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New definitions for good practice: Regulators as activists for urban road-transported sanitation in eastern and southern Africa

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Abstract

This paper considers the changing role of national and local regulators scaling safe emptying and transport of faecal sludge in east and southern Africa. We aim to understand how regulators are going beyond currently defined good practice and what should be learnt for others. Established roles and characteristics for regulators were synthesised and emergent practice identified, through secondary data review and key informant interviews within leading national and local regulators. This paper identified how utilities and municipalities are required to work as local regulators of service providers, who fall outside of direct or delegated arrangements, and that this role should be formally recognised to facilitate wider change. We describe the moral courage demonstrated by regulators in attempting to engage the informal sector and scale services in the face of limited resources and capacity, incomplete rules and fragmented roles and powers. Engaging informal manual emptiers already working in low-income areas, and enabling them to work safely, is considered an important part of reaching universal access by leading regulators but is not recognised in current legal frameworks and guidance. Moral courage is an important part of building trust and voluntary compliance. It is also imperative given the public health impacts of poor sanitation on the poorest and most vulnerable, and the need to challenge deeply held stigma and prejudice. We see these leading regulators as social and environmental activists, not just actors. We conclude that the focus for the sector should be on reducing the risks faced by organisations scaling this most basic of public services. In the immediate term, local, national, regional and global leaders need to recognise the important role of the informal sector in sanitation and actively support local regulators in reaching universal access.

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1. Introduction

Effective regulation balances social, environmental and economic interests to reach policy objectives [1]. Regulatory policy has been identified as a crucial part of welfare and social protection in the global context of health and economic crises and increasing uncertainty [2].

Sanitation is widely recognised as a universal human right (United Nations General Assembly resolution 64/292), which should be provided based on need, rather than the ability or willingness to pay [3]. However, discussions around sanitation provision have often focussed on affordability and financial viability rather than acceptable cost burdens, service levels and pollution or public health impacts [4]. Regulation in the sanitation sector is essential due to the significant externalities in public health and environmental protection, the costs and benefits of which accrue to society at large rather than back to service providers [1,5].

More than 1.5 billion people in urban areas do not have access to safely managed sanitation, contributing to a high public health burden from diarrhoeal diseases, acute respiratory infections and undernutrition [6,7]. Poor sanitation contributes to the continued prevalence of diseases like cholera, which impacts up to 4 million people per year [8]. Patterns of exclusion may be rooted in stigma and continue embedded historical patterns [9–11]. The stigma and marginalisation faced by sanitation workers themselves is well documented [12,13]. The human response of disgust may even shape policy responses to sanitation [14,15].

Rapidly scaling good quality road-transported sanitation is one avenue to reaching universal access to safe sanitation services [16,17]. Safe emptying and transport of faecal sludge is a critical stage in the sanitation chain, often provided through a heterogenous private sector ranging from informal individuals and community-based groups to formal businesses running multiple vacuum tankers [18,19].

Water and sanitation regulators are recognised as crucial in scaling inclusive sanitation services [19–21]. However, regulation of road-transported sanitation is very different to networked water and sewerage, requiring a greater level of regulatory sophistication given the complexity of the dispersed responsibilities to households and, implicitly or explicitly, a heterogenous private sector [5,22]. Despite being largely delivered through private sector providers, regulation of road-transported sanitation is also very different from business regulation, there is a public health and environmental imperative to ensure latrine pits and septic tanks are emptied citywide, including low-income and hard to access areas where commercial drivers are limited [4,23].

Regulation of faecal sludge emptying and transport services are additionally complicated by the existence of multilayered regulatory systems. Where road-transported sanitation is being actively addressed, national regulators are often regulating city level authorities, utilities or municipalities with the mandate for service provision. Those city level authorities are often acting as both direct service providers and as local regulators of private businesses or individuals providing services [24,25].

The ‘rise of the regulator’ in enabling universal water and sanitation access was identified as an important sector trend at the UNC 2024 Water Symposium [26]. Leading regulators have been credited with taking a wider social,

technical and economic role in enabling change and leading sector reform [23,27–31]. However, this wider role is not well defined; there is little research into how national and local regulators need to work in this complex multi layered regulatory system so that private sector providers provide safe faecal sludge emptying and transport services for all households, including low-income areas [23,24,32]. Do national and local regulators 'just' need to implement existing and established good practice [33]? Or are there potentially novel requirements and ways of working?

This paper aims to understand firstly, how leading national and local regulators are working differently to facilitate safe faecal sludge emptying and transport services at scale, and secondly whether this is transferable to other national and local regulators in east and southern Africa.

2. Materials and methods

2.1. Ethics

This study was reviewed and approved by Cranfield University Research Ethics System (CURES/23444/2024). Informed consent was obtained from key informants.

2.2. Overview

A literature review synthesised the established roles and characteristics for regulators. Secondary data from the Eastern and Southern Africa Water and Sanitation Regulators Association (ESAWAS) and the International Network of Drinking-water and Sanitation Regulators (World Health Organisation) were then analysed to identify emergent roles and characteristics which appear to differ or go beyond established good practice. These findings were combined into a coding framework and used to design and analyse interviews with 19 key informants within national and local regulators. The findings are then discussed against wider trends in sanitation and regulatory policy.

2.3. Definitions

This paper takes a broad view of regulation as a process of effecting change, led by regulators who work through, and with, a wide range of actors [34].

'National regulator' is used for whichever national authority has the primary responsibility for regulating sanitation service provision.

'Local regulator' is used for utilities and municipalities, or the responsible department within the municipality, which are seeking to monitor and control the activities of a local private sector. This regulation could be explicit or implicit, for both formal and informal service providers. In many cases utilities or municipalities may also be directly contracting or providing services themselves. This paper looks only at the de-facto local regulatory role for utilities and municipalities.

'Service provider' refers to the individuals or businesses directly involved in faecal sludge emptying and transport.

'Trust', both interpersonal and interorganizational, is used in this paper to mean "the intention to accept vulnerability to the actions of another party, based upon the expectation that the other will perform a particular action" [[35], p.61].

'Pro poor regulation' aims to extend service to low-income groups, for example designing social tariffs and explicit targets for low-income areas [5].

The 'informal' sector or service providers refers to all individuals and organisations "that are – in law or in practice – not covered or insufficiently covered by formal arrangements" [36].

'Formalisation' means bringing 'informal' service providers under "*the regulation of the state with the advantages and obligations that this entails"* [36]. The formal and informal sectors are seen as distinct and separate, as commonly presented in literature road-based sanitation [31].

2.4. Literature review, secondary data analysis and development of the coding framework

A review was completed of academic and practitioner literature which laid out roles and characteristics of good practice regulation. Academic and practitioner literature looking specifically at the regulation of road-transported sanitation in urban settings was identified building from a published scoping review by the same lead authors completed in 2023 [23]. This review on road-transported sanitation was updated for 2024 and 2025, with peer-reviewed publications and practitioner literature from international bodies which are active in regulatory policy of the related sectors of water, sanitation and environmental regulation; World Health Organisation (WHO), East and Southern African Water and Sanitation Regulators' Association (ESAWAS), and the International Water Association (IWA). This review of regulation of road-transported regulation was supplemented by cross-sector definitions of roles and characteristics using four seminal texts as the basis: (i) Baldwin et al. (2011), still the most comprehensive interdisciplinary introduction [1]; (ii) Nolan Committee (1995), as a foundational text for how the authors consider public sector responsibilities [37], (iii) Sparrow (2000) which, in the opinion of the authors is the most comprehensive outline of the challenges inherent in regulation [33], and (iv) Brown et al. (2006) which is used in the evaluation of regulatory systems by the World Bank and has informed commonly used indicators such as Global Indicators of Regulatory Governance [38]. The literature review then builds from these references and checks for consistency and updates, supplemented by practitioner literature from the organisational websites of the World Bank, Organisation for Economic Cooperation and Development (OECD), and the International Network for Environmental Compliance and Enforcement. A total of 26 documents were shortlisted for coding, including 11 peer reviewed articles, or chapters, and 15 practitioner documents from international organisations. The overall process and PRISMA diagram are given in the literature review protocol provided as *Supplementary Materials (*S2 Text*)*.

Roles and characteristics were extracted from this shortlisted literature, grouped and synthesised. The process consolidated findings until data saturation was reached [39]. The final eight bullet points defining the role and characteristics of a good practice regulator is given in Table 1a. If an issue was only referenced by a small number (<5) of recent (since 2020) publications, then it was classed as emergent, rather than established good practice. Trust and engagement of the informal sector was the one emerging issue identified. The full list of literature is given as a footnote to Table 1.

Table 1. Initial coding framework for the roles and characteristics of a good practice regulator and regulators as a change agent.

1a: Roles and characteristics of a good practice regulator[1]
Adequate resources and capacity
Independent and accountable, with a clear role and requisite powers to enact that role
Complete and clear rules which are applied predictably and consistently
Participatory approaches and proportionate responses, which are responsive and flexible
Sets, monitors, enforces and reviews in the allowed tariffs and service standards
Improves financial sustainability and performance of service provider, including capacity building and by supporting or disseminating innovation.
Increases accountability and transparency in the sector and strengthens the consumer voice
Designs and enacts pro-poor regulation to extend access to sanitation for the lowest income groups.
1b: Regulators going beyond currently defined good practice (emergent)[2]
Courageous: Going beyond the mandate, challenging the status quo, acceptance of risk, recognises and overcomes prejudice.
Accessible: Understanding service providers and developing relationships of trust, reaching across the divide to engage unconventional partners including those working informally and illegally.
1: Literature review: [1,2,5,19,21,23,24,28,32,33,37,38,40–53].
2: Secondary data analysis, see Table 2. Literature review: [23,32].

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The literature review defined good practice, in Table 1a. The next step was to review recent secondary data from national and local regulators active in scaling faecal sludge emptying and transport services and extract and compare their perspectives. Transcripts from interviews completed to inform WHO and ESAWAS publications on accountability and regulating onsite sanitation were sourced from partners [31,40]. There was no formal ethical process as part of developing these previous publications and the use of this data is therefore limited to informing primary data collection. However, it did enable the authors to develop more targeted questions, therefore reducing the time requested from key informants. Open text responses from a Delphi study completed by the authors [31] on building compliance in faecal sludge emptying and transport were also collated [23] and reviewed. Secondary data reviewed is summarised in Table 2.

Commentary related to the roles and characteristics of regulators was extracted from this secondary data and compared to the definition of good practice in Table 1a. Roles and characteristics were coded as good practice or emergent.

There were two elements which were consistently raised which clearly go beyond the definition of good practice developed: (i) Courageous: Going beyond the mandate, challenging the status quo, acceptance of risk, recognises and overcomes prejudice, and (ii) Accessible: Understanding service providers and developing relationships of trust, reaching across the divide to engage unconventional partners including those working informally and illegally. These elements, given in Table 1b were used to inform the questions for semi-structured interviews used for primary data collection, including about working with the informal sector and adding probing questions around going beyond mandates, risks taken, and unpopular or difficult decisions.

2.5. Key informant interviews

A series of 19 semi-structured interviews with senior leadership from national and local regulators were completed to analyse and extend the emergent roles and characteristics in Table 1b.

This paper targets 'information rich' country cases [54] where water and sanitation regulators are widely considered to be driving change in the sector. Country cases (i) are within east and southern Africa in order to build directly from secondary data; (ii) have at least 40% of the urban population reliant on road-transported sanitation; (iii) have seen change in either sector reform or engagement of service providers in faecal sludge emptying and transport, over the last five years;

Table 2. Secondary data analysis and Primary key informant interviews.

Secondary data analysis					
UNICEF Prog. region	**Transcripts analysed**		**Delphi Study - open text responses**		
	National regulator	**Local regulator**	**National regulator**	**Local regulator**	**Service provider**
East and Southern Africa	5	2	3	12	4
West and Central Africa	3	–	–	–	–
Latin America and the Caribbean	1	–	2	–	–
South and Eastern Asia	2	–	–	1	–
Middle East and North Africa	1	–	1	–	–
Total: 37	**12**	**2**	**6**	**13**	**4**
Primary data collection: Key informant interviews					
East and Southern Africa UNICEF Prog. Region	**National regulator**		**Local regulator**		
Kenya	4		4		
Mozambique	1		0		
Tanzania	2		1		
Uganda	1		1		
Zambia	2		3		
Total: 19	**10**		**9**		

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and (iv) have a multilayered regulatory system, with both national and local regulators scaling faecal sludge emptying and transport services [55].

The selected locations, Kenya, Mozambique, Tanzania, Uganda and Zambia, are described in detail in the ESAWAS publication on sanitation regulatory journeys [55]. Within each country the national regulator and the small number of local regulators in each country who are actively moving forward with regulating services were identified as sources of key informants. The local regulators were identified from ESAWAS, WHO and UN-Habitat case studies [46] and confirmed with ESAWAS. These national and local regulators are not intended to be presented as homogenous, or representative of the wider sector; they are at different stages and working at different levels, however they are all considered to be actively progressing.

Purposive sampling was then used to identify key informants from these identified national and local regulators. Interviews are summarised in Table 2. All interviews were conducted with current, or recently exited, senior managers with responsibility for sanitation. Key informants were individuals who have been instrumental to the changes observed. They were asked to speak from their own experience within the organisation, rather than formally as an organizational spokesperson. Initial interviewees were identified through the secondary data analysis referenced in Table 2. Interviewees were requested to recommend other key informants.

As described above, the key informants were leading individuals, within leading organisations, within leading countries regulating road-transported sanitation in the east and southern Africa region. The perspectives given within this paper are therefore taken to represent positive outliers in terms of sector reform [54].

The interviews were conducted remotely in English by the UK based first and second authors, online through standard video conferencing platforms. Each interview was held for 45–60 minutes. Conducting interviews remotely facilitates a wider geographic scope, however, it also limits participant observation and contextual understanding [56]. Additional time has been invested in researching participant backgrounds, and structured questions are limited to allow time for discussion, as advised in [57].

National and local regulators were asked to reflect on their own role and how it changed as they started to regulate faecal sludge emptying and transport services. They were asked to reflect on what characteristics they thought regulators required to be effective in scaling these services and to reflect on their relationship with either national or local regulators. In addition, practical questions around the resources, organisation and steps required for this transition were asked. The interview guide is provided as *Supplementary Materials*.

Initial invitations were sent to key informants from 16 July 2024–8 November 2024. The interviews were run between 16 August 2024 and 16 December 2024. The informed consent template and information sheet was provided to participants in advance of the interview. Interviews were recorded using the video conferencing software. A simple verbatim transcription was produced for each interview, removing repetition, verbal tics and false starts. Consent for data collected, including audio and video recordings and interview notes, was obtained either verbally or in writing from all key informants before the commencement of the interviews. The information sheet and consent form template are provided as Supplementary Materials (S1 Text). The signed consent form with the participant numbers was shared with each participant along with the anonymized transcript for validation. Ethical clearance for the interviews was obtained from Cranfield University (CURES/23444/2024).

2.6. Analysis

A thematic analysis was completed in NVivo (v14, 2023), applying the coding framework laid out in Table 1 [58]. The analysis looked for common themes, outliers and contradictory information. Four themes emerged from this process; (i) confirming the basic definition of good practice, (ii) challenges preventing established good practice being implemented, (iii) evidence of regulators going beyond good practice in two areas: courage in making bold choices and engaging the informal sector, and (iv) how local regulators understood and described their role.

Only those aspects which were consistently raised across multiple locations, and where there appeared to be consensus within national or local regulators, were considered in the results section. This approach limits the range of issues considered in the results and discussion. However, it increases the confidence that they are likely to be generalisable to other locations.

The results were then reviewed and discussed against the urban sanitation literature and the wider regulation literature. The discussion aims to clarify; is there anything novel in how these national and local regulators are working? Is there anything which could or should be learnt by others?

The draft research manuscript was shared with key informants for feedback and validation. More than 70% of key informants responded confirming that the findings resonated with their experience, providing some level of testimonial validity.

3. Results

3.1. Definition of a good practice regulator

The definition of the roles and characteristics of a good practice regulator taken in this paper, and the range of literature reviewed, are given in Table 1. The requirements on the regulator to meet established good practice, as summarised in Table 1, are substantial. As outlined in the regulator's dilemma [[33]p.17] regulators need to "be less intrusive – but more effective, focus your efforts – but be consistent, process things quicker – and be more careful next time, deal with important issues – but do not stray outside your statutory authority, be more responsive to the regulated community – but do not get captured by industry, be kinder and gentler – but don't let the b*******s get away with anything".

3.2. Case locations

Table 3 summarises the legal frameworks and current status in each of the case countries.

3.3. Revisiting the concept of local regulators

Interviews started by asking about the conception of multi-layered national and local regulators. With some notable exceptions, utilities and municipalities were often seen, and saw themselves, as contract managers or enablers and monitors, rather than local regulators. Utilities and municipalities typically identified the local government departments of health,

Table 3. Legal and regulatory frameworks and progress [19,29,55].

	Kenya	Mozambique	Tanzania	Uganda	Zambia
National water and sanitation regulator	Autonomous agency	Autonomous agency	Autonomous agency	Ministerial department	Autonomous agency
Mandated authority for road transported sanitation	(Quasi) Commercial utilities – city	Municipality	Water and sanitation authorities - city	Local government – shifting to utilities	(Quasi) Commercial utilities – regional
Legal backing for universal access to safe sanitation.	Constitutional. Mandated within service areas	Constitutional	Constitutional. Mandated with authority service areas.	Constitutional	Constitutional. Mandated within service areas
Guidelines and standards for provision of services	Established and disseminated	Established and dissemination ongoing	Established and dissemination ongoing	Established and dissemination ongoing	Established and disseminated
Monitoring of on-site sanitation	Indicators in the process of being introduced	Regulatory framework being rolled out	Monitoring within the capital city only.	Monitoring within the capital city only.	Indicators introduced and reported on
Legal status of manual emptying of faecal sludge from pit latrines or septic tanks	Allowed in national guidelines [59], disallowed in some County bylaws	Legal, as long as it is completed in a hygienic fashion [60]	Legal, but improved pit emptying tools must be used [61]	At least semi mechanised emptying must be used [62]	Legal and incorporated into national training scheme [63]

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environment, labour and construction as being the local regulators of sanitation services. These local departments often had conflicting aims and incentives, to prevent unsafe practices, rather than scale safe practice. The manual handling of faecal sludge has historically been a particular issue in these conflicts, often perceived locally as unacceptable, even when allowed for in national regulations.

The importance of public health, and reaching complete coverage, as a personal and professional driver was raised by many key informants. This topic then led to reflections on the arms-length influence required for engaging informal manual pit emptiers. It was often only during these discussions that the language of local regulation began to be used by utilities or municipalities in reference to their own work. Ultimately all interviewees talked about utilities and municipalities as local regulators, however this appears to be novel language in some locations. In some cases, the perceived role of the utility as being responsible for only directly delegated services persisted alongside mandates for universal sanitation access. Several local regulators identified their regulatory role as being unclear in the regulatory framework, an implied rather than explicit role.

> *"So, we kind of regulate, sort of. I don't know the right term to use.... it is implied that if you get into partnership with any service providers,.... you play a regulatory role. But I think in the regulatory framework that doesn't really come out." - Local regulator.*

3.4. Good practice

The majority of the roles and characteristics described by national and local regulators fell within the current definition of good practice as outlined in Table 1. The scope of this established good practice was not contradicted. However, it may already be an ambitious requirement for regulators in many resource-constrained settings. Respondents across locations identified gaps in (i) adequate resources and capacity, (ii) clear role and requisite powers, and (iii) complete and clear rules.

A lack of **adequate resources and capacity** to work effectively was the most prominent gap. National and local regulators across all locations identified insufficient financial and human resources, and a lack of skills, as important barriers to building their own or others' capacity and scaling services.

Clear role and requisite powers were often not in place. Overlapping mandates and unclear responsibilities hampered implementation.

For all local regulators at least some of the powers to enforce safe practices were held by others. The department of health or environment would issue fines to households for unsafe emptying, or to emptiers for unsafe disposal. The department of labour, or equivalent, would enforce licensing of enterprises.

The largest gap in requisite powers identified by national and local regulators was around household containment and the lack of formal influence over the regulations or enforcement of containment quality. Two substantial impacts were noted due to poor quality design and construction resulting in pit latrines and septic tanks which are difficult or impossible to empty safely. Firstly, that it is not possible to comply with national or local guidelines and standards for emptying, and secondly that the market for pit emptying services is reduced, thereby increasing the transport and logistical costs per household and making it more difficult to realise economies of scale.

Complete and clear rules. The key informant interview locations were selected partly because the local or national regulators had led in developing frameworks and guidance. However, there were still challenges in cascading new guidelines for local implementation, particularly around safe and dignified manual handling.

In most locations manual emptying of pit latrines and septic tanks is disallowed – with at least semi mechanised or specialist equipment being required. Zambia appears to be the only location where adapted garden tools are explicitly accepted for manual emptying. Even where manual handling is accepted by the national regulator, there may be local bylaws which effectively criminalise the practice.

In most locations the feasibility of safe disposal was limited by a lack of treatment infrastructure. There was little clarity on allowable interim options while faecal sludge treatment plants, or transfer stations were built.

3.5. Beyond currently defined good practice and potential learning for others

Through the key informant interviews there was evidence of regulators going beyond good practice in; (i) courage in making bold choices, and (ii) engaging the informal sector.

3.5.1. Courage in making bold choices. The bold choices described by individuals, in moving mandates forward despite the challenges given in Section 3.4, fell into three main groups: taking financial risks, going beyond mandates and outside of authority to scale services, and challenging power structures.

Financial risks. All local regulators described taking financial risks in trying to scale safe services, *"You are allocating budget you do not have, just to get this started".* Individuals highlighted how they had to advocate internally for resources allocation, *"Every time I ask for a budget, to be told what I need is a water meter [for] billing. … I do not have a shit meter!" - Local Regulator.*

This perspective conflicts with the perspective of national regulators, who tended to see outsourcing services as a low-cost approach where the risk would be largely borne by the private sector, *"[we are] just basically trying to open the eyes [of the utilities] to how they can provide these services and how and where the private sector can come in areas that can be profitable. So, in transport there's definitely profit. In emptying there is profit that can be made from there" - National Regulator*.

Going beyond mandates. Local and national regulators described how they had gone beyond their mandates – and in some cases outside of their zone of authority in order to address the gaps described in Section 3.4. National regulators "*made all these bold steps [to influence] a draft statutory instrument … which speaks to [our] issues".* Local regulators described how they started working with the private sector to improve services when *"…there was no regulatory framework and therefore everything was being done as [a] pilot, or trial and error*".

Local regulators reported how they had designed containment standards and advocated for their adoption, in some cases accompanying the mandated department in inspections to build their understanding of the needs for emptying.

At the most extreme, local regulators were working in a legal grey zone, enabling incremental improvements to manual handling and disposal but still effectively working outside the law. Some local regulators highlighted how they had negotiated interim disposal sites, which allowed safer working but entailed other authorities *"turning a blind eye"* rather than fully endorsing the practice. The solutions described were pragmatic, given that faecal sludge treatment plants were not available, but underscore the risks being held by the local regulator.

Challenging power structures were demonstrated in national regulators by a willingness to take a strong stance with line Ministries, and in some cases with International Financing Institutions (IFIs). National regulators *"said no [to the IFI], and we started this struggling…"* when trying to shape the development of the road-transported sanitation sector. Similarly, in local regulators internal power structures with the utility board, or with senior management in the municipality were challenged; *"You know these big people sit in their boardrooms and they say 'no' … until someone actually gets up and says, you know what? Let's take a walk and have this done"*.

3.5.2. Engaging the informal sector. All of the national and local regulators interviewed indicated that engaging informal manual emptiers, and enabling them to work safely, was an important part of reaching universal access. Interviewees also identified this engagement of the informal sector as a novel aspect of regulating faecal sludge emptying and transport. An important distinction to make here is that in many cases regulators were talking about working through the informal sector, rather than attempting gradual formalisation. The focus was often on supporting informal providers to work more safely, rather than to come under more formal arrangements.

Several national regulators reported working with local regulators to create a route for engaging the informal sector. This engagement was about recognising the skills and ability to reach low-income populations with services, rather than

sanctioning and controlling an informal workforce. *"They've been doing it … illegally, so they know how they go about it… how do we bring them on board and regulate them without … crushing them?".* The perception of the informal sector as part of the solution for rapidly scaling services was not uniform across, or even within, national regulators. However, even where the informal sector was not perceived so positively, the acceptance that this group needed support rather than sanctions was consistent.

Local regulators described a similar process of recognizing that *"they are illegal, yes, but we can still get them to work more safely…"* and the possibility of incremental improvements impacting on much larger populations. Some local regulators proactively engaged the informal sector as part of scaling safe service provision, building the capacity of informal, in some cases illegal, manual pit emptiers. *"They were hiding… we could not even get them to speak to us, but … I'm showing them that - we are not in this to police you. We are here to support you."* The adaption and reinterpretation of national regulation by local regulators was reported by some as allowing them to work more productively with faecal sludge emptying and transport service providers, particularly those smaller or informal providers.

National and local regulators highlighted that this approach required quite different ways of working, moving away from the use of sanctions and towards much more extensive relationship building and support. The overall steps described were initial engagement, often working through informal networks, developing safe spaces for consultation, understanding concerns and capacity and adapting training and requirements to suit. The focus of formalisation was on improving practices, rather than the bureaucratic processes. Tacit amnesties until safe practices were feasible were frequently cited. One local regulator who has been working with informal service providers for more than ten years identified that *"now we are at a stage where we can start to sanction, because really, you know, we've said everything that needs to be said. We've engaged them as much as we can and we will continue to engage but it's I think now the stage we are like, OK, now let's start to identify what those penalties will be".* The need to build relationships and trust was also emphasised: *"even the process of actually identifying these people that were doing illegal emptying in the communities, that part of the work was purely social... because they were doing an illegal activity, they were not so open to meet... maybe they would get arrested... they had to find them. Speak to them. Convince them to come for meetings and then explain what the plan was so that they established some level of trust within them so they were able to open up and come in the open. There was a lot of social kind of interaction."*

It was recognised by many key informants that these informal actors are regulated by multiple bodies, through the Ministry of Environment, Health and Labour, and that these aims are often conflicting and can prevent scaling safe services. A number of national and local regulators had been instrumental in forming platforms to facilitate collaboration between these groups.

Engagement of the informal sector is also linked to courage. This link is immediate and practical in the locations where informal manual pit emptiers may be working outside of the law to provide services. However, even where manual emptiers are working within the law, courage is still needed to engage with such a highly stigmatised and marginalised group.

4. Discussion

The main new findings from this paper are the evidence of regulators acting courageously and scaling services through the informal sector. We believe that the most important finding from this paper is regulators seeing the informal sector as an essential part of reaching universal access to safe sanitation. Both findings are discussed below, considering how this is evidenced in the wider regulation literature, and what aspects can or should be learnt for other national and local regulators of road transported sanitation.

The terminology of local regulators and how they relate to national regulators, particularly in terms of the differing perspective of risk, appears to be an area requiring further research and is discussed at the end of this section.

In addition, there are a number of areas where we add to an existing substantial evidence base. The findings confirm well documented challenges in the sanitation sector of inadequate resources and capacity, unclear and fragmented roles

and rules [23]. The findings also confirm the view from recent practitioner literature of national regulators as social and environmental actors [31,55].

4.1. Moral courage and navigating uncertainty

The bold choices as described in Section 3.5.1 are more clearly understood as moral courage; an individual, or organisation's "ability to act ethically, even when it may not be popular or could result in personal loss" [64].

There is scant literature explicitly referencing regulatory courage, or regulators acting with moral courage. Perez [65] highlights the need for courage in regulatory judgement. Kasdorp [66] expanded this idea further into the conception of the regulator being able to take on the role of a 'public architect' in going beyond the law and generating public value. Moral courage is considered an important regulatory principle in areas which, arguably, pose an existential crisis to human existence; the regulation of nuclear power [67] and in the development of regulatory frameworks for climate law [68]. We believe that this concept of moral courage is pertinent also to the public health risks linked to poor sanitation, given the scale of the challenge.

Moral authority, being recognised as doing the 'right thing', is considered in the regulatory literature an antecedent to building trust and thereby voluntary compliance [[35] p.17] [[69] p.35] [70].

Looking more widely at management literature there is a recognition that moral courage, in individuals and organisational culture, may be more important for business ethics than setting the 'right' rules and regulations [71]. Moral courage in this context is considered to encourage moral conduct, particularly where a morally correct choice could have negative repercussions [72]. Moral courage is highly pertinent when the moral decision to scale safe sanitation services in low-income or informal areas requires actors to work outside of the law. The 'obligation to disobey' an unjust law has been accepted by ethicists for some time [73]. It has also been demonstrated by public responses to insufficient sanitation programmes in South Africa [74]. However, it has not been documented as an institutional response in sanitation.

It should be noted that, in large part, the moral courage demonstrated through this paper was a response to challenges faced. Moral courage was needed to navigate an unclear role, incomplete rules and a lack of resources. This brings us to the second question of this paper, what should be learnt for others?

The willingness of regulators, particularly local regulators, to work in a legal grey space and take, potentially substantial, financial and legal risks to scale safe sanitation services should, we believe, be applauded. However, we would argue that courage should not be a requirement for organisations trying to scale the most basic of public services. National and local regulators should be supported and protected. As regulators take this activist role, investment is needed for infrastructure and the enabling environment to make universal access to safe sanitation feasible.

4.2. Scaling public services through informal, or less formal, providers

There were two main findings around the informal sector; firstly, that regulators are trying to engage them as part of the wide range of service providers, secondly that regulators see the informal sector as an opportunity to scale safe service into low-income areas.

The first finding confirms existing research in urban sanitation and wider regulation literature. In multiple locations manual handling of faecal sludge was criminalised in an attempt to improve practices but found to create greater negative impacts for both sanitation workers and households [75,76]. The importance of engaging the informal sector is reflected in the sector literature and advocacy around the rights of sanitation workers, positioning them as front-line public workers playing a critical role in service provision [72]. A number of analogous sectors have identified the need to engage with, rather than displace, informal service providers. There are multiple examples, across street food, artisanal mining, solid waste management and informal transport, where state actors attempted to displace the informal sector, and witnessed the negative social impacts of this punitive approach, before finally shifting to a more conciliatory stance and supporting

improved practices [77–79]. A transnational review identifies progressive formalisation, rather than displacement, as the main approach now adopted by supra-national agencies and national governments [80].

The novel finding from this paper is regulators' perspectives of the informal sector as a part of the solution for universal access to sanitation. Specifically, the focus on scaling safe services through changing practices in the informal sector. Both national and local regulators described informal sector service providers as well positioned to serve the lowest income areas due to their history, knowledge and specialist skill set. Some described working with informal providers to provide training and support to all those willing to participate. This perspective was maintained while understanding the well documented challenges of engaging the informal sanitation sector [81].

There is scant literature in urban sanitation reporting regulators' positive perspective of the informal sector, particularly the need for wide scale engagement to change practice. The predominance of informal sector providers and the need for policies to target and protect this group is recognised by many [31,82,83]. However, recommended responses across these publications are gradual formalisation, often starting with formal recognition and enforcement despite recognition of the barriers of cost and bureaucracy [31,82,83]. Only in Burundi are there noted examples of nascent policies which support both formal and informal sanitation providers [55]. WHO (2025) recommend the gradual formalisation of informal sectors as part of their roadmap for sanitation regulation, including the development and enforcement of Standard Operating Procedures and additional protection and training for sanitation workers [31]. The findings from this paper support those recommendations, as a long-term goal. However, the findings also demonstrate that in the short-term, the informal sector should be accepted and supported as an important part of sanitation service provision. What this could mean in practice is described below.

Research in regulation of analogous sectors, such as off-grid water, street food and small-scale mining, support these findings. Several papers across these sectors identify that the use of a binary formal/informal distinction is not helpful in improving service quality or environmental outcomes, and that there is a need to focus on changing practice and managing informality [84–86].

The active engagement of the informal sector in scaling safe faecal sludge emptying and transport services, whether actual or anticipated, appears to be a novel finding for road-transported sanitation.

In terms of the second question of this paper; what should be learnt for others? We believe that much could be learnt from leading regulators in how to effectively engage and scale through the informal sector. We also see this as an important area for faecal sludge emptying and transport provision going forward. A focus on practice rather than paperwork is a pragmatic response in east and southern Africa given the high levels of informality in the wider economy. Excluding South Africa, informal employment makes up 50–90% of total employment across the region (ILO, 2024).

The proactive engagement of the informal sector to rapidly scale incremental improvements to services requires regulators to accept some level of informality and a reduced level of control. As identified in this paper, it will require local regulators to recognise and support service providers who are not legally registered and have amnesties in place until capacity to comply is built. The steps identified in this paper reflect much of the documented good practice for engaging the informal sector; understanding the landscape and strengthening the evidence base, providing safe spaces for collaboration, public recognition and social protection, building up low-capacity and informal service providers, a focus on practices rather than bureaucracy, and bringing them into an appropriate regulatory system [36,87].

The approach described of amnesties and phased implementation reflects the enabling and facilitating role of regulation [1]. It may be appropriate in this scenario to protect de-facto local regulators by setting final end states and timelines, rather than rigid standards.

A final reflection is that the current understanding of informality in the sanitation sector literature may need to be reconsidered in the light these findings, to shift towards an understanding of the formal and informal sectors as intertwined and interdependent [88].

4.3. Terminology of local regulators

Utilities and municipalities are acting as de-facto local regulators in addition to the well-established roles of contract manager for delegated services and direct service provider. We found that the terminology of 'local regulator' was novel for utilities and municipalities, and that this role was often implicit, rather than explicit. This confirms findings from previous research with utilities in the target locations [89]. In putting this term forward, we recognise that the position of utilities and municipal departments as service authorities is quite different to that of national regulators. We are drawing attention to the wider role being played, not implying self-regulation by utilities or municipalities.

We believe that recognising the significant regulatory role being taken on by utilities and municipal departments and considering them as de-facto local regulators provides a useful distinction for three reasons. Firstly, utilities and municipal departments are responding to explicit aims to extend services and reach universal access to safe services. Within the current context of limited resources and assumptions of private sector delivery, this mandate necessarily entails a regulatory role to engage service providers who fall outside of direct or delegated arrangements. Secondly, as they support incremental improvements, this aim may be in conflict with departments of environment, health and labour, who are trying to control and prevent unsafe emptying and disposal of faecal sludge. Considering utilities and municipal departments as local regulators might enable closer alignment with others in terms of sanctions and support. Thirdly and finally, as outlined in Table 1, the skill set of a good practice regulator is very different to that of a contract manager or service provider. Recognizing this regulatory role may support gap analysis and capacity building, it also signposts utilities and municipal departments towards a wide range of approaches and tools for engaging private sector providers.

4.4. Limitations and generalizability

The use of positive outliers within positive outliers as key informants means that the conclusions drawn point towards possible future trends rather than documenting current sectoral practice [90]. In addition, self-reported practice is likely to be impacted by social desirability bias [91]. Scaling road-transported sanitation has been financed by international organisations in many cases and some key informants had gained recognition due to their involvement in this work [32].

In addition, the framework for analysis and discussion is limited by the positionality of the authors who, while geographically diverse, have all been trained and employed in western headquartered organizations [92]. The concept of moral courage as expressed in this article has strong European roots [71]. The assumptions of regulated market-based sanitation as the approach to reach universal access is a paradigm largely led by IFIs and western institutions [25].

However, working within the current framework of resource constrained regulators mandated with universal access, the findings do appear to be highly relevant and generalisable beyond the case study locations. Across east and southern Africa, and other locations where road-transported sanitation is the main form of urban sanitation, municipalities and utilities will need to take on regulatory responsibilities for private sector providers and engage the informal sector.

5. Conclusion

This paper centres on the role of utilities and municipalities as local regulators and the importance of the informal sector in scaling safe services. These are critical avenues for research alongside the increased focus on national water and sanitation regulators among policy makers.

Multi-layered regulatory systems are common for faecal sludge emptying and transport in east and southern Africa. However, utilities and municipalities may not recognise themselves as 'local regulators' facilitating wider sector change. We conclude that utilities and municipalities should be recognised as de facto local regulators by national regulators and municipal departments of public health and environment. Utilities and municipalities should be supported, by national regulators and other development partners, to develop the skills required for this role.

Based on the experience of leading national and local regulators in east and southern Africa, informal service providers have the potential to extend access to safe services into low-income and informal areas, including those hardest to reach.

We conclude that good practice regulation should include a focus on improving the practices of informal service providers, and that policy makers in the region should develop guidelines and approaches that recognise the role of the informal sector in road-transported sanitation. We understand that ESAWAS, as the regional body for water and sanitation regulators, is developing technical guidance for utilities to take on the combined mandate of sewered and road-transported sanitation. These guidelines should describe how to incorporate the activities of the informal sector in road-transported sanitation.

Further research is needed to understand effective approaches taken by national and local regulators to engage and support informal service providers. This research should be informed by cross-sectoral reviews which collate and assess good practice in formalising and regulating the informal sector for positive social change.

We describe the moral courage demonstrated by national and local regulators in seeking to engage with the informal sector and scale services, in the face of limited resources and capacity, incomplete rules and fragmented roles and powers. Moral courage is an important part of building trust and voluntary compliance. It is also imperative given the public health impacts of poor sanitation on the poorest and most vulnerable, and the need to challenge deeply held stigma and prejudice. We see these leading regulators as social and environmental activists, not just actors. National ministries, with the support of development partners, should recognise these risks and ensure that national and local regulators are adequately resourced to take on this role. Policy development and political support will be required at the national and local levels to overcome national and local resistance to the recognition of the informal providers.

We conclude that the focus for the sector should be on reducing the risks faced by organisations scaling this most basic of public services. In the immediate term, local, national, regional and global leaders need to recognise the important role of the informal sector in sanitation and actively support local regulators in reaching universal access.

Supporting information

S1 Text.
(DOCX)

S2 Text.
(DOCX)

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