil. AGIR regulates a mix of municipal utility service providers, a state-owned utility (CESB) and one private concession. Most utilities provide only water services. For sanitation, most residents rely on septic tanks, even in the largest cities, and only four towns have any sewers at all. Yet comprehensive recent surveys show that only a minority of septic tanks are ever desludged. *'There is a cultural problem that people don't think about maintaining the septic tank regularly. They just maintain it when there is a problem.'* AGIR does not regulate the small private contractors for septic tank emptying, regulations are made in the context of policy, not services. The regulator can influence some organizations, some appointments, some notifications, but not regulating overall, it cannot define tariffs – *'it is not for us to do this'*.

AGIR is currently working with the Association of Municipalities of the European Valley (AMVE) to improve sanitation. *'We need to change strategy. The municipality should make more funds available for sanitation. We need to increase public investment in sanitation, rather than looking to the private sector for this.'* There is a need to transfer tax money to improve sanitation with public money. AGIR and AMVE are jointly developing a guide for municipalities to manage on-site sanitation systems.

It is believed that public-private partnerships (PPPs) could possibly work in Brazil in the big cities, through concessions and privatization *'but it is very problematic for essential services'*. However, as a means of supporting the people of Brazil who don't have sanitation at present, it's likely to be of very limited potential. For the city of Blumenau, the budget for universal sewered sanitation is approximately USD52 million and it would likely take more than 30 years to recover this. *'We have a private sector that is interested – but it won't attract the private sector as the tariffs would have to be so high.'*

For municipalities *'this is about investment priorities. They prefer to make tarred roads than invest in sanitation'*. There is an example of where there is public finance to construct a treatment plant in one municipality, but there is not one metre of sewer network. *'How can the sewage reach the treatment plant? But first, they make asphalt in many streets in the city.'* *'Sanitation is not the priority. It is not a public priority to make investments in essential services like sanitation'*.

It is suggested that individual, household-level sanitation needs to be delivered as a public service. *‘We need to have streamlined, efficient, affordable desludging maintenance services to bring down the cost and ensure that the public good, is safeguarded, that you don’t get health problems, that you don’t get environmental management problems.’* To deliver that service the provider needs to assume responsibility. *‘It is possible to use the private sector to get the operational efficiencies and then get the public sector to fund the costs for those.’*

Minas Gerais State – ARSAE-MG

Lead source: Otávio Hamdan

In the context of approximately 30% sewerage coverage, Minas Gerais State regulator ARSAE-MG has developed a standardised approach that allows municipalities to receive up to 4% of the net revenue from water supply and sewage services for their Municipal Sanitation Fund. Municipalities can use this fund to expand sanitation services in unserved areas. More than 220 municipalities have received this revenue to date and have improved their service coverage. In total, these municipalities have access to approximately USD29 million annually.

‘In the midst of the serious situation of budgetary constraints caused by the pandemic, the transfer of funds to the Municipal Sanitation Fund is indispensable for the promotion of improvements in basic sanitation conditions.’

Argentina, Buenos Aires – ERAS

Lead sources: Alejo Molinari, Oscar Pintos, and Agustin Landaburu

Urban ‘basic’ sanitation is at 95.9%, safely managed not scored. City-level regulator ERAS has the regulatory oversight and control of AySA, the city and surrounding region public service provider, who took over in 2006 after the earlier private concession was revoked. City-level service is at 99% for that 3 million population but only 51% in the 12 million population of the Great Buenos Aires area. There is limited capacity in existing sewers (frequent sewer overflows) and limited wastewater treatment, particularly at the secondary treatment level. Service providers barely recover operation and maintenance costs and have no capacity to self-finance investments. There is no coherent national policy in terms of sector financing, subsidies, tariffs, and service standards. AySA is mandated to serve peri-urban areas and indirectly provides for but doesn’t recognize the population in informal areas as customers, and so the company doesn’t maintain the systems because they are deemed to be informal. The City of Buenos Aires then takes responsibility for maintenance, but without any regulatory oversight.

Residents are not charged for the services which are funded by the City. In effect, the municipality is another customer, but one that represents 250,000 low-income inhabitants. There have been discussions looking for

the transfer of such services from the City to AySA, but only after building formal networks. AySA is reluctant to accept any solution different from the traditional sewerage network. *'Alternative solutions are needed if SDG6 is to be met'*.

It is necessary for regulators to understand the location and numbers of peri-urban and rural populations, allow for appropriate alternative technical solutions, verify the planning of the infrastructure by the mandated service provider and check the potential for financing the infrastructure and the coverage of costs of the operation of services. This is likely to include adaptation of rates, subsidies (for infrastructure, social tariff), external financing of infrastructure along with other forms of financing such as Build, Operate, Transfer.

It is understood there needs to be flexibility in regulation to reach everyone. It is necessary to reconcile the ideal with what will expand services to all as quickly as possible. *'Regulation too often bypasses users'*. It is impossible to achieve inclusive sanitation through sewerage, where the public streets are so narrow and the required distance between pipes is not available.

A new approach is not only about technical and financial issues – participative processes and social inclusion must be included in each phase, particularly focused on the regularizing of the very necessary public land, that is introducing the concept of community space where there is not a single owner.

'The independence of the regulators is key, as they must be immune to illegitimate pressures that can hinder the implementation of the Human Right to Sanitation and the achievement of the SDGs.'

Reflections on ensuring CWIS works

How do these cases regulate their transition to sewerage whilst improving their NSS?

In several of these cases, the key service providers have not accepted the responsibility for ensuring adequate sanitation for their informal settlement citizens, regulators have not yet (been allowed?) to require them to take up this responsibility, whilst regulations regarding scheduled desludging and overall wastewater treatment are either not being formalised or addressed in the majority of cases.

In some instances, there is a sense that 'regulatory independence' is even more uncertain than usual for all regulators, the cases indicating a limited regulatory role, with regulators functioning more as 'bureaucratic tariff-checkers' or 'contract compliance officers' than deliverers of 'regulating'.

Regulators are aware of the need for subsidies for low-income household access to sanitation but there is little sense that the overall system is allowing regulators to find the pragmatic balance in the various possible cross-subsidies between water tariffs and sanitation tariffs, richer households to poorer households, richer municipalities to poorer municipalities. There is a strong understanding in Latin America of the value of the Chilean form of direct governmental water and sanitation subsidies for the poorest – but no sense that governments would be willing to fund such an approach.

There appears to be an outstanding issue of the acceptability of tariff increases, whatever the regulator might say, to funding appropriate wastewater treatment let alone achieving a level of treatment that will allow for water recycling and reuse, with that being an issue once households have been supported in connecting to the sewerage system – the ‘last metre’ being as important as ‘the last mile infrastructure connectivity’. Desludging, inevitably appearing as ‘service provider scheduled desludging’ (though with the activity easily outsourced to the private sector), is not being included in tariff considerations, where small monthly add-on payments to the water bill would be sufficient to fund the biennial desludging.

There is no sense of regulatory understanding of, or responsibility for, Integrated Urban Water Management, including drainage for grey water (in low-income informal settlements) and rain/stormwater drainage, although Manila is undertaking interesting experiments in this area.

Specifically in Brazil, new legislation requiring competitive awards by municipalities for service provision contracts is likely to facilitate enhanced private sector interest. There is concern that this will not only focus on conventional sewered and ‘high-tech’ wastewater treatment but will also be challenging due to the resulting required increase in tariffs, even with the private sector efficiencies anticipated, to properly fund services. Regulators indicate a sense of ‘powerlessness’ in this situation.

How have the highest level ‘safely managed’ sanitation group found a way through these difficulties? Have they completed sustainable service provision for the last decile of their urban populations? The third group of cases focus on regulatory systems attempting to support the completion of the CWIS journey.

'Completing the CWIS journey'

How do these cases address regulating the 'remainder' NSS households?

What can regulating say for these USD29,500 GNI per person average (at Purchasing Power Parity) countries regarding:

- How to ensure the quality of pockets of non-sewered sanitation amidst the general sewerage service?*
- How to deliver and fund scheduled desludging of NSS septic tanks?*
- How to ensure ongoing affordability and sustainability of sewerage services?*
- How to enable and fund ever-increasing standards for wastewater treatment leading to ever more direct reuse, based on economic viability?*
- How to facilitate effective rain/stormwater management, particularly of combined sewer storm overflows, in the context of ever more demanding and environmentally concerned citizens?*

Brazil, São Paulo State – ARES-PCJ

Lead sources: André Felipini and Rodrigo Taufic

ARES-PCJ is a regional regulatory agency for sanitation services (water, sewerage, solid waste) that regulates services in 58 cities in São Paulo State, 8 with private providers, 45 with public companies and 5 where water is public and sewage is privately provided.

It is estimated that over 90% of the population accesses sewerage, but only 65-70% of wastewater is treated. Sanitation planning, service provision and regulation is the obligation of each municipality, the service plans ('a municipal legal task') are required to aim for 100% sewerage coverage. Non-sewered sanitation is supposed to be the exception. New legislation makes it harder to implement Non-Sewered Sanitation (NSS), so to broaden its mandate to include NSS, ARES-PCJ would need to lobby the municipalities. The 2007 legal framework on sanitation lacks any specific binding rules of protection and inclusiveness, though approximately 7% of households are living in informal settlements. Although regulating in a comparatively affluent area, with high service coverage, there is this profound issue of informal settlements – which should be part of the regulatory mandate. It goes to the question of sanitation. It is very difficult right now to evaluate the situation where we all already had coverage but are seeing the popping up of these islands of non-coverage, no service. *'I don't know how we will face that as a regulator. It will be a step forward in our mandate to address that obligation but right now we don't have this instrument.'*

There are two main models of regulation of service provision: private firms, regulated based on long-term municipal contracts where the regulator enforces the rules laid out in the contract (but is not involved in the contract preparation); and public firms regulated based on legal rules drawn up by the regulator, including defined rules for economic analysis and tariff calculation.

Recent changes to the legislative framework affirm the role of municipalities but requires competitive bidding – state companies can no longer be appointed without competition so there is a greater emphasis on possible public-private partnerships – privatisation. Municipalities will be aggregated into blocks, to support cross-subsidisation. *‘It will be better – but will it be affordable?’*

‘Regulatory Incentives are very weak right now, to incentivise the public providers, we have to follow the municipal planning. It’s our first objective, which is very difficult to do actually in practice. The regulator presently has more punishment instruments than incentives. We have the power to define new methodologies of tariff calculation. We have the possibility to institute benchmarking. These are very promising works that we’re about to do if the new legal framework makes this possible. But on private contracts, we are very constrained.’

Regarding affordability, the concern is mostly the protection of those more vulnerable – *‘we still really don’t have an answer for that. We’re working on it. And it actually is a fight we’re getting into. To make sure those who can’t really pay, in fact, don’t really pay for this bill.’*

From the technical point of view, the trend is towards more sophisticated, higher-cost technology. *‘When we try to integrate with the network of the city provider of sanitation, I think the new legal framework will need to address this, how we can be more receptive to technological alternatives, to an incremental perspective.’*

Colombia – CRA

Lead source: Diego Polanía, former Executive Director and current Expert Commissioner of Colombia’s Regulatory Commission for Drinking Water and Basic Sanitation (CRA)

Urban ‘basic’ sanitation is at 92.9%, safely managed 15.8%. Colombia is a middle-income country with 93% urban sewerage coverage, 43% treated wastewater, though gaps and inequalities and reaching the last mile of service delivery are both challenging and expensive, particularly with informal settlements and unregulated dumping of sludge. Municipalities have the core mandate for ensuring that public services are provided to everyone. The regulator, Comisión de Regulación de Agua Potable y Saneamiento Básico (CRA), recognises the need for a differentiated approach to incentivise the utilities, public or private, to close the gap, now acknowledging NSS as part of the solution. CRA requires service providers, *‘you know best how to deliver in unserved areas’*, to develop business plans, against which CRA can then

agree tariff adjustments. In regularised areas, providers must achieve 100% coverage in a maximum of 5 years whereas in informal areas the business plan can state that the provider can take an extended number of years to come up with the 100% coverage standard. The only requirement is that they establish KPIs that commit to continuous improvement in coverage, quality, and sustainability each year – which the regulator can monitor.

CRA has an important role to play in understanding what is possible in different areas, and how those targets should evolve over time, CRA saying *‘we can regulate utilities, but municipalities have a huge role here – they have to allocate funds, they have to plan the urban development, they have to legalise some of those neighbourhoods. First and foremost, the utilities now have a mandate to reach peri-urban areas where there are no or poor services, and their reputation is important to them. This is the first incentive, and our task is to set the rules so that there is not a high risk for them to work there.’*

Chile – SISS

Lead source: Victor Galvez, Inter-American Association of Sanitary and Environmental Engineering (AIDIS), formerly Superintendency of Sanitary Services (SISS)

Urban ‘basic’ sanitation is at 100%, safely managed 81.4%. Tariff-setting by national regulator SISS of ‘high-achieving’ private service providers (95%) in an upper-middle-income economy has led to real benefits over the past 30 years, now at 97% sewerage and 100% wastewater treatment in Santiago for example. This level of service has been supported by direct government subsidies to poor households, over 12% of urban consumers in total. There are two forms of direct demand-side subsidies for water and sanitation services for low-income families: municipalities administer a subsidy for those who apply and qualify, and the central government Chile Solidario program provides a social grant for households in extreme poverty which can provide an additional benefit for WSS charges. In this system, an additional benefit can be provided for water and sanitation to cover 100% of the fixed tariff and the first 15 m³ of volumetric consumption tariffs. The underlying principle of this approach is that the entities responsible for drinking water and sanitation service supply are not the same as those responsible for ensuring affordability of the service.

Based on this success, the regulator SISS has recently been given the extended mandate to regulate in the rural areas, about which *‘they’re very apprehensive as they don’t know how to even think about regulating the public sector, where you can’t dangle tariff increases and increased revenue as the primary incentive to drive performance’*.

Malaysia – SPAN

Lead source: Recca Tharmarajah, Director of the Standard and Technical Compliance Division, National Water Services Commission (SPAN)

Urban ‘basic’ sanitation is at 99.9%, 96% managed with 20% NSS. The National Water Services Commission (SPAN) regulates the single national sanitation service provider (Indah Water Konsortium, IWK), though suggesting that *‘competition is better than a single operator’*. There are government subsidies for enhanced treatment CAPEX, concessionary tariffs for the very poor at one-quarter of the already very low sewerage tariffs, with no tariff increase for almost 30 years so the system could be described as not sustainable. The regulator estimates that it would need a 100% increase in sanitation charges to become closer to cost. The service licensee has the obligation to submit a three-year rolling and a 30-year business plan to the regulator. Upon the approval of the business plan by the regulator, the operator is responsible to submit their business plan to ensure the funds for necessary capital works as per the licensee’s approved business plan are raised and the works are implemented. On-demand desludging, adopted in a liberalised private sector approach, led to the incidence of desludging falling by half. As a result, desludging by septic tank owners on a two-yearly basis, under a March 2021 Regulation, is now required, IWK sending a desludging notice to every individual premise.

Capital works funding for sanitation infrastructure is heavily dependent on real estate developers who are required to provide systems but seek to minimise costs – the regulator is responsible for ensuring design compliance, subcontracted to private certifying agencies (though SPAN is trying to go towards self-regulating, *‘we want to put the responsibility more on the owner, and on the developer and also the consultant’*). There is a challenge to get property owners to connect to sewers where there are uncertainties as to who is responsible to ensure the property is not damaged during connection.

Improving regulation in Malaysia may need improved inter-agency collaboration, between municipalities and the Department of Environment, for example regarding pollution and the source of that pollution.

Portugal, Azores – ERSARA

Lead source: Hugo Pacheco, Water and Waste Services Regulation Authority of Azores (ERSARA)

Urban ‘basic’ sanitation is at 99.5%, safely managed 92.7%. Non-sewered sanitation (extensive reliance on septic tanks) is more common than sewerage (the population connected to public wastewater drainage and treatment system ranges from 0% to 44% in the most populated islands). In this context, it is understood to be not financially or operationally feasible to rely on centralized sewerage systems. This, in a region of a high-income country through ERSARA regulated (precise specifications and guidelines for

septic tanks) municipal service provision (private operators provide services for the municipalities and the municipality is responsible for the quality of the service and eventual environmental impact), requiring regular desludging and wastewater treatment paid through the water bill. Municipal politicians approve tariffs, though it is understood that they are not approving tariffs at the level required to fund 'future-proofing'. For septic tanks, users can either pay a tariff based on water consumption and then get two desludging services each year, then pay extra if more is needed, or it is possible to pay by volume each time. The municipalities choose which pricing mechanism is used.

The Azores Government monitors the quality of seawater closely and the results are globally excellent concluding that there are no water quality impacts from septic tanks and wastewater treatment plants.

ERSARA has a KPI which measures the affordability of the tariff to households – a limit of 0.5% of the family budget per month.

Japan

(ADB, 2021 and Gaulke, 2006)

Urban sanitation is at 100%. Government-subsidised enhanced septic tanks in a high-income country with government quality assurance based on trained and government certified maintenance technicians.

In the lower-density peri-urban areas, areas which are outside the 'provider pipe network efficiency frontier', Japan uses an approach known as 'Johkasou', in English, it could be called 'household wastewater treatment plant' or 'enhanced septic tank'.

There is a government programme to monitor, enforce, and subsidize system installation in all new construction, which drives private investment in product innovation and service provision and a government programme to monitor regular servicing requirements for installed systems (this is also subsidized).

The significant public investment to support on-site upgrades from unsafe to safe systems focuses on enhanced septic tanks costing approximately USD7,500 each (updated to 2020 prices), with the government funding 40% of that amount. With assumptions about decreasing household size over the period, the average annual subsidy (in 2020 prices) has been approximately USD254 million (USD1,260 per person) to serve approximately 6.65 million people.

There are government-supported training programmes, certification, and penalty systems to ensure product and service providers' qualifications, with an annual inspection for effluent water quality assurance with the household funding the annual desludging and 'a few times a year' required maintenance by the 200,000 trained and examination qualified registered technicians.

All these points are important components of the costs of good public service systems that are often left out of project estimates and budgets, and when making assumptions about household adoption rates, continued performance of on-site systems, and incentives for private sector engagement.

Republic of Korea

(Shim et al., 2016)

Urban sanitation is at 100%. Using regulatory techniques to deliver full sewerage and water treatment in a high-income country – through significant public subsidies, private sector efficiency and a tripling of tariffs.

This case is included here to indicate the cost levels of a ‘fully sewerage and wastewater treated’ urban sanitation system, and an indication of public subsidy levels that have been deployed in the Republic of Korea, in addition to confirming that there is a role for the private sector in operations (with OPEX benefits) and, less significant, financing.

Using regulatory techniques, though not a ‘regulator’ (industry-wide benchmarking, municipality tariff approvals), sewerage connection and treatment rates in the Republic of Korea rose from about 2% (1961) to about 90% (2012), supported by accessing USD800m of private capital financing for 100 wastewater treatment plants 1998-2008 (also delivering a 25% reduction in plant OPEX). This is in the context of National and Local Subsidies averaging USD2.8 billion per year and water user charges increasing about 3.8 times (2000-2012).

Reflections on completing the CWIS journey

How do these cases address regulating the ‘remainder’ NSS households?

In these USD29,000 GNI per person average countries (this level of average wealth generation making all things possible, even though society will still argue against each and every tariff increase) the service mandate to serve the peri-urban poor has been clarified. Partnerships with municipalities deliver legalisation of informal settlements or at least allow for formal service provision.

Standards for wastewater treatment, at household level as well as at sewerage level, have been agreed. Standards for sludge treatment, for scheduled household desludging and for wastewater treatment works are agreed and, to a considerable extent, delivered. Standards for enhanced septic tank systems and certification of technicians to ensure quality has been set in Japan, for example.

The art of regulating is delivering pragmatic service targets, where 100% is not yet quite achieved, based on required service provider business plans. Approaches are flexible and adapted when found not to be working, as in the Malaysian experience of trying on-demand before returning to scheduled desludging.

Funding expansion of sewerage networks, through requiring real estate developers to take responsibility for construction before asset transfer, is being regulated (just about) but requires further work to ensure quality and minimise fragmentation.

Overall, subsidies from national government taxes are both significant and common. Whether these are for wastewater treatment works or for social tariffs, subsidies appear to be a necessary balancing between service delivery and enhancement and resulting direct tariffs. The private sector is playing a role, in efficient service delivery generally, with relatively limited inputs to financing – which can be seen as ‘wise regulating’, to minimise ‘cost of private capital’ effects on tariffs.

Regulatory issues regarding effective rain/stormwater management, particularly of combined sewer storm overflows in the context of ever more demanding and environmentally concerned citizens have not been raised in these case studies but are understood to have been addressed.

Overall Lessons Learnt in Regulating CWIS

Focusing upon the regulatory process, rather than present sanitation outcomes, the initial lesson is that there is no correlation between regulating and country income levels. NWASCO, WASREB and RURA demonstrate significant empowerment (more useful than the word ‘independent’ perhaps) as well as abilities to bring together stakeholders and begin to set the agenda and context in which sanitation for all can be delivered.

Whether low, middle or high-income economies, although the targets of regulatory inputs might vary (extent of NSS relative to sewerage relative to wastewater treatment), the task of regulating looks to be much the same: to be the nudger, facilitator, interlocutor, the ‘referee’, the integrator but also, the cases suggest, the promoter, the mobiliser of change, who acts as the intermediary between policy-makers and service providers and citizens ‘to make things happen fairly’, always with an eye on the societal-required outcomes.

Figure 2 tries to capture the role of the regulatory process, whether an individual regulator with a combined mandate or an aggregation of regulators with the shared responsibility to make possible the agreed decisions of policymakers through their politicians by society’s formal service providers, all to meet the needs and wants of the citizen consumer customer.

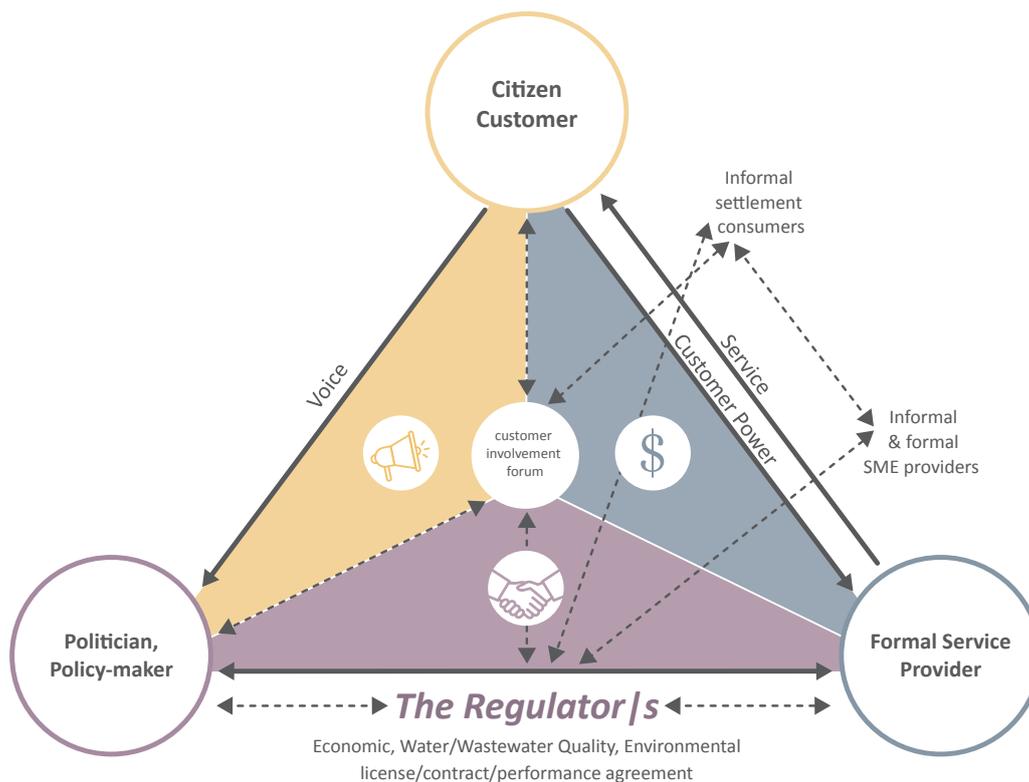


Figure 2. The role on Regulating in the ‘Accountability Triangle’ (after World Development Report, Making Services Work for Poor People, 2004).

None of the cases has referred to the role of customer involvement in CWIS, though NWASCO, for example, has its Water Watch Groups supporting water supply delivery over many years. When the difficult CWIS tariff decisions cannot be avoided any longer, the role of customer involvement, of regulatory consultation papers, of NGO and media briefing will become ever more important in supporting CWIS delivery, whilst challenging regulators and service providers.

The major challenge along the way is the professional (service provider and consultants and contractors) and political bias towards sewerage solutions – only affordable during the transitions to date by governments providing massive taxation-supported subsidies to sewerage CAPEX and service providers delivering massive (usually unknown, as never accounted for) subsidies to sewerage OPEX – but all that only accessible by the ‘rich few’ who have the luxury of a sewerage connection.

‘Almost all users of the flush toilet and its sewage system are the rich in our cities. Our political system literally subsidises the rich to excrete in convenience’ (Agarwal and Narain, 2002).

Key Points

Safe-guarding safe services provision to all requires a review of utility and regulator mandates, especially in fast-growing settlements

- Urbanising areas, unplanned settlements, informal settlements.
- Making service provision affordable and feasible may require cross-subsidisation from water to sanitation, and from affluent areas to less affluent areas.

Regulating for CWIS is relevant in all contexts, not just in lower-income countries

- Even in comparatively affluent contexts, there are instances where a majority rely on non-sewered sanitation, and where the regulator regulates all types of sanitation services. E.g., Azores, Santa Caterina.

Data is essential

- Data gathering is expensive and likely to require external funding – which limits its reach.
- Need to be pragmatic about what data it is realistic to expect utilities to collect. What data do utilities need for their own operations and planning, against what data does government and the regulator need. If the primary benefit is to the government and is in the public interest, rather than the utility, then the government should provide an incentive – i.e., payment/funding for data gathering.

The gradual, incremental approach

- Introduction of pragmatic, incremental regulatory measures are likely to be more workable than bold big-bang moves.
- Difficult to move fast when countries are still in the lower reaches of the learning curve – especially around how to provide viable latrine emptying services in dense unplanned settlements. Moving slowly allows more time to build relationships and trust.

It's time to rethink the role of the regulator

- There are many roles, depending on the context, and no one size-fits-all.
- The scope of economic regulation of water and sanitation has expanded substantially beyond what was envisaged in the 1990s [extensive uptake for privatised public sector utilities], and the requirements of CWIS require further shifts.
- The role of the regulator may be very different to that typically associated with economic regulation – activist, innovator, not command and control, willing to experiment/make mistakes / take risks. Regulators need to partner with service providers, particularly in lower-income countries, rather than act as a stern detached overseer.
- Conventional economic regulation focuses on the institution providing the service, the water and the sanitation utility. But sanitation – especially NSS – needs to be planned and managed to take account of cross-cutting linkages with housing, drainage, and solid waste as well. Multi-sector regulators may have some advantages here. Multi-sector coordination is particularly imperative.

Considerably more exploration of incentives to pursue CWIS is needed

- Non-sewered sanitation regulation is much more challenging than for sewerage – many more moving parts, more diverse systems, more role-players. Current economic regulation approaches are focused on expanding the role and mandate of commercial utilities so that they play the overall coordinating role and marshal the different elements in the service chain. But utilities will not be able to play this role without additional support.
- Private sector vs public commercial utility – different incentives, different tools, different approaches. Incentives to spur the public sector are very different to those for private-sector utilities – *'you can't dangle tariff increases and increased revenue as the primary incentive to drive performance'*.
- Effective incentives for public providers to tackle CWIS are currently somewhat limited, especially where many customers are extremely poor and unable to pay a cost-reflective tariff. Command-and-control approaches are only feasible where they are affordable.

Very difficult to regulate effectively in contexts with low GNI per person – funding constraints at households and sector level leave large gaps between policy and practice

- Without minimum income thresholds, and/or supplementary funding, there are firm limits on what regulation can achieve. Dedicated funds may be needed to support the activities at households and service provider level that are needed to make regulation meaningful.
- Economic regulation focuses on service providers. This needs to be complemented with effective regulation of households and other users – i.e., enforcement of local planning and health regulations. But this presupposes that compliance is feasible (a comparison being KCCA’s minimum standard for VIPs costing over USD2,000). Supplementary funding will be needed to enable households to comply with physical requirements – this is the critical issue that regulation cannot resolve unless it can unleash additional funding.
- Incentives to utilities, or, at the very least, facilitating funds, as described in the Zambia case study.
- These new services are not lucrative for commercially oriented utilities, they are difficult to take services, and there is no incentive. How to motivate? How to make sure that there are benefits provided [for service providers] to move into such service areas?
- Without some sort of ‘CWIS Infrastructure Fund’ it’s a very difficult thing to do. Because utilities really need to have the motivation and financial support to deliver CWIS.

The implications of equitable tariff regulation for CWIS need a lot more thought

- Funding for sewerage and non-sewered sanitation are fundamentally different.
- Sewerage requires high CAPEX and a long pay-back period, then [depending on the wastewater treatment requirements] has comparatively low OPEX costs.
- Non-sewered sanitation has relatively modest CAPEX costs, and most of the capital costs are borne by individual users. OPEX costs are comparatively higher than for sewerage.
- Manila charges a single standard tariff for sanitation, which covers the cost of a connection to a combined sewer or a separate sewer, wastewater treatment and a desludging service – irrespective of the type of facility people use. In what circumstances does this make sense?
- The rate of return-based regulatory methods has a built-in bias against non-sewered sanitation. This needs to be reviewed where sewerage is not feasible in all areas.
- In Brazil, for example, historically there has been over expenditure on capital investment, ‘a built-in incentive to opt for more costly technologies’, because of the assumed generous rate of return – which immediately raises red flags around tariff increases and tariff affordability.

- In many countries – especially LMICs – where sewage is collected but not treated adequately, sewerage tariffs do not reflect the real costs of collecting, treating, and discharging wastewater that is safe to public health and the physical environment. This constitutes a significant externality and a further subsidy on the cost of sewered sanitation. In inland settlements, the cost is borne by all downstream water users, especially those without access to safe services.
- Growing constraints on water availability require more comprehensive environmental regulation, and linked to that, more comprehensive sanitation regulation and more accurate costing of safely treated wastewater.

Economic regulation of utilities requires effective regulation of user behaviour to make their mandate doable

- Poor enforcement of sanitation regulations means that households bypass safe containment or emptying, preventing the FSM market from developing further.
- But in LMICs, enforcement of local health/planning environmental regulations tends to focus on only the most extreme abuses and even then, only when the political cost of not doing so is higher than the costs of inaction.
- Available enforcement staff tend to focus on areas of oversight offering good personal incentives – meals from restaurants, take-aways from butcheries, gifts from landlords.

Regulators need a whole new set of skills

- Understanding of CWIS and its various dimensions and implications for local application [peri-urban/informal/unplanned settlements], not least what it means for tariff setting.
- Ability to engage utilities in dialogue around options and how best to tackle and fund them. Every city has its own specific sanitation characteristics, and multiple parallel solutions may be needed to achieve city-wide integrated sanitation in each case.
- Service providers need to be in a symbiotic relationship with regulators, with mutual respect and acknowledgement of interdependence. If the regulator puts too much pressure on the utility, it won't be able to do its job anymore – and there may be no one else to do the job.

COVID-19 has heightened inequality, and in many countries is reducing the resources available to reduce inequality. It is vital to minimise deferral of investment in sanitation improvement.

- For example, in Zambia, NAWASCO has allowed utilities to tap into funds raised through sanitation surcharges for general operational expenses.

CWIS Regulatory Requirements

Finally, we attempt to bring together the Lessons Learnt in a summary of the regulatory activities that must be undertaken to deliver CWIS. This follows the Roles and Responsibilities, Regulations, and Regulating sequence described earlier.

Regulatory Enabling Environment for CWIS – Roles and Responsibilities

The lessons learnt are that regulators, aiming to achieve sanitation for all, need to address roles and responsibilities by:

- Recognising CWIS as the critical first step to the longer-term goal of **‘Integrated Urban Water Management’** planning (including greywater and stormwater, particularly in informal settlements), a definition of sanitation also referring to *‘the maintenance of hygienic conditions, through services such as garbage collection and wastewater disposal (WHO, 2021).’*
- Having developed the necessary consensus, consider adjusting the license of the public water (and/or sewerage) supplier to become a **‘water and sanitation company’** with responsibilities to manage sanitation service provision for all, NSS in addition to sewerage; alternatively, where municipalities have proven to be effective service providers or where there is no likely separate public water supplier, the municipality to be mandated as CWIS regulated license holder.
- Establish processes for license renewals. The license needs to mandate clearly defined geographical boundaries, with the expectation boundaries will adjust over time.
- Communicate with the government as to the likely extent of necessary **subsidies needed from taxes** to support the phased development of CWIS.

Regulation and Standards

The lessons learnt are that regulators, aiming to achieve sanitation for all, need to address regulations and standards by:

- Harmonising regulatory requirements across sanitation-related sectors to ensure the protection of **human health and the environment**.
- Requiring the preparation of **Standard Operating Procedures** to ensure the well-being of sanitation workers.
- Facilitating the updating and reconfiguration of **quality-of service standards, norms, and bylaws** to facilitate the progressive realisation of non-sewered sanitation, including accessible and emptiable pit/tanks, in addition to sewered (conventional & reduced cost) sanitation.
- Accessible and emptiable pits, the substructure of low-income toilets, are likely to require ‘public good funding’ from external sources. Household toilet superstructures do not need to be overly specified in regulations and can be self-funded at the level households chose.
- Establishing criteria for the siting and management of **communal public toilets** in informal settlements.
- Formalising the standard for **pit/tank scheduled desludging**, including the use of electronic vehicle trackers to ensure safe disposal, and means of funding this public service.
- Facilitating agreed standards for **upper and middle-income multi dwelling developments** regarding the quality of on-site wastewater treatment and effluent disposal.
- Recognising that to achieve SDG6.2 in lower-income countries requires an **almost total focus on non-sewered sanitation for the next decade**. The regulatory system should develop agreed criteria for where limited investment in conventional sewerage might be considered within Service Provider Business Plans.
- Prior to any commitment to extend sewerage to domestic households, cost-benefit calculations are recommended to account for non-household funding of sewer connections direct to households to avoid the less than ten per cent self-connection rates achieved on over-optimistic plans, negating at the post-implementation stage any benefits from sewerage. If this recommendation makes sewerage unaffordable it confirms the focus on NSS.

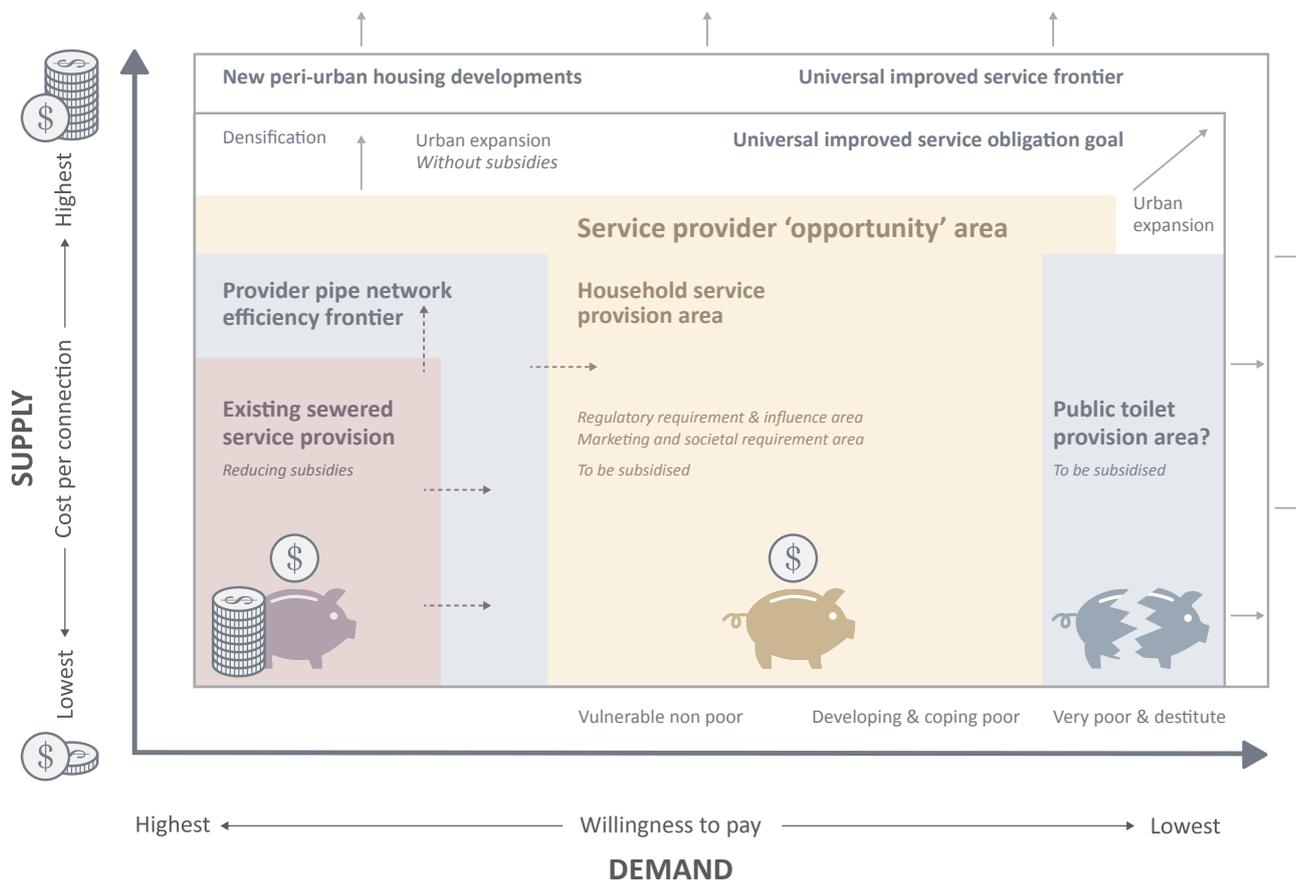


Figure 3. Regulating CWIS – The Universal Service Obligation and the ‘Sewerage pipe network efficiency frontier’ (after Franceys and Gerlach, 2008).

Figure 3 suggests a way that economic regulators can consider the sewerage/non-sewered sanitation trade-off. The size of the blocks (which indicate the dynamic nature of service provision through the dotted arrows) will vary between cases. The concept of the ‘pipe network efficiency frontier’ (sewerage pipes in this case), where the cost of supply (influenced by water availability, wastewater capacity, topography, materials, and skilled labour availability etc.) and the level of effective demand can provide an ‘efficiency frontier’ (a concept much used by some regulators) within which it is effective and efficient to provide expensive sewerage. In practice, ‘the rich who have been enabled to excrete in convenience’ tend not to have allowed tariffs to rise to match what was presumed to be their effective demand. This suggests that until sewerage tariffs rise to something approaching cost reflectivity (which does not mean that all water users without access to the luxury of sewerage must pay the same ‘sewerage tax’ on their water bill) then sewerage is uneconomic. It also suggests that regulators must direct their service providers, through the approval of their business plans and subsequent tariff settlements, towards the present ‘Service provider failure area’ and ensure that they make urgent progress with the marketing, the support, and the directed subsidies to make non-sewered sanitation work for all.

Setting Licensed Service Provider Requirements

- Collect, and report on, appropriate data – **service quality information and costs**, based on regulatory accounting guidelines for sewerage & sanitation costs separation – with an incremental **strengthening of information management and reporting** systems across the entire sanitation service chain.
- Deliver periodic (regulator defined) **business plans, service, and asset management plans** for the entire sanitation service chain, including funding proposals, justifying the balance between sewered and NSS solutions (both also relative to water supply investments), related to anticipated outcomes based on health risk assessments.

Regulating Service Providers to Deliver CWIS

The lessons learnt are that regulators, aiming to achieve sanitation for all, need to address ‘the art of regulating’ by:

- Communicating with the government as to the likely extent of necessary **subsidies needed from taxes** to support the phased development of CWIS.
- Promoting a range of incentives to mobilise service providers in **servicing neglected areas** in the context of pragmatism, gradualism, and flexibility.
- Engaging with **private service providers** to understand better what incentives would enable them to cover neglected areas.
- Promote a culture of **collaboration, shared learning, and willingness to innovate** to achieve the goal, incentivising operators to be open to new technologies and solutions – regulators accepting service providers’ preparedness to experiment, learn from mistakes and work collaboratively with all stakeholders
- **Continually engaging with main service providers**, there needing to be a symbiotic relationship with regulators, with mutual respect and acknowledgement of interdependence.
- Commencing development of a joint regulator and service provider transparent **‘tariffs and charges financial model’** (spreadsheet), including sewered (reducing present subsidies) and non-sewered sanitation options, including each component of the non-sewered sanitation service chain.
- In order to raise awareness, develop an understanding of **the ‘true cost of sewerage’** (in parallel to the already known ‘true cost of water’).

- Developing **Key Performance Indicators** (but not too many!), linked to incentives and efficiency requirements, to ensure service provider plans include incremental service improvement to the poor – with a specific KPI for **ongoing service levels (services used) to the lowest-income quartile**.
- Begin **satisfaction surveying**, use of Citizen Report Cards, benchmarking, and comparative performance tables across the range of licensed service providers.
- Supporting weaker service providers (and consumer representatives) through **capacity-building**, particularly in supporting the development of risk-based approaches to preparing service and asset management plans.
- Developing **proposed tariffs and user charges** (within the regulator’s guidelines & financial model), structured to balance affordability to users and sustainability for service provision, particularly across each element of the non-sewered sanitation service chain.
- Overseeing the **subsidies**, particularly from water tariffs, but also from municipal taxes and national or state investment (plus transfers for the lowest-income countries), directed to the highest outcome areas first to reach needy households – poorer users to be subsidised through the lever of regulation, ensuring that subsidies are used as efficiently as possible.
- Investigate and develop **innovative funding and financing options**, including any possible benefits of ‘*waste to wealth*’.
- Ensuring an adequate mechanism for **service provider appeals** against regulatory decisions.

Considering these final activities, the case studies demonstrate that for all the benefits of the regulatory process, setting service standards for all with properly determined tariffs, supported by sustainable subsidies where appropriate, is the hardest part of the task. We started this overview with the anglophone idiom of ‘squaring the circle’. In our consultation, it was pointed out that *‘the idea of transforming a square into a circle (instead of a circle into a square) could give an idea of searching for a higher ideal. Start from a rigid structure to a more flexible one’*. Regulating as an ongoing circular process, rather than regulations that tick the square box. A higher ideal indeed!

It appears the core regulatory CWIS task is indeed that challenging – perhaps just two of the cases describing regulators presently empowered to undertake tariff-setting. And even then, only one of them having to address the significantly more complex challenge of enabling non-sewered sanitation relative to sewered sanitation. WASREB commented that *‘Whatever interventions we put in place, tariff-setting is the key role for the regulator to have to protect those at the bottom of the pyramid’*.

Finally, the cases demonstrate that regulators need to have sufficient ‘independence’ (always partial, regulators always necessarily being aware of the socio-economic-political context in which they are operating) and professional capacity to address, and continually re-address as the context evolves, the issues relating to enabling the sustainable delivery of sanitation for all. These cases demonstrate that regulating is indeed making a difference. But there is a long way to go!

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References

ADB, Spotlight on Japan's "Johkasou" Sanitation System: A Model for Asia – Video, 18 February 2021

Agarwal, A. and Narain, S. (2002) 'Private Sector cannot solve India's water and sanitation problems', *Water and Waste Water International*, April 2002

Cruz, V., Melo, C., Medeiros, D., Costa, S., Cymbron, R., Rocha, S., Medeiros, C., Valente, A., Mendes, S., Silva, D. and Martins, F. (2017) Water management and planning in a small island archipelago: the Azores case study (Portugal) in the context of the Water Framework Directive, *Water Policy* 19 (2017) 1097–1118, IWA Publishing

Dodane, P-H., Mbéguéré, M., Sow, O. and Strande, L. (2012) Capital and Operating Costs of Full-Scale Fecal Sludge Management and Wastewater Treatment Systems in Dakar, Senegal, *Environ. Sci. Technol.* 2012, 46, 7, 3705–3711, March 13, 2012

Franceys, R. and Gerlach, E. (2008) *Regulating Water and Sanitation for the Poor - Economic Regulation for Public and Private Partnerships*, Routledge, ISBN 9781844076178

Gaulke, L. (2006) On-site wastewater treatment and reuses in Japan, *Proceedings of the Institution of Civil Engineers, Water Management* 159, June 2006, Issue WM2, pages 103 - 109

Groom E, Halpern J and Ehrhardt D (2006) *Explanatory Notes on Key Topics in the Regulation of Water and Sanitation Services*, Water Supply and Sanitation Sector Board Discussion Paper Series 6, World Bank, Washington, DC.

Heller, L. (2017) Service regulation and the human rights to water and sanitation, Report to the 36th session of the Human Rights Council by the Special Rapporteur on the human rights to water and sanitation, A/HRC/36/45, OHCHR, Geneva

ISO/IWA 24:2016 (2016) *Non-sewered sanitation systems — General safety and performance*

International Water Association (2015). *The Lisbon Charter - Guiding the Public Policy and Regulation of Drinking Water Supply, Sanitation and Wastewater Management Services*

McConville, J., Kvarnström, E., Maiteki, J. and Niwagaba, C. (2019) Infrastructure investments and operating costs for fecal sludge and sewage treatment systems in Kampala, Uganda, *Urban Water Journal*, 16:8, 584-593

Mumssen, Y., Gustavo, S., Kingdom, B., Norhan, S., and Marques, R. (2018) "Regulation of Water Supply and Sanitation in Bank Client Countries: A Fresh Look." World Bank, Washington, DC.

Narzetti, D. and Cunha Marques, R. (2020) Models of Subsidies for Water and Sanitation Services for Vulnerable People in South American Countries: Lessons for Brazil - 13 July 2020, *Water* 2020, 12, 1976; doi:10.3390/w12071976

Norman, G. (2019) Is slum sanitation likely to require major subsidy? WSUP, July 2019, London

Peletz, R., MacLeod, C., Kones, J., Samuel, E., Easthope-Frazer, A., Delaire, C. (2020) When pits fill up: Supply and demand for safe pit emptying services in Kisumu, Kenya. *PLoS ONE* 15(9): e0238003.

Shim, Y-S., An, S-H. and Ahn, J-H. (2016) Transformation of the Water Sector (1960–2012) Korean Water and Wastewater Works Association (KWWA), May 2016, Seoul

UNICEF (2020) Global and Regional Costs of Achieving Universal Access to Sanitation to Meet SDG Target 6.2 November 2020

United Nations Children’s Fund (UNICEF) and the World Health Organization (2020) State of the World’s Sanitation: An urgent call to transform sanitation for better health, environments, economies, and societies. New York

WHO (2021): <https://www.afro.who.int/node/5691>

World Bank (2021a) <https://data.worldbank.org/indicator/EN.POP.SLUM>

World Bank (2021b) <https://data.worldbank.org/indicator/NY.GNP.PCAP.PP.CD>

WSUP (2020) Referee! Responsibilities, regulations and regulating for urban sanitation, WSUP Discussion Paper, Water and Sanitation for the Urban Poor, London

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