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Review

Challenges Facing Sanitation Workers in Africa: A Four-Country Study

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Abstract: Sanitation workers provide an essential public service that is key to achieving the Sustainable Development Goals (SDG), but often costs them their dignity and health. Many governments in low- and middle-income countries fail to support their sanitation workforce. This is due, in part, to a lack of knowledge about sanitation workers' needs and the challenges they face. This study aims to address this knowledge gap through four assessments conducted in Burkina Faso, Nigeria, Tanzania, and Zambia that explored the health and safety, financial security, legal protection, and dignity of sanitation workers. Methodologies included literature reviews, key informant interviews (110), focus group discussions (7), and a survey. The findings suggest that sanitation workers across Africa face serious health and safety risks, heightened by a lack of adequate protective equipment and access to healthcare services. Their pay is insufficient and unstable, and the regulatory environment offers them little legal protection. Many also face stigma and discrimination. These challenges were found to be more acute for manual emptiers and those working informally. The study concludes that governments must develop context-specific action plans to support their sanitation workforce, guided by the results of national and sub-national assessments and in collaboration with sanitation worker groups.

Keywords: sanitation workers; sanitation workforce; emptiers; health and safety; legal protection; financial security; dignity; discrimination; faecal sludge management; sustainable development goal 6.2; sustainable development goal 8

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1. Introduction

Sanitation workers are defined as, 'All people—employed or otherwise—responsible for cleaning, maintaining, operating, or emptying a sanitation technology at any step of the sanitation chain' [1] (p. 2). In this paper, sanitation refers to faecal waste and excludes solid waste. The term sanitation workers, therefore, includes toilet cleaners (often for public institutions), pit or septic tank emptiers, sewer cleaners, and treatment plant operators. These sanitation workers provide a public service that is fundamental to achieving the ambitious global target for safely managed sanitation services set out in the Sustainable Development Goal (SDG) 6.2. The goal is access to adequate and equitable sanitation and hygiene for all and an end to open defecation by 2030, paying special attention to the needs of women and girls and those in vulnerable situations. Despite their essential role, however, sanitation workers are often invisible, discriminated against, and subject to serious occupational and environmental health hazards [1,2]. To achieve SDG 6.2, the sanitation sector must, therefore, also address SDG 8 which calls for decent work for all—including sanitation workers.

The vulnerability of sanitation workers has been a global reality throughout history, with increased risks for workers in low- and middle-income countries. These workers, which often operate in the informal economy, not only face occupational and environmental health hazards, but also challenges in accessing healthcare services, legal protection, and financial security [2,3]. A key barrier to supporting sanitation workers is the knowledge gap around their profiles, in particular their needs, the challenges they face, and the environments they work in. From the literature review for this paper, it appears that very few academic papers have dealt with this topic.

The first comprehensive assessment of sanitation workers in low-income countries was released in 2019 [2]. The report acknowledged the need to build an evidence base to quantify and understand sanitation workers, stating that, 'Although significant advances have been made in the past decade in understanding urban sanitation technical systems, there is a dearth of good-quality information about the workers who underpin those systems and about their working conditions' [2] (p. 14). The report is a key resource on sanitation workers and will be referred to as the Global report in the following sections. A subsequent report assessing sanitation workforces at city-level also identified this knowledge gap, acknowledging that, '[...] in many settings data is scarce on the number of workers, their working conditions, modes of employment and legal status' [3] (p. 4). Efforts to reduce this knowledge gap include the Initiative for Sanitation Workers (ISW) which is a global advocacy partnership set up in 2018 by the World Bank, the International Labour Organisation (ILO), the World Health Organisation (WHO), the SNV Netherlands Development Organisation, and WaterAid. The initiative raises awareness of sanitation workers globally, supports sanitation worker groups, and encourages and supports research on the topic.

The limited information that is available about sanitation workers is mostly focused on South Asia [4,5], and India in particular [6–13]. With the exception of a couple of countries, little is known about the situation of sanitation workers in Africa. Given the fact that sanitation services need to expand rapidly in Africa to meet SDG 6.2, it is critical to better understand and address the situation of the sanitation workers providing those services. To address this knowledge gap, WaterAid commissioned assessments of the challenges and needs of sanitation workers in urban areas of Burkina Faso, Nigeria, Tanzania, and Zambia (the assessment in Zambia was in partnership with the National Water Supply and Sanitation Council). These assessments were carried out in 2021 and explored health and safety, financial security, legal protection and dignity. The findings provide the sanitation sector, and governments in particular, with insights to the common challenges faced by their sanitation workforce and recommendations for how best to support them.

2. Methods

2.1. Country and City Selection

The four African countries selected for this study were Burkina Faso, Nigeria, Tanzania, and Zambia (Figure 1). The countries were selected for their geographical diversity, to include the regions of West Africa, East Africa and Southern Africa, as well as based on WaterAid's in-country presence and team availability.

In-country assessment teams selected a city or multiple cities within their country based on the need for Faecal Sludge Management (FSM) services due to rapid population growth. The Burkina Faso assessment focused on the city of Banfora in the south-west province of Comoe but also included Ouagadougou and Bobo-Dioulasso, two major cities with sanitation worker organisations. The Nigeria assessment focused on Kano City in the northern state of Kano which is among the fastest-growing cities in the country. The Tanzania assessment focused on Arusha, Dar es Salaam, and Dodoma, all selected for their rapid urbanisation and the emerging challenges of FSM. The Zambia assessment focused on Mongu Town in Western Province and the national capital, Lusaka.

Figure 1. Country selection for assessment [14].

2.2. Scope

The topics investigated were health and safety; financial security; legal protection; and dignity. They were determined by the findings of the report, City-level Quantification and Profiling of Sanitation Workers [3]. They were:

The scope of the assessments varied in terms of the 'types' of sanitation workers (e.g., manual emptier, mechanical emptier, treatment plant operator, toilet cleaner). The types of sanitation workers included in each assessment depended on the local definition of sanitation workers and the local priorities. In Burkina Faso and Nigeria, the assessment teams focused on manual and mechanical pit emptiers, while the Tanzania and Zambia assessment teams also included treatment plant operators and toilet cleaners.

Table 1 below presents the types of sanitation worker included in the methodology for each country.

Table 1. Types of sanitation workers included in the methodology.

	Burkina Faso	**Nigeria**	**Tanzania**	**Zambia**
Manual emptiers	x	x	x	x
Mechanical emptiers	x	x	x	x
Treatment plant operators			x	x
Toilet cleaners			x	x

2.3. Data Collection

Data collection included a global literature review on sanitation workers and four country assessments which included focused literature reviews, key informant interviews (110), focus group discussions (7), and a survey (1). The four country assessment teams were supported by a technical advisor for the methodology and data collection, and a data analyst to identify trends.

The global literature review included various databases to identify resources and reviewed the Global Report which included an extensive literature review on the topic from 2019. Google Scholar was used to search for academic papers, while key WASH libraries were used for grey literature including the Sustainable Sanitation Alliance (SuSanA) library, IRC's resource page, and the Water Engineering and Development Centre (WEDC) database

of resources. Key search terms included different terms used to define sanitation workers such as "sanitation workers", "sanitation workforce", "emptiers", "emptying service providers", and "sanitation service providers". Other search terms included the key topics of the review including "health", "safety", "occupational risks", "finance", "regulation", "legal protection", "dignity", and "stigma".

The in-country literature reviews focused on identifying administrative documents, regulations, and policies to understand the national legal and institutional frameworks. The literature review methodology in each country included online searches and in-person sharing of local documents by key informants such as government officials and subject matter experts.

In addition to the in-country literature reviews, the country assessment teams collected primary data via key informant interviews, focus group discussions, and a survey. The in-country assessment teams designed the methodology and data collection tools based on the local context and the availability of informants: all assessment teams included key informant interviews, all teams included focus group discussions apart from Tanzania, and Zambia is the only country to have used a survey to collect more representative data from the two urban areas included. A total of 110 key informant interviews were conducted with sanitation workers and their families, sanitation associations, government officials, utilities, Non-Governmental Organisations (NGOs), traditional and religious leaders, academics, and households. Focus group discussions were organised with sanitation workers, officials from sanitation worker associations, government officials, and households. The survey conducted in Zambia included 168 sanitation workers who were provided with hardcopies of a questionnaire via municipal authorities. Sampling was not randomised, but covered all the workers that could be reached on the days when the towns were visited.

Table 2 below presents details of the four assessments including location, data collection methods, and sample sizes.

Table 2. Methodology of the four assessments.

	Burkina Faso	**Nigeria**	**Tanzania**	**Zambia**
Language	French	English	English	English
Region	West Africa	West Africa	East Africa	Southern Africa
Date of data collection	23 March–2 April 2021	1–25 February 2021	October 2021	27 September–1 October 2021
Location (s)	Banfora, Bobo Dioulasso, Ouagadougou	Kano City	Arusha, Dar es Salaam, Dodoma	Mongu Town, Lusaka
Literature review	Yes	Yes	Yes	Yes
Key informant interviews	52	33	19	6
Focus group discussions	2	2	0	3
Survey interviewees	-	-	-	168

2.4. Data Analysis

Four reports were produced to capture the findings from each country [15–18]. For each topic, the findings were compared across countries using Microsoft Excel to identify trends and differences. The findings from the assessments were then compared with the findings from the global literature review. The results section presents the findings from the country assessments, while the discussion compares these findings with the situations of sanitation workers in other countries and continents.

2.5. Limitations

Limitations to the study include:

- The study compares data from four countries in Africa. The study, therefore, provides an overview of common challenges faced by sanitation workers in various African countries but does not provide a continent-wide picture. Other countries may face unique challenges that were not identified in this study.
- There are limited in-country primary data sources on sanitation workers (e.g., number of workers, profiles, income, vaccination, the number of incidents of discrimination, deaths, and illnesses) and resources (e.g., research papers, reports). The results are, therefore, based mainly on qualitative data collected through in-person discussions, with limited triangulation.
- The types of sanitation workers included varied by country. The Burkina Faso and Nigeria assessments focused on manual and mechanical emptiers, while the Tanzania and Zambia assessments also included toilet cleaners and treatment plant operators. The data on toilet cleaners and treatment plant operators are, therefore, more limited.
- The study used rapid assessments to gain an overview of the sanitation workforce in each city. More comprehensive assessments including all types of sanitation workers would be required to quantify the extent of the challenges and draw more representative conclusions.

3. Results

The findings from a comparative analysis of the four assessments are presented as four key topics:

1. Health and safety (illnesses, injuries and fatalities, personal protective equipment (PPE), healthcare services);
2. Financial security;
3. Legal protection (regulation and formalisation);
4. Dignity (stigma and discrimination, infrastructure, equipment, inclusivity).

The following sections each include challenges and solutions identified by sanitation workers and other relevant parties.

3.1. Health and Safety

3.1.1. Illnesses, Injuries, and Fatalities

All four assessments reported occupational risks to physical health including injuries, illnesses, and death. Injuries resulted from operating and lifting heavy equipment and contact with sharp objects. Sanitation workers sustained cuts from sharp objects during pit excavation and solid waste removal and suffered fractures from falling objects.

Illnesses were caused by dangerous chemicals (e.g., fumes, kerosene), bacteria, parasites, and viruses. Reported illnesses included Tetanus, Cholera, Hepatitis A, Tuberculosis, Typhoid, and Leptospirosis. Sanitation workers also spoke of dermatological symptoms such as itchy skin after contact with faecal sludge, respiratory symptoms such as breathing difficulties and chest pain, and digestive symptoms such as diarrhoea. Fatigue and loss of strength were given as general symptoms.

Fatalities were reported in two countries. In Burkina Faso, sanitation workers suggested the two fatalities known to them were caused by a lack of experience. In Nigeria, fatalities were linked to the absence of Personal Protection Equipment (PPE). Sanitation workers shared the risks of fatality including electrocution from electric cables passing through pits; untreated tetanus infections from cuts by metallic objects in pits; drowning in unseen water under solid sludge in a pit; suffocation by harmful gas inhalation; and the collapse of a pit, potentially due to poor lining.

As PPE and healthcare services were not always accessible or appropriate, sanitation workers relied on other strategies that they believed minimised risks. These included pit inspections to assess the structure and sludge, pouring kerosene into the pit to reduce faecal

smells and kill pathogens, wearing condoms as PPE when entering a pit, and drinking milk afterwards to cleanse the gasses they inhaled.

3.1.2. Personal Protective Equipment (PPE)

Sanitation workers were aware of the occupational risks they faced and understood the importance of PPE. However, they rarely used it. This was a particular challenge for manual emptiers. In Nigeria, only a quarter of manual emptiers reported using PPE. In Tanzania, the use of PPE for both mechanical and manual emptiers was rare, with workers using their old, worn-out clothes and wearing no boots, head protection, or gloves. In Banfora, Burkina Faso, the majority of manual and mechanical emptiers did not use PPE.

In Zambia, the findings suggest that the use of PPE is influenced by employment status, with formal workers more likely to use PPE than informal workers. In Mongu Town, all mechanical emptiers used PPE and worked for Western Water and Sanitation Company (WWSC), whereas in Lusaka only 51% of mechanical emptiers used PPE, and only 38% were in formal employment. In Mongu Town, only 33% of manual emptiers used PPE and they all worked informally, while in Lusaka, 73% of manual emptiers used PPE, with 38% working formally under a management contract with Lusaka WSC (LWSC). In both Mongu Town and Lusaka, all treatment plant operators wore PPE and were employed by WWSC and LWSC. Some of these operators said their PPE was worn-out and needed to be replaced.

Sanitation workers claimed impracticality as the main reason for not wearing PPE. In Nigeria, Tanzania, and Burkina Faso, sanitation workers said that the available PPE was impractical, not adapted to their working conditions, and could even increase occupational risks. In Burkina Faso, the vast majority of emptiers said that the PPE was not adapted and increased their risk of accidents. They mentioned heavy boots making it difficult to enter a pit, the low quality of the gloves, the difficulty of breathing when wearing face masks and the increased body temperature when wearing work suits. In Nigeria, mechanical emptiers said that the affordability of PPE was a key barrier.

All country assessments found that to reduce the physical occupational health risks associated with sanitation work, it is necessary to increase the provision of PPE, improve the awareness of its importance and create legal frameworks to ensure sanitation workers systematically wear PPE during service. There was no mention, however, of improving the practicality of PPE to respond to the challenges highlighted by sanitation workers. Interviewees identified and prioritised the following solutions to overcoming PPE challenges:

- Tanzania: Promote adherence to health and safety requirements at the Local Government Authority (LGA) level, improve enforcement, and strengthen on-the-job training;
- Zambia: Deliver training programmes to sensitise sanitation workers on guidelines and health and safety policies, including the use of PPE;
- Nigeria: Revisit the health and safety guidelines for sanitation workers to ensure the use of PPE;
- Burkina Faso: Provide PPE to emptiers, make it mandatory to wear PPE when delivering sanitation services; provide training programmes and certificates.

3.1.3. Healthcare Services

Besides the issues with PPE, sanitation workers also faced challenges accessing healthcare services. Many sanitation workers were either not vaccinated or not fully vaccinated against occupational illnesses. In addition, without available or affordable healthcare services, sanitation workers did not systematically seek emergency services in the case of an injury or illness.

Access to healthcare services appeared to be influenced by employment status, with informal sanitation workers less likely to have access to healthcare services compared to government sanitation workers. For example, toilet cleaners in Tanzania were employed by private companies but held no formal employment status and were, therefore, not covered by healthcare insurance. By comparison, in Mongu Town, Zambia, 42% of cleaners employed by government institutions reported having healthcare insurance under the Na-

tional Health Insurance Management Authority (NHIMA). Additionally, in Mongu Town, all government-employed sewage plant attendants reported having access to healthcare insurance, while all informally employed manual emptiers said they had no such insurance. Healthcare access for private service providers varied. In Mongu Town, all formally employed mechanical emptiers had access to healthcare insurance, while in Tanzania, private providers faced difficulties accessing social security due to weak compliance with social security laws. For example, some truck operators and assistants were paid per trip rather than every month, meaning compliance with social security laws was not assured.

Another factor that may influence access to healthcare is proximity to economically important cities. Vaccination coverage of sanitation workers in Zambia was found to be higher in Lusaka compared to Mongu Town. Manual emptiers, mechanical emptiers, and treatment plant operators in Mongu Town reported not having any vaccinations, whereas, in Lusaka, all three types of sanitation workers were vaccinated to some extent, with the vaccines investigated (Tetanus, Hepatitis A, Hepatitis B, Cholera, Typhoid, COVID-19). Coverage ranged from 4% of mechanical emptiers vaccinated for Hepatitis B to 93% of treatment plant operators vaccinated for Cholera.

Although all countries identified the need to address challenges with PPE to improve the health of sanitation workers, only two countries identified the need to ensure vaccinations. The Burkina Faso assessment recommended subsidies be provided for at least one vaccine for manual emptiers. The Zambia assessment suggested that all vaccinations due to sanitation workers should be administered accordingly. In terms of improving access to healthcare services, Burkina Faso stated the need to coordinate and sign an agreement with the Sanitary District and suggested institutionalising the use of health booklets, while the Nigeria assessment highlighted the need to ensure all sanitation workers were registered with a primary healthcare facility near the workplace and that sanitation workers should be informed about health and safety guidelines. The Zambia assessment highlighted the need for periodical medical check-ups for sanitation workers.

3.2. Financial Security

In all four countries, financial security was an issue for sanitation workers. Challenges included low and unstable incomes, payment delays, and difficulties accessing financial services such as loans and opening bank accounts.

Financial security appeared to depend on the type of sanitation work and employment status. With regard to the type of sanitation worker, toilet cleaners sometimes earned below the minimum wage, and mechanical emptiers earned more than manual emptiers. For example, in Nigeria, the daily wage for a manual emptier ranged from NGN 750 (USD 1.82) to NGN 3000 (USD 7.27), and for a mechanical emptier it was NGN 5000 (USD 12.12) or more. With regard to employment status, it appeared that government employees such as treatment plant operators and contracted emptiers had a higher and more stable income compared to informal emptiers who were dependent on small contracts and what season it was.

To overcome these challenges, manual emptiers in some countries developed strategies to support each other financially. In Burkina Faso, during times of low demand, workers joined together to provide a service that ensured all workers had enough income to cover their living costs. In Nigeria, manual emptiers paid NGN 50 (USD 0.12) to their union each week for the welfare of group members and unforeseen circumstances. Manual emptiers also often had secondary jobs such as night watch, firewood chopping, excavation, and masonry, to prevent financial insecurity.

The Nigeria and Tanzania assessments identified finance as a key priority for supporting sanitation workers. In Nigeria, the assessment highlighted the need to facilitate links with financial institutions to increase access to financial tools such as loans and grants. The Tanzania assessment found there was a broader need to develop an appropriate economic model to support sanitation workers. The Zambia assessment highlighted the need to formalise contracts between employers and sanitation workers.

3.3. Legal Protection

3.3.1. Regulation

All four countries had a policy or strategy to ensure access to sanitation services. However, regulation and legislation on the health and safety of sanitation workers varied by country and were generally weak; either not targeted for sanitation workers and/or not enforced.

In Burkina Faso, there is no specific regulation on the health and safety of sanitation workers. The Government applies the National Work Code and the Public Hygiene Code to regulate sanitation workers and give fines for illegal disposal of faecal sludge.

In Nigeria, there are various policies and laws on sanitation, most specifically on access to sanitation services, operations, and disposal. However, these legal documents do not address the health and safety of sanitation workers.

In Tanzania, three key legal documents relate directly and indirectly to the health and safety of sanitation workers: (1) The Occupational Health and Safety Act (2003) aims to prevent accidents and illnesses, and requires employers to provide workers with training, equipment, vaccinations, and PPE to reduce risks. (2) The Employment and Labour Relations Act (2004) ensures that workers are members of trade unions and party to the service charter agreement that defines priorities to protect workers, particularly those working in hazardous environments. (3) The Workers Compensation Act (Amended in 2015) established the Workers Compensation Fund to ensure adequate and equitable compensation and rehabilitation for employees who suffer occupational injuries or contract occupational diseases arising out of and in the course of their employment, and in the case of death, for their dependents. The Fund requires employers to contribute on a monthly basis.

In Zambia, the Occupational Health and Safety Act (2010) aims to prevent accidents and illnesses and requires employers to provide workers with training, equipment, vaccinations, and PPE to reduce risks. Awareness and enforcement of the Health and Safety Policy and the Infection Prevention and Control Guidelines are weak.

Of the four countries, it appears that Tanzania has the most targeted regulation for sanitation workers. However, developing national guidelines on sanitation services, including workers' safety, was still identified as a priority, along with promoting adherence to health and safety requirements at the LGA level. This suggests that the regulatory framework for sanitation workers needs to be strengthened.

The Zambia, Nigeria, and Tanzania assessments identified the need to reform, develop, promote, and/or enforce regulations and guidelines to support sanitation workers. The Zambia assessment more specifically prioritised improving adherence to the country's labour laws and formalising contracts between sanitation workers and employers. The Nigeria assessment prioritised developing a legal framework for FSM and sanitation workers, including health, safety, and rights. It also recommended revisiting the health and safety guidelines for sanitation workers to ensure they are aligned with ILO standards. The Tanzania assessment also identified the need to develop national guidelines on sanitation services including operations, and health and safety.

3.3.2. Formalisation

The lack of legal recognition of sanitation workers, particularly those providing emptying services, is a key barrier to them accessing financial and social services, as well as engaging with authorities to advocate for their rights. Two solutions for legally recognising sanitation workers are: (1) the registration of service providers and (2) the formalisation of emptier organisations. The extent to which sanitation workers were registered and members of an emptier organisation varied between the type of sanitation worker and the location.

In Burkina Faso, the majority of mechanical emptiers were officially recognised, whereas manual emptiers worked informally. The organisational structure of sanitation workers differed by location. Only Ouagadougou and Bobo-Dioulasso had emptiers associ-

ations, both registered by the Ministry of Territorial Administration. In Bobo-Dioulasso, manual and mechanical emptiers organised themselves under one association called the Association des Vidangeurs de Bobo (Association of Emptiers of Bobo) (AVB). In Ouagadougou, emptiers formed two associations, one comprised of manual emptiers called the Association Burkinabè pour l'Assainissement et la Sauvegarde de l'Environnement (Burkina Association for Sanitation and Safeguarding the Environment) (ABASE), and the other made up of mechanical emptiers called the Association des Vidangeurs de Faso (Association of Emptiers of Faso) (AVIF). In Banfora, there were no organisations. However, manual emptiers had formed four groups, each with a leader in charge of communicating with clients as required.

In Kano City, Nigeria, there were two associations—the Manual Pit Emptiers Association (also known as *Gidan Kowa Da Akwai*) which is not recognised by the Government, and the Vacuum Trucks Owners Association, which has a certificate of incorporation from the Corporate Affairs Commission. The Manual Pit Emptiers Association revealed a strong organisational structure, headed by a State Chairman, that organised meetings, mediated with the Government, and intervened during misunderstandings between residents and emptiers. The Association also had a State Secretary and the emptiers were divided into headquarters called 'Mazauna' that were spread across the city. By contrast, the members of the Vacuum Trucks Owners Association rarely worked as a team and had a weak relationship with the Government.

In Zambia, one emptiers association was identified. It operated primarily in Lusaka where sanitation systems were more advanced. The association represents both manual and mechanical emptiers, and is recognised by the Registry of Societies of Zambia. In both Lusaka and Mongu Town, a portion of sanitation workers had contracts with the Government, suggesting the Government recognised sanitation workers. In Lusaka, both mechanical emptiers and manual emptiers had contracts with the Lusaka Water and Sanitation Company (LWSC), while in Mongu Town, only mechanical emptiers and treatment plant operators had contracts with the Western Water and Sanitation Company (WWSC)—not manual emptiers. Toilet cleaners were employed in government institutions.

In Tanzania, sanitation worker groups existed, but no associations were identified. Utilities had contracts with sanitation workers including truck drivers, equipment operators, supervisors, and maintenance personnel. Private emptying service providers were registered with water utilities but the registration process did not involve health and safety offices. Manual emptiers were not recognised because the Public Health Act (2009) states that it is an offence for any person to operate liquid or solid waste management activities unless they are contracted by the authority and comply with basic safety requirements. Manual emptiers tried to register their groups but blamed bureaucracy and disagreements on how to generate organisational overheads as key barriers. According to the Water and Sanitation Act and the Public Health Act, LGAs are mandated to register sanitation service providers.

Although the steps and progress towards formalisation are different in each country, the four assessments recognised the urgent need to formalise sanitation workers:

- The Tanzania assessment identified the need to advocate for the recognition of sanitation workers to all concerned authorities (Ministry of Health, Community Development, Gender, Elderly, and Children; the President's Office—Regional Administration and Local Government; and the Ministry of Water), to develop the capacity of LGAs to register sanitation service providers, and to develop a suitable model for formalising sanitation workers;
- The Zambia assessment identified the need to improve contracts with employers to ensure adherence to the country's labour laws;
- The Nigeria assessment identified the need to reform policy to include the legal rights of sanitation workers and to register and license organisations representing sanitation workers;
- The Burkina Faso assessment identified the need to license emptiers after completion of training and to define rules and bylaws to create associations in all communes

across the country. It recommended financial and technical support be provided to these associations.

3.4. Dignity

3.4.1. Stigma and Discrimination

Across all four countries, sanitation workers experienced stigma and discrimination due to their profession. Discrimination occurred at work, in public, and within the family. At work, sanitation workers reported being mocked and insulted by clients and managers, and their inability to rent materials (e.g., tricycles, wheel barrels) due to unwilling business owners or the rise in prices specifically for sanitation work. Society at large stigmatised sanitation workers through a lack of government recognition, evictions, and difficulties in renting parking spaces for their equipment. Some sanitation workers hid their profession from their families. They described themselves as masons or builders to avoid embarrassment and protect their families from community gossip. There was, however, one proud sanitation worker who had the respect of his family.

The impact of stigmatisation depended on the individual and their coping mechanisms. Substance abuse was reported in Burkina Faso and Tanzania as a way to calm the mind and cope with the stress of the profession.

To overcome challenges with stigma and discrimination, the Nigeria and Burkina Faso assessments identified a need for greater public awareness. In Nigeria, the recommendation was a behaviour change campaign on the rights and dignity of sanitation workers that would target the general public, health workers, NGOs, community-based organisations, and religious organisations. Proposed activities included seminars, awareness campaigns (e.g., though media outlets), and capacity development activities. In Burkina Faso, public awareness-raising included identifying sanitation champions who could share their stories through television and radio shows.

3.4.2. Infrastructure

The assessments identified challenges related to insufficient infrastructure, including Faecal Sludge Treatment Plants (FSTPs) and office space, that impacted the dignity of sanitation workers. Without FSTPs, sanitation workers were often left with no other choice but to unsafely dispose of faecal sludge into the environment, thereby increasing the stigma of their profession. Without office and parking space, sanitation workers lacked credibility and were at greater risk of discrimination.

All countries found that a lack of FSTPs led to the unsafe disposal of faecal sludge into the environment. In Tanzania, FSTPs owned by regional utilities were estimated to treat only 2.7% of annual faecal sludge production. In Mongu Town, Zambia, settlers built houses without permission on land designated for wastewater treatment ponds, while in Lusaka, the LWSC managed seven wastewater treatment plants and stabilisation ponds, covering an estimated 14% of the population. In Kano City, Nigeria, two dysfunctional wastewater treatment plants stopped working in the 1990s, and only three formal faecal sludge disposal sites (with no treatment) were in operation. In Burkina Faso, four FSTPs were in operation by the National Water and Sanitation Office (ONEA)—three in Ouagadougou and one in Bobo-Dioulasso. At the time of the assessment, ONEA was conducting a study to build an FSTP in Banfora. Nigeria, Burkina Faso, and Zambia identified the need to construct new FSTPs. The Burkina Faso assessment specifically identified the need to buy land for FSTPs.

Challenges around office and parking space included a lack of designated parking spaces for vacuum trucks, parking on busy roads where there was a risk of eviction, difficulty accessing toilets and handwashing stations, and squatting on open land or under trees due to a lack of office space. The Nigeria assessment investigated office space in more detail and showed that of the 50 manual emptier groups, only one owned an office and one other rented a space. Sanitation workers also spoke of the eviction of the Filin Mushe sanitation worker group to highlight the lack of tenure security. The group stationed their trucks and drums on a plot of land known as the ‘carcass field’ for over thirty years until

they were relocated to allow the city to develop the neighbourhood. The emptiers were initially allowed to stay but were forced to move their equipment to the bush at the edge of the Badala (city walls). Eventually, the emptiers had to move to join their operational tools/equipment. For mechanical emptiers, three out of the twelve providers rented office space and only one of the providers had parking space.

The Nigeria assessment identified the need to support sanitation workers in acquiring office and parking spaces, while the Zambia assessment identified the need to provide additional facilities for sanitation workers, such as structures for shade, toilet facilities and handwashing stations, and the need for company owners to invest in equipment for emptiers.

3.4.3. Equipment

The country assessments identified challenges with the quantity, quality and functionality of equipment (e.g., tools, vehicles) that not only impacted the health and safety of sanitation workers, but also their dignity. The reasons for these equipment challenges were not determined through the assessments.

Manual emptiers often used traditional tools such as shovels, spades, ropes, buckets, hoes, pickaxes, chisels, and ladders. Efforts were made in Tanzania to improve equipment for manual emptiers by introducing innovative small-scale emptying equipment such as the MAPET, the Vacutug, and the Gulper. However, these technologies had yet to reach scale and manual emptying practices persisted using traditional tools. In Nigeria, manual emptiers were able to increase their number of vehicles, although they were not in good condition.

For mechanical emptiers, the quality of equipment varied. In Mongu Town, Zambia, 50% of drivers said the state of their equipment was 'excellent' and the other 50% said it was 'good' (on a four-point Likert scale, from excellent to poor). However, in Lusaka, 17% of operators said the state of their equipment was 'poor', 31% 'fair', and 52% 'good'. In terms of functionality, the mechanical emptiers in Tanzania reported difficulties accessing certain households, particularly those in dense settlements, as well as difficulties emptying thick faecal sludge. Mechanical emptiers in Burkina Faso had challenges collecting faecal sludge in pits with a depth greater than four metres.

For workers maintaining sewers, challenges included the limited quantity of water jets and special equipment for opening inspection chambers. Workers had to dive into the drains and use drain sticks as a consequence. In Tanzania, the lack of equipment for inspection chambers led to two accidents in which sanitation workers lost their fingers.

The assessments in Nigeria, Tanzania, and Zambia identified the following solutions for overcoming challenges with equipment:

- Nigeria: Provide support to sanitation workers, including the provision of tools, equipment and vehicles;
- Tanzania: Promote new innovative desludging equipment;
- Zambia: Company owners invest capital in equipment for mechanical and manual emptiers.

3.4.4. Gender and Inclusion

Data on gender suggest that sanitation workforces in these four countries are comprised predominately of men. In Burkina Faso, sanitation workers reported that women could only work in marketing for sanitation services. In Nigeria, all sanitation workers were male. This contrasted with the solid waste management sector which included female workers. In Tanzania, the female sanitation workers were all toilet cleaners for public facilities. In Zambia, the majority of toilet cleaners were women. In Lusaka, however, 14% of sewage plant attendants were female, as were 2% of manual emptiers, suggesting a potentially more inclusive sanitation workforce.

The Zambia assessment identified the need to promote inclusivity in the sector to accommodate people with disabilities and increase the number of women in the sanitation workforce.

4. Discussion

The findings from this study show that sanitation workers in all four countries faced challenges related to health and safety, financial security, legal protection, and dignity. Each assessment identified and prioritised solutions to overcome these challenges, adding to 'a growing body of actors working to improve sanitation workers' conditions and rights' as identified in the Global report [2] (p. 14). The report described previous efforts to support sanitation workers as ad hoc and fragmented and called for greater coordination.

4.1. Challenges

An important challenge for sanitation workers was found to be health and safety. Sanitation workers reported being exposed to various occupational risks that could lead to injuries, illnesses, and death. These risks included exposure to faecal pathogens, heavy labour, working in confined spaces, and the use of hazardous chemicals. Sanitation workers were aware of these risks but had limited options to mitigate them or to change their livelihoods. Although wearing PPE correctly and consistently is essential for reducing occupational risks, the study suggests that the use of PPE was a challenge among most types of sanitation workers, including manual and mechanical emptiers, and treatment plant operators. Although all types of sanitation workers faced challenges with PPE, the findings from this study suggest that the employment status of sanitation workers was a contributing factor, with a lower use of PPE among informal workers compared to formal workers. Sanitation workers said they did not use PPE because of the cost and the impracticality which could increase occupational risks.

The occupational health risks of sanitation workers are recognised by the WHO [1], the ILO [19], and increasingly, by the Water, Sanitation and Hygiene (WASH) sector and academia [7,12,20–22]. The lack of correct and consistent use of adequate PPE by different types of sanitation workers is confirmed in the Global report which states 'it is not uncommon for sanitation workers of all kinds to work without any form of PPE' [2] (p. 9). Later research showed how the COVID-19 pandemic further increased the health and safety risks of sanitation workers, with many working longer hours with increased risks of exposure to the SARS-CoV-2 virus [23]. Sanitation workers were not systematically included in COVID-19 safety measures for frontline workers. The majority of sanitation workers in India, for example, received no safety instructions and worked through the pandemic without the necessary PPE or access to handwashing facilities [6,10].

Access to healthcare services (e.g., vaccinations, medical check-ups, emergency services) is essential for minimising occupational risks and providing rapid care in the case of illness or injury. However, the sanitation workers interviewed for this study were generally not fully vaccinated and did not seek emergency services when required. The findings suggest that access to healthcare services varied between countries and cities and depended on the employment status of sanitation workers. Informal workers were less likely to have access to healthcare services compared to government workers, while access for private service providers varied between countries. The ILO report states that the quality of healthcare services varies between countries and regions and emphasises that in many low-income countries, healthcare structures are weak and unable to meet the needs of the general population, let alone informal workers with no insurance [19]. Differences in access to healthcare between formal and informal workers appear to be common in other parts of the world too. For example, in Bangladesh, sweepers employed by the city corporation have access to partial health insurance, while informal sweepers do not [2].

The sanitation workers in the four assessment countries also faced challenges with financial security. These included low and unstable income, payment delays, and difficulties accessing financial services such as loans and opening bank accounts. Although there was a lack of information on the financial situation of sanitation workers, in part due to limited financial tracking, the assessments suggest the scale of precariousness depended on the type of sanitation work and employment status. It appeared that government employees and service providers with contracts had higher incomes and greater financial stability

compared to informal workers and manual emptiers who struggled to meet their basic needs and often required secondary jobs.

The Global report found similar financial challenges and identified the vulnerability of workers to extortion [2]. Their report gave examples of sanitation workers in India being paid in food, and sanitation workers in Senegal struggling to mobilise finances for operation and maintenance. Cawood's study also identified bribery and sub-contracting as financial challenges to sanitation workers [4]. The Global report observed that financial challenges were more acute amongst informal workers, providing an example from South Africa in which 'unskilled sanitation workers' were paid the minimum wage by contractors, whereas municipal workers earned double the amount with a 13-month salary. In other words, the financial security of sanitation workers depends on the extent to which a sanitation sector in a country is formal or informal [2]. This can vary significantly among countries. South Africa has a sanitation workforce that is predominantly in the formal economy, and on the other end of the spectrum, Burkina Faso has a sanitation workforce that is predominantly in the informal economy.

The country assessments also showed that sanitation workers faced challenges with legal protection. The literature reviews of legal documents showed a lack of regulation on health and safety, and employment rights specific to sanitation workers. Countries that had regulations relating to sanitation workers, such as Occupational Health and Safety Acts, were challenged with the enforcement of these regulations. These findings align with other sources. The Global report confirmed that few countries have guidelines specific to sanitation workers [2]. The ILO report showed that enforcement of occupational regulations is a challenge in many parts of the world and is caused by various factors, including governments not having enough inspectors to police numerous small and individual service providers [19]. Botchwey's study highlighted the impact of poor regulation enforcement on sanitation workers in Ghana, with sanitation workers not provided with a permanent position after completing the maximum authorised time for employment as a casual worker [18]. The sanitation workers described feeling taken advantage of and unsafe.

Sanitation workers in the four countries also faced difficulties with the recognition and registration of their businesses and sanitation worker associations. The study suggests that the level of recognition varied between countries and cities. For example, the only associations in Zambia and Burkina Faso were located in the main cities (Lusaka, Ouagadougou, and Bobo-Dioulasso). This suggests that the majority of sanitation workers across these countries were not part of a registered association and that associations were more likely to exist in large cities. The Global report confirmed the limited number of associations elsewhere, stating that, 'successful experiences are often localised to a town or district' [2] (p. 14).

The study also found that manual emptiers may face more challenges registering their associations than mechanical emptiers and they are less likely to have formal contracts. For example, the mechanical emptiers association in Kano City, Nigeria, was recognised but the manual association was not, despite having a strong organisational structure. In Tanzania, the manual emptiers tried to register but their attempt failed, in part due to bureaucracy. The Global report confirmed that unions and associations, 'may associate only a subset of sanitation workers, such as the permanent employees or vacuum tank owners' [2] (p. 14), and often exclude the most vulnerable workers. Joining associations and unions is, however, not always desirable for all sanitation workers. For example, some emptiers of the Government employees' union in Bangladesh said that the union was a financial burden providing them with no support, but if they left, they would lose their jobs [5].

Lastly, in all four assessment countries, sanitation workers faced challenges with dignity, including social stigma and discrimination occurring at work, in public, and within the family. Discrimination was exacerbated by the lack of basic infrastructure (FSTPs, office space, parking space, handwashing stations) and equipment (e.g., tools and vehicles). Sanitation workers had no choice but to dispose of faecal sludge unsafely and use open land or squat under trees for office space. These challenges increased the risk of substance

abuse to cope with the stress of the profession. This coping mechanism was discussed by sanitation workers in two countries, suggesting either that it may not be a risk in all countries or that it is a taboo subject in some. The latter hypothesis appears more plausible as the Global report also identified substance abuse as a risk, finding that, 'alcoholism and drug addiction to evade the working conditions are common among some sanitation workers' [2] (p. 10).

The stigmatisation of sanitation workers is a global challenge. The Global report states that, 'low-grade, unskilled sanitation workers often face social stigma and discrimination' [2] (p. 10). The report provides examples of stigma such as emptiers in Haiti changing their names and working at night, and manual emptiers in Kenya receiving abuse from local residents. The report also refers to a 'multigenerational poverty trap' which is an acute issue in caste-based societies such as India and Bangladesh. In India, sanitation work is relegated to the Dalit caste and is referred to as 'dirty work', causing deep issues of social exclusion and invisible trauma [9,11]. Women sanitation workers are even more vulnerable as they are also subject to gender discrimination [8].

4.2. Solutions

4.2.1. Health and Safety

The findings from this study suggest that sanitation workers need support accessing appropriate and affordable PPE and healthcare services, rather than an increased awareness of occupational health risks. The assessments identified the following solutions to improve the health and safety of sanitation workers:

- Develop or improve health and safety guidelines for sanitation workers in accordance with the ILO and WHO guidelines on sanitation and health [1];
- Improve inspections and enforcement processes of health and safety guidelines to ensure adherence;
- Develop the capacity of sanitation workers on health and safety guidelines to ensure compliance;
- Provide training programmes and certificates to ensure the safe provision of sanitation services;
- Coordinate efforts between the ministries responsible for sanitation and ministries of health to improve healthcare services for sanitation workers, including medical check-ups and vaccinations;
- Develop a system to ensure regular medical check-ups and vaccinations for sanitation workers, including registration with primary healthcare facilities and subsidies;
- Institutionalise the use of health booklets for sanitation workers (e.g., vaccinations, PPE) and use these tools as part of the registration process;
- Promote innovative desludging equipment to overcome challenges with manual emptying.

The solutions identified are aligned with the Global report recommendations [2] and the WHO guidelines on sanitation and health [1]. One of the four recommendations in the Global report is 'the development and adoption of operational guidance, codes of practice and standard operating procedures for sanitation work' [2]. The report highlights the important role local governments play in ensuring compliance with guidelines, codes, and standards. The WHO guidelines also highlight the need to train sanitation workers on standard operation procedures and occupational risks [1].

To improve health and safety, some countries, such as India and Senegal, have prohibited manual emptying [2]. The WHO guidelines recognise the importance of manual emptying, particularly where mechanical emptying is not possible, but recommend minimising manual emptying practices by transitioning towards manual and motorised pumps [1]. The Global report suggests that prohibiting manual emptying will not put an end to manual emptying but will simply further obscure it [2]. The report also gave examples of countries such as Bangladesh and South Africa, where manual emptying was formally recognised and workers were trained.

What is clear is that addressing the health and safety challenges of sanitation workers requires multiple measures and a multi-disciplinary approach [7,13]. Other solutions may also need to be considered based on the challenges identified in the assessments and other sources:

1. Sanitation workers reported the inconvenience and increased occupational risks of using impractical PPE. Not addressing these issues could limit the effectiveness of PPE initiatives. For example, in Bolivia, mechanical emptiers did not wear PPE even when it was provided to them [2];
2. Treatment plant operators said they were using worn-out PPE and needed more systematic replacements. This suggests there is a need to improve the management of PPE in utilities;
3. There is a need to address the occupational risks associated with household behaviours such as, 'non-compliance of septic tank construction to design standards, irregular cleaning, improper disposal of inappropriate items in toilets' [7] (p. 1).

4.2.2. Financial Security

To improve financial stability, workers created formal and informal alliances to provide financial support to each other (e.g., unions, associations, arrangements). The formality of these alliances and the protection they provided varied between countries and cities. The assessments identified the following potential solutions to improve the financial security of sanitation workers:

- Recognise all sanitation workers to ensure protection under labour laws and improve contract modalities;
- Recognise and create associations in all towns and cities, and provide financial support to these associations;
- Develop an appropriate economic support model for sanitation workers to ensure effective and sustainable operations;
- Facilitate links between sanitation workers and financial institutions that are often reluctant to provide loans and grants.

The Global report agrees on the importance of unions and associations for improving the financial stability of sanitation workers [2], and the WHO guidelines on sanitation and health provide recommendations for how to support service providers with the acquisition of equipment and working capital [1]. The recommendations for supporting service providers include, 'joint representation to financial institutions to facilitate access to credit', 'small grants or equity contributions from government or project funds', 'a guarantee fund to facilitate borrowing', and 'results-based financing agreements' [1] (p. 77). The guidelines also highlight the importance of marketing, campaigns and regulation to sustain demand.

4.2.3. Legal Protection

To improve legal protection, some sanitation workers created formal and informal alliances. All four assessments recognised the urgent need for the formalisation of sanitation workers and identified the following solutions:

- Advocate for the recognition and rights of sanitation workers to all concerned authorities at all levels;
- Reform or develop the legal framework for sanitation workers and associations, including enforcement processes;
- Develop or strengthen the registration process (e.g., health and safety, training) to include all sanitation workers and associations;
- Provide financial and technical support to create sanitation worker associations in all cities and towns across the country;
- Develop the capacity of local government to register sanitation service providers;
- Ensure employers adhere to national labour laws to improve contracts with sanitation workers.

The ILO report also encourages the development of alliances to transition towards a formal sector, suggesting that, 'informal workers should organise, form cooperatives and reach out to workers' and employers' organisations' [19] (p. 19). To do so, Cawood's study recommends the support of 'grassroots leadership and collectivisation to ensure that the demands of sanitation workers are at the forefront of advocacy, policy and planning' [4] (p. 2). The ILO report also states that the inclusion of informal workers, 'depends on the will of government authorities, campaigning by organisations supporting such workers or/and on the pro-activeness of the workers themselves' [19] (p. 18), further highlighting the need for a comprehensive strategy for the formalisation of sanitation workers.

Reforming and developing legal frameworks could be supported by international standards, including those of the ILO, the World Bank Environmental and Social Standards, and the International Standards Organisation Sanitation Standards (ISO 24521, ISO 24510, ISO 24511), as well as the WHO guidelines on sanitation and health [1]. For the enforcement of legal frameworks, more information would be required to understand best practices. The ILO report suggests changing, 'the role of labour inspectors to one of education and prevention, as opposed to inspection and prosecution' [19] (p. 15), while the Global report states that, 'municipal-level oversight and enforcement of sanitation service providers (both public and private) have an important role in the adoption of standard operating procedures [. . .]' [2] (p. 19), and recognises the need for more research to answer the question, 'What does an effective enforcement and inspection look like?' [2] (p. 46).

4.2.4. Dignity

The four assessments highlighted the magnitude and diversity of challenges related to the dignity of sanitation workers. The assessments identified the following solutions to overcome these challenges:

- Create public awareness of the role sanitation workers play in protecting public health and the environment;
- Implement a behaviour change campaign on the rights and dignity of sanitation workers targeting government, health workers, NGOs, community-based organisations, and religious organisations;
- Identify sanitation champions who could share their stories on media platforms such as television and radio shows;
- Identify land for FSTPs and invest in infrastructure to allow sanitation workers to effectively conduct their work;
- Promote new innovative desludging equipment.

The Global report also recommends advocating for sanitation workers and promoting their empowerment [2] and emphasises that advocacy for sanitation workers requires all stakeholders' participation. Cawood's study supports this recommendation, referring to the need for strategic alliances between various stakeholders for effective advocacy, including the WASH sector, human rights organisations, and sanitation workers [4].

4.3. Next Steps

4.3.1. Increase Knowledge, Improve Knowledge Management

To fill the knowledge gap that remains, governments could conduct in-depth country assessments. These assessments should consider all types of sanitation workers and contract modalities. Given the differences between cities within the same country, locations should be carefully selected to consider factors such as region, population density, social norms, political will, economic activity, etc.

The sector also needs to improve its knowledge management practices so that it builds on insights from the successes and failures of previous sanitation worker initiatives in different regions of the world, as well as initiatives from other sectors such as solid waste management and water management. The sector needs to collect, analyse, and disseminate the knowledge appropriately to the various sanitation stakeholders.

With regard to health and safety, more information is needed to understand how to increase the use of PPE. This requires conducting behaviour change studies to better understand the motivators and barriers to wearing PPE, investigating the impracticality of PPE and potential design options, and understanding the market and supply chain to reduce the cost of PPE. More information is also required on access to and availability of healthcare services for sanitation workers. This includes understanding the pros and cons of different vaccination strategies (e.g., campaigns, subsidies), and medical check-up strategies. The mental health needs of sanitation workers should also be further investigated to better support their mental health and understand issues around substance abuse.

To improve legal protection and financial security, more information is required about the types of regulation and enforcement strategies that other governments have developed, and to understand their efficacy. This information would motivate and support governments to design and adapt regulation and enforcement strategies to their contexts. To help sanitation workers organise themselves, more examples and case studies of associations are needed to understand the options for structure, rules, and overhead management. To increase the number of sanitation associations in a country, it would be beneficial to investigate registration processes in countries with high numbers of associations. For financial security, more information is required on contracting modalities, the reluctance of financial institutions to provide loans and grants, as well as the capacity of sanitation workers in financial management.

To eradicate stigma and discrimination, behavioural studies should be conducted to understand the negative labelling of sanitation workers in society and then inform public awareness campaigns. Investigating how other countries have responded to the stigma of sanitation workers and other types of workers, could further inform a strategy. To understand the full scale of discrimination, further information is also required on the stigma faced by female sanitation workers.

4.3.2. National Action Plans and Implementing Solutions

These national assessments and global insights can inform urgently needed national-level action plans to support the rights of sanitation workers. Sanitation worker representatives should be involved at all stages, including the design of national assessments, producing evidence, and developing action plans. However, action should not wait until these assessments and plans are completed. Governments and their partners can start implementing city or national-level priority solutions and other no-regret actions that are mentioned in this paper and detailed in the assessment reports [15–18]. An example of this has already happened in Tanzania, where the Ministry of Health, after going through the assessment report, began planning the development of health and safety guidelines for informal sanitation workers.

5. Conclusions

This study has increased the understanding about the situation of sanitation workers in Africa. Sanitation workers face challenges with health and safety, financial security, legal protection, and dignity, with informal workers and manual emptiers more impacted by these challenges. The study shows that there are nuances between countries and cities, including variability in legal frameworks, contractual agreements (e.g., informal, contracts, government full-time employee), and the recognition of sanitation worker associations.

There are still many knowledge gaps. More research is required on the health and safety, financial security, legal protection, and dignity of sanitation workers in Africa and around the world, to understand their challenges and provide targeted solutions. To fill these gaps, governments could conduct in-depth country assessments. Sanitation sector actors also need to improve knowledge management practices to build on insights from the successes and failures of previous sanitation worker initiatives. For future similar multi-site studies, researchers can pre-empt some of the limitations faced in this study. First, by having consistent definitions of categories of sanitation workers and agreeing which ones

to include. Second, by establishing some core indicators, questions and tools to be used across all study sites, while allowing for additional locally relevant ones.

As Martin Luther King Junior said during the Memphis sanitation strikes on 18 March 1968 (solid waste workers), "Whenever you are engaged in work that serves humanity and is for the building of humanity, it has dignity, and it has worth." [24]. Six decades later, many societies around the world are failing to recognise the worth of the critical work that sanitation workers do and are failing to ensure they can do it with dignity. This needs to change. To support sanitation workers' rights to dignity, safety and health, everyone involved needs to take the matter up as a priority.

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