ATHENA INFONOMICS

BILL & MELINDA GATES foundation

CITYWIDE INCLUSIVE SANITATION

SURVEY TOOLKIT

SYSTEM PERFORMANCE

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CHAPTER

1

INTRODUCTION

Chapter 1: Introduction

The toolkit provides an indicator framework and a set of survey instruments to measure sanitation system performance that adhere to global standards yet can be adapted to meet the needs of national and local data systems. This toolkit was developed to reliably benchmark and compare sanitation system status and progress across the eight cities implementing Citywide Inclusive Sanitation (CWIS) programs in Africa and South Asia. Without an aligned indicator framework, there were discrepancies in sanitation system definitions and levels of performance, both within and across countries, that made it difficult to understand and compare status and progress.

Developed in partnership with CWIS program partners and local authorities from these five countries in Asia and Africa, this toolkit was designed to assess the performance against the CWIS core outcomes of the service framework, notably Equity, Safety and Sustainability. The toolkit was designed to help local sanitation service authorities, national level authorities, as well as international financial institutions and philanthropic foundations with their distinctive monitoring and measurement needs.

The toolkit is not meant to be used for creating parallel datasets that substitute government data systems; instead, it is ***intended to be used to strengthen existing government data systems***. It is crucial to institutionalize CWIS monitoring and data collection efforts into existing government data systems, so that critical data points can be sustainably generated and updated.

This document is divided in two parts:

- Guidance, including background and purpose of the toolkit (Chapter 1), guidance for survey preparation including sampling (2) and guidance for data analysis, which details out the survey questions and options that should be used for arriving at the values corresponding to a sample set of indicators (3);
- Data collection instruments: present the survey instruments, including indicators and questions divided in household survey (4.1), toilet inspection survey (4.2), desludging services survey (4.3) and the sanitation authority interview guide (4.4).

1.1 Background and Motivation

The CWIS Monitoring, Learning, and Evidence (CWIS MLE) initiative, funded by the Bill & Melinda Gates Foundation, is a three-year program that is supporting eight cities and the Foundation to measure and learn from the implementation of Citywide Inclusive Sanitation (CWIS). This CWIS system performance survey toolkit evolved from our work monitoring sector performance in urban sanitation across eight cities in five countries in Africa and South Asia. The CWIS MLE program sought to collate data obtained from existing monitoring approaches across the program countries and cities against a common set of sanitation indicators, which are both aligned with global standards, such as the Joint Monitoring Programme (JMP), and local data systems and stakeholder needs. In the process of collating data, there were ***discrepancies between global, national, and local sanitation definitions and differences in data collection approaches***.

Distinctive attributes relevant to local context or definitions driven by environmental or public health issues have influenced how sanitation is monitored nationally or locally. For example, for an onsite sanitation system to be considered “improved” or “sanitary”, requires a lined pit (vs. unlined pit) in Kampala, a twin pit (vs. single pit) in India, and a water seal or covered pan in Bangladesh. However, none of these attributes are part of the JMP’s definition of improved

sanitation. The definition of "lined pit" as improved sanitation in Kampala was driven by local context and health and safety issues. As many households build low-cost unlined pits which tend to collapse during desludging, the local authority has focused on promotion of "lined pits" to address the health and environmental issues, thus included this in their definition of improved sanitation.

Experiences from our eight pilot cities found that variations between global frameworks, such as the Joint Monitoring Programme for the SDGs, local data systems and stakeholders data needs has several implications for data collection:

- Globally focused data collected for SDG/JMP reporting are often aggregated at a national level and are at times difficult to disaggregate by locally important attributes needed for decision-making. The human and financial resources dedicated to strengthening SDG/JMP reporting are hence only able to benefit urban local decision-makers to a very limited extent.
- As local data collection efforts are driven by context-specific needs and are not harmonized across countries, definitions and standards may differ. Consequently, the data converted from these local efforts for global reporting is not always comparable across different countries and even across cities within the same country.

Another gap discovered from the cross-country pilot was that most sanitation data collection and measurement focus on quantitative data. There was insufficient qualitative data on the institutional design of sanitation service delivery systems, which is a major determinant of system performance. Our approach and efforts at bridging this gap within the MLE program cities are presented in the other toolkit in this set of CWIS survey toolkits, which focus on data collection for sanitation system design.

This set of tools are a programmatic response to the challenges we faced, and we hope that they can also be of use to various local, national, and global stakeholders as they think about data collection for measuring sanitation system performance outcomes.

1.2 Purpose of the Toolkit

The purpose of this toolkit is to provide a monitoring framework and set of survey instruments to measure sanitation system performance. These survey instruments were design to adhere to global standards yet be flexible to adapt to existing data systems across Asia and Africa. They aim to produce reliable data that can be benchmarked and compared and help inform city planning and decision-making, when collected and made available in a certain format and frequency.

By periodically collecting datasets using the survey instruments in this toolkit, we hope that more and consistent data will become available for nationwide and cross-country monitoring as well as for local decision-making on targeted interventions to enhance sanitation service delivery for the poor and women and girls, and to improve working conditions for the sanitation workers.

The toolkit has the following characteristics:

- *Comprehensive*: Considers all common urban sanitation data sources—Households, Desludging Operators, Public Toilet/ Community Toilet (PT/CT), Institutions (focusing on educational institutions and healthcare facilities), and the local Sanitation Authority.

Includes a range of data collection methods such as quantitative questionnaires and qualitative Key Informant Interviews (KII). A summary of the survey tools is included in *Section 1.5 Overview of the System Performance Toolkit*.

- *Flexible:* Considers the key attributes for different sanitation systems compiled from global, national, and city level data systems. on the inclusion of technology options and attributes was informed by the systems that prevail in these cities. The survey instruments are adaptable to the needs and context of the city. Questions can be used in parts or added to existing surveys; likewise, cities can build on these instruments and add more questions to obtain context specific data.
- *Reliable:* While data reliability is influenced by many factors, and some of those are outside the scope of this toolkit, the set of instruments in this toolkit are designed to improve data reliability through:

  (i) Capturing attributes through descriptive questions and options, instead of imposing definitions. For example, to track 'women friendly' Public Toilets (PTs), the instruments focus on minimum standards that a PT should meet to be classified as such. These include Y/N questions on whether PT has separate entrances for women and men, separate cubicles for women and men, whether it is well lit at night, etc

  (ii) Triangulating data within and across survey instruments to minimize inaccuracies in enumerator communication and respondent comprehension. This was achieved by asking the same thing in different ways for key areas of interest at various points in the survey; recording infrastructure observations to validate verbal responses; and collecting data from different sources and with different approaches.

  (iii) Providing clear guidelines on analyzing the datasets to reduce the chances of error in data analysis and improve consistency and comparability of findings. For example, chapter 3 provides two different methods for calculating the proportion of systems desludged based on different datasets and using these findings for verification and reporting.

1.3 Intended Users

The toolkit is designed to simultaneously cater to the needs of three distinctive groups of users:

- **Sanitation service authorities and implementation agents at the local level:** The instruments are designed to capture data on both service outcomes for monitoring progress and infrastructural and behavioral characteristics that can help identify service gaps and inform intervention design. The data collected is intended to help local decision-makers to establish better linkages between interventions and outcomes. For example, sanitation service authorities and city level decision-makers may find it useful to track indicators such as the percentage of onsite sanitation systems that have been emptied for households and institutions alike, percentage of FS collected that reaches the treatment plant, treatment effectiveness, adequacy of CT/PTs, etc.
- **National level authorities:** The survey instruments can help benchmark and understand the sanitation systems performance in cities across the country, and monitor local

sanitation service authority performance in a manner that is both aligned with global standards and allows ample room for pursuing national agendas.

- **International Financial Institutions (IFIs) and philanthropic foundations:** The datasets collected using the survey instruments in this toolkit will allow those interested to consistently evaluate the performance of their investment portfolios across different geographies, while also providing valuable data for global monitoring efforts to assess safely managed sanitation for the SDGs.

1.4 Indicators Covered by the Survey Instruments

While designed to be compatible with various global and national systems, the survey instruments also have a specific purpose of generating data for a set of indicators that intend to measure progress towards Citywide Inclusive Sanitation (CWIS). The full list of CWIS indicators include 29 quantitative and qualitative indicators and indicator areas, and 86 sub-indicators. This section introduces the concept of CWIS, the CWIS service framework, the CWIS indicators, and how the toolkit is designed to reliably generate data for the CWIS indicators.

CWIS is a public service approach to planning and implementing urban sanitation systems to achieve outcomes of Sustainable Development Goal 6: Safe, Equitable, and Sustainable sanitation for everyone in an urban area, paying special attention to the needs of the poor, the marginalized, and women and girls.[1] CWIS is guided by a set of seven principles (Annexure III) summarized by a service framework (Figure 1), which identifies the core outcomes and functions for public service delivery systems. These were informed by a series of regional consultative workshops with ministerial, municipal and utility leaders, economic regulators, engineering firms, and development partners from over 40 countries, and expanded on the initial CWIS building blocks and objectives.[2] The core CWIS functions of Responsibility, Accountability, and Resource Planning and Management form the institutional foundation required of any effective sanitation service delivery system to achieve the outcomes of Equity, Safety, and Sustainability.[3]

[1] Schrecongost, A., Pedi, D., Rosenboom, J. W., Shrestha, R., & Ban, R. (2020). Citywide Inclusive Sanitation: A public service approach for reaching the urban sanitation SDGs. Frontiers in Environmental Science, 8, 19. https://doi.org/10.3389/fenvs.2020.00019

[2] Gambrill, M., Rosenboom, J. W., Evans, B., Moe, C., Perez, E., Trémolet, S., et al. (2016). Addressing the Urban Sanitation Crisis: Time for a Radical Shift. Available at: https://blogs.worldbank.org/water/addressing-urban-sanitation-crisis-time-radical-shift (accessed December 15, 2020)

[3] Bill & Melinda Gates Foundation (2020). CWIS Factsheet.

CWIS SERVICE FRAMEWORK			
CORE CWIS OUTCOMES	**EQUITY**	**SAFETY**	**SUSTAINABILITY**
	Services reflect fairness in distribution and prioritization of service quality, prices, and deployment of public finance/ subsidies.	Services safeguard customers, workers, and communities from safety and health risks—reaching *everyone* with safe sanitation.	Services are reliably and continually delivered based on effective management of human, financial and natural resources.
CORE CWIS FUNCTIONS	**RESPONSIBILITY**	**ACCOUNTABILITY**	**RESOURCE PLANNING AND MANAGEMENT**
	An authority(ies) executes a clear public mandate to ensure safe, equitable, and sustainable sanitation for all.	Authorities' performance against their mandate is monitored and managed with data, transparency and incentives.	Resources—human, financial, natural, assets—are effectively managed to support execution of mandate across time/space.

Figure 1: CWIS Service Framework by Schrecongost, et al.

A set of two toolkits have been developed to adequately assess a city's performance against the CWIS service framework:

1. This system performance toolkit which assesses city progress and achievement towards the CWIS core outcomes: Equity, Safety, Sustainability.
2. The sanitation system design toolkit which monitors the CWIS core functions: Responsibility, Accountability, Resource Planning and Management. The system design toolkit outlines the directions for institutional and governance reforms through which the core CWIS outcomes can be achieved.

The CWIS indicators in this system performance toolkit were informed by global monitoring frameworks, project or country specific frameworks and country systems from our pilot project across eight cities in five countries. The indicator list was developed following a consultative and iterative process involving the sanitation service authorities and local implementation partners in these eight cities. The choice of indicators combines global and various national requirements, and aims to inform city planning and decision-making. This requires that the indicators are collected and made available in a suitable format and adequate frequency. The detailed method followed to develop this indicator list and mapping of the convergence between CWIS indicators and selected global frameworks is presented in Annexure III.

In addition to tracking key performance outcomes across the sanitation service chain, the CWIS indicators also seek to fill in these critical gaps in existing global measurement frameworks:

- Intra-city sanitation equity: certain CWIS indicators are disaggregated with regards to service provision in Low Income Communities (LICs). By comparing the percentage of households with access to safely managed sanitation in LICs as versus citywide, for instance, we hope to help city level service providers better understand the magnitude of discrepancy in service levels for the poor and the non-poor.
- Gender: the CWIS measurement framework includes gender intentional indicators on both system performance outcomes and system design. Efforts at gender mainstreaming range from incorporating gender dimensions into infrastructure related indicators such as CT/PT design, to collection of sex-disaggregated data and women's representation in sanitation related decision-making bodies.

- Sanitation workers: CWIS indicators cover a set of issues related to both the rights and the health and safety of sanitation workers, who are among the most vulnerable to occupational hazards and social stigma. The indicators seek to understand key questions such as whether all sanitation workers have social security and health insurance, and highlight differences within the group between formal workers and informal manual emptiers.

The table below summarizes the CWIS indicator areas corresponding to the CWIS Framework. A detailed list of specific indicators and sub-indicators used for measurement is available in Annexure II.

Table 1: CWIS Indicators Corresponding to the CWIS Service Framework

	Equity	Safety	Sustainability
Service Outcomes	*Services reflect fairness in distribution and prioritization of service quality, prices, and deployment of public finance/ subsidies* • Toilet access and safe management of sanitation in LICs is proportionate to those of citywide • Equitable use of public finance across populations and communities • HH & users' costs to access sanitation services are equitable across the city • Gender intentional representation in decision-making • Sanitation workers' rights, protections, and safety nets	*Services safeguard customers, workers, and communities from safety and health risks—reaching* everyone *with safe sanitation* • Residents and city users have access to adequate toilet facilities in residential, community & public spaces, schools & healthcare facilities. • Toilet facilities and waste services are managed to protect public health and environmental outcomes • Waste disposal and treatment facilities are sufficient and operational	*Services are reliably and continually delivered based on effective management of human, financial and natural resources* • Cost recovery of service delivery system operating expenses • Financing resources for CAPEX expansion and renewal

	Responsibility	Accountability	Resource Planning & Management
System Functions	*Authority(ies) executes a clear public mandate to ensure safe, equitable, and sustainable sanitation for all.* • Clear and non-overlapping mandate covering the entire service chain • Mandates cover all urban areas without exclusions related to land tenure or artificial administrative boundaries • Mandate is explicitly pro-poor, gender intentional, and inclusive of other vulnerable groups or status	*Authorities' performance against their mandate is monitored and managed with data, transparency and incentives.* • Service authority performance is monitored with clear KPIs and targets • Service authority performance is managed with data-driven incentives and/or penalties • Accountability process is inclusive of customer and non-customer engagement, including marginalized voices	*Resources—human, financial, natural, assets—are effectively managed to support execution of mandate across time/space.* • Sanitation budget allocation is based on mandate and performance across service areas • Sanitation investment decisions are driven by impact and cost considerations, incl. on water and energy requirements relative to their availability and cost, and are technology agnostic • Sanitation planning is pro-poor, gender intentional, and inclusive

1.5 Overview of the System Performance Toolkit

This toolkit is organized in two parts, the first half general guidance (chapters 1-3) and the second half the data collection instruments. The chapter on data collection instruments includes all the indicators and highlights the purpose of each indicator. The full questionnaires of all four instruments are included in Annexure I.

Table 2: Overview of the toolkit

	Key themes: sampling, survey administration, indicator calculation methods	
Guidance	**Chapter 2: Survey Preparation**	**Chapter 3: Data Analysis**

	Quantitative	Qualitative
Data Collection Instruments	**Chapter 4.1: Household Survey** *for households living in Low Income Communities (LICs) and rest of the city*	**Chapter 4.4: Sanitation Authority Interview Guide – Service Outcome Component** *for key informants within the sanitation authority who have access to data on treatment and reuse, health and environmental outcomes, and who are knowledgeable about current staffing*
	Chapter 4.2: Toilet Inspection Survey *for public/ community toilets, schools, healthcare facilities*	

CHAPTER

2

SURVEY PREPARATION

Chapter 2: Survey Preparation

This chapter covers an overview of the survey instruments, their uses and limitations, and their structures (2.1); a sampling guide for each of the survey instrument (2.2); the design of the instruments compatible with the Open Data Kit software (2.3); how to edit and customize the surveys to suit the local context (2.4); data collection methods for KII (2.5); survey frequency (2.6) and tips for conducting field work such as training of enumerators and quality control (2.7).

2.1. Overview of Instruments

We have created four data collection instruments for use in the tracking of the equity, safety and sustainability of urban sanitation systems. The four instruments include three surveys—the Household Survey, the Toilet Inspection Survey and the Desludging Services Survey, and a Key Informant Interview (KII) guide for obtaining data on service outcomes from the sanitation service authority. See Table 2 for an overview of all four instruments which are detailed in sections 4.1, 4.2, 4.3 and 4.4.

Table 3: Overview of the Data Collection Instruments

	Household Survey	Toilet Inspection Survey	Desludging Services Survey	Sanitation Authority Interview Guide – Service Outcome Component
Target Population	Individual households	Public/ community toilets, schools and healthcare facilities	Desludging operators (individuals and businesses)	Sanitation service authority
Main Topics Covered	Household information, sanitation access, containment & collection	Facilities information, sanitation access, containment & collection	Work environment for the operators, collection practices, disposal	Sanitation workers' rights and safety, gender balanced representation, gender pay gap, environmental and health outcomes, treatment and reuse, financial sustainability of sanitation infrastructure and investments
Quantitative /Qualitative	Quantitative	Quantitative	Quantitative	Qualitative (semi-structured KII)
Sample Type	Stratified random sample	Stratified random sample	Snowball Sample	Purposive sample
Frequency of Surveys	Once in 3 years	Once in 3 years	Once 3 years	Every Year
Limitations	Time and resource intensive	Certain questions require the enumerators to observe and record data over an extended period of time	Due to the informal nature of many emptiers, the survey needs to rely on snowball sampling wherever a list of all operators is not available. As this is not a representative sample, some bias in answers may arise	Qualitative data obtained from the interviews is more subjective in nature and difficult to draw objective generalizations

Each of the three quantitative surveys contain five sections: see Table 4 for the breakdown of sections in each survey. Across all three surveys, the introduction and end sections are nearly identical. The general structure of the Households survey is similar to the Toilet Inspection Survey, with the questions for the Sanitation Access and Containment and Collection sections (Sections 3 and 4) almost identical; however, the Toilet Inspection survey includes visual inspection to validate some responses.

We have designed all three surveys such that they should take between 15 and 45 minutes, although we expect the majority to take around 30 minutes – but it should be known that these surveys have not, as of the writing of this manual, been piloted in the field, and so those estimates for the length of time necessary have not been verified.

Table 4: Structure of the Quantitative Surveys

	Household Survey	Toilet Inspection Survey	Desludging Services Survey
Section 1	Introduction	Introduction	Introduction
Section 2	Household Information	Facilities Information	Work Environment
Section 3	Sanitation Access	Sanitation Access	Collection Practices
Section 4	Containment & Collection	Containment & Collection	Disposal
Section 5	End	End	End

The qualitative survey instrument presented in section 4.4 is organized by topic areas meant to be answered by the sanitation service authority and follows the format of a semi-structured Key Informant Interview (KII). The topic areas covered include gender-balanced representation in the sanitation sector, sanitation workers' rights, and workers' safety. The KII guide includes questions to record existing data collected by the authority or by other stakeholders that share key service data with the authority. Hence, the interview does not need to be completed in a single session as this information is not always available on-hand. It is recommended to share the questions beforehand and allow time for the Key Informant (KI) to look up data from databases or records to locate the exact data points instead of providing rough estimates based on memory.

2.2 Sampling Guideline

Setting up a sampling protocol is essential to obtaining a representative dataset. Each sampling protocol will be different, as it will depend on the geographic area, population covered and the variation across that population. In order to obtain a representative sample, some combination of stratification and randomization may be required. To develop a sampling protocol that is representative of the population being sampled, we encourage the data collection team to confer with their own local statisticians and study design experts as well as reference texts, such as

"Research methods for the behavioral and social sciences" (2010) by Weathington, Cunningham, and Pittenger.

Sampling for the Household Survey & the Toilet Inspection Survey

A sampling framework should be finalized before any data is collected. The goal of any sampling framework will be to create a sample that is representative of the entire coverage area (in most cases this will cover the entire city, but may also include nearby suburbs, depending on the goals of the monitoring exercise). As such, the sample will need to spread across the area geographically, but it should also draw from across the socio-economic spectrum proportionate to its make-up. For example, if, based on local definitions, 30% of the city is considered to be in LICs, then it should be a goal of the sampling frame to have 30% of the same come from LICs as well. There are many on-line calculators and other resources which will allow the data collection team to estimate the total number of respondents, the size of the sample clusters and the number of sample clusters that should be included in the sample; it is not just the total sample size, but also the way that these numbers are distributed over the city that will determine whether or not the sample represents the larger urban population or not.

In order to make sure that the sample is representative, it is recommended that a stratified random sample approach be adopted. The requires some additional data before it can be implemented: some metric of the distribution of wealth and socio-economic status (SES) across the city, and an observational survey of the city. The metric of wealth and socio-economic status might be gleamed from DHS or census data; it should, at a minimum, tell the proportion of LIC households, but it might have more fine-grained distributions as well, such as the distribution of slums, the proportion of households living in poverty, or the proportion of households with access to the sewer network. Perhaps it will have the proportion of households that are low-, middle- and high-income, if such categories are well defined in the local context.

In any case, choosing which categories will be part of the sampling frame is a crucial decision that should be made by the local data collection team, based on the local context and policy priorities. Using the categories chosen, an observational survey of the city should be performed, whereby each neighborhood in the city is assigned to one of the categories adopted. The number of sample clusters assigned to each category should be proportional to its existence in the city at large, with as wide a geographic spread as possible. The sample of respondents within a given cluster can then be randomized, using whatever randomization method works best for the data collection team. The Toilet Inspection Survey should then be conducted at all, or a random subsample, of the public toilets found within the general area or neighborhood of the cluster locations that have been selected.

At the end of data collection, it is important to verify the representativeness of the sample. This should be done by comparing the proportions across the city in DHS or census data for the sample categories chosen with the proportions for the same categories across the sampled data collected. Any divergence between the two indicates that the sample may not be as representative as it could be; complete divergence indicates that the sample is not representative at all. In such a case, corrective weighting of results is necessary, and the presence of such weighting disclosed in the final reports created.

Sampling for the Desludging Services Survey

To the extent possible, both manual and mechanical desludging services should be included in the survey, roughly in proportion to their relative extent of coverage of the market for emptying services. The Desluding Survey would ideally be done as a random sample, but this would require that the city has a complete listing of all desludging services, for both manual and mechanical desludgers. If such a list exists for mechanical desludging services, then the data collection team is advised to randomly sample from that list and use snowball sampling for manual desludging services. In the case where no list exists for either type of service, then a snowball sample should be implemented for both types of services.

For a snowball sample each new respondent is asked to share the name and contact information (if possible) for any additional desludging operators that they might know. The idea being that each one will likely know more than one, and the sample will grow exponentially until the sample size has been met, assuming that the sample size is less than the total population of desludging service operators. A snowball sample does not assure a representative dataset, thus it is recommended that as many desludging operators as possible are surveyed; if the sample itself is close to the size of the population then representativeness becomes less of an issue altogether. Given that the total number of desludging operators in a city is likely to require a manageable number of surveys, it is recommended that the data collection team try to reach as many of them as possible.

Sampling for the Sanitation Authority KII

Identification of the Key Informant (KI) should be informed by the service authority's organogram, which lists out the roles and responsibilities of each position. The identification process should consider all types of sanitation services and steps in the service chain, as these may not necessarily be managed by the same authority. For example, in cities with sewer networks, sewered sanitation is often managed by the local/ regional/ national utility that is also responsible for water supply. Meanwhile, non-sewered/ onsite sanitation may be the responsibility of the local government in many cases. In this scenario, KIs from both authorities would need to be interviewed to provide a comprehensive picture.

Within the same sanitation authority, more than one KI may also be required to answer all of the questions, depending on the authority's organogram. For example, the questions on number of staff by gender and in leadership positions may be best answered by the Human Resource Manager, while the Director of Finance would have the best knowledge about revenues and costs that are needed for calculating financial sustainability. To make it easier to identify the most relevant KI/KIs for the survey, the interview guide is divided into five sections by topic area. The questions in each topic area can most likely be answered by a single KI, although one KI may be able to answer the questions in multiple topic areas depending on the organizational structure of the service authority.

2.3 Survey Design and Open Data Kit (ODK) Software

About ODK data collection tool

All three quantitative surveys have been designed for use with the free Android app called Open Data Kit (ODK). The ODK system has three major components: an app, which can be used to collect data on phones and tablets (named ODK collect); an online data aggregation system (ODK aggregate); and a local data aggregation system (ODK suitcase). There is a wealth of information available online which can explain how to set up and troubleshoot the ODK system; see Annex V for details.

Typically, the app is used to collect individual survey responses, these individual responses are uploaded to the cloud, where they are combined into one dataset, then the aggregated dataset is downloaded directly to a designated laptop as a single, or multiple, csv file(s). These files can then be downloaded by ODK suitcase, although various downloading, saving and encryption options exist to suit different confidentiality and data security requirements (see Appendix V).

This manual will not provide more details on ODK Collect, ODK Aggregate or ODK suitcase. We will instead spend the remainder of this section discussing the design of surveys for ODK Collect, and how to create updated versions of the Household Survey, Toilet Inspection Survey and Desludging Services Survey.

Uploading and editing ODK survey files

All three surveys have been provided which are in in an excel format that allows them to be uploaded into the ODK online XLS to XML converter, which can be found here: https://getodk.org/xlsform/. Each survey location will require that this file is updated to suit local context, the following section 2.4 details which exact questions should be updated.

2.4 Adapting the Survey to the Local Context

Before any of the surveys can be implemented, there are a few minor edits that are required to suit the local context. Here is a list of items that must be edited before deployment:

1. The names of all enumerators should be entered in the choices sheet under the [*EnumName_choices*] list_name. If there are more than three, additional lines should be inserted, codes added to the name column and the names written in the label column.
2. The names of the sector/district and cells/villages/wards should be written in the label column of both the survey and choices sheets. For the survey sheet, they would need to be added to the question for [*district*] and [*village1, village2, village3 etc*]. For the choices sheet, they would need to be added to [*district_choices*] and [*village1_choices, village2_choices, village3_choices etc*]
    a. If there are more than four sectors/districts, which is likely, then additional lines will need to be added to the choices sheet for list_name [*district_choices*]. If less than four, then any excess lines will need to be removed.
    b. Question 18 will need to be repeated for each additional district, in both the survey sheet and the choices sheet. Please note that a new, unique name and a new, unique list_name will need to be given to each.

3. The information to be shared with prospective participants will need to be added to the label column of the [*consent*] question.
4. Either the [Polite] question should be deleted; or the [*last_name* and *first_name*] questions should be deleted; or both should be deleted, depending on whether the surveys are to be confidential or anonymous, and in the case of anonymous, whether the name of the respondent will be asked at all (see Chapter 2).
5. On the settings sheet, in row 2, entries must be given for the following columns: form_title, form_id, and submission_url. The first two can be given any short label, but no spaces nor special characters are allowed. The submission url should be added – this is the web address to which completed surveys will be sent. If encryption is being used, the key must be entered under public_key.

After these changes have been made, the updated excel file can be converted to an ODK-compatible XML file by uploading to this webpage: https://getodk.org/xlsform/.

Chapters 4 of this manual will introduce and discuss each section of all three surveys. In the discussion, some optional edits will be suggested along the way. In implementing those, or other edits, the data collection team will need to be careful to follow the guidelines for XLS form design.

2.5 KII Data Collection

KIIs are qualitative interviews with Key Informants (KIs) who have firsthand knowledge of the topics and issues. The KII guide in this toolkit focuses on topics such as sanitation workers' rights and safety, gender balance within the sector, and sanitation financing. These questions are usually best answered by KIs within the sanitation service authority. These interviews can either be conducted in person or over a call. For the sanitation authority KII covered in this toolkit, the interview guide should be shared with the KIs prior to the meeting so that they are well prepared with the necessary information prior to the interview.

A few things to keep in mind while conducting these interviews:

1. **Time management**: Qualitative interviews are often long and time consuming. It is important to ensure that KIs are comfortable and have sufficient time to complete the interview. If needed, the interview could be divided into two separate rounds. It is also helpful to begin the interview with a few minutes of general conversation and introductions to make the respondent comfortable before delving into factual questions.
2. **Probing**: Before a KII is conducted, it is important to review the available information through project records and documents, published or unpublished studies, and national/ state/ city level statistical data. Knowing such background information can help the interviewer come up with context specific probes and collect more complete and nuanced data.
3. **Recording the interview with the KI's consent**: During the interview, it is often easy to miss out on details while manually jotting down information, simultaneously paying attention to the KI, as well as making sure they are comfortable. To ensure key details are not missed, having an audio recording of the interview could be helpful for notetaking purposes. Before recording, it is important to explicitly seek consent from the KI to record the interview, and explain the purpose and usage of the recording. If the KI does not appear comfortable with being recorded, do not record.

2.6 Frequency of Surveys

The sanitation scenario of a city may continue to change as various national/ state/ city level initiatives take place and as a result of program-linked interventions. To ensure that the data collected is reflective of ongoing changes and progress made, it is important to fix a frequency at which data will be collected and updated through these surveys.

The household survey, toilet inspection survey and the desludging services survey require fairly large sample sizes and substantial time and resources to execute.

KII with the sanitation authority can be conducted annually to monitor changes.

2.7 Training and Quality Assurance of Enumerators

For the Household Survey, Toilet Inspection Survey, and Desludging Services Survey, teams of enumerators will need to be trained and deployed for data collection. To ensure that the data collection process is smooth and that the data collected is accurate, it is crucial to plan well in advance and take quality assurance measures. Some of the key steps include:

1. **Hiring Enumerators:** Enumerators must have prior knowledge of conducting surveys, ideally with experience in the same or similar sectors. They should be proficient in the local language to make the survey respondents feel comfortable while answering questions. In addition, they must be familiar with the research locations as well as local behavioral customs.
2. **Enumerator training**: Prior to field deployment, enumerators must be trained on the survey content, using data collection software on tablets/ mobile phones, and data security and confidentiality. The training should familiarize the enumerators with the different types of toilets and containment systems, ways of emptying the OSS (manually, mechanically/ vacuum trucks, semi-mechanically/ gulpers, etc.), common sanitation terminologies, etc. to equip them with the necessary knowledge for accurate data collection. It is also important that enumerators are well sensitized about participant consent and adhere to the ethics protocols of data collection at all times.
3. **Pilot testing:** This is a small scale preliminary study used to test the feasibility of the survey before a full scale rollout. It helps in understanding the duration of the survey, the appropriateness of the questions, and in identifying common field-based challenges. For example, wording of specific questions in the surveys may need to be modified based on participant reactions during the pilot testing, if any confusion arises.
4. **Quality control**:
    i. Spot checks: The field supervisor must shadow the enumerators and observe how each of them administers the survey. The enumerators must be provided with useful feedback post the interview.
    ii. Progress tracking: Field managers and supervisors should develop a field movement plan prior to survey deployment, keep a record of the completed surveys on a daily basis, and adjust field plans according to completion.
    iii. Back checks: 10-20% of the total observation should be back-checked i.e. the project supervisor should revisit or call a sub-sample of households who have already been interviewed by the enumerators. However, this will be a much smaller set of questions from the actual survey instrument.

CHAPTER

3

DATA ANALYSIS

Chapter 3: Data Analysis

It is important to analyze the collected data to assess both quantitative and qualitative indicators. Analyzing these data values is essential as it provides information on city's current sanitation scenario and helps the sanitation authority in making well-informed and efficient decisions to improve the sanitation service delivery. This chapter provides information on categorization of indicators, its description and how it is calculated using the specific questions from the four instruments (*Household Survey, the Toilet Inspection Survey, the Desludging Services Survey, and a Key Informant Interview (KII) guide*) for obtaining data on service outcomes detailed out in chapter 4-7.

The CWIS data for the eight program cities is aggregated in an online repository and is used for benchmarking sanitation system performance. Apart from the indicator value, information on each indicator like methodology adopted and the assumptions made to arrive at the value is provided via additional the data notes. Sanitation authorities use this repository to understand the gaps, identifying the current challenges and in planning the necessary interventions to improve the sanitation service delivery.

3.1 Safely Managed Sanitation

In order to calculate many of the CWIS indicators, it is first necessary to calculate the proportion of the population that has access to safe individual toilets and the proportion that has access to safely managed sanitation. Indicator EQ-1 covers **safe individual household toilets**; in this indicator we have focused on toilet access and not the subsequent safe management across the service chain. As described in EQ-1 below, by focusing on access, we were able to incorporate proxy measures for access which include comfort in use, and frequency of use. For many other indicators, including EQ-2 and SF-1 through SF-6, these are instead based on our definition **of access to safely managed sanitation** (considering the entire service chain).

In order to define what safely managed sanitation is, we have adapted the approach put forward by GIZ in the creation of their Shit-Flow-Diagrams [4] (SFDs). Their approach integrates considerations for the safe handling of fecal matter across the sanitation services chain, including containment, transport and treatment. Our indicators focus on the proportion of the population that has access to safely managed sanitation, but do not differentiate among the different types of access (e.g. types of containment or off-site sanitation), therefore our process is simpler than the process for creating an SFD.

In order to determine the proportion of a population that has access to safely managed sanitation, we created four categories: category 1 has no on-site sanitation system; category 2 has on-site sanitation system, but it has an impermeable structure and considered safe; and category 3 has on-site sanitation system which is permeable, but it is located in an area with low risk of groundwater contamination; and category 4 has unsafe onsite sanitation system. See Table 3 for a more detailed description of these four categories.

[4] The definitions used for the SFD variables have been adapted from SFD Manual - Volume 2, 2018 https://sfd.susana.org/knowledge/the-sfd-manual

Table 3: Categorization of sanitation access

Containment category and transport	Waste streams
Category 1: no onsite container, toilet discharges to underground sewer, or lined and covered drain	Estimation of proportion of wastewater that gets treated
Category 2: water-tight on-site system - *Fully lined pit/ tank (sealed)* no outlet* - *Septic tank: supernatant discharges to underground sewer or lined and covered drain*	Estimation of the proportion of supernatant and fecal sludge that is collected safely and is treated
Category 3: permeable on-site system, in an area with low risk of groundwater contamination - *Lined tanks/ pits: open bottom or semi-permeable walls* - *Unlined pits* - *Fully lined tank/ septic tank: supernatant discharges to soakpit*	Estimation of the proportion of supernatant and fecal sludge that is collected safely and is treated
Category 4: Unsafe containment systems - Permeable on-site system, in an area with high-risk of groundwater contamination - *Fully lined tank/ septic tank: supernatant discharges to open drain/ open ground/ water body*	Estimation of the proportion of supernatant and fecal sludge that is collected safely and is treated

* Here, a fully lined pit is one that has a concrete lining at the bottom (as well as the sides) and produces no leachate.

If a toilet or latrine does not fit into one of these four categories, then we have classified it as not safely managed sanitation. But inclusion in these categories does not necessarily mean it is safely managed sanitation as only containment and networked transport (i.e. sewer) has been considered, but not sludge transport nor treatment. Sanitation access types from category 1 produce wastewater, those in category 2, 3, and 4 produce fecal sludge and supernatant (see Table 3). Safely managed sanitation includes safe transportation and treatment of any wastewater, supernatant and fecal sludge generated, which are described below. In each of the four categories we mention the 'proportion of all toilets/latrines' which meet a certain criterion (e.g. all toilets and latrines connected to an underground sewer). These proportions should always be calculated by counting the total number of toilets/latrines that meet the criteria from the household survey, divided by the total sample population within the sampled data recorded using the survey instruments included in this manual. The total sample population includes each respondent for the Household Survey, and all the other members of their household. This number does not include the total sample population in the Toilet Inspection Survey, since this may result in double-counting.

Groundwater Depth

In order to verify whether onsite sanitation systems are safely contained, it is important to understand the groundwater level in a city. This information can be obtained from the authority providing water supply services in a city. The data, type of OSS in the city, obtained from the household survey needs to be overlaid with the existing topographic data, groundwater level across the city, to estimate the percentage of onsite sanitation systems which are safely contained.

Category 1: Networked sanitation

Category 1 includes toilets and latrines that are directly connected to an underground sewer network, or a lined and covered drainage network. In the Household Survey and the Toilet Inspection Survey, category 1 is indicated by answering 'nearby underground sewer' to the question of 'to where does this toilet or latrine discharge?' This question is [*BlackWDisposal*], and the answer value is 4. Category 1 is also indicated by answering 'nearby drain' for [*BlackWDisposal*] if the drain is both covered and lined ([*OpenDrain1*] = 1 & [*LinedDrain1*] = 1). We have labeled the proportion of all toilets and latrines that fall into Category 1 as C1. See Table 4 for a summary of this protocol.

Table 4: Definition of Category 1

		Category 1	
			Toilet is connected to a nearby drain
			[BlackWDisposal] = 5
[BlackWDisposal]		Toilet is connected to a nearby underground sewer	Drain is lined and covered
Answers	Answer Values	[BlackWDisposal] = 4	[OpenDrain1] = 1 & [LinedDrain1] = 1
Septic Tank	1		
Pit	2		
Soakpit	3		
Nearby underground sewer	4		
Nearby drain	5		
Other	99		
I don't know	999		

For Category 1, wastewater is discharged from the toilet or latrine directly to a sewer or drainage network. All or some portion of that wastewater ends up at a treatment plant, which may effectively treat all or some portion of that wastewater. The wastewater produced is aggregated together, and mixes with the supernatant produced within a 'sanitation shed'[5], and impossible to attribute any of it to specific toilets or latrines. When calculating the proportion of the total population that uses safely managed sanitation, we propose proportional attribution based on

[5] A sanitation shed is analogous to a watershed – it is the area of the network which flows to a specific aggregation point, usually a discharge point or the point of entry to a treatment plant.

volume of wastewater effectively treated. Written out as a formula, the proportion of households that have safely managed sanitation from Category 1 ($C1_{sm}$) can be found in equation 1.

$$C1_{sm} = C1 * VTW / VW \quad (1)$$

The volume of wastewater which is effectively treated is usually known to the sanitation authority: we will call this as VTW (for volume of treated wastewater). In order to estimate the proportion, an estimate of the total volume of wastewater produced is needed as well: we will call this as VW (for volume of wastewater). VW can be estimated for household toilets and latrines by multiplying the average water consumption for households connected to the networked sanitation by the number of households connected to sewers and drains. Average consumption of water should be known to the local utility; if the average for households that are connected to sewers and drains is not known, then the average for all households can be used instead.

Category 2: On-site sanitation systems with impermeable structure

Category 2 includes toilets and latrines that are connected to either a septic tank or a fully lined pit/ tank. In both cases, the structure is impermeable. While the septic tank has an outlet for supernatant, a fully lined pit can be completely sealed (no outlet) or have an outlet for supernatant. In the Household Survey and the Toilet Inspection Survey, Category 2 is indicated by answering 'septic tank' to the question of 'to where does this toilet or latrine discharge?' This question is [*BlackWDisposal*], and the answer value is 1. We have labeled these as $C2_{ST}$. Similarly, Category 2 includes answer value 2 for [*BlackWDisposal*] which corresponds to 'pit'. This is labeled as $C2_{LP1}$ Additionally, Category 2 is also indicated by answering 'pit' for [*BlackWDisposal*] if the pit is fully lined, has no outlet and is emptied at least twice per year ([*ToiletWasteTechnical5*] = 1 & [*SeptictankOutlet*] = 1 & [*pitfillfreq*] ≤ 6 & [*pitfillfreq_units*] = 1). We have labeled the proportion of all toilets and latrines that meet these criteria as $C2_{LP2}$. See Table 5 for a summary of this protocol.

Table 5: Definition of Category 2

		Category 2		
		Toilet is connected to a septic tank or a lined pit		Toilet is connected to a lined pit
		[BlackWDisposal] = 1 or 2		[BlackWDisposal] = 2 & [ToiletWasteTechnical5] = 1
[BlackWDisposal]		Septic tank/lined pit is connected to a sewer	Septic tank/lined pit is connected to a lined and covered drain	Lined pit has no outfall and is emptied at least twice a year
Answers	Answer Values	[SeptictankOutlet] = 3	[OpenDrain2] = 1 & [LinedDrain2] = 1	[SeptictankOutlet] = 1 & [pitfillfreq] ≤ 6 & [pitfillfreq_units] = 1
Septic Tank	1			
Pit	2			

Soakpit	3			
Nearby underground sewer	4			
Nearby drain	5			
Other	99			
I don't know	999			

For Category 2, the toilet or latrine is attached to either a septic tank or a fully lined pit. Fecal sludge collects in the septic tank and blackwater collects in the pit.[6] Supernatant flows out of the septic tank and fully lined pit; if it flows into an underground sewer or a lined and covered drain, then it is considered to be safely transported. All or some portion of that supernatant ends up at a treatment plant, which may effectively treat all or some portion of it. The supernatant produced is aggregated together, and mixes with the wastewater produced within a 'sanitation shed', and impossible to attribute any of it to specific toilets or latrines. Likewise, the fecal sludge and blackwater is sometimes mixed with the waste emptied from other septic tanks and pits, and regardless impossible to track after collection. When calculating the proportion of the total population that uses safely managed sanitation, we propose proportional attribution based on volume of supernatant, fecal sludge/blackwater effectively treated. Written out as a formula, the proportion of households that have safely managed sanitation from Category 2 ($C2_{sm}$) is:

$$C2_{sm} = C2_{ST} * [0.5 * VTW / VW + 0.5 * VTFS/VFS] + C2_{LP1} * [0.5 * VTW / VW + 0.5 * VTFS/VFS] + C2_{LP2} * [0.5 * VTW / VW + 0.5 * VTFS/VFS] \quad (2)$$

Since supernatant and wastewater are effectively mixed together, it is safe to assume that the ratio of VTW/VW can be applied to supernatant from Category 2 in the same matter that it is applied to wastewater from Category 1. The volume of fecal sludge which is effectively treated is usually known to the sanitation authority: we will call this as VTFS (for volume of treated fecal sludge). In order to estimate the proportion, an estimate of the total volume of fecal sludge produced is needed as well: we will call this as VFS (for volume of fecal sludge). VFS can be estimated for toilets and latrines in two ways: 1) by surveying the desludging operators for an estimate of the total volume that they collect in a year or 2) by assuming an average amount of fecal sludge produced per person, and multiplying that by the number of people who access sanitation using a toilet or latrine that connects to an on-site system.[7] We recommend that both methods are executed, so that one can be a verification of the other.

Category 3: On-site sanitation systems with permeable structure

Category 3 includes toilets and latrines that are connected to any kind of on-site system where the containment structure is permeable, or the supernatant is discharged to a permeable structure. If any individual on-site system fits one of these descriptions, but is in an area with a risk of

[6] For the purposes of determining the proportion of toilets and latrines which are safely managed, this blackwater is equivalent to fecal sludge, since both will need to be collected and mechanically transported.

[7] See our protocol for calculating SF-1 for a more detailed explanation on how to estimate the total volume of fecal sludge using both of these protocols.

groundwater contamination, then they should not be included in Category 3[8]. In the Household Survey and the Toilet Inspection Survey, Category 3 is indicated by answering 'soak pit' to the question of 'to where does this toilet or latrine discharge?' This question is [*BlackWDisposal*], and the answer value is 3. We have labeled these as $C3_{SP}$. Category 3 is also indicated by answering 'pit' for [*BlackWDisposal*] if the pit is not lined ([*ToiletWasteTechnical5*] ≠ 1). We have labeled the proportion of all toilets and latrines that meet these criteria as $C3_{P}$. Further, Category 3 is indicated by answering 'septic tank' for [*BlackWDisposal*] if the septic tank discharges supernatant to a soak pit or leach field ([*SeptictankOutlet*] = 4). We have labeled the proportion of all toilets and latrines that meet these criteria as $C3_{ST.}$ Lastly, Category 3 is indicated by answering 'pit' for [*BlackWDisposal*] if the lined pit discharges supernatant to a soak pit or leach field ([*SeptictankOutlet*] = 4). We have labeled the proportion of all toilets and latrines that meet these criteria as $C3_{LP}$. See Table 5 for a summary of this protocol.

Table 6: Definition of Category 3

		Category 3		
		Toilet/latrine is connected to a septic tank/lined pit	Toilet/latrine is connected to a pit	
		[BlackWDisposal] = 1 or 2	[BlackWDisposal] = 2	
		Septic tank/ lined pit is connected to a soak pit	Pit is permeable	Toilet/latrine is connected to a soak pit
[BlackWDisposal]		**[SeptictankOutlet] = 4**	**[ToiletWasteTechnical 5] ≠ 1**	**[BlackWDisposal] = 3**
Answers	**Answer Values**	**Verification that area is at low risk of groundwater contamination**		
Septic Tank	1			
Pit	2			
Soakpit	3			
Nearby underground sewer	4			
Nearby drain	5			
Other	99			
I don't know	999			

For Category 3, the toilet or latrine is attached to a permeable pit or a soak pit, or a septic tank or a fully lined pit which flows to a soak pit and. Fecal sludge collects in all four cases. The fecal sludge is sometimes mixed with the waste emptied from other septic tanks and pits, and regardless impossible to track after collection. When calculating the proportion of the total population that uses safely managed sanitation, we propose proportional attribution based on volume of fecal

[8] The risk of groundwater contamination depends on the depth of the water table, whether the water table is used for drinking water, and the permeability of the soils. In order to determine the risk of contamination, experts at the sanitation authority, or local geologists or hydrologists, should be consulted.

sludge effectively treated. Written out as a formula, the proportion of households that have safely managed sanitation from Category 3 ($C3_{sm}$) is:

$$C3_{sm} = C3_{ST} *[0.5 * VTW / VW + 0.5 * VTFS/VFS] + C3_{LP} * *[0.5 * VTW / VW + 0.5 * VTFS/VFS] + C3_{SP} * VTFS/VFS + C3_{P} * VTFS/VFS \quad (3)$$

The ratio of VTFS/VFS is calculated in the same way as described in the protocols assigned for Category 2 (see previous section).

Category 4: Unsafe on-site sanitation systems with permeable structure

Category 4 includes toilets and latrines that are connected to any kind of on-site system where the containment structure is permeable, or the supernatant is discharged to an open drain, a surface water body, to an open ground or the discharge location is unknown. If any individual on-site system fits one of these descriptions, and is in an area with a risk of groundwater contamination, then they should be included in Category 4. These containment systems are not safe, however they are safely emptied and transported to the treatment plant, hence considered under safely managed sanitation. In the Household Survey and the Toilet Inspection Survey, Category 4 is indicated by answering 'soak pit', to the question of 'to where does this toilet or latrine discharge?' This question is [*BlackWDisposal*], and the answer value is 3. We have labeled these as $C4_{SP}$. Category 4 is also indicated by answering 'pit' for [*BlackWDisposal*] if the pit is not lined ([*ToiletWasteTechnical5*] ≠ 1). We have labeled the proportion of all toilets and latrines that meet these criteria as $C4_{P}$. Further, Category 4 is indicated by answering 'pit' for [*BlackWDisposal*] if the lined pit discharges supernatant to nearby drain, to a soak pit or leach field, open ground or to a waterbody ([*SeptictankOutlet*] ≠ 1& 3]). We have labeled the proportion of all toilets and latrines that meet these criteria as $C4_{LP.}$ Lastly, Category 4 is also indicated by answering 'septic tank' for [*BlackWDisposal*] if the septic tank discharges supernatant to nearby drain, to a soak pit or leach field, open ground or to a waterbody ([*SeptictankOutlet*] ≠ 1& 3]). We have labeled the proportion of all toilets and latrines that meet these criteria as $C4_{ST}$. See Table 5 for a summary of this protocol.

Table 7: Definition of Category 4

		Category 4			
		Toilet/latrine is connected to a septic tank/ lined pit		Toilet/latrine is connected to a pit	
		[BlackWDisposal] = 1 or 2		[BlackWDisposal] = 2	
[BlackWDisposal]		Septic tank/ lined pit is connected to a soak pit, water body, open ground and unknown destination	Septic tank/lined pit is connected to an open drain	Pit is permeable	Toilet/latrine is connected to a soak pit
		[SeptictankOutlet] ≠ 1 & 3	[OpenDrain2] ≠ 1 & [LinedDrain2] ≠ 1	[ToiletWasteTechnical5] ≠ 1	[BlackWDisposal] = 3
Answers	Answer Values	Verification that area is at high risk of groundwater contamination			

Septic Tank	1				
Pit	2				
Soakpit	3				
Nearby underground sewer	4				
Nearby drain	5				
Other	99				
I don't know	999				

For Category 4, the toilet or latrine is attached to a permeable pit, soak pit or a septic tank or a fuly lined pit which flows to a soak pit, open drain, surface water body, open ground or an unknown location (high risk of ground water contamination). Fecal sludge collects in all four cases. The fecal sludge is sometimes mixed with the waste emptied from other septic tanks and pits, and regardless impossible to track after collection. When calculating the proportion of the total population that uses safely managed sanitation, we propose proportional attribution based on volume of fecal sludge effectively treated. Written out as a formula, the proportion of households that have safely managed sanitation from Category 4 ($C4_{sm}$) is:

$$C4_{sm} = C4_{ST} *[0.5 * VTW / VW + 0.5 * VTFS/VFS] + C4_{LP} *[0.5 * VTW / VW + 0.5 * VTFS/VFS] + C4_{SP} * VTFS/VFS + C4_{P} * VTFS/VFS \quad (4)$$

The ratio of VTFS/VFS is calculated in the same way as described in the protocols assigned for Category 2 (see previous section).

The proportion of the total population that has access to safely managed sanitation (T_{sm}) is then the sum of the variables $C1_{sm}$, $C2_{sm}$ and $C3_{sm}$.

$$T_{sm} = C1_{sm} + C2_{sm} + C3_{sm} + C4_{sm} \quad (5)$$

To calculate the same, but for LIC only, perform the same calculations as described above, but with the added restriction that only LIC households be included both for the denominator and the numerator in the ratio used to calculate proportions; this includes C1, $C2_{ST}$, $C2_{LP1}$, $C2_{LP2}$, $C3_{ST}$, $C3_{SP}$, $C3_{P}$, $C4_{ST}$, $C4_{LP}$, $C4_{SP}$ and $C4_{P}$.

3.2 Low Income Communities (LIC)

Households belonging to different income groups have different sanitation needs and priorities. This section focuses on distinguishing households via a set of wealth indicators that will help to determine houses which are in low-income communities (LIC). Collecting this information will help the sanitation authority to assess equity in sanitation service provision between different income groups.

The indicators include social categorizations that might indicate marginalization, such as religion or caste; education; employment category; housing type, size and material used for construction; type of water access; fuel used for cooking; and asset ownership. They include the following:

[*Religion, Category, Caste, Education*, *PrIncome, HouseOwnership, HouseType, HouseType_oth, AreaPlot, ApartmentNumber, BuildingNumber, HHRooms, WallType, FloorType, Rooftype, SourcePri, SourcePriShare, Dirty, TastePri, cooking_fuel, AssetsNote, HouseholdItems1, HouseholdItems2, HouseholdItems3, HouseholdItems4*]

If the data collection team prefers, a set of these wealth indicators could be used as criteria for defining which households are LIC in their city. If a household meets those criteria, they are determined to be non-LIC; otherwise they are considered LIC. Such criteria might include ownership of high-priced items, such as a car or a roof-top water tank; or they might include specific job categories or access to piped water services. Whatever the criteria are, they would need to be tailored to the context of the city in question.

Alternatively, they could be used to create a wealth-index. The wealth-index could be unweighted, or a system of weights could be created based on local expertise. But perhaps the most comprehensive and objective method would be to create a wealth-index through principle components analysis (PCA). A PCA could include all of the wealth indicators or a subset, chosen based on local expertise. For more information on how to create a wealth-index using PCA, please see Vyas and Kumaranayake (2006).[9]

Regardless of the method used to create a wealth-index, the end product will be to assign a wealth-index score to each household that corresponds to their wealth relative to the other households in the sample. Using these scores, a threshold must be set, in order determine which households are LIC and which households are non-LIC. This might be any score below the median wealth-index score, or it might be the lower quartile of scores, for example. The setting of the threshold should be done using local experts and verified by empirical observations.

3.3 Equity Indicators

EQ-1: Equity of Access to Improved Sanitation

Definition: Ratio LIC access to total population access.

Calculation: The numerator of this ratio is the percentage of LIC population with access to 'safe' individual toilets. The denominator of this ratio is the percentage of the total population with access to 'safe' individual toilets. This includes the JMP definition for improved sanitation, which can be determined by using [ToilLat] and [Squat]. [ToilLat] should have a value of '1', for private, individual toilet/latrine; [Squat] should also have a value of '1', indicating that the toilet/latrine has a squat plate. These two questions are sufficient to establish access to improved sanitation. In addition, the Household Survey has included questions for usage frequency for the specified toilet/latrine for any men, women, boys and girls that live in the household, since access does not always imply usage. Those questions include [MenToiletHome, WomToiletHome, BoyToiletHome, GirlToiletHome]

[9] Vyas, S., and L. Kumaranayake. "Constructing Socio-Economic Status Indices: How to Use Principal Components Analysis." Health Policy and Planning 21, no. 6 (August 30, 2006): 459–68. https://doi.org/10.1093/heapol/czl029.

EQ-2: Equity of Access to Safely Managed Sanitation

Definition: Ratio of LIC access to safely managed sanitation to total population access to safely managed sanitation

Calculation: The numerator of this ratio is the percentage of LIC population with access to safely managed sanitation. The denominator of this ratio is the percentage of the total population with access to safely managed sanitation. Safely managed sanitation, and how to calculate the proportion of the population that has access to safely managed sanitation (T_{sm}), using variables from the Household Survey, was defined in section 3.1. Using those definition, indicator EQ-2 can be calculated using equation 5.

$$T_{sm}^{LIC} / T_{sm} \quad (5)$$

Where T_{sm}^{LIC} is the proportion of LIC households that have access to safely managed sanitation services. In addition, the Household Survey has included questions for usage frequency for the specified toilet/latrine for any men, women, boys and girls that live in the household, since access does not always imply usage. Those questions include [MenToiletHome, WomToiletHome, BoyToiletHome, GirlToiletHome]

EQ-3: Equity of subsidies

Definition: Ratio of subsidies paid to non-sewered sanitation to subsidies paid to sewered sanitation

Calculation: The calculation of this indicator depends on data from the local sanitation authority. While it would be preferable to learn the amounts of revenue collected by government service providers directly from the sanitation authority, the survey tools included in this manual also include the price of user fees for public and community toilets, and the price of fecal sludge collection services. Revenues can then be estimated by multiplying price by the number of customers for each of these government services.

This indicator is only applicable to cities which have a combination of both sewered sanitation (SS) and non-sewered sanitation (NSS). In the cities that are partially sewered, most of the households that are sewered belong to the relatively well-off population segment, whereas the vast majority of the poorest in these cities rely on NSS. In this context, the total government subsidy given to the NSS households as compared to that given to the SS households provides insight into the extent to which sanitation subsidy is actually being directed to the poorer population segments of the city.

This indicator requires that subsidies be included from all stages of the sanitation service chain; these stages include user interface (including squat plate, flushing mechanism and superstructure); containment (for on-site sanitation); transport (including sewers and drains as well as fecal sludge collection trucks); treatment; and disposal/reuse. For the user interface and containment stages of both NSS and SS, subsidies are recorded directly as these are often in the form of direct payments to households. For transport in SS, subsidies are calculated by subtracting collected revenues from the annualized total cost of service – this may be done in conjunction with calculations made for treatment and disposal/reuse. For transport in NSS, any subsidies for private

operators can be tallied directly, in the same way as subsidies are tallied for household payments for the user interface and containment. For any public operators, it is advised to calculate the subsidy by subtracting collected revenue from total annualized costs. Treatment and disposal/reuse stages of both SS and NSS are assumed to be managed by the public sector, either directly or through a single PPP contract, therefore subsidies should be calculated by subtracting collected revenues from the annualized total cost of service. See Table 7 for a breakdown of this process. As long as the cost for the service authorities to serve a market segment (NSS or SS) exceeds the revenue that the service authorities are generating from this market segment, this is considered a subsidy.

Table 8: A breakdown of subsidy calculation across the sanitation service chain

	NSS	SS
Private Services		
User Interface & Containment		
Desludging Services		NA
Public Services		
User Interface & Containment (Community, Public Toilets/Latrines)		
Desludging Services		NA
Sewers	NA	
Decanting Station & Treatment		

KEY:	
	Uses equation 6
	Uses equation 7, 8, 9 & 10

Equation (6) can be used to sum up the total government expenditures on private subsidies for households with access to SS (***TIS$_{SS}$***) and those with access to NSS (***TIS$_{NSS}$***), if the individual amounts and the number of households are known.

$$TIS_{SS} = IS * H_{SS} \quad (6)$$

Where ***IS*** is the individual subsidy amount, and ***H$_{SS}$*** are the number of households with access to SS that have received subsidy ***IS*** in the previous year. The equation for NSS is analogous to the same for SS. Alternatively, government sources might have information on the total amount dispersed to all SS households in a subsidy program, which can be inserted for ***TIS$_{SS}$*** directly.

Equation (7) can be used to annualize the capital costs (CAPEX) for a given capital infrastructure investment, ***i***.

$$AC_i = C_i \left(\frac{r(1+r)^n}{(1+r)^n - 1} \right) \quad (7)$$

Where AC_i is the annualized capital costs, C_i is the upfront investment, r is the local annual interest rate, and n is the expected useful life in years of the i^{th} capital infrastructure in question. AC_i can then be plugged into equation (8) or equation (9) to calculate the total public subsidy for government services associated with SS (TPS_{SS}), or for government services shared by both NSS and SS, respectively (TPS).

$$TPS = \sum_i AC_i + \sum_i OC_i - TR \quad (8)$$

$$TPS_{SS} = \sum_i AC_i + \sum_i OC_i - TR_{SS} - (H_{SS}/H_{Total}) * TPS \quad (9)$$

$$TPS_{NSS} = \sum_i AC_i + \sum_i OC_i - TR_{NSS} - (H_{NSS}/H_{Total}) * TPS \quad (10)$$

Where TPS is the total subsidy given to government services used by households with access to SS or NSS; TPS_{SS} is the total subsidy given to government services used exclusively by households with access to SS; and TPS_{NSS} is the total subsidy given to government services used exclusively by households with access to NSS. OC_i is the operating costs for capital infrastructure i: for equation (8) these should include infrastructure that is shared by SS and NSS systems; for equation (9) these should include infrastructure that is used by SS systems, but not NSS systems; and for equation (10) these should include infrastructure that is used by NSS systems, but not SS systems. TR is the total revenue collected from customers for the sanitation services provided in combined NSS and SS systems; TR_{SS} is the total revenue for services used exclusively by SS systems; and TR_{SS} is the total revenue for services used exclusively by NSS systems. In the event that capital infrastructure is used for both NSS and SS systems, for example a treatment plant that accepts both wastewater and fecal sludge, then TPS should be multiplied by the proportion of households which send wastewater (H_{SS} / H_{Total}), or fecal sludge (H_{NSS} / H_{Total}), to the treatment plant, in order to get TPS_{SS} and TPS_{NSS}, respectively. If no infrastructure is shared by both households that use SS services and those that use NSS services, then equation (8) can be ignored and TPS set to zero. Indicator EQ-3 can then be calculated as the ratio of TPS_{NSS} over TPS_{SS}.

EQ-4: Gender equity in sanitation leadership

Definition: Percentage of women working in sanitation-related, decision-making bodies

Calculation: "Sanitation related decision-making bodies" refers to all sanitation service authorities, such as the city government/corporation and utilities. This does not include NGOs or community organizations, even if they are actively engaged with the service authorities. While counting the number of employees, consider all employees (both full and contract, if information is available) at all levels regardless of whether their mandate directly involves sanitation, as planning and implementing sanitation interventions often requires close interaction with other departments in the service authorities. This indicator should be calculated by taking the ratio of the total number of women in sanitation related decision-making bodies, both full time and contract (Section **4.4.4 Section 4: Gender in sanitation**Question 2) over the total number of employees in sanitation related decision-making bodies (Section **4.4.4 Section 4: Gender in sanitation**Question 1). The data for this indicator should be collected from local sanitation authorities.

EQ-4 (a): Gender equity in sanitation leadership

Definition: Percentage of women in leadership positions within sanitation-related, decision-making bodies

Calculation: This indicator looks at a subset of the group considered in indicator EQ-4 above (within sanitation service authorities). Leadership positions should include these categories:

1. Functional heads and above: Functional heads are those who lead departments or directorates within the institution in question. This category includes anyone who's at the level of functional heads and above, and can include the city commissioner (for South Asian cities), corporate leadership (for African utilities), etc.

2. Managerial heads: Positions that report directly to functional heads and are responsible for specific activities under each department or directorate.

This indicator should be calculated by taking the ratio of the total number of women in leadership positions, sum of total number of women working as Functional heads and above, and managerial head (Section **4.4.4 Section 4: Gender in sanitation** Question-4) over the total number of employees in all leadership positions, sum of total number of employees working as Functional heads and above, and managerial head (Section **4.4.4 Section 4: Gender in sanitation** Question-3) in sanitation-related, decision-making bodies. The data for this indicator should be collected from local sanitation authorities.

EQ-5: Gender pay gap in the sanitation workforce

Definition: Ratio of difference of average annual salary between men and women to the average annual salary of men

Calculation: This examines both the differences in wages for men and women with the same occupation, and differences caused by occupational segregation--e.g. a disproportionate number of men may occupy relatively well paid positions such as treatment plant engineers, while more women may end up in the lowest paid sanitation jobs.

Gender pay gap = (***B*** - ***A***) / ***B***

Where ***A*** is the average annual salary of all women (Section **4.4.4 Section 4: Gender in sanitation** – Question 6) in the sanitation workforce and ***B*** is the average annual salary of all men (Section **4.4.4 Section 4: Gender in sanitation**– Question 7) in the sanitation workforce. The formula applies only if the city has conducted a survey of sanitation workers' wage levels (Section **4.4.4 Section 4: Gender in sanitation**– Question 5). This includes workers at the treatment plant and decanting stations (e.g. plant manager, engineers, and maintenance staff), sewer cleaners, and private emptiers.

Most of the salary data necessary for calculating this indicator will need to be collected with the sanitation authority; the exceptions being the salaries of men and women staffing public and community toilets, and those working for businesses that provide fecal sludge collection services.

The salaries for men and women that staff public and community toilets can be calculated using the following variables from the Toilet Inspection Survey:

[*Workers, Attendants_M, AttendantsTime_M, AttendantsEarn_M, Attendants_F, AttendantsTime_F, AttendantsEarn_F, Cleaners_M, CleanersTime_M, CleanersEarn_M, Cleaners_F, CleanersTime_F, CleanersEarn_F, OtherWorkers, WorkersOtherName, OthWork_M, OthWorkTime_M, OthWorkEarn_M, OthWork_F, OthWorkTime_F, OthWorkEarn_F*]

The salaries for men and women that work for businesses that provide fecal sludge collection services can be calculated using the following variables from the Desludging Services Survey:

[*EmpFTW, EmpFTW_Hrs, EmpFTW_Wage, EmpPTW, EmpPTW_Hrs, EmpPTW_Wage, EmpFTM, EmpFTM_Hrs, EmpFTM_Wage, EmpPTM, EmpPTM_Hrs, EmpPTM_Wage*]

For both sets of variables, the number of workers, the weekly earnings and the number of hours is collected for separately for men and women, for a variety of job titles.

EQ-6: Sanitation worker equity

Definition: Fairness in distribution and prioritization of service quality for sanitation worker's

Calculation: This indicator focuses on sanitation workers' equity in a city. It can be calculated by answering a series questions [1-15] (Section **4.4.1 Section 1: Sanitation workers' equity4.4.1 Section 1: Sanitation**) which includes understanding the type of work sanitation workers are engaged in, workers belonging to a specific social or ethnic group, training requirement for workers, availability of an ombudsman to file complaints, their right to unionize, and the availability of social security, and health insurance for them.

3.4 Safety Indicators

SF-1: Access to safely managed sanitation

Definition: Percentage of households with access to safely managed sanitation

Calculation: This indicator is calculated using the process described in section 3.1. As described there, the proportion of households with access to safely managed sanitation is T_{sm}.

SF-1(a): Access to safe individual toilets

Definition: Percentage of households with access to safe, private, individual toilets/latrines.

Calculation: The numerator of this ratio is the percentage of the population with access to 'safe' individual toilets over the total population. This includes the JMP definition for improved sanitation, which can be determined by using [*ToilLat*] and [*Squat*]. [*ToilLat*] should have a value of '1', for private, individual toilet/latrine; [*Squat*] should also have a value of '1', indicating that the toilet/latrine has a squat plate. These two questions are sufficient to establish access to improved sanitation. In addition, the Household Survey has included questions for usage frequency for the specified toilet/latrine for any men, women, boys and girls that live in the household, since access

does not always imply usage. Those questions include [MenToiletHome, WomToiletHome, BoyToiletHome, GirlToiletHome].

SF-1(b): Rate of desludging

Definition: *Percentage of on-site sanitation that have been desludged*

Calculation: This indicator looks at desludging activity by the type of system—tanks and pits. This is because tanks are built with the understanding that it will have to be desludged at some point, while pits are sometimes dug with the intention of abandonment after they are full. The NSS being considered here are only those connected to IHHLs. This indicator looks at desludging activities for the previous year.

There are two methods for calculating this indicator using data collected from the Household Survey and the Desludging Service Survey. The data collection team will need to determine which of the two methods to prioritize, but it is recommended that the other method is also calculated, in order to verify the prioritized method through triangulation.

Method 1: Direct report

In the Household Survey, respondents are asked directly, '*When your pit/septic tank is full, what do you do?*' [*emptypract1*]. Only households that use an on-site sanitation system will be asked this question, therefore this indicator can be calculated by taking the ratio of households that answered 'empty it' ([*emptypract1*] = 2), over the total number of households that were asked this question (after removing households which answered 'I don't know').

Method 2: Ratio of Rates

In the Desludging Services Survey, if the respondent works independently, they are asked to report the average number of empties performed by the respondent [EmptiesInd]. This can be entered on a per month or per year basis, so the data analysis team should be sure to convert all answers to a per year format. These respondents are also asked to estimate the number of independent emptiers that work in the city overall [ServicesInd]. Multiplying the average of all reported empties per year by the average reported number of independent emptiers yields an estimate for the total number of empties performed by independent emptiers per year. Likewise, respondents that work for businesses are asked to report the number of empties performed by their organization per month or per year, which should also be converted to a per year format [ServicesBus]. These respondents were also asked to estimate the number of businesses providing emptying services in the city [EmptiesBus]. The average of each of these can be multiplied to estimate the average number of empties performed per year by businesses. The average number of empties performed per year in the city is the sum of the average for independent emptiers and businesses.

In the Households Survey, respondents are asked to report the frequency at which their pits fill up [*pitfillfreq, pitfillfreq_units*]. Calculating the average frequency per year and then inverting it (taking one and dividing it by this number) will give the average rate per year at which we might expect a new pit to be full in the city from which the survey sample was taken. Then, taking the ratio of the

average number of empties performed per year over the expected number of full pits in a given year will yield an estimate of indicator SF-1(b).

SF-1(c): Fecal Sludge Treatment and Disposal

Definition: Percentage of collected FS disposed at a treatment plant or a designated disposal site

Calculation: This indicator intends to capture illegal dumping. FS collected can be from different emptying mechanisms - semi mechanical (using a gulper) and mechanical (via desludging vehicles). This information can be arrived at in multiple ways. For example, if all emptiers are registered and licensed (mechanical), a system to track FS collected at the time of desludging (digital/mobile or paper based) plus GPS based tracking of vehicles can act as effective ways to monitor any abnormal behaviour/ potential illegal dumping. In cities where this is not yet available, we have included two methods for estimation using data collected in the Household Survey and the Desludging Services Survey. It is recommended that the data collection team chooses one method in order to estimate the indicator, while using the remaining method as a verification of the estimated indicator, through triangulation.

Method 1: Fecal Sludge Accumulation

For each type of NSS facility, the average number of users can be estimated using [*SharedTankNum*] and [*FamilySize1*]. Multiplying the average number of users for each type by an assumed annual FS accumulation rate for each facility type (it will be different for septic tanks and pits), will yield the average production per toilet/latrine for each type of NSS facility. Using the Household Survey, the proportion of the population using each type of NSS can be estimated using [*ToilLat*], and then multiplied by the total number of households in the city, to get the total number of households using each type of NSS facility. These can be multiplied by the estimates for fecal sludge accumulation for each type, and the products summed together to get the estimated production of fecal sludge per year across the city. Some of this might be assumed to be disposed of, safely, in situ, if such a disposal method poses no risk to groundwater supplies. In this case, the estimate for fecal sludge production should be reduced proportionately based on the rate of emptying reported in question [*emptypract1*], by multiplying by the ratio of respondents which report emptying, over the total number of respondents. This estimate can then be divided by the volume of fecal sludge that is delivered to municipal treatment plants (data which should be obtained from the sanitation authority), in order to get the indicator itself.

Method 2: Fecal Sludge Collection

The Desludging Services Survey requests information from respondents that will allow estimation of the total annual volume of fecal sludge collected in the city. The variables [FSVolUnit1, FSVol, FSVolUnit2 FSVolTruck1, FSVolTruck2, FSVolBucket, FSVolBarrel] can be used to estimate the average volume of fecal sludge collected per empty. The number of empties per day is collected with the variables [EmptiesInd, EmptiesIndDays], and the number of days per month spent emptying with [EmptiesBus]. Multiplying the fecal sludge collected per empty by the number of empties per day and the number of days emptying per month yields the volume collected per month. Multiplying this by 12 yields the volume of fecal sludge collected per year. This estimate

can then be divided by the volume of fecal sludge that is delivered to municipal treatment plants (data which should be obtained from the sanitation authority), in order to get the indicator itself.

SF-1(d): Treatment and Disposal of Fecal Sludge Generated

Definition: FS treatment capacity as a percentage of total FS generated from NSS connections (excluding safely disposed in situ)

Calculation: The volume of fecal sludge generated can be estimated using Method 1, described in the calculation directions for SF-1(c). Note that the estimate should not be reduced proportionately based on the rate of emptying reported in question [*emptypract1*]. The capacity of the municipal treatment plants (data which should be obtained from the sanitation authority) should then be divided by this estimate for fecal sludge generated, in order to get the indicator itself.

This is to understand whether there is enough treatment capacity to treat the entire FS generated in the city, excluding from systems that safely dispose the waste in situ (such as correctly designed and used twin pits and composting toilets, if any). FS treatment capacity is the total capacity of all FSTPs plus the capacity of STPs which can be utilised for co-treatment of FS (if applicable).

SF-1(e): Treatment and Disposal of Fecal Sludge Collected

Definition: FS treatment capacity as a percentage of total FS collected from NSS connections

Calculation: The volume of fecal sludge generated can be estimated using Method 2, described in the calculation directions for SF-1(c). The capacity of the municipal treatment plants (data which should be obtained from the sanitation authority) should then be divided by this estimate for fecal sludge generated, in order to get the indicator itself.

This is to understand whether there is enough treatment capacity to treat the entire FS collected in the city. FS treatment capacity is the total capacity of all FSTPs plus the capacity of STPs which can be utilised for co-treatment of FS (if applicable).

SF-1(f): Treatment and Disposal of Wastewater

Definition: Wastewater treatment capacity as a % of total wastewater generated from sewered connections and greywater generated from non-sewered connections

Calculation: Wastewater is a combination of both blackwater (coming from toilets) and greywater (from kitchen, bathing water, and other household activities). While SFD focuses on fecal matter and does not consider greywater generated from households dependent on OSS, this indicator looks at both blackwater and greywater from all households. Blackwater includes both fecal sludge and supernatant. Based on the type of system (onsite or offsite) and the containment/ conveyance system (whether connected to sewers), the wastewater categories are either combined or separated. For instance,

- for HHs connected directly to a centralized/ decentralized sewer system, the entire wastewater is collected and conveyed through the sewer network;
- for HHs connected to septic tanks with outlets connected to a sewer system, the FS and part of the supernatant is retained in the tank, the remaining supernatant is collected and conveyed by the sewer system, and the greywater is either let out into the open drain or into the sewer system
- for HHs connected to septic tanks that are connected to a soak pit, the FS and part of the supernatant is retained in the septic tank, the remaining supernatant undergoes tertiary treatment in the soak pit and is discharged, and the greywater is let out into the open drains
- for HHs connected to pit latrines, the FS is retained in the pit (no supernatant), and the greywater is let out into the open drains

From a technical treatment perspective, there are different mechanisms/standards for treating greywater, sewage, faecal sludge, and supernatant. In an ideal case/CWIS city, there should be enough capacity to treat the FS generated and greywater and supernatant generated from HHs dependent on NSS and capacity to treat wastewatwer generated from HHs dependent on SS.

While SF 1.e looks at capacity to treat FS from NSS systems, this indicator captures the capacity available to treat greywater and supernatant from NSS HHs and wastewater from SS HHs.

Data points:

	Calculations
Combined maximum volume of wastewater that all TPs in	A
the city can treat (MLD)	
Total volume of wastewater generated in the city (MLD)	B= 0.8 * (Per capita water supply in
from IHHLs directly connected to centralized/ decentralized	the city (in litres per capita per day))
sewers	* (Total population of the city)*X /
**Note: Percentage of population connected to sewer systems is adapted*	1000000
from table 1, where X= (A+A1). This is also the same as wastewater	
contained	
Total volume of greywater and supernatant generated in	C
the city (MLD) from IHHLs connected to an onsite	
containment system that discharges into sewers	
Total volume of greywater and supernatant generated	D
from IHHLs connected to an onsite containment system	
that does not discharge into sewers	
Volume of greywater generated in the city from HHs	E
relying on pit latrines	

Reference notes for calculating B, C, D, E: Please use this only as a reference. If detailed field level observations are not available for your city, you are encouraged to use the local norms and your standard assumptions to estimate them.

- For HHs directly connected to sewer systems, the wastewater can be generated using the thumb rule - 80% of the water supply can be considered as wastewater generated.
- For HHs connected to septic tanks and pits, the fecal sludge quantification can be done using the sludge accumulation rate. Please refer to this document for rates for a few countries https://www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/publikationen/EWM/FS_Quantification_Characterisation/methods_reliably_estimate.pdf. You can also refer to your country level norms such as the CPHEEO/IS Code standards in India or the Building Code in Bangladesh.
- For onsite containment systems not connected to sewers, the greywater generated can be estimated based on the household water usage pattern (On average, how much water do the households/population use for activities such as cooking, bathing, cleaning and other household activities)

Formula for the indicator:

Wastewater treatment capacity as a % of total wastewater generated from sewered connections and greywater and supernatant generated from non-sewered connections = A/ (B + C + D + E)

SF-1(g): Effectiveness of Treatment

Definition: Effectiveness of FS/WW treatment in meeting prescribed standards for effluent discharge and biosolids disposal

Calculation: Standards may not always be available for both effluent and biosolids. For example in India, there are national standards for effluent discharge, such as CPCB or NGT, but no national standards exist for biosolids. Please list the standards (name of standards/ institution that sets the standards, usually at the national level) followed in your city.

Data points: • Number of samples that meet the guidelines for effluent discharge (A) • Total number of effluent samples collected (B) • Number of samples that meet the guidelines for biosolids disposal (C) • Total number of biosolids samples collected (D)
Formula for the indicator Effectiveness of FS/WW treatment in meeting prescribed standards for effluent discharge = A/B Effectiveness of FS/WW treatment in meeting prescribed standards for biosolids disposal = C/D

SF-2: Access to Safely Managed Sanitation for Low-Income Communities (LIC)

Definition: Percentage of LIC households with access to safely managed sanitation

Calculation: This indicator is only for individual household latrines (IHHLs) in LICs. This indicator follows the same calculation as SF-1, but applied only to LIC households.

SF-2(a): Access to safe individual toilets for Low-Income Communities (LIC)

Definition: Percentage LIC households with access to safe individual toilets

Calculation: 'Safe' here follows the definition of 'contained' (wastewater, fecal sludge, supernatant). This indicator follows the same calculation as SF-1(a), as described in section 3.1.

SF-2(b): Rate of Desludging for Low-Income Communities (LIC)

Definition: Percentage of LIC, NSS, IHHLs that have been desludged

Calculation: This indicator follows the same calculation as SF-1(b), but with only LIC households being included.

SF-2(c): Treatment and Disposal of Fecal Sludge Collected from Low-Income Communities (LIC)

Definition: Percentage of collected FS (collected from LIC) disposed at treatment plant or designated disposal sites.

Calculation: This indicator follows the same calculation as SF-1(c), but with only LIC households being included.

SF-3: Access to safe shared facilities

Definition: Percentage of dependent population (those without access to a private toilet/latrine) with access to safe shared facilities (CT/PT)

Calculation: This indicator looks at safe toilet access for the population without individual household toilets. "Access" is defined by distance as per national/ local standards. E.g. in India, SBM guidelines require CT to be within 500 meters of HH, so if a dependent household is located more than 500m away from the nearest CT, the household is considered as without access to CT. 'Safe' here follows the definition of 'contained' (for wastewater, fecal sludge, supernatant) used in the Shit Flow Diagram, described in the indicators S1b and S2b.

Estimating access requires establishing the criteria for access; as mentioned above the criteria may change from country to country, but it is likely to include distance from the house to the facilities or time spent traveling from the house to the facilities, both variables that are collected in the Household Survey in variables [*PTDistance*] and [*PTTime*], respectively. It may also include the ratio of users to the number of seats/squats, which is collected in the Toilet Inspection Survey. The variables [*UsersPT, UsersUnitPT*] record the number of users per day, week or month, while the variables [*ToiletAll*] provides the total number of seats/squats, the variable [*ToiletMen*] records

those just for men, [*Urinals*] records the number of urinals in the men's facilities, and [*ToiletWomen*] records the stalls just for women.

Access may also be defined by usage. The Household Survey has included questions for usage frequency for the specified toilet/latrine for any men, women, boys and girls that live in the household, since access does not always imply usage. Those questions include [MenToiletHome, WomToiletHome, BoyToiletHome, GirlToiletHome]. It is possible that women and girls, for instance, may not feel safe using a PT or CT, and this might be expressed in lowered reported usage. Safety, of course, is an important component of this indicator.

The dependent population can be estimated using variable [*ToilLat*]; all households that answered either 'I have access to a public toilet/latrine' or 'I don't have access to a toilet/latrine' can be considered as constituting the dependent population. Whatever the criteria are which are used to define 'access', this indicator can be calculated by taking the ratio of those number of households, over the total number of households found in the dependent population.

SF-3(a): Treatment and Disposal of Fecal Sludge and Wastewater from Community Toilets (CTs)

Definition: Percentage of CTs where FS and WW generated is safely transported to TP or safely disposed in situ

Calculation: To be considered 'safely transported', the FS should be collected mechanically or semi-mechanically using a gulper or a vacuum truck, and disposed at the treatment plant (not illegally dumped). The FS is considered safely disposed in situ if there is no risk of groundwater contamination. Selecting for the community toilets, as indicated by the variable [*SurveyType*] in the Toilet Inspection Survey but applying the same criteria for safely managed sanitation as described in Section 2.1, should allow for the calculation of T_{SM} for CTs specifically.

SF-3(b): Universal Design Principals in Community Toilets (CTs)

Definition: Percentage of CTs that adhere to principles of universal design

Calculation: Universal design refers to the design of a CT block that allows it to cater to the sanitation needs of different population groups, such as women, third-gender/transgender children, the elderly, and Persons with Disabilities (PWD). In many places, there are national level guidelines or local standards for such a design. In India for example, the CPHEEO's 'Advisory on Public and Community Toilets' sets national level guidelines for a comprehensive set of design characteristics that PT/CT blocks are advised to follow to cater to differential sanitation needs.

For calculating this indicator, national or local standards may be followed if they contain at least the minimal set of attributes described below in the constituent data points. In the absence of national/ local standards or if the national/ local standards do not cover all of the attributes listed below, cities should use the set of attributes listed below to measure the percentage of CTs that adhere to principles of universal design.

The Toilet Inspection Survey was designed using the Universal Design Principles published in the "Advisory for public and community toilets" (CPHEEO, 2018). We derived items 2 through 13 in the list in Table 9 from this manual. It is a subset of all of the recommendations contained in the manual; we tried to select attributes that were the most salient and universal. The manual also recommends that every toilet have a water seal; since this is not a standard requirement in many contexts outside of India, this was modified to a requirement to have a squat plate instead (attribute 1 in Table 9), allowing for the occurrence of a pit latrine. The data collection team may choose to amend this list, and add corresponding questions to the survey, but it is our recommendation that these attributes not be removed from the surveys, in order to have at set of standard, basic attributes that might be compared across countries and over time. We included questions covering all of the attributes in the Toilet Inspection Survey. But we did not include questions pertaining to items 10-13 in the Household Survey. This was done in order to keep the survey brief.

Table 9: PT and CT attributes included in the Household Survey and in the Toilet Inspection Survey.

1. Toilets/latrines should have a squat plate
2. Highly visible entrance, with clear signage
3. Aesthetic appearance
4. Path, entrance and inside of facilities are well-lit at night
5. Gender segregation
6. Private stalls
    a. Out of sight of the main entrance
    b. No gaps in the stalls through which users can be seen
    c. All doors and stalls have operational locking mechanism
7. Water supply available
    a. At washbasins
    b. Inside of stalls
8. Soap available
9. Adequate facilities for MHM
    a. A place for discrete and private disposal of MHM products
    b. A discrete and private place where women and girls can wash themselves or their clothes
    c. MHM products are available
10. Ramp access to building
11. Handrails at all ramps, steps and stairs
12. Urinals have a flush valve or an odor trap
13. At least one stall for differently abled in men's, women's, and third-gender/transgender sections
    a. Space to maneuver a wheelchair
    b. Grab bars
    c. Sloped ramps with railings
    d. Non-slippery flooring
    e. Wash basin near the entrance

In order to apply these principles, the following variables should be used:

[*LightPT1, LightPT2, FacilityGender, Entrance1, Entrance2, Access, EntranceStairs, EntranceRamp1, EntranceRamp2, EntranceRamp, ToiletAll, ToiletMen, Urinals, UrineFlush, ToiletWomen, Privacy, ToiletThirdGender, Privacy, DAbleAccess, DAbleAccessMen, DAbleAccessWom, DAbleAccessTrans, WatSeal, Squat, Water1, Water2, Water3, Soap, MHM_PT, PTClean*]

After determining the number of toilets that meet all of the criteria to be included, this number should be divided by the total number of toilets inspected, in order to arrive at this indicator.

SF-3(c): Women's Usage of Community Toilets (CTs)

Definition: Percentage of users of CTs that are women

Calculation: This indicator looks at the percentage of visits by women among all visits to the community toilets, as an indication of women's comfort with using the CTs. This should be counted by footfall (i.e. per visit) regardless of whether it's the same person visiting the CT multiple times in a day. CTs that are more gender friendly (e.g. well maintained, well lit, with separate entrances for women and men, with bins for MHM, etc.) are considered to be more encouraging for women to use the toilets.

This indicator can be calculated through direct report: in the Toilet Inspection Survey, respondents are asked directly what percentage of users are women (see variable [*UsersGender*]).

SF- 3(d): Average Waiting Time at Community Toilets (CTs)

Definition: The average time spent waiting to enter community toilets during high peak times

Description: This indicator is an indication of whether a CT block has enough functional seats to adequately cater to the needs of the dependent population. Average waiting time should be calculated for peak hours at the CT. Peak hours may differ across CTs, but generally happen during the hours of 6am-10am and 6pm-10pm. The Toilet Inspection Survey includes the variables [*WaitTimeWomen, WaitTimeMen*], which are direct reports on waiting times, and can be weighted by variable [*UsersGender*], and then averaged together, in order to calculate this indicator.

SF-3(e): Distance to Community Toilets (CTs)

Definition: Average distance from the house to the closest CT (in meters)

Calculation: This indicator is meant as an indication of the level of difficulty for dependent households to access the nearest CT, whether the CTs are located in the right places, and potential risks of open defecation if CTs are located far away from dependent households. There may be national/ local standards on maximum distance from a CT to a dependent household. In India, the national standard is that CTs should be located within a 500 meters distance of HHs of dependent users, but some studies have found that it is less likely for a household to use a CT if it is located more than 200-300m away.

This indicator can be calculated using the direct reports collected in variable [*PTDistance*], from the Household Survey.

SF-4: Access to Public Toilets in Public Spaces

Definition: Percentage of public spaces that have access to PTs

Calculation: Examples of public spaces include markets, bus stands, railway stations, parks, etc. This does not include institutional/ commercial/ industrial places such as educational institutions, healthcare facilities, shopping malls, or industrial parks. Each of these places should have a PT at least within 1km if not less. Info should also be provided for the time of the day that PTs are open, if available—at market places for example, PTs should be open from early morning to cater to the demand. Adequacy of sanitation facilities will be defined by user to stance ratio and condition (whether functional) of the sanitation facilities. The data for this indicator should be collected from the local sanitation authorities.

Many countries have guidelines on adequate user to stance ratios. In India for example, the recommended user to stance ratio as per CPHEEO advisory on public toilets are as follows:

- Men: One per 100 persons up to 400 persons; for over 400 add at the rate of one per 250 persons or part thereof
- Men - urinals: One for 50 persons or part thereof
- Women: One per 100 persons up to 200 persons; for over 200 add at the rate of one per 100 persons or part thereof

SF-4(a): Treatment and Disposal of Fecal Sludge and Wastewater from Public Toilets (PTs)

Definition: Percentage of PTs where FS and WW generated is safely transported to TP or safely disposed in situ

Calculation: This indicator should follow the same protocols as those specified for SF-3(a), except applied to PTs instead of CTs.

SF-4(b): Universal Design Principals in Public Toilets (PTs)

Definition: Percentage of PTs that adhere to principles of universal design

Calculation: This indicator should follow the same protocols as those specified for SF-3(b), except applied to PTs instead of CTs.

SF- 4(c): Average Waiting Time at Community Toilets (CTs)

Definition: The average time spent waiting to enter community toilets during high peak times

Calculation: This indicator should follow the same protocols as those specified for SF-3(d), except applied to PTs instead of CTs.

SF-4(d): Women's Usage of Public Toilets (PTs)

Definition: Percentage of users of PTs that are women

Calculation: This indicator should follow the same protocols as those specified for SF-3(c), except applied to PTs instead of CTs.

SF-5: Access to Safely Managed Sanitation in Educational Institutions

Definition: Percentage of educational institutions where FS/WW generated is safely transported to TP or safely disposed in situ.

Calculation: Educational institutions include schools and colleges/ universities. The variable [*SurveyType*] can be used to select for only those facilities in educational institutions. To be considered 'safely transported', the FS should be collected mechanically or semi-mechanically using a gulper. This indicator follows the same calculation as SF-1, but applied only to educational institutions, as described in Section 2.1.

SF-6: Access to Safely Managed Sanitation in Healthcare Facilities

Definition: Percentage of healthcare facilities where FS/WW generated is safely transported to TP or safely disposed in situ.

Calculation: Healthcare facilities include hospitals, clinics, health care centres, and diagnostic centres/testing laboratories. The variable [*SurveyType*] can be used to select for only those facilities in healthcare facilities. To be considered 'safely transported', the FS should be collected mechanically or semi-mechanically using a gulper. This indicator follows the same calculation as SF-1, but applied only to healthcare facilities, as described in Section 2.1.

SF-7: Safe Emptying

Definition: Percentage of desludging services completed mechanically or semi-mechanically (by a gulper).

Calculation: Common ways of desludging are mechanical (e.g. using vacuum trucks), semi-mechanical (e.g. using gulpers), and manual. As mechanical and semi-mechanical emptying do not require the operators to come into direct contact with the fecal matter, they are considered much safer and preferred options to manual emptying. However, in some places, there might be other steps in the service process that require sanitation workers to be in direct contact with FS even if they use mechanical desludging. e.g. some households may require the vacuum truck operators to enter into septic tanks and wipe down the walls after desludging. The variable [*HowTransport*] is a multiple-select question which includes both ‘a gulper’ and ‘a vacuum truck’ as answer options: the ratio of the number of respondents that select these options, over the total sample number yields this indicator.

SF-8: Vehicle Maintenance

Definition: Percentage of desludging vehicles which comply with maintenance standards

Calculation: As a prerequisite for calculating this indicator, an audit system needs to be in place for registered and licensed trucks. Audits of truck maintenance should cover the following aspects: checking the tires, checking the fluids (coolant, oil, oil pressure, temperature, and air pressure gauges), vacuum pump check, brakes, electrical system (lights, warning lights, brake lights), and engine. While truck maintenance is usually done once every 10000-15000 kms, for this indicator, truck maintenance data is tracked only once every year to begin with and could be more often. The variable [*TruckMaintenance*] in the Desludging Service Survey records whether or not the truck used for emptying (vacuum trucks and flatbed trucks included) is properly maintained.

SF-9: Compliance with Water Quality Standards

Definition: Percentage of tests which are in compliance with water quality standards for fecal coliform

Calculation: This indicator looks at the environmental outcomes linked to sanitation. It can be calculated by taking the ratio of number of water samples that test negative for fecal coliform (Section **4.4.3 Section 3: Community and environment safety**Question-16) over the total number of water samples taken (Section **4.4.3 Section 3: Community and environment safety**Question-15). While sanitation is not the only factor that influences water quality in a city, monitoring this indicator also sheds light on potential environmental outcomes of improved sanitation management. The water samples should include groundwater, surface water, and treated wastewater. Data for this indicator should be collected from the sanitation authority.

SF-10: Diarrheal Incidence

Definition: Incidence (per 1000 people) of fecal-oral pathway diseases

Calculation: The types of fecal-oral pathway diseases captured across countries and cities may vary, but common types of fecal-oral pathway diseases captured include diarrhea, cholera, dysentery and typhoid. This indicator can be calculated by taking the ratio of the number of fecal-oral pathway diseases occurring among the population (Section **4.4.3 Section 3: Community and environment safety**Question-17) over the total population of the city. Data for this indicator should be collected from the sanitation authority.

SF-11: Sanitation Workers' Safety

Definition: Services provided by the sanitation authority to safeguard the sanitation workers' from safety and health risks.

Calculation: This indicator focuses on sanitation workers' safety in a city. It can be calculated by answering a series questions [1-6] (Section **4.4.2 Section 2: Sanitation workers' safety**) which includes questions on the existence of a Standard Operating Procedures (SOP) that protects sanitation workers' health across the sanitation service chain, licensing of desludging trucks, and availability of government funded periodic health check-ups for sanitation workers.

SF-12: Certification mechanism for treated effluent and biosolids

Definition: Services provided by the sanitation authority to safeguard the community from safety and health risks

Calculation: This indicator focuses on the safety of the community from health risks arising from untreated effluent and biosolids discharge. It can be calculated by answering a series of questions [8-14, and18-20] (Section **4.4.3 Section 3: Community and environment safety**) which includes questions on quality testing of effluent and biosoilds, the degree of treatment wastewater goes through, national/state standards on discharge and disposal of effluent and biosolids, availability of a testing facility at the treatment plant, design of treatment per the existing standards, penalty associated to non-compliance with the effluent standards, and certification of the treated effluent and biosolids.

3.5 Sustainability Indicators

SS-1: Reuse of wastewater and biosolids

Definition: Percentage of treated effluent and biosolids that is reused.

Calculation: This indicator seeks to capture resource reutilization in the sanitation value chain. It is disaggregated into two parts—treated effluent (SS-1a) and treated biosolids (SS-1b). Data for this indicator should be collected from the sanitation authority.

SS-1a: Reuse of wastewater and biosolids

Definition: Percentage of treated effluent that is reused.

Calculation: This indicator seeks to capture resource reutilization in the sanitation value chain. It can be calculated via the ratio between the total volume of treated effluent that is reused (KLD) (Section **4.4.3 Section 3: Community and environment safety**: Question-5) and the total volume of treated effluent that is generated (Section **4.4.3 Section 3: Community and environment safety**: Question-4)

SS-1a: Reuse of biosolids

Definition: Percentage of treated biosolids that are reused.

Calculation: This indicator seeks to capture resource reutilization in the sanitation value chain. It can be calculated via the ratio between the total volume of treated biosolids that is reused (KLD) (Section **4.4.3 Section 3: Community and environment safety**: Question-7) and the total volume of treated biosolids that is generated (Section **4.4.3 Section 3: Community and environment safety**: Question-6)

SS-2: Cost Recovery for O&M Expenditures

Definition: Percentage of O&M cost recovered for sanitation infrastructure (operated and maintained by service authorities)

Calculation: This indicator looks at the O&M component of financial sustainability for sanitation service authorities. Sanitation infrastructure operated and maintained by the service authorities may be present throughout the service chain, including CT/PT, desludging vehicles, decanting / mobile transfer stations, sewer network, and treatment plants.

% of O&M cost recovered from sanitation infrastructure (operated and maintained by service authorities) = ***A*** / ***B***

where ***A*** is ratio between total government revenue generated from CT/PTs (through user fees) (Section **4.4.5 Section 5: Sanitation Finance**Question-9) and the total O&M cost incurred by the service authority for all the CT/PTs (maintained by the utility/government) (Section **4.4.5 Section 5: Sanitation Finance**Question-8), whereas ***B*** is the ratio between the revenue generated across FSM value chain, and from sewage charges/tariffs/sanitation levy (Section **4.4.5 Section 5: Sanitation Finance**Question-14) and O&M cost across the sanitation service chain incurred by the service authority (Section **4.4.5 Section 5: Sanitation Finance**Question-15). Calculation for ***A*** will be valid only if the utility/government operate and maintain any CT/PTs. Data for this indicator should be collected from the sanitation authority.

SS-3: Cost Recovery for Capital Expenditures

Definition: Percentage of sanitation investments covered by budget line/ government transfers

Calculation: This indicator looks at the CAPEX component of sanitation financing. It seeks to capture CAPEX from within the government system--city government's own revenue and budget transfer from higher level governments, versus that from non-government sources (loans from IFIs, grants from donors, and private banks if applicable). When calculating budget transfers from state/ central governments, this should NOT include funds from international financial institutions/ development banks channelled through the state/ central government. Data for this indicator should be collected from the sanitation authority.

% of sanitation investments covered by budget line/ government transfers= ***A*** / ***B***

where ***A= X+Y+Z,***

X- Treatment infrastructure CAPEX covered by government sources (include city government's own revenue and transfers from state or central government) (Section **4.4.5 Section 5: Sanitation Finance**: Question- 2 and 3),

Y- CT/PT CAPEX covered by government sources (include city government's own revenue and transfers from state or central government) (Section **4.4.5 Section 5: Sanitation Finance**: Question- 5 and 6),

Z- CAPEX for desludging vehicles owned by the service authority and other CAPEX covered by government sources (include city government's own revenue and transfers from state or central government) (Section **4.4.5 Section 5: Sanitation Finance**: Question- 12-13),

whereas ***B*** = ***X1+Y1+Z1***

X1- Annualized CAPEX for existing treatment infrastructure (Section **4.4.5 Section 5: Sanitation Finance**: Question- 1),

Y1- Annualized CAPEX for CT/PTs (Section **4.4.5 Section 5: Sanitation Finance**: Question- 4),

Z1- Annualized CAPEX for existing desludging vehicles owned by service authority and other capital investments (Section **4.4.5 Section 5: Sanitation Finance**: Question- 10-11).

CHAPTER

4

HOUSEHOLD SURVEY

Chapter 4: Data Collection Instruments

This chapter discusses the purpose behind each group of questions in the four data collection instruments – the Household survey (4.1); the Toilet Inspection Survey (4.2), the Desludging Services Survey (4.3), and the service outcome component of the Key Informant Interview (KII) guide (4.4) for the sanitation service authority. The full instruments are available in Annexure I.

4.1 Household Survey

4.1.1 Section 1: Introduction

Section 1: The introduction section of each of the three surveys is the same. The initial set of questions (1-20) are to be ansewered by the enumerators before they approach any potential respondent. This will save time when administering the survey, reducing the chance that the respondent will become distracted or frustrated. The description of these questions includes details on what needs to be updated in the survey template to customize it to each city.

Questions 1.1-1.8 [*Intro, start_time, end_time, auto_date, deviceid, simserial, phone, day, month*]

Purpose: Data management

The first six questions for all three surveys will be automatically collected by the personal digital assistant (PDA), i.e. the phone or tablet being used. These include the start and end times for the survey, the date of the survey, the device ID, the SIM serial number, and phone number associated with the SIM card. Since all of this data will be taken from the device's system and SIM card settings, the accuracy will depend on the device. Therefore, we recommend that the system be checked for the correct time and date before starting data collection, each day. As a data verification step, in questions seven and eight, the enumerators are requested to enter the date and the month, respectively.

Questions 1.9-1.13 [*EnumName, EnumName_oth, HHIDsMin, HHIDsMax, Resp_ID*]

Purpose: Data management

Question 9 (*EnumName*) will be a dropdown menu of the names of all of the enumerators that will be conducting the survey. These must be input with actual enumerator names while customizing the survey. There is also an 'other' option; when this is selected, a follow up question asking for the name of the 'other' enumerator will appear. For question 11 (*Resp_ID*), the enumerator will input the respondent ID. It was assumed that each enumerator will be assigned a set of respondent IDs for them to use, in order to ensure that each ID is unique. This survey has been programmed such that the first enumerator listed in the answer options in question 9 will have IDs 1-400; the second 401-800; the third 801-1200 and so on, for as many enumerators as are listed. Please note that in order for this programming to work, the entries in the 'name' column for the *EnumName* question must remain numeric and sequential. The ranges assigned to enumerators can be edited in 'calculation' column of questions 11 and 12. To remove the restrictions on what IDs can be entered, the constraints for question 13 can be deleted.

Questions 1.14 – 1.19 [*district, village1, village2, village3, village4, pop_loc_name*]

Purpose: Location

These questions are meant to record the location where the survey is conducted. Question 14 (*district*) refers to a higher-level spatial demarcation, such as a district in India or a sector in Rwanda for example; in this text we will use the term district for simplicity. Questions 15-18 (*village1, village2, village3, village4*) refer to the smallest spatial unit of governance, such as a cell, village or ward; in this text we will use the term village for simplicity. Questions 15-18 are then linked to question 14, such that question 15 only appears when the first district is selected, question 16 appears when the second district is selected etc. If more than four districts are included in the survey, additional repetitions of question 18 will need to be added, and the skip logic edited accordingly. Question 19 (*pop_loc_name*) allows the entry of colloquial names for the location where the survey is to be conducted.

Question 1.20 [*SlumArea*]

Purpose: LIC determination

This question asks the enumerator to make an observation of the location in question as to whether or not it is a slum. The definition of 'slum' changes from country to country, from state to state and sometimes from city to city. It can be a relatively subjective assessment, changing from person to person. Therefore, while this question is useful for determining whether the survey is conducted in a low-income community (LIC) or not, it should only be retained if the enumerators have been properly trained on what defines a slum. In order to do this, the team in charge of data collection will need to all agree on the specific characteristics which designate a slum and ensure that all of the enumerators understand and can consistently and accurately apply those criteria. This question is only useful for the Desludging Service Survey if the survey is being conducted in the area where services are provided; if this is not going to be the case it should be removed.

Questions 1.21-1.22 [*approach, consent*]

Purpose: Informed consent

Question 21 (*approach*) is not a question but a prompt that the enumerator can approach the potential respondent. They should not interact with them before this point in the survey. Question 22 (*consent*) provides the text the enumerator must read, including introduction, explanation of the study and informed consent. This must be edited for the local context and include any other information to be provided to the prospective respondent. This might include informed consent language or general information about the aims of the survey and the length of time required. The data collection team must determine what text should be added here prior to the surveys.

Questions 1.23-1.27 [*start, RespGender, Polite, last_name, first_name*]

Purpose: Data management

It is advised to obtain consent at the start of any survey following an adequate explanation of the survey purpose and content. The enumerator should confirm that the respondent understands this explanation, as well as their ability to withdraw, and seeks their consent to participate prior to starting the questions. Therefore the '*start*' question records whether they have given consent or not.

- If consent is not given, then the survey will skip to the end, where the enumerator will be prompted to record the GPS of the location, note whether it is a complete survey, and on

what number the survey was stopped. They will then be prompted to end the survey and select 'save and finalize' in the last screen.

- If consent is given, then the gender of the respondent is recorded, through observation, and the name of the respondent is asked. If the data collection team is maintaining a confidential dataset, then the name is recorded in *last_name* and *first_name*; in this case the *Polite* question should be deleted. If the dataset is to be anonymous then the name is asked out of politeness, but not recorded; in this case the *last_name and first_name* questions should be deleted. If the data collection team prefers that the enumerator not ask for the respondent's name, then all three questions corresponding to *Polite, last_name, first_name* should be deleted.

4.1.2 Section 2: Household Information

This section focuses on questions that are only found in the Household Survey. They cover household characteristics that will be used, for the most part, to establish which houses are in a low-income community (LIC) and which are not. This can be achieved by selecting a few of these questions as indicators, or by creating a wealth index through principal components analysis (PCA). In addition, many of these questions are the same or similar to those found in national sample surveys and census surveys of households; results from data collection efforts using this survey tool can be compared with national-level surveys, in order to determine how representative they are.

Questions 2.1-2.4 [*HoH1, HoH2, HoH3, HoH4,*]

Purpose: Data management

These questions allow for there to be one, or more, head of household. At the same time, it collects the gender of the head of household, if the respondent is not a head of household.

Questions 2.5-2.8 [*Religion, Category, Caste, Education*]

Purpose: LIC determination

These questions will need to be adapted to the local context: the categories listed in *Category* reference official government designations found in India; likewise *Caste* may not be relevant outside of the South Asian context (e.g. in Zambia, this could be 'People Living with HIV'). However, if there are social categories that make sense in the local context, and which designate marginalization, or privilege, they should be added, especially if they are included in any national sample surveys of households. Also, if any of these questions are felt to be sensitive issues, the data collection team may choose to move them to the end of the survey, or remove them altogether.

Questions 2.9-2.17 [*hh_define, hh_residtime, FamilySizeGrp, FamilySize1, Children, BoyTeen, GirlTeen, AdultMen, AdultWom, TotalPeeps, FamilySize2*]

Purpose: Demographics to be used when asking about access

Question 2.9, *hh_define*, explains the definition for household to inform the respondent as to who should be included when they answer questions in this section. Although the data collection team may want to edit this definition to meet local concepts of what makes a household, it is important

that some kind of definition be retained, and that the need for the enumerators to share this definition be imparted during training. For questions 2.11-2.15 we ask the number of children under five, the number of girls and boys between 5 and 17 years old, and the number of men and women who are 18 years of age or older. The ages mentioned here can be changed for the local context, but the categories themselves should not be changed, as the answers for these questions are used later in the survey in order to ask about toilet access and usage for each person in each of these categories. The sum of these categories is calculated by the Open Data Kit (ODK) software, and populated in the variable *TotalPeeps.* This is then compared with *FamilySize1*, and if they do not match, then question 2.17 appears (*FamilySize2*) and requests the enumerator to go back and correct the answers. If this correction step becomes burdensome during data collection, then the data collection team may elect to remove question 2.17.

Questions 2.18-2.38 [*PrIncome, HouseOwnership, HouseType, HouseType_oth, AreaPlot, ApartmentNumber, BuildingNumber, HHRooms, WallType, FloorType, Rooftype, SourcePri, SourcePriShare, Dirty, TastePri, cooking_fuel, AssetsNote, HouseholdItems1, HouseholdItems2, HouseholdItems3, HouseholdItems4*]

Purpose: LIC determination

These questions are all proxies for wealth and should be used to designate whether a household is LIC or not. In addition, they can help to estimate local population densities, plot size and types of housing, which may be useful for sanitation planning purposes. Questions 2.18 and 2.20 (*PrIncome, HouseType*) may need to be adapted to the local context; they are now written for the Indian context. Questions 2.23 and 2.24 (*ApartmentNumber, BuildingNumber*) may also be relevant when estimating the rate of fecal sludge accumulation or the likely frequency of filling for any shared septic tanks servicing the household. Questions 2.31 and 2.32 (*Dirty, TastePri)* can be used as a proxy (if water quality data is not available), or as a verification, for CWIS indicator SF-9.

4.1.3 Section 3: Sanitation Access

Questions 3.1-3.19 [*toilet_prompt, WorkMen, MenToilet, count2, MenToiletAccess, WorkWom, WomToilet, count1, WomToiletAccess, BoyTeenToilet, count4, TeenBoySchool, TeenBoyToiletAccess, TeenBoyToiletUse, GirlTeenToilet, count3, TeenGirlSchool, TeenGirlToiletAccess, TeenGirlToiletUse, ToilLat, ToilLat_oth, WatSeal, Squat, MenToiletGrp, count5, MenToiletHome, WomToiletGrp, count6, WomToiletHome, BoyToiletGrp, count7, BoyToiletHome, GirlToiletGrp, count8, GirlToiletHome*]

Purpose: Indicators EQ-1, EQ-2, SF-1, SF-2, SF-3, SF-4

Questions 3.1-3.19 are exclusive to the Household Survey. They establish the type of sanitation access (if any at all) for the individual members of the household, and the frequency of use. Access and frequency of use are recorded both at their place of work (if outside the home) as well as when at home.

These questions ask about sanitation access for four different categories of individuals that might be a part of the household: women, men, girls and boys. The ages for each category are set by the questions *BoyTeen, GirlTeen, AdultMen* and *AdultWom*. Access to sanitation at work is recorded for the women and men, and access and use of sanitation at school is recorded for girls and boys. Then the respondent is asked to specify what kind of toilet or latrine they have access to at (or near) their home, if any at all. If they have access, they are asked if has a water seal, and if not,

they are asked if it has a squat plate. Note that these terms may have different names in the local context (e.g. a water seal is sometimes called a goose neck) and should be customized. The next questions then ask each of the four categories of household members their frequency of use (always, sometimes, rarely, or never) for the type of sanitation specified. It is important to record both access and usage, because women do not always feel safe using a public or communal toilet (PT or CT), and when this is the case, it should be considered a barrier to access. This is especially important for the users of PTs and CTs, because the percentage of women users is a first-level sub-indicator included in SF-3 and SF-4; usage is therefore needed, in addition to availability/access.

Questions 3.20-3.38 [*ToiletFee, ToiletFeeAmount, ToiletFeeType, ToiletFeeType_oth, PTDistance, PTTime, WaitTimeWomen, WaitTimeMen, LightPT1, LightPT2, FacilityGender, Entrance1, Entrance2, Privacy, Water1, Water2, Water3, Soap, MHM_PT, PTClean*]

Purpose: Indicators EQ-3, SF-3, SF-4

Information on the fees charged (*ToiletFee, ToiletFeeAmount, ToiletFeeType, ToiletFeeType_oth*) at PTs and CTs could be used as part of a larger calculation for EQ-3. If information on PT and CT fees is not going to be used for EQ-3, the data collection team may consider deleting it, since it is not used for any other indicators. It was assumed that no fees were charged in the toilets/latrines at schools and healthcare centers. Wait time and distance to PTs, CTs and neighbors latrines [*PTDistance, PTTime*] are only in the Household Survey; they are first level sub-indicators included in SF-3 and SF-4.

The remaining questions in this section were derived from the Universal Design Principles published in the "Advisory for public and community toilets" CPHEEO (2018). See Table 9 in Chapter 3 for a summary of the attributes captured.

4.1.4 Section 4: Containment and Collection

This section covers fecal sludge containment and collection. At the start, the respondents are asked about the destination of blackwater (toilet water) after the toilet. If they answer that it is connected to a sewer or drainage, most of the questions will be automatically skipped. If the respondent uses onsite sanitation, then they are asked an in-depth set of questions about the containment unit and emptying practices.

Questions 4.1-4.4 [*ContNote, BlackWDisposal, OpenDrain1, LinedDrain1*]

Purpose: Indicators SF-1, SF-2, SF-3, SF-4, SF-5, SF-6

Questions 4.1-4.4 asks about blackwater (toilet water) discharge – where does it discharge after the toilet? If the answer is that it goes to a sewer, then the rest of this section is skipped. If the answer is a drain, then they are asked if the drain is covered and lined, and then the rest of the section is skipped. But if the answer is any kind of onsite sanitation, the survey continues with this section.

Questions 4.5-4.8 [*SharedTank, SharedTankNum, who_pays, who_pays_oth*]

Purpose: Indicators SF-1, SF-2, SF-3, SF-4, SF-5, SF-6

These questions aim to understand the shared use of containments which occurs since PTs and CTs are shared, and the fiscal responsibility clearly defined.

Questions 4.9-4.31 [*AgeSeptic, AgeSepticUnits, ToiletWasteTechnical1, ToiletWasteTechnical2, ToiletWasteTechnical3, ToiletWasteTechnical4, ToiletWasteTechnical5, SeptictankOutlet, OpenDrain2, LinedDrain2, fill_vol, pittfill_before, pitfillfreq, pitfillfreq_units, emptypract1, emptypract1_oth, emptypract2, emptypract2_oth, emptypract3, emptypract4, emptypract5, emptypract5_oth, cost_empty,*]

Purpose: Indicators EQ-3, SF-1, SF-2, SF-3, SF-4, SF-5, SF-6, SF-7, SF-11

While question 4.2 asked respondents to indicate the type of containment system (pit, soak pit, septic tank etc), this section collects information on the shape and size of the onsite system (*ToiletWasteTechnical1, ToiletWasteTechnical2*) to verify the containment type as households may not have been present during the installation of the containment unit or may not know type of containment that they have. Septic tanks are generally larger and rectangular, while soak pits and pits are generally smaller and circular. The materials used to construct the containment unit (*ToiletWasteTechnical3, ToiletWasteTechnical4*) are recorded in order to estimate installation costs, in case such estimates are to be included in the calculation of EQ-3. Whether the containment is water-tight and where the supernatant (effluent) discharges (*ToiletWasteTechnical5, SeptictankOutlet, OpenDrain2, LinedDrain2*) are both important factors in determining whether the containment is part of a safely managed sanitation service chain.

The observations on the frequency of filling (*pitfillfreq, pitfillfreq_units*), and frequency of full pits (*fill_vol, pittfill_before*) can be used to estimate the average frequency that pits are filling in a given area. For the former, a simple average is taken; for the latter, the length of time used for data collection is divided by the proportion of all septic tanks / pits that are full. Allowing comparison between the calculation methods.

The method of emptying (*emptypract3*) and the disposal/discharge method (*emptypract5*) are important part of indicators SF-1, SF-2, SF-3, SF-4, SF-5 and SF-6. What tools were used (*emptypract3*), and what safety equipment (*emptypract4*) was used, are important parts of SF-7 and SF-11. The cost of emptying is an important part of EQ-3.

Questions 4.32-4.33 [*MHM_Priv, MHMdisp*]

Purpose: Indicators SF-1, SF-2, SF-3, SF-4

Questions 32 and 33 (*MHM_Priv, MHMdisp*) are only in the household survey. The first is only asked of households that have access to a private toilet/latrine, since questions about MHM facilities for PTs, CTs, schools and healthcare centers were asked earlier in the survey.

4.1.5 Section 5: End

Questions 5.1-5.8 [*questions, remaining_doubt, comment, GEOpoint, output1, Complete, PartialNumber, end*]

Purpose: Survey implementation; Location

The last section in all three surveys is the same. The respondent is asked if they have any remaining questions, the enumerator is asked for any comments, and the GPS is recorded. Lastly the

enumerator is asked if this is complete survey; if not, then the enumerator is asked to note the last question answered. Finally, they are then prompted to 'save and finalize' the survey.

4.2 Toilet Inspection Survey

4.2.1 Section I - Introduction

The initial set of 20 questions are the same as in section 4.1.1 Section 1: IntroductionnThe additional questions are covered below.

Questions 1.21-1.22 [*approach, consent*]

Purpose: Informed consent

Question 21 (*approach*) prompts the enumerator to approach the potential respondent. They should not interact with them before this point in the survey. Question 22 (*consent*) must be edited for the local context; this is a place holder for any information to be provided to the prospective respondent. This might include informed consent language or general information about the aims of the survey and the length of time required. It is up to the data collection team to determine what text should be added here.

Questions 1.23-1.26 [*SurveyType, started, startMed*]

Purpose: Determination of eligibility

These questions verify whether the respondent is eligible to participate in the survey or not. For the Toilet inspection survey, the enumerator must select the type of facilities that they are at, whether that is a PT, CT, school or healthcare centers. They can also enter 'other' as well. If they are at a school or a healthcare center, they are further asked whether there is an operational toilet on site, available to students and patients, respectively. If not, then the survey will skip to the end.

Questions 1.27-1.31 [*start, RespGender, Polite, last_name, first_name*]

Purpose: Data management

It is assumed that consent will be needed in order to administer the survey. Therefore the '*start*' question records whether they have given consent or not; if consent is not given, then the survey will skip to the end, where the enumerator will be prompted to record the GPS of the location, note whether it is a complete survey, and on what number the survey was stopped. They will then be prompted to end the survey and select 'save and finalize' in the last screen. If consent is given, then the gender of the respondent is recorded, through observation, and the name of the respondent is asked. If the data collection team is maintaining a confidential dataset, then the name is recorded in *last_name* and *first_name*; in this case the *Polite* question should be deleted. If the dataset is to be anonymous then the name is asked out of politeness, but not recorded; in this case the *last_name and first_name* questions should be deleted. If the data collection team prefers that the enumerator not ask for the respondent's name, then all three questions corresponding to *Polite, last_name, first_name* should be deleted.

4.2.2 Section 2: Facilities Information

Questions 2.1-2.42 of the Toilet Inspection Survey are particular to this survey. While it is a long list of questions, only a subset apply to each type of facility (PTs, CTs, Schools and Healthcare Centers).

Questions 2.1-2.42 [*TitlePT, TitlePT_oth, TitleCT, TitleCT_oth, CoveragePT, UsersUnitPT, UsersPT, UsersUnitPT, UsersGender, EdType, EdType_oth, EdTitle, EdTitle_oth, TitleEd, Students, StudentsGender, MedType, MedType_oth, MedTitle, MedTitle_oth, TitleMed, Workers, Attendants_M, AttendantsTime_M, AttendantsEarn_M, Attendants_F, AttendantsTime_F, AttendantsEarn_F, Cleaners_M, CleanersTime_M, CleanersEarn_M, Cleaners_F, CleanersTime_F, CleanersEarn_F, OtherWorkers, WorkersOtherName, OthWork_M, OthWorkTime_M, OthWorkEarn_M, OthWork_F, OthWorkTime_F, OthWorkEarn_F*]
Purpose: Indicators EQ-3, EQ-5, SF-3, SF-4, SF-5, SF-6
This section collects the title of the respondent, indicating their association with the facilities in question. For the PTs and CTs, the number of households in their catchment area, the average number of users and the percentage of users that are women or girls are also collected. For schools and healthcare centers, the name of the institution is asked: if this causes concern for confidentiality, *TitleEd* and *TitleMed* should be removed. For schools, the number of students and percentage of them that are girls, are also collected. For all types of facilities information is collected on the hourly wages for both men and women, for both attendants and cleaners.

4.2.3 Section 3: Sanitation Access

The set of questions asked in the Household Survey are almost exclusively a subset of the questions in this section.

Questions 3.1-3.36 [*ToiletFee, ToiletFeeAmount, ToiletFeeType, ToiletFeeType_oth, WaitTimeWomen, WaitTimeMen, LightPT1, LightPT2, FacilityGender, Entrance1, Entrance2, Access, EntranceStairs, EntranceRamp1, EntranceRamp2, EntranceRamp, ToiletAll, ToiletMen, Urinals, UrineFlush, ToiletWomen, Privacy, ToiletThirdGender, Privacy, DAbleAccess, DAbleAccessMen, DAbleAccessWom, DAbleAccessTrans WatSeal, Squat, Water1, Water2, Water3, Soap, MHM_PT, PTClean*]
Purpose: Indicators EQ-3, SF-3, SF-4, SF-5, SF-6

Information on the fees charged (*ToiletFee, ToiletFeeAmount, ToiletFeeType, ToiletFeeType_oth*) at PTs and CTs could be used as part of a larger calculation for EQ-3. If information on PT and CT fees is not going to be used for EQ-3, the data collection team may consider deleting it, since it is not used for any other indicators. It is assumed that no fees are charged in the toilets/latrines at schools and healthcare centers so there are no questions about this. Wait time and distance to PTs, CTs and neighbor's latrines [*PTDistance, PTTime*] are not in this survey and only in the Household Survey.

The remaining questions in this section were derived from the Universal Design Principles published in the "Advisory for public and community toilets" CPHEEO (2018). See Table 9 in Chapter 3 for a summary of all attributes captured.

4.2.4 Section 4: Containment and Collection

This section covers fecal sludge containment and collection. The set of questions is almost identical to the household survey, providing additional insights on the kind of toilet that is being used. At the start, the respondents are asked about the destination of black water (toilet water) after the

toilet. If they answer that it is connected to a sewer or drainage, most of the questions will be automatically skipped. If the respondent uses onsite sanitation, then they are asked an in-depth set of questions about the containment unit and emptying practices.

Questions 4.1-4.4 [*ContNote, BlackWDisposal, OpenDrain1, LinedDrain1*]
Purpose: Indicators SF-1, SF-2, SF-3, SF-4, SF-5, SF-6

Questions 1-4 asks about blackwater (toilet water) discharge – where does it discharges after the toilet? If the answer is that it goes to a sewer, then the rest of this section is skipped. If the answer is a drain, then they are asked if the draine is covered and lined, and then the rest of the section is skipped. But if the answer is any kind of onsite sanitation, the survey continues with this section.

Questions 4.5-4.27 [*AgeSeptic, AgeSepticUnits, ToiletWasteTechnical1, ToiletWasteTechnical2, ToiletWasteTechnical3, ToiletWasteTechnical4, ToiletWasteTechnical5, SeptictankOutlet, OpenDrain2, LinedDrain2, fill_vol, pittfill_before, pitfillfreq, pitfillfreq_units, emptypract1, emptypract1_oth, emptypract2, emptypract2_oth, emptypract3, emptypract4, emptypract5, emptypract5_oth, cost_empty*]
Purpose: Indicators EQ-3, SF-1, SF-2, SF-3, SF-4, SF-5, SF-6, SF-7, SF-11

While question 2 asked respondents to indicate the type of containment system (pit, soak pit, septic tank etc), this section collects information on the shape and size of the onsite system (*ToiletWasteTechnical1, ToiletWasteTechnical2*) to verify the containment type as, households may not have been present during the installation of the containment unit or may not know the type of containment that they have. Septic tanks are generally larger and rectangular, while soak pits and pits are generally smaller and circular. The materials used to construct the containment unit (*ToiletWasteTechnical3, ToiletWasteTechnical4*) are recorded in order to estimate installation costs, in case such estimates are to be included in the calculation of EQ-3. Whether the containment is water-tight and where the supernatant (effluent) discharges (*ToiletWasteTechnical5, SeptictankOutlet, OpenDrain2, LinedDrain2*) are both important factors in determining whether the containment is part of a safely managed sanitation service chain.

The observations on the frequency of filling (*pitfillfreq, pitfillfreq_units*), and frequency of full pits (*fill_vol, pittfill_before*) can be used to estimate the average frequency that pits are filling in a given area. For the former, a simple average is taken; for the latter, the length of time used for data collection is divided by the proportion of all septic tanks / pits that are full, allowing comparision between the calculation methods.

The method of emptying (*emptypract3*) and the disposal/discharge method (*emptypract5*) are important part of indicators SF-1, SF-2, SF-3, SF-4, SF-5 and SF-6. What tools were used (*emptypract3*), and what safety equipment (*emptypract4*) was used, are important parts of SF-7 and SF-11. The cost of emptying is an important part of EQ-3.

Questions 4.28-4.34 [*see_toilet, Aesthetic, Clean, latrineobs_type, latrineobs_type_oth, latrineobs_slab, latrineobs_slab_oth*]
Purpose: Indicators SF-3, SF-4, SF-5, SF-6

Questions 4.28-4.38 are observations of the toilet/latrines. These questions are only included in the Toilet Inspection Survey. If the data collection team wishes to reduce the time required to implement this survey, they may elect to remove these questions, as they are only meant to as a visual verification of information reported by the respondent.

4.2.5 Section 5: End

Questions 1-8 [*questions, remaining_doubt, comment, GEOpoint, output1, Complete, PartialNumber, end*]

Purpose: Survey implementation; Location

The last section in all three surveys is the same. The respondent is asked if they have any remaining questions, the enumerator is asked for any comments, and the GPS is recorded. Lastly the enumerator is asked if this is complete survey; if not, then the enumerator is asked to note the last question answered. Finally, they are then prompted to 'save and finalize' the survey.

4.3 Desludging Services Survey

4.3.1 Section 1: Introduction

The desludging services survey is valid for respondents who provide emptying services, including the manual emptiers. These respondents must have the primary source of their income derived from desludging services, or, own a business that provides desludging services.

The initial set of 20 questions are the same as in section 4.1.1 Section 1: IntroductionThe additional questions are covered below.

Questions 1.21-1.22 [*approach, consent*]

Purpose: Informed consent

Question 21 (*approach*) prompts the enumerator to approach the potential respondent. They should not interact with them before this point in the survey. Question 22 (*consent*) must be edited for the local context; this is a place holder for any information to be provided to the prospective respondent. This might include informed consent language or general information about the aims of the survey and the length of time required. It is up to the data collection team to determine what text should be added here.

Questions 1.23-1.24 in [*DesludgeYN1, DesludgeYN2*]

Purpose: Determination of eligibility

These questions verify whether the respondent is eligible to participate in the survey or not. For the Desludging Services Survey, the respondent is asked whether the primary source of their income is derived from desludging services, or, if not, whether they own a business that provides desludging services. If they answer no to both of these questions then the survey will skip to the end.

Questions 1.25-1.29 [*start, RespGender, Polite, last_name, first_name*]

Purpose: Data management

It is assumed that consent will be needed in order to administer the survey. Therefore the '*start*' question records whether they have given consent or not; if consent is not given, then the survey will skip to the end, where the enumerator will be prompted to record the GPS of the location, note whether it is a complete survey, and on what number the survey was stopped. They will then be prompted to end the survey and select 'save and finalize' in the last screen. If consent is given, then the gender of the respondent is recorded, through observation, and the name of the respondent is asked. If the data collection team is maintaining a confidential dataset, then the name is recorded in *last_name* and *first_name*; in this case the *Polite* question should be deleted. If the dataset is to be anonymous then the name is asked out of politeness, but not recorded; in this case the *last_name and first_name* questions should be deleted. If the data collection team prefers that the enumerator not ask for the respondent's name, then all three questions corresponding to *Polite, last_name, first_name* should be deleted.

4.3.2 Section 2: Work Environment

Questions 2.1-2.4 [*Business, BusinessGrp, BusinessFam, BusinessForm, Emp]*

Questions 2.1 to 2.4 request respondents to provide details on the nature of their employment, ownership of the business, its legality (registered business), and the number of people employed.

Questions 2.5-2.17 (*Inclusion, EmpFTW, EmpFTW_Hrs, EmpFTW_Wage, EmpPTW, EmpPTW_Hrs, EmpPTW_Wage, EmpFTM, EmpFTM_Hrs, EmpFTM_Wage, EmpPTM, EmpPTM_Hrs, EmpPTM_Wage*)

Purpose: Indicator EQ-5

These questions request detailed information which will facilitate understanding the average hourly wages for part time and fulltime men, and part time and fulltime women.

Questions 2.18-2.**24** (*PPE, PPEFBodysuit, PPEMasks, PPEGumBoots, PPEHandGloves, PPEHelmet, PPEGlasses*)

Purpose: SF-11

Questions 2.18 to 2.24 asks about the frequency of use of specific safety equipment, such as bodysuit, facemasks, gumboots, hand gloves, helmet and safety goggles; these are important for estimating SF-11.

4.3.3 Section 3: Collection Practices

Questions 3.1-3.19 [*HowTransport, HowTransport_oth, TruckMaintenance, FSVolUnit1, FSVol, FSVolUnit2, FSVolTruck1, FSVolTruck2, DryPit, TrashVol, TrashVolUnit2, FSVolBucket, FSVolBarrel, EmptiesInd, EmptiesIndRange, EmptiesIndMin, EmptiesIndMax, EmptiesIndDays, EmptiesBus, EmptiesBusRange, EmptiesBusMin, EmptiesBusMax, EmptiesIndDays*]

Purpose: Indicators SF-1, SF-2, SF-3, SF-4, SF-5, SF-6, SF-7, SF-8

The method of emptying (*HowTransport, HowTransport_oth*) are important part of indicators SF-1, SF-2, SF-3, SF-4, SF-5 and SF-6. What tools were used (*emptypract3*), and what safety equipment (*emptypract4*) was used, are important parts of SF-7 and SF-11. The cost of emptying is an

important part of EQ-3. Question 3 (*TruckMaintenance*) is the only question included for the estimation of indicator SF-8.

Estimating the volume of fecal sludge collected during an empty (*FSVolUnit1, FSVol, FSVolUnit2, FSVolTruck1, FSVolTruck2, DryPit, TrashVol, TrashVolUnit2, FSVolBucket, FSVolBarrel*), and the average number of empties per day (*EmptiesInd, EmptiesIndRange, EmptiesIndMin, EmptiesIndMax, EmptiesBus, EmptiesBusRange, EmptiesBusMin, EmptiesBusMax*) and the number of days per month that they are emptying pits (*EmptiesIndDays, EmptiesBusDays*). This can be scaled up to estimate the average volume of fecal sludge collected per empty.

4.3.4 Section 4: Disposal

Questions 4.1-4.7 [*Disposal, Disposal_oth, DispEnv, DispOpen, DispSewer, DispBury, DispTP, DispGarden, DispManure, DispFarm, Treatment, ServicesInd, ServicesBus, ServicesBus*]

Purpose: SF-1, SF-2, SF-3, SF-4, SF-5, SF-6

Questions 1-7 present a series of options covering the different ways that fecal sludge can be discharges or disposed. It might be that the respondent is not aware of what happens to fecal sludge, or that they are reluctant to say, if their discharge method is illegal. And in Questions 11-14 (*Treatment, ServicesInd, ServicesBus, ServicesBus*) the respondent is asked to estimate the number of suppliers in the desludging services market.

4.3.5 Section 5: End

Questions 5.1-5.8 [*questions, remaining_doubt, comment, GEOpoint, output1, Complete, PartialNumber, end*]

Purpose: Survey implementation; Location

The last section in all three surveys is the same. The respondent is asked if they have any remaining questions, the enumerator is asked for any comments, and the GPS is recorded. Lastly the enumerator is asked if this is complete survey; if not, then the enumerator is asked to note the last question answered. Finally, they are then prompted to 'save and finalize' the survey.

4.4 Sanitation Authority Interview Guide — Service Outcome Component

The purpose of this interview is to collect data and insights from the sanitation service authority, to inform the CWIS service outcome components of Equity, Safety, and Sustainability which are assessed with the indicators described in Chapter 3. The sanitation service authority could be the city government or the national/regional utility responsible for local sanitation service provision. This interview focuses on the indicators in Chapter 3 that are not covered in the quantitative survey instruments described in the previous three sections. The interview guide in this section includes five topic areas: (i) sanitation workers' equity, (ii) sanitation workers' safety, (iii) community and environment safety, (iv) gender in sanitation and (v) sanitation finance. Additional interview questions for the sanitation service authority that focus on the CWIS core

functions (Responsibility, Accountability, Resource Planning & Management) are available in the toolkit on system design (link).

The target participant(s) are key informants within the sanitation authority who have access to data on treatment and reuse, health and environmental outcomes, and who are knowledgeable about current staffing structure and policies and practices regarding sanitation workers. This KII guide includes questions to record existing data collected by the authority or by other stakeholders who share key service data with the authority. Hence, the interview does not need to be completed in a single session as this information is not always available on-hand. It is recommended to share these questions beforehand and allow time for the Key Informant (KI) to look up data from databases or records to locate the exact data points instead of providing rough estimates based on memory. This survey is proposed to be conducted annually to capture updates or changes in policies and practices.

4.4.1 Section 1: Sanitation workers' equity

Questions 1.1 – 1.11

Purpose: Sanitation Workers' Equity

These questions aim to understand the fairness in distribution and prioritization of the available services for sanitation worker's. Question 1.1 refers to sanitation workers working exclusively on sanitation (fecal sludge and wastewater management) or also on solid waste management. Question 1.2 asks whether sanitation workers belonging to any specific social or ethnic groups. Question 1.3 reviews training or certification requirements to become a sanitation worker in the city, and if so, question 1.4 follows up asking the scope of training. Question 1.5 refers to the presence of an ombudsman for sanitation workers to file complaints. Questions 1.6 will help understand if the sanitation workers' are allowed to unionize in the city. If so, further details about these unions asked in questions 1.7 and 1.8, and if sanitation workers are not allowed to unionize respondents are asked question 1.9. Question 10 asks whether any support offered to sanitation workers' unions by the city government and is followed up by question 1.11 for further details.

Questions 12 – 15

Purpose: Social security and health insurance

These questions assess whether sanitation workers' are provided with any form of social security or health insurance. Question 1.12 asks about any form of social security that is provided to sanitation workers, with details followed up in question 1.13. Question 1.14 refers to health insurance provided to sanitation workers and followed up with question 1.15 .

4.4.2 Section 2: Sanitation workers' safety

Questions 2.1 – 2.6

Purpose: Sanitation workers' safety

These questions assess the services provided by the sanitation authority to safeguard the sanitation workers from safety and health risks. Question 2.1 refers to the existence of a Standard Operating Procedures (SOP) that protects sanitation workers' health across the sanitation service

chain, with further details asked in question 2.2 if a SOP exists. Question 2.3 allows to understand if all the desludging trucks in the city are registered and licensed, with requirements for this followed up in question 2.4. Question 2.5 refers to the availability of the government supported health checkups for sanitation workers with details about these health checkups in question 2.6.

4.4.3 Section 3: Community and environment safety

Questions 3.1 – 3.11

Purpose: Indicator SS 1, SF 1-g- Disposal, reuse and quality standards

These questions review if adequate disposal and reuse methods are adopted to safeguard the environment. Question 3.1 refers to treatment system's design for reuse. Question 3.2 and 3.3 refers to the volume of effluent generated and the amount that is reused. Questions 3.4 and 3.5 refers to the volume of treated biosolids generated and the amount that is reused. Questions 3.6 and 3.9 refers to testing norms for the effluent and biosolids respectively. Questions 3.7 and 3.10 refers to the standards followed by central/state government or the utility for testing the effluent and biosolids quality respectively. Questions 3.8 and 3.11 refers to the authority to which the effluent and biosolids tests results are reported.

Questions 3.12 – 3.17

Purpose: Indicators SF-9 and SF-10 - Treatment and testing

Question 3.12 refers to penalty imposed or any actions taken in case of non-compliance with effluent/biosolids discharge standards. Question 3.13 asks whether there is a lab facility to test effluent and biosolids on-site, and if not question 3.14 asks where testing is done. Question 3.15 identifies to the total number of water samples being tested for quality check. Question 3.16 refers to the number of samples that tested positive for fecal coliform. Question 3.17 refers to the number of excreta related diseases diseases occurring amongst the total population of the city in a particular year.

Questions 3.18 – 3.19

Purpose: Certification mechanism

These questions assess whether the treated effluent and biosolids pass through a certification mechanism before reuse. Question 3.19 refers to certification requirement for treated effluent and biosolids, and question 3.20 asks for details about this certification.

4.4.4 Section 4: Gender in sanitation

Questions 4.1 4.9

Purpose: Indicators EQ-4 and EQ-5

These assess the percentage of women in the sanitation authority (city government/corporation or utilities), the percentage of women in leadership positions within the sanitation authority and the gender paygap in the sanitation workforce. Question 4.1 refers to the total number of employees in the sanitation authority. Question 4.2 refers to the total number of women in the sanitation authority. Question 4.3 refers to the total number of employees in leadership positions

within the sanitation authority. Question 4.4 refers to the total number of women in leadership positions within the sanitation authority. Question 4.5 asks whether a survey was coducted to understand the sanitation workers' wage levels. With question 4.6, 4.7, 4.8, and 4.9 requesting further data on this survey, if conducted, about wage of each gender.

4.4.5 Section 5: Sanitation Finance

Questions 5.1 5.15

Purpose: Indicators SS-2 and SS-3

The series of question under this section will facilitate in understanding how the CAPEX and OPEX for sanitation treatment infrastructure, community and public toilets, desludging trucks and other sanitation investments are covered. It also focuses on the total revenue generated and O&M cost incurred by the sanitation service authority across the sanitation service chain. This information should be sourced from the service authority's cost database. One important note is that CAPEX needs to be annualized to understand the overall impact across a period of time, and cannot simply be treated as a lump sum amount added to the year in which the investment was made. Annualizing the CAPEX spreads the total investment amount on an asset over the useful life of the asset, hence requiring the service authority to also specify the year in which the investment was made for calculation purposes.

Annex I: Survey Questionnaires

1. Household Survey

#	type	list_name	name	label::English	Skip Logic: These questions will only appear when the stated conditions are satisfied
	begin group	**Intro**		**Section 1: Introduction**	
1.1	start	start_time		Start Time	
1.2	end	end_time		End Time	
1.3	today	auto_date		Date of Survey	
1.4	deviceid	deviceid		Device ID	
1.5	simserial	simserial		SIM Serial Number	
1.6	phonenumber	phone		Enumerator's phone number	
1.7	integer	day		Please enter the current day (numeric)	
1.8	integer	month		Please enter the current month (numeric)	
1.9	select_one [EnumName_choices]	EnumName		Enter Enumerator Name	
		[EnumName_choices]	1		
		[EnumName_choices]	2		
		[EnumName_choices]	3		
		[EnumName_choices]	4	Other	
1.10	text	EnumName_oth		Specify "other"	If 'Other' is selected
1.11	calculate	HHIDsMin			
1.12	calculate	HHIDsMax			
13	integer	Resp_ID		Input your household id	

1.14	select_one [district_choices]	district		What is the name of the [sector/district]?	
		[district_choices]	1		
		[district_choices]	2		
		[district_choices]	3		
		[district_choices]	4		
1.15	select_one [village1_choices]	village1		What is the name of the [cell/village/ward]?	If district '1' is selected
		[village1_choices]	1		
		[village1_choices]	2		
		[village1_choices]	3		
		[village1_choices]	4		
1.16	select_one [village2_choices]	village2		What is the name of the [cell/village/ward]?	If district '2' is selected
		[village2_choices]	1		
		[village2_choices]	2		
		[village2_choices]	3		
		[village2_choices]	4		
1.17	select_one [village3_choices]	village3		What is the name of the [cell/village/ward]?	If district '3' is selected
		[village3_choices]	1		
		[village3_choices]	2		
		[village3_choices]	3		
		[village3_choices]	4		
1.18	select_one [village4_choices]	village4		What is the name of the [cell/village/ward]?	If district '4' is selected
		[village4_choices]	1		
		[village4_choices]	2		

		[village4_choices]	3		
		[village4_choices]	4		
1.19	text	pop_loc_name		What is the popular name of this area called? *Note: you may write the name of a landmark, popular person or any other reference point. If none, leave blank.*	
1.20	select_one [SlumArea_choices]	SlumArea		Is this house in a slum area? (don't ask this question, just observe)	
		[SlumArea_choices]	1	Yes	
		[SlumArea_choices]	0	No	
		[SlumArea_choices]	999	Don't know	
1.21	note	approach		You may now approach the prospective respondent.	
1.22	note	consent		Introduction: My name is _____. [[Add in study explanation and informed consent text here]]	
1.23	select_one [start_choices]	start		Do you consent to participate in our survey?	
		[start_choices]	1	Yes	
		[start_choices]	0	No	
1.24	select_one [RespGender_choices]	RespGender		Choose one specific person as your respondent. Tell them that you would like them to answer all of your questions. Now	If 'Yes' is selected for question 1.23 [start]

				mark the gender of that person.	
		[RespGender_choices]	1	Male	
		[RespGender_choices]	2	Female	
		[RespGender_choices]	3	Third gender, transgender	
1.25	acknowledge	Polite		Ask their name but do not record it anywhere	If 'Yes' is selected for question 1.23 [start]
1.26	text	last_name		What is your family name?	If 'Yes' is selected for question 1.23 [start]
1.27	text	first_name		What is your given name?	If 'Yes' is selected for question 1.23 [start]
	end group				
	begin group	**HHInfo**		**Section 2: Household Information**	**If 'Yes' is selected for question 1.23 [start]**
2.1	select_one [HoH1_choices]	HoH1		Is there only one person who is the head of this household?	If 'Yes' is selected for question 1.23 [start]
		[HoH1_choices]	1	Yes	
		[HoH1_choices]	0	No	
2.2	select_one [HoH2_choices]	HoH2		Are you the head of this household?	If 'Yes' is selected for question 2.1[HoH1]
		[HoH2_choices]	1	Yes	
		[HoH2_choices]	0	No	
2.3	select_one [HoH3_choices]	HoH3		Are you one of the heads of this household?	If 'No' is selected for question 2.1[HoH1]
		[HoH3_choices]	1	Yes	
		[HoH3_choices]	0	No	

2.4	select_one [HoH4_choices]	HoH4		What is the gender of the head of the household?	If 'No' is selected for question 2.2 [HoH2], OR for question 2.3 [HoH3]
		[HoH4_choices]	1	Male	
		[HoH4_choices]	2	Female	
		[HoH4_choices]	3	Third gender, transgender	
2.5	select_one [Religion_choices]	Religion		Could you tell me your religion? (select any one)	If 'Yes' is selected for question 1.23 [start]
		[Religion_choices]	1	Hindu	
		[Religion_choices]	3	Muslim	
		[Religion_choices]	4	Christian	
		[Religion_choices]	5	Sikh	
		[Religion_choices]	6	Buddhist	
		[Religion_choices]	99	Other	
		[Religion_choices]	999	Don't know / Don't wish to say	
2.6	select_one [Category_choices]	Category		What type of ration card do you have? (select any one) (APL / BPL)	If 'Yes' is selected for question 1.23 [start]
		[Category_choices]	1	APL	
		[Category_choices]	2	BPL	
		[Category_choices]	3	Anthodaya/Akshaya	
		[Category_choices]	4	I don't have a ration card	
		[Category_choices]	999	Don't know / Don't wish to say	
2.7	select_one [Caste_choices]	Caste		What is your reservation category? (select any one)	If 'Yes' is selected for question 1.23 [start]
		[Caste_choices]	1	General	

		[Caste_choices]	2	OBC	
		[Caste_choices]	3	SC	
		[Caste_choices]	4	ST	
		[Caste_choices]	999	Don't know / Don't wish to say	
2.8	select_one [Education_choices]	Education		What is the highest level of education that you have achieved?	If 'Yes' is selected for question 1.23 [start]
		[Education_choices]	1	No education	
		[Education_choices]	2	Technical training	
		[Education_choices]	3	Some Primary	
		[Education_choices]	4	Completed Primary	
		[Education_choices]	5	Some Secondary	
		[Education_choices]	6	Completed Secondary	
		[Education_choices]	7	Some University	
		[Education_choices]	8	Completed University	
		[Education_choices]	9	Post-graduate	
		[Education_choices]	999	Don't know / Don't wish to say	
2.9	note	hh_define		Now I will ask you questions about your household. What I mean by household is the people living with you in the same place, sharing meals and living expenses. This is probably people you are closely related to. It should include non-relatives if they are living with you long-term, but it does	If 'Yes' is selected for question 1.23 [start]

				not include guests. If you are living in a compound, there may be several households in one compound.	
2.10	integer	hh_residtime		How long has your household lived here? (Enter in Years) *Note: type '999' if 'don't know'*	If 'Yes' is selected for question 1.23 [start]
	begin group	FamilySizeGrp		Family Size	If 'Yes' is selected for question 1.23 [start]
2.11	integer	FamilySize1		The total number of people living in this household?	If 'Yes' is selected for question 1.23 [start]
2.12	integer	Children		Number of children, < 5 years?	If 'Yes' is selected for question 1.23 [start]
2.13	integer	BoyTeen		Number of boys, 5 - 17 years?	If 'Yes' is selected for question 1.23 [start]
2.14	integer	GirlTeen		Number of girls, 5 - 17 years?	If 'Yes' is selected for question 1.23 [start]
2.15	integer	AdultMen		Number of men, 18 years or older	If 'Yes' is selected for question 1.23 [start]
2.16	integer	AdultWom		Number of women, 18 years or older	If 'Yes' is selected for question 1.23 [start]
	end group				

	calculate	TotalPeeps		Total number of people in the household	If 'Yes' is selected for question 1.23 [start]
2.17	note	FamilySize2		The total number of people living in this household is ${FamilySize1}. Please go back and check the answers.	If the sum of the individual entries for children, boys, girls, men and women (questions 2.12-2.16) is not equal to the entry for question 2.11 [FamilySize1]
2.18	select_one [PrIncome_choices]	PrIncome		What is the main source of income for the household? (Select any one)	If 'Yes' is selected for question 1.23 [start]
		[PrIncome_choices]	1	salaried	
		[PrIncome_choices]	2	business owner (large - employs people from outside the family)	
		[PrIncome_choices]	3	self employed / small business owner (does not employ people outside the family)	
		[PrIncome_choices]	4	agriculture	
		[PrIncome_choices]	5	rental income	
		[PrIncome_choices]	6	pension	
		[PrIncome_choices]	7	wage labour	
		[PrIncome_choices]	8	unemployed	
		[PrIncome_choices]	999	other	
		[PrIncome_choices]	9999	don't wish to say	
2.19	select_one [HouseOwnership_choices]	HouseOwnership		Status of house ownership	If 'Yes' is selected for question 1.23 [start]
		[HouseOwnership_choices]	1	Own	

		[HouseOwnership_choices]	2	Rented	
		[HouseOwnership_choices]	3	Leased	
		[HouseOwnership_choices]	99	Other	
2.20	select_one [HouseType_choices]	HouseType		Type of housing	If 'Yes' is selected for question 1.23 [start]
		[HouseType_choices]	1	Independent house/compound with ground floor	
		[HouseType_choices]	2	Apartment	
		[HouseType_choices]	3	Multi-family building/compound	
		[HouseType_choices]	4	Chawl houses	
		[HouseType_choices]	99	Other	
2.21	text	HouseType_oth		Specify "other"	If 'Other' is selected
2.22	integer	AreaPlot		What is the plot area (in sqft)? (put '999' if don't know)	If 'ground floor' is selected for question 2.20 [HouseType]
2.23	integer	ApartmentNumber		How many apartments are in your apartment complex? (put '999' if don't know)	If 'Apartment' is selected for question 2.20 [HouseType]
2.24	integer	BuildingNumber		How many separate households are in your building? (put '999' if don't know)	If 'Multi-family buidling/compound' is selected question 2.20 [HouseType]
2.25	integer	HHRooms		How many rooms do you have in your house, excluding kitchen and bathroom(s)?	If 'Yes' is selected for question 1.23 [start]
2.26	select_one [WallType_choices]	WallType		Predominant Material of house walls?	If 'Yes' is selected for question 1.23 [start]

		[WallType_choices]	1	Concrete	
		[WallType_choices]	2	Burnt Brick	
		[WallType_choices]	3	Thatched/grass/bamboo	
		[WallType_choices]	4	Asbestos / Metal sheet / Galvanized Iron	
		[WallType_choices]	5	Wood	
		[WallType_choices]	6	Mud/Unburnt Brick	
		[WallType_choices]	7	Stone packed without mortar	
		[WallType_choices]	8	Stones packed with Mortar	
		[WallType_choices]	99	Other	
2.27	select_one [FloorType_choices]	FloorType		Predominant Material of floor of your house?	If 'Yes' is selected for question 1.23 [start]
		[FloorType_choices]	1	Mud	
		[FloorType_choices]	2	Cement	
		[FloorType_choices]	3	Mosaic/Floor tiles	
		[FloorType_choices]	4	Marble	
		[FloorType_choices]	5	Wooden/Bamboo	
		[FloorType_choices]	6	Stone	
		[FloorType_choices]	7	Burnt Brick	
		[FloorType_choices]	99	Other	
2.28	select_one [Rooftype_choices]	Rooftype		Predominant material of the roof of your house?	If 'Yes' is selected for question 1.23 [start]
		[Rooftype_choices]	1	Concrete	
		[Rooftype_choices]	2	Wooden/bamboo/thached/mud	
		[Rooftype_choices]	3	Asbestos / Metal sheet / Galvanized Iron	
		[Rooftype_choices]	4	Burnt Bricks	
		[Rooftype_choices]	5	Stone/Slate Roof	

		[Rooftype_choices]	6	Machine made Tiles	
		[Rooftype_choices]	7	Hand made Tiles	
		[Rooftype_choices]	99	Other	
2.29	select_one [SourcePri_choices]	SourcePri		What is your primary source of drinking water? (Can be private, shared or public).	If 'Yes' is selected for question 1.23 [start]
		[SourcePri_choices]	1	piped water	
		[SourcePri_choices]	2	Tubewell / borehole	
		[SourcePri_choices]	3	protected dug well **/** protected spring	
		[SourcePri_choices]	4	open dug well / unprotected spring	
		[SourcePri_choices]	5	rainwater harvesting	
		[SourcePri_choices]	6	open surface water (lake, stream, pond etc)	
		[SourcePri_choices]	7	Tanker water	
		[SourcePri_choices]	8	Delivered jug of water	
		[SourcePri_choices]	9	bottled water	
		[SourcePri_choices]	99	Other	
2.30	select_one [SourcePriShare_choices]	SourcePriShare		Is your source shared with other households?	If 'piped water', 'Tubewell/borehole', 'protected dug well/protected spring', 'open dug well/unprotected spring' or 'rainwater harvesting' is selected for question 2.29 [SourcePri]
		[SourcePriShare_choices]	1	My source is private and located in my house/compound	

		[SourcePriShare_choices]	2	My source is private and located in my neighbor's house/compound	
		[SourcePriShare_choices]	3	My source is publicly accessible	
		[SourcePriShare_choices]	99	Other	
2.31	select_one [Dirty_choices]	Dirty		Does your water ever smell bad, or look cloudy/muddy?	If 'Yes' is selected for question 1.23 [start]
		[Dirty_choices]	1	Always	
		[Dirty_choices]	2	Often	
		[Dirty_choices]	3	Sometimes	
		[Dirty_choices]	4	Rarely	
		[Dirty_choices]	5	During rainy season	
		[Dirty_choices]	6	Never	
		[Dirty_choices]	999	I don't know/I'd rather not say	
2.32	select_one [TastePri_choices]	TastePri		What is the taste of primary source of drinking water? (select one)	If 'Yes' is selected for question 1.23 [start]
		[TastePri_choices]	1	slightly salty - hard, bitter	
		[TastePri_choices]	2	sweet, like pure water	
		[TastePri_choices]	99	Other	
2.33	select_one [cooking_fuel_choices]	cooking_fuel		What type of fuel does your household mainly use for cooking?	If 'Yes' is selected for question 1.23 [start]
		[cooking_fuel_choices]	1	Wood	
		[cooking_fuel_choices]	2	Charcoal	

		[cooking_fuel_choices]	3	Kerosene	
		[cooking_fuel_choices]	4	Electricity	
		[cooking_fuel_choices]	5	LPG Cylinder	
		[cooking_fuel_choices]	99	Other	
		[cooking_fuel_choices]	999	I don't know/I'd rather not say	
2.34	note	AssetsNote		The next few questions cover asset ownership. None of this information at a household level will be shared with anyone. We are asking these questions in order to know the sanitation problems across different income levels.	
2.35	select_multiple [HouseholdItems1_choices]	HouseholdItems1		What items /facilities from the following list does your household have? (select multiple)	If 'Yes' is selected for question 1.23 [start]
		[HouseholdItems1_choices]	1	Two-wheeler	
		[HouseholdItems1_choices]	2	Car / Jeep / Van	
		[HouseholdItems1_choices]	3	Bicycle	
		[HouseholdItems1_choices]	4	Rick	

		[HouseholdItems1_choices]	5	Tractor/Tiller	
		[HouseholdItems1_choices]	0	None of the above	
2.36	select_multiple [HouseholdItems2_choices]	HouseholdItems2		What items /facilities from the following list does your household have? (select multiple)	If 'Yes' is selected for question 1.23 [start]
		[HouseholdItems2_choices]	1	Washing Machine	
		[HouseholdItems2_choices]	2	Water Storage Tank - Roof tank	
		[HouseholdItems2_choices]	3	Underground storage tank	
		[HouseholdItems2_choices]	4	AC	
		[HouseholdItems2_choices]	5	Fridge	
		[HouseholdItems2_choices]	0	None of the above	
2.37	select_multiple [HouseholdItems3_choices]	HouseholdItems3		What items /facilities from the following list does your household have? (select multiple)	If 'Yes' is selected for question 1.23 [start]
		[HouseholdItems3_choices]	1	Computer/Laptop with internet access	
		[HouseholdItems3_choices]	2	Computer/Laptop without internet access	
		[HouseholdItems3_choices]	3	Landline phone	
		[HouseholdItems3_choices]	4	Basic mobile phone	
		[HouseholdItems3_choices]	5	Smart mobile phone	

		[HouseholdItems3_choices]	6	Radio	
		[HouseholdItems3_choices]	7	TV	
		[HouseholdItems3_choices]	0	None of the above	
2.38	select_multiple [HouseholdItems4_choices]	HouseholdItems4		What items /facilities from the following list does your household have? (select multiple)	If 'Yes' is selected for question 1.23 [start]
		[HouseholdItems4_choices]	1	table	
		[HouseholdItems4_choices]	2	chair	
		[HouseholdItems4_choices]	3	sofa seat	
		[HouseholdItems4_choices]	4	almirah/cupboard	
		[HouseholdItems4_choices]	5	grinder	
		[HouseholdItems4_choices]	6	livestock	
		[HouseholdItems4_choices]	0	None of the above	
	end group				
	begin group	**SanAcc**		**Section 3: Sanitation Access**	**If 'Yes' is selected for question 1.23 [start]**
3.1	note	toilet_prompt		Prompt: Now I would like to ask a few questions about your access to sanitation facilities.	If 'Yes' is selected for question 1.23 [start]
3.2	integer	WorkMen		Number of men that work outside your home for 20 or	

				more hours per week?	
	begin_repeat	**MenToilet**		**Men's Toilet Access at Work**	**If there are no men that work outside the home, then question 3.3 will be skipped**
	calculate	**count2**			
3.3	select_one [MenToiletAccess_choices]	MenToiletAccess		Does man ${count2} have easy access to an operational toilet at his work place or near his work place?	
		[MenToiletAccess_choices]	1	Always	
		[MenToiletAccess_choices]	2	Usually	
		[MenToiletAccess_choices]	3	Sometimes	
		[MenToiletAccess_choices]	4	Rarely	
		[MenToiletAccess_choices]	5	Toilet is present but not used	
		[MenToiletAccess_choices]	6	Never	
		[MenToiletAccess_choices]	999	Don't know	
	end_repeat				
3.4	integer	WorkWom		Number of women that work outside your home for 20 or more hours per week?	
	begin_repeat	**WomToilet**		**Women's Toilet Access at Work**	**If there are no women that work outside the home,**

					then question 3.5 will be skipped
	calculate	**count1**			
3.5	select_one [WomToiletAccess_choices]	WomToiletAccess		Does woman ${count1} have easy access to an operational toilet at her workplace or close to her workplace?	
		[WomToiletAccess_choices]	1	Always	
		[WomToiletAccess_choices]	2	Usually	
		[WomToiletAccess_choices]	3	Sometimes	
		[WomToiletAccess_choices]	4	Rarely	
		[WomToiletAccess_choices]	5	Toilet is present but not used	
		[WomToiletAccess_choices]	6	Never	
		[WomToiletAccess_choices]	99	Don't know	
	end_repeat				
	begin_repeat	**BoyTeenToilet**		**Toilet Access at School**	**If there are no school-age boys, then question 3.6 will be skipped**
	calculate	**count4**			
3.6	select_one [TeenBoySchool_choices]	TeenBoySchool		Does boy ${count4} go to school?	
		[TeenBoySchool_choices]	1	Yes	
		[TeenBoySchool_choices]	0	No	

		[TeenBoySchool_choices]	99	Don't know	
3.7	select_one [TeenBoyToiletAccess_choices]	TeenBoyToiletAccess		Does boy ${count4} have easy access to an operational toilet at school?	If 'Yes' is selected for question 3.6 [TeenBoySchool]
		[TeenBoyToiletAccess_choices]	1	Yes	
		[TeenBoyToiletAccess_choices]	0	No	
		[TeenBoyToiletAccess_choices]	99	Don't know	
3.8	select_one [TeenBoyToiletUse_choices]	TeenBoyToiletUse		Many schools have an operational toilet present but students are not always comfortable using them. Is boy ${count4} comfortable using the toilet at school whenever he needs to?	If 'Yes' is selected for question 3.7 [TeenBoyToiletAccess]
		[TeenBoyToiletUse_choices]	1	Yes	
		[TeenBoyToiletUse_choices]	0	No	
		[TeenBoyToiletUse_choices]	99	Don't know	
	end_repeat				
	begin_repeat	**GirlTeenToilet**		**Toilet Access at School**	**If there are no school-age girls, then question 3.9 will be skipped**
	calculate	**count3**			
3.9	select_one [TeenGirlSchool_choices]	TeenGirlSchool		Does girl ${count3} go to school?	
		[TeenGirlSchool_choices]	1	Yes	

		[TeenGirlSchool_choices]	0	No	
		[TeenGirlSchool_choices]	99	Don't know	
3.10	select_one [TeenGirlToiletAccess_choices]	TeenGirlToiletAccess		Does girl ${count3} have easy access to an operational toilet at school?	If 'Yes' is selected for question 3.9 [TeenGirlSchool]
		[TeenGirlToiletAccess_choices]	1	Yes	
		[TeenGirlToiletAccess_choices]	0	No	
		[TeenGirlToiletAccess_choices]	99	Don't know	
3.11	select_one [TeenGirlToiletUse_choices]	TeenGirlToiletUse		Many schools have an operational toilet present but students are not always comfortable using them. Is girl ${count3} comfortable using the toilet at school whenever she needs to?	If 'Yes' is selected for question 3.10 [TeenGirlToiletAccess]
		[TeenGirlToiletUse_choices]	1	Yes	
		[TeenGirlToiletUse_choices]	0	No	
		[TeenGirlToiletUse_choices]	99	Don't know	
	end_repeat				
3.12	select_one [ToilLat_choices]	ToilLat		Do you have access to a toilet/latrine at or near your home?	If 'Yes' is selected for question 1.23 [start]
		[ToilLat_choices]	1	I have a private toilet/latrine at my residence, that only my household uses	

		[ToilLat_choices]	2	I have a private toilet/latrine at my residence, that my household shares with at least one other household	
		[ToilLat_choices]	3	I have access to a private toilet/latrine, at my neighbor's house	
		[ToilLat_choices]	4	I share a private community toilet/latrine with my neighbor(s)	
		[ToilLat_choices]	5	I have access to a public toilet/latrine	
		[ToilLat_choices]	6	I don't have access to a toilet/latrine	
		[ToilLat_choices]	99	other	
3.13	text	ToilLat_oth		Specify "other"	If 'Other' is selected
3.14	select_one [WatSeal_choices]	WatSeal		Does this toilet have a water seal?	If 'I have a private toilet/latrine at my residence, that only my household uses', 'I have a private toilet/latrine at my residence, that my household shares with at least one other household', 'I have access to private toilet/latrine, at my neighbour's house', 'I share a private community toilet/latrine with my neighbour(s)', or 'I have access to a public toilet/latrine' is selected for

					question 3.12 [ToilLat]
		[WatSeal_choices]	1	yes	
		[WatSeal_choices]	2	no	
		[WatSeal_choices]	999	Don't know	
3.15	select_one [Squat_choices]	Squat		Does this toilet have a squat plate that can be kept clean and does not break easily?	If 'no' is selected for question 3.14 [WatSeal]
		[Squat_choices]	1	yes	
		[Squat_choices]	2	no	
		[Squat_choices]	999	Don't know	
	begin_repeat	**MenToiletGrp**		**Men's Toilet Access at Home**	**If there are no men, then question 3.16 will be skipped**
	calculate	count5			
3.16	select_one [MenToiletHome_choices]	MenToiletHome		How often does man ${count5} use this toilet when at home?	
		[MenToiletHome_choices]	1	Always	
		[MenToiletHome_choices]	2	Usually	

		[MenToiletHome_choices]	3	Sometimes	
		[MenToiletHome_choices]	4	Rarely	
		[MenToiletHome_choices]	5	Never	
		[MenToiletHome_choices]	999	Don't know	
	end_repeat				
	begin_repeat	**WomToiletGrp**		**Women's Toilet Access at Home**	**If there are no women, then question 3.17 will be skipped**
	calculate	count6			
3.17	select_one [WomToiletHome_choices]	WomToiletHome		How often does woman ${count6} use this toilet when at home?	
		[WomToiletHome_choices]	1	Always	
		[WomToiletHome_choices]	2	Usually	
		[WomToiletHome_choices]	3	Sometimes	
		[WomToiletHome_choices]	4	Rarely	
		[WomToiletHome_choices]	5	Never	
		[WomToiletHome_choices]	999	Don't know	
	end_repeat				
	begin_repeat	**BoyToiletGrp**		**Boy's Toilet Access at Home**	**If there are no school-age boys, then question 3.18 will be skipped**
	calculate	**count7**			

3.18	select_one [BoyToiletHome_choices]	BoyToiletHome		How often does boy ${count7} use this toilet when at home?	
		[BoyToiletHome_choices]	1	Always	
		[BoyToiletHome_choices]	2	Usually	
		[BoyToiletHome_choices]	3	Sometimes	
		[BoyToiletHome_choices]	4	Rarely	
		[BoyToiletHome_choices]	5	Never	
		[BoyToiletHome_choices]	999	Don't know	
	end_repeat				
	begin_repeat	**GirlToiletGrp**		**Girl's Toilet Acces at Home**	**If there are no school-age girls, then question 3.19 will be skipped**
	calculate	**count8**			
3.19	select_one [GirlToiletHome_choices]	GirlToiletHome		How often does girl ${count8} use this toilet when at home?	
		[GirlToiletHome_choices]	1	Always	
		[GirlToiletHome_choices]	2	Usually	
		[GirlToiletHome_choices]	3	Sometimes	
		[GirlToiletHome_choices]	4	Rarely	
		[GirlToiletHome_choices]	5	Never	
		[GirlToiletHome_choices]	999	Don't know	

	end_repeat				
3.20	select_one [ToiletFee_choices]	ToiletFee		Does this toilet charge any kind of fees? This could be a per use fee, a membership fee or a maintenance fee	If 'I share a private community toilet/latrine with my neighbour(s)', or 'I have access to a public toilet/latrine' is selected for question 3.12 [ToilLat]
		[ToiletFee_choices]	1	Yes	
		[ToiletFee_choices]	0	No	
		[ToiletFee_choices]	999	Don't know / don't wish to say	
3.21	integer	ToiletFeeAmount		What is the amount paid? *(put '999' if don't know)*	If 'Yes' is selected for question 3.20 [ToiletFee]
3.22	select_one [ToiletFeeType_choices]	ToiletFeeType		What type of fee is this?	If 'Yes' is selected for question 3.20 [ToiletFee], AND 'Don't know' is not selected for question 3.21 [ToiletFeeAmount]
		[ToiletFeeType_choices]	1	per use	
		[ToiletFeeType_choices]	2	per month	
		[ToiletFeeType_choices]	99	other	
3.23	text	ToiletFeeType_oth		Specify "other"	If 'Other' is selected

3.24	integer	PTDistance		How far away is the toilet from your home (in meters)? Note: enter answer in meters (put '999' if don't know)	If 'I have access to private toilet/latrine, at my neighbour's house', 'I share a private community toilet/latrine with my neighbour(s)', or 'I have access to a public toilet/latrine' is selected for question 3.12 [ToilLat]
3.25	integer	PTTime		On average, how much time does it take to get there (in minutes)? (put '999' if don't know)	If 'I have access to private toilet/latrine, at my neighbour's house', 'I share a private community toilet/latrine with my neighbour(s)', or 'I have access to a public toilet/latrine' is selected for question 3.12 [ToilLat]
3.26	integer	WaitTimeWomen		What is the average wait time for women between 6am-10am and 6pm-10pm (in minutes)? *(put '999' if don't know)*	If 'I share a private community toilet/latrine with my neighbour(s)', or 'I have access to a public toilet/latrine' is selected for question 3.12 [ToilLat]
3.27	integer	WaitTimeMen		What is the average wait time for men between 6am-10am and 6pm-10pm (in minutes)? *(put '999' if don't know)*	If 'I share a private community toilet/latrine with my neighbour(s)', or 'I have access to a public toilet/latrine' is

					selected for question 3.12 [ToilLat]
3.28	select_one [LightPT1_choices]	LightPT1		Is the path to these facilities well-lit at night?	If 'I have access to private toilet/latrine, at my neighbour's house', 'I share a private community toilet/latrine with my neighbour(s)', or 'I have access to a public toilet/latrine' is selected for question 3.12 [ToilLat]
		[LightPT1_choices]	1	yes	
		[LightPT1_choices]	2	no	
		[LightPT1_choices]	999	Don't know	
3.29	select_one [LightPT2_choices]	LightPT2		Are the facilities well-lit at night?	If 'I have access to private toilet/latrine, at my neighbour's house', 'I share a private community toilet/latrine with my neighbour(s)', or 'I have access to a public toilet/latrine' is selected for question 3.12 [ToilLat]
		[LightPT2_choices]	1	yes	
		[LightPT2_choices]	2	no	
		[LightPT2_choices]	999	Don't know	

3.30	select_one [FacilityGender_choices]	FacilityGender		Are there separate facilities for different genders?	If 'I share a private community toilet/latrine with my neighbour(s)', or 'I have access to a public toilet/latrine' is selected for question 3.12 [ToilLat]
		[FacilityGender_choices]	1	yes	
		[FacilityGender_choices]	2	no	
		[FacilityGender_choices]	999	Don't know	
3.31	select_one [Entrance1_choices]	Entrance1		Is there a visible entrance, with clear signage?	If 'I share a private community toilet/latrine with my neighbour(s)', or 'I have access to a public toilet/latrine' is selected for question 3.12 [ToilLat]
		[Entrance1_choices]	1	yes	
		[Entrance1_choices]	2	no	
		[Entrance1_choices]	999	Don't know	
3.32	select_one [Entrance2_choices]	Entrance2		Are there separate entrances for each gender, with clear signage?	If 'I share a private community toilet/latrine with my neighbour(s)', or 'I have access to a public toilet/latrine' is selected for question 3.12 [ToilLat]
		[Entrance2_choices]	1	yes	
		[Entrance2_choices]	2	no	

		[Entrance2_choices]	999	Don't know	
3.33	select_multiple [Privacy_choices]	Privacy		Do these facilities provide adequate privacy for women and girls? If so, please indicate the features provided. *Note: mark all that apply*	If 'I have access to private toilet/latrine, at my neighbour's house', 'I share a private community toilet/latrine with my neighbour(s)', or 'I have access to a public toilet/latrine' is selected for question 3.12 [ToilLat]
		[Privacy_choices]	1	Occluded stall entrances (the stall entrances cannot be seen from outside the facilities).	
		[Privacy_choices]	2	No gaps in the stalls through which the users can be seen	
		[Privacy_choices]	3	All doors and stalls have operational locking mechanisms	
		[Privacy_choices]	0	None of the above	
		[Privacy_choices]	999	Don't know	
3.34	select_one [Water1_choices]	Water1		Is water available at the toilet/latrine facilities?	If 'Yes' is selected for question 1.23 [start]
		[Water1_choices]	1	yes	
		[Water1_choices]	2	no	
		[Water1_choices]	999	Don't know	

3.35	select_one [Water2_choices]	Water2		When water is available at the facility, is it made available inside the stalls? This might be an operational tap or a bucket/barrel. *Note: Probe a bit in order to find the correct answer*	If 'Yes' is selected for question 3.34 [Water1]
		[Water2_choices]	1	Water is available at the facility, but not inside any of the stalls	
		[Water2_choices]	2	Water is available inside one or more of the stalls, but not all of the stalls	
		[Water2_choices]	3	Water is available inside all of the stalls	
		[Water2_choices]	999	Don't know	
3.36	select_one [Water3_choices]	Water3		Is there a wash basin with water available for washing?	If 'Yes' is selected for question 1.23 [start]
		[Water3_choices]	1	yes	
		[Water3_choices]	2	no	
		[Water3_choices]	999	Don't know	
3.37	select_one [Soap_choices]	Soap		Is there soap available?	If 'Yes' is selected for question 1.23 [start]
		[Soap_choices]	1	yes	
		[Soap_choices]	2	no	
		[Soap_choices]	999	Don't know	

3.38	select_one [MHM_PT_choices]	MHM_PT		Are there adequate facilities for Menstrual Hygiene Management (MHM)? *Note: mark all that apply*	If 'Female' is selected question 3.24 [RespGender], AND 'I have access to private toilet/latrine, at my neighbour's house', 'I share a private community toilet/latrine with my neighbour(s)', or 'I have access to a public toilet/latrine' is selected for question 3.12 [ToilLat]
		[MHM_PT_choices]	1	A place for the discrete and private disposal of MHM products is available	
		[MHM_PT_choices]	2	A discrete and private place where women and girls can wash themselves or their clothes is available	
		[MHM_PT_choices]	3	MHM products are available and can be obtained at this facility	
		[MHM_PT_choices]	0	None of the above	
		[MHM_PT_choices]	999	Don't know	
3.39	select_one [PTClean_choices]	PTClean		Are these facilities clean and well maintained?	If 'I have access to private toilet/latrine, at my neighbour's house', 'I share a private community toilet/latrine with my neighbour(s)', or 'I have access to

					a public toilet/latrine' is selected for question 3.12 [ToilLat]
		[PTClean_choices]	1	yes	
		[PTClean_choices]	2	no	
		[PTClean_choices]	999	Don't know	
	end group				
	begin group	**Cont**		**Section 4: Containment and Collection**	**If 'I have a private toilet/latrine at my residence, that only my household uses', 'I have a private toilet/latrine at my residence, that my household shares with at least one other household', 'I have access to private toilet/latrine, at my neighbour's house', or 'I share a private community toilet/latrine with my neighbour(s)' is selected question 3.12 [ToilLat]**

4.1	acknowledge	ContNote		The next few questions are regarding the discharge of wastewater and the handling of fecal sludge.	If 'I have a private toilet/latrine at my residence, that only my household uses', 'I have a private toilet/latrine at my residence, that my household shares with at least one other household', 'I have access to private toilet/latrine, at my neighbour's house', or 'I share a private community toilet/latrine with my neighbour(s)' is selected forquestion 3.12 [ToilLat]
4.2	select_one [BlackWDisposal_choices]	BlackWDisposal		To where does this toilet or latrine discharge? *Note: if they know it is a pit, but they are not sure if it is a soakpit or a pit, mark 'pit'*	If 'I have a private toilet/latrine at my residence, that only my household uses', 'I have a private toilet/latrine at my residence, that my household shares with at least one other household', 'I have access to private toilet/latrine, at my neighbour's house', or 'I share a private community toilet/latrine with my neighbour(s)' is selected for question 3.12 [ToilLat]

		[BlackWDisposal_choices]	1	Septic Tank	
		[BlackWDisposal_choices]	2	Pit	
		[BlackWDisposal_choices]	3	Soakpit	
		[BlackWDisposal_choices]	4	Nearby underground sewer	
		[BlackWDisposal_choices]	5	Nearby drain	
		[BlackWDisposal_choices]	99	Other	
		[BlackWDisposal_choices]	999	I don't know	
4.3	select_one [OpenDrain1_choices]	OpenDrain1		Is the drain closed (covered) or open?	If 'Nearby drain' is selected for question 4.2 [BlackWDisposal]
		[OpenDrain1_choices]	1	Closed (covered)	
		[OpenDrain1_choices]	2	Open	
		[OpenDrain1_choices]	999	I don't know	
4.4	select_one [LinedDrain1_choices]	LinedDrain1		Is the drain lined with cement (bottom and both sides)?	If 'Nearby drain' is selected for question 4.2 [BlackWDisposal]
		[LinedDrain1_choices]	1	Yes	
		[LinedDrain1_choices]	0	No	
		[LinedDrain1_choices]	999	I don't know	
	begin group	**SepPit**		**Septic Tanks and Pits**	**If 'Nearby drain' is selected for question 4.2 [BlackWDisposal]**
4.5	select_one [TwinPit_choices]	TwinPit		Do you have a single-pit or a twin-pit?	If 'Pit' or 'Soackpit' is selected for question 4.2 [BlackWDisposal]

		[TwinPit_choices]	1	Yes	
		[TwinPit_choices]	0	No	
		[TwinPit_choices]	999	I don't know	
4.6	integer	SharedTankNum		How many households share your septic tank/ pit/ soakpit? (put '999' if don't know)	
4.7	select_one [who_pays_choices]	who_pays		When the septic tank/ pit / soakpit for the toilet/latrine is filled, who is responsible (to empty, seal etc)?	
		[who_pays_choices]	1	I am the one who is primarily responsible	
		[who_pays_choices]	2	A group of people living here are responsible, and I am one of them	
		[who_pays_choices]	3	My household and the landlord share the responsibility	
		[who_pays_choices]	4	My household, other households and the landlord share the responsibility	
		[who_pays_choices]	5	The landlord is responsible	
		[who_pays_choices]	99	Other response	
		[who_pays_choices]	999	I don't know/I'd rather not say	
4.8	text	who_pays_oth		specify "other"	If 'other response' is selected
4.9	integer	AgeSeptic		Age of the Septic Tank/ Pit / Soakpit (Years) (put 999 if 'don't know')	

4.10	select_one [AgeSepticUnits_choices]	AgeSepticUnits		Units Used:	
		[AgeSepticUnits_choices]	1	months	
		[AgeSepticUnits_choices]	2	years	
4.11	select_one [ToiletWasteTechnical1_choices]	ToiletWasteTechnical1		Shape of Septic Tank / Pit / Soakpit (Select any one)	
		[ToiletWasteTechnical1_choices]	1	Round / Cylindrical	
		[ToiletWasteTechnical1_choices]	2	Rectangular	
		[ToiletWasteTechnical1_choices]	999	I don't know	
4.12	select_one [ToiletWasteTechnical2_choices]	ToiletWasteTechnical2		Area of land taken by Septic tank / Pit / Soakpit (Select any one)	
		[ToiletWasteTechnical2_choices]	1	20 sq ft (2 m2) or less	
		[ToiletWasteTechnical2_choices]	2	more than 20 sq ft (2 m2) but less than or equal to 40 sq ft (4 m2)	
		[ToiletWasteTechnical2_choices]	3	more than 40 sq ft (4 m2)	
		[ToiletWasteTechnical2_choices]	999	I don’t know	
4.13	select_one [ToiletWasteTechnical3_choices]	ToiletWasteTechnical3		What is the wall material of your Septic tank / Pit?	
		[ToiletWasteTechnical3_choices]	1	Pre-fabricated cement/concrete	
		[ToiletWasteTechnical3_choices]	2	Cast in-situ concrete	

		[ToiletWasteTechnical3_choices]	3	Reinforced cement concrete (RCC)	
		[ToiletWasteTechnical3_choices]	4	Bricks	
		[ToiletWasteTechnical3_choices]	5	Stone masonry	
		[ToiletWasteTechnical3_choices]	6	Pre-fabricated plastic	
		[ToiletWasteTechnical3_choices]	999	Other	
4.14	text	ToiletWasteTechnical3_other		specify "other"	If 'other response' is selected
4.15	select_one [ToiletWasteTechnical4_choices]	ToiletWasteTechnical4		Bottom material of Septic Tank / Pit (Select any one)	
		[ToiletWasteTechnical4_choices]	1	Gravel	
		[ToiletWasteTechnical4_choices]	2	Concrete	
		[ToiletWasteTechnical4_choices]	3	Plastic	
		[ToiletWasteTechnical4_choices]	99	Other	
		[ToiletWasteTechnical4_choices]	999	I don't know	
4.16	select_one [ToiletWasteTechnical5_choices]	ToiletWasteTechnical5		What is the structure of your septic tank / pit?	
		[ToiletWasteTechnical5_choices]	1	Completely water tight walls and bottom	
		[ToiletWasteTechnical5_choices]	2	Water tight walls, but open/gravel bottom	
		[ToiletWasteTechnical5_choices]	3	Perforated walls and bottom	

		[ToiletWasteTechnical5_choices]	999	I don't know	
4.17	select_one [SeptictankOutlet_choices]	SeptictankOutlet		Wastewater from septic tank/pit is released into? (Select any one)	
		[SeptictankOutlet_choices]	1	It does not have outfall	
		[SeptictankOutlet_choices]	2	Overflows into a nearby drain	
		[SeptictankOutlet_choices]	3	Overflows into a nearby underground sewer	
		[SeptictankOutlet_choices]	4	Overflows into a soak pit/trench specifically made for this purpose	
		[SeptictankOutlet_choices]	5	Overflows into a cow manure pit	
		[SeptictankOutlet_choices]	6	Release it into the ground	
		[SeptictankOutlet_choices]	7	Outfalls directly to surface water or temporary wetland/pool	
		[SeptictankOutlet_choices]	99	I don't know	
		[SeptictankOutlet_choices]	999	Other	
4.18	select_one [OpenDrain2_choices]	OpenDrain2		Is the drain closed (covered) or open?	If 'Overflows into a nearby drain' is selected for question 4.16 [SeptictankOutlet]
		[OpenDrain2_choices]	1	Closed (covered)	
		[OpenDrain2_choices]	2	Open	
		[OpenDrain2_choices]	999	I don't know	

4.19	select_one [LinedDrain2_choices]	LinedDrain2		Is the drain lined with cement (bottom and both sides)?	If 'Overflows into a nearby drain' is selected for question 4.16 [SeptictankOutlet]
		[LinedDrain2_choices]	1	Yes	
		[LinedDrain2_choices]	0	No	
		[LinedDrain2_choices]	999	I don't know	
4.20	select_one [fill_vol_choices]	fill_vol		How full is your septic tank/ pit/ soakpit? *Note: Read all the answer options and allow them to choose one.*	
		[fill_vol_choices]	1	Over-flowing	
		[fill_vol_choices]	2	Full	
		[fill_vol_choices]	3	Close to full	
		[fill_vol_choices]	4	More than half full	
		[fill_vol_choices]	5	Half full	
		[fill_vol_choices]	6	Less than half full	
		[fill_vol_choices]	7	Almost empty	
		[fill_vol_choices]	8	Empty	
		[fill_vol_choices]	99	I don't know/I'd rather not say	
4.21	select_one [pittfill_before_choices]	pittfill_before		Has this septic tank/ pit / soakpit ever been full before?	
		[pittfill_before_choices]	1	Yes	
		[pittfill_before_choices]	0	No	
		[pittfill_before_choices]	99	I don't know/I'd rather not say	
4.22	integer	pitfillfreq		How often does your septic tank/ pit / soakpit system fill? *Once every ___ months/years*	

				(type '999' if 'don't know')	
4.23	select_one [pitfillfreq_units_choices]	pitfillfreq_units		What is the time period mentioned?	If 'Don't know' is not selected for Section 4 - question 4.22 [pitfillfreq]
		[pitfillfreq_units_choices]	1	month	
		[pitfillfreq_units_choices]	2	year	
4.24	select_one [emptypract1_choices]	emptypract1		When your septic tank/ pit/ soakpit is full, what do you do? *Note: Don't read the options to them.*	
		[emptypract1_choices]	1	seal it	
		[emptypract1_choices]	2	empty it	
		[emptypract1_choices]	3	do nothing, use a neighbor's toilet/latrine	
		[emptypract1_choices]	4	do nothing, instead do open defecation	
		[emptypract1_choices]	5	use detergent/chemical reagent to decrease sludge volume	
		[emptypract1_choices]	6	do nothing, call the landlord	
		[emptypract1_choices]	99	other	
		[emptypract1_choices]	999	I don't know/I'd rather not say	
4.25	text	emptypract1_oth		specify "other"	If 'Other' is selected
4.26	select_one [emptypract2_choices]	emptypract2		Who emptied it?	If 'empty it' is selected for question 4.24 [emptypract1]

		[emptypract2_choices]	1	We did it ourselves	
		[emptypract2_choices]	2	We hired an informal worker to empty it	
		[emptypract2_choices]	3	We hired a private company to empty it	
		[emptypract2_choices]	4	We hired the government service to empty it	
		[emptypract2_choices]	99	other	
		[emptypract2_choices]	999	I don't know/I'd rather not say	
4.27	text	emptypract2_oth		specify "other"	If 'Other' is selected
4.28	select_one [emptypract3_ choices]	emptypract3		How did they empty it?	If 'empty it' is selected for question 4.24 [emptypract1]
		[emptypract3_choices]	1	Only using simple tools (shovels, picks, buckets etc)	
		[emptypract3_choices]	2	Pumped out with a gulper	
		[emptypract3_choices]	3	Pumped out with a vacuum truck	
		[emptypract3_choices]	99	Other	
		[emptypract3_choices]	999	I don't know/I'd rather not say	
4.29	select_multiple [emptypract4_ choices]	emptypract4		Were they using any of the following safety equipment? *(select all that apply)*	If 'empty it' is selected forquestion 4.24 [emptypract1]
		[emptypract4_choices]	1	Full body suits	
		[emptypract4_choices]	2	Face masks	
		[emptypract4_choices]	3	Gumboots	
		[emptypract4_choices]	4	Hand gloves	
		[emptypract4_choices]	5	Helmets	

		[emptypract4_choices]	6	Goggles/safety glasses	
		[emptypract4_choices]	0	None of the above	
		[emptypract4_choices]	999	I don't know/I'd rather not say	
4.30	select_one [emptypract5_choices]	emptypract5		What did you/they do with the fecal sludge?	If 'empty it' is selected for question 4.24 [emptypract1]
		[emptypract5_choices]	1	Dump contents in the environment/wetland	
		[emptypract5_choices]	2	Dump contents in an open drain	
		[emptypract5_choices]	3	Dump contents into an underground sewer	
		[emptypract5_choices]	4	Bury the contents in a hole dug on our compound	
		[emptypract5_choices]	5	Bury the contents in a hole dug outside of our compound	
		[emptypract5_choices]	6	It is brought to a treatment plant	
		[emptypract5_choices]	7	It is used in a nearby garden	
		[emptypract5_choices]	8	It is added to a nearby cow manure pit	
		[emptypract5_choices]	9	It is brought to farms, treated and then mixed with the soil	
		[emptypract5_choices]	10	It is brought to farms, not treated and then mixed with the soil	
		[emptypract5_choices]	99	other	

		[emptypract5_choices]	999	I don't know/I'd rather not say	
4.31	text	emptypract5_oth		specify "other"	If 'Other' is selected
4.32	integer	cost_empty		How much did you pay to empty your latrine or septic tank? *(type '99' if 'don't know')*	If 'We hired an informal worker to empty it', 'We hired a private company to empty it', or 'We hired the government service to empty it' is selected for question 4.26 [emptypract2]
	end group				
4.33	select_one [MHM_Priv_choices]	MHM_Priv		Do you have adequate access to facilities for MHM? *Note: mark all that apply*	If 'Female' is selected for the question 1.24 [RespGender], AND 'I have a private toilet/latrine at my residence, that only my household uses', or 'I have a private toilet/latrine at my residence, that my household shares with at least one other household' is selected from question 3.12 [ToilLat]
		[MHM_Priv_choices]	1	A place for the discrete and private disposal of MHM products	
		[MHM_Priv_choices]	2	A discrete and private place where women and girls can wash	

				themselves or their clothes	
		[MHM_Priv_choices]	3	MHM products are available and can be obtained	
		[MHM_Priv_choices]	0	None of the above	
		[MHM_Priv_choices]	999	Don't know	
4.34	select_one [MHMdisp_choices]	MHMdisp		How do you usually dispose of feminine hygiene products?	If 'Female' is selected for the question 1.24 [RespGender]
		[MHMdisp_choices]	1	bury it separately from other solid waste	
		[MHMdisp_choices]	2	burn it separately from other solid waste	
		[MHMdisp_choices]	3	throw it into my pit latrine	
		[MHMdisp_choices]	4	throw it into my pour flush latrine	
		[MHMdisp_choices]	5	dispose with other solid waste	
		[MHMdisp_choices]	6	I don't use them	
		[MHMdisp_choices]	77	other	
		[MHMdisp_choices]	99	I don't know/I'd rather not say	
	end group				
	begin group	**End**		**Section 5: End**	
5.1	select_one [questions_choices]	questions		Do you have any remaining questions? *(If yes, try to answer their questions. If you cannot answer their questions, refer them to the phone*	If 'Yes' is selected for question 1.23 [start]

				number on the contact card).	
		[questions_choices]	1	Yes	
		[questions_choices]	0	No	
5.2	text	remaining_doubt		(Note: Write a brief summary of their question here. Try to answer their question. If you can't, kindly suggest to them that they can call the contact phone number)	If 'Yes' is selected for question 1.23 [start]
5.3	text	comment		If you, the enumerator, have any general comments, you can write them here.	If 'Yes' is selected for question 1.23 [start]
5.4	geopoint	GEOpoint		Lat/Long of Household	
	calculate	latitude1			
	calculate	longitude1			
	calculate	accuracy1			
5.5	note	output1		Accuracy: ${accuracy1} m	If the error margin of the GPS reading [accuracy1] is greater than 20 meters
5.6	select_one [Complete_choices]	Complete		Is this a complete survey?	
		[Complete_choices]	1	Yes	
		[Complete_choices]	0	No	
5.7	integer	PartialNumber		On what question number did you stop?	If 'No' is selected for question 5.6 [Complete]

5.8	note	end		This is the end of the survey. If you have completed the survey, press "save and finalize".	
	end group				

2. Toilet Inspection Survey

#	type	list_name	name	label::English	Skip Logic: These questions only appear when the stated conditions are satisfied
	begin group	**Intro**		**Section 1: Introduction**	
1.1	start	start_time		Start Time	
1.2	end	end_time		End Time	
1.3	today	auto_date		Date of Survey	
1.4	deviceid	deviceid		Device ID	
1.5	simserial	simserial		SIM Serial Number	
1.6	phonenumber	phone		Enumerator's phone number	
1.7	integer	day		Please enter the current day (numeric)	
1.8	integer	month		Please enter the current month (numeric)	
1.9	select_one [EnumName_choices]	EnumName		Enter Enumerator Name	
		[EnumName_choices]	1		
		[EnumName_choices]	2		
		[EnumName_choices]	3		
		[EnumName_choices]	4	Other	
1.10	text	EnumName_oth		Specify "other"	If 'other' is selected
1.11	calculate	HHIDsMin			
1.12	calculate	HHIDsMax			
1.13	integer	Resp_ID		Input your toilet inspection survey id	
1.14	select_one [district_choices]	district		What is the name of the [sector/district]?	
		[district_choices]	1		
		[district_choices]	2		
		[district_choices]	3		

		[district_choices]	4		
1.15	select_one [village1_choices]	village1		What is the name of the [cell/village/ward]?	If district '1' is selected
		[village1_choices]	1		
		[village1_choices]	2		
		[village1_choices]	3		
		[village1_choices]	4		
1.16	select_one [village2_choices]	village2		What is the name of the [cell/village/ward]?	If district '2' is selected
		[village2_choices]	1		
		[village2_choices]	2		
		[village2_choices]	3		
		[village2_choices]	4		
1.17	select_one [village3_choices]	village3		What is the name of the [cell/village/ward]?	If district '3' is selected
		[village3_choices]	1		
		[village3_choices]	2		
		[village3_choices]	3		
		[village3_choices]	4		
1.18	select_one [village4_choices]	village4		What is the name of the [cell/village/ward]?	If district '4' is selected
		[village4_choices]	1		
		[village4_choices]	2		
		[village4_choices]	3		
		[village4_choices]	4		

1.19	text	pop_loc_name		What is the popular name of this area called? *Note: you may write the name of a landmark, popular person or any other reference point. If none, leave blank.*	
1.20	select_one [SlumArea_choices]	SlumArea		Is this toilet in a slum area? (don't ask this question, just observe)	
		[SlumArea_choices]	1	Yes	
		[SlumArea_choices]	0	No	
		[SlumArea_choices]	999	Don't know	
1.21	note	approach		You may now approach the prospective respondent.	
1.22	note	consent		Introduction: My name is _____. [Add in study explanation and informed consent text here]	
1.23	select_one [SurveyType_choices]	SurveyType		Where are you conducting this survey?	
		[SurveyType_choices]	1	In a public toilet - accessible to anyone (this might be in a slum, at a market or at a bus/train station)	
		[SurveyType_choices]	2	In a community toilet - access restricted to local residents / members	
		[SurveyType_choices]	3	At a pre-school, school or university	
		[SurveyType_choices]	4	At a medical facility	
		[SurveyType_choices]	99	Other	
1.24	text	SurveyType_oth		Specify "other"	If 'other' is selected
1.25	select_one [startEd_choices]	startEd		Is there an operational toilet available for students to use here?	If 'At a pre-school, school or university' is

					selected for question 1.23 [SurveyType]
		[startEd_choices]	1	Yes	
		[startEd_choices]	0	No	
1.26	select_one [startMed_choices]	startMed		Is there an operational toilet available for patients to use here?	
		[startMed_choices]	1	Yes	
		[startMed_choices]	0	No	
1.27	select_one [start_choices]	start		Do you consent to participate in our survey?	If 'In a public toilet', 'In a community toilet' or 'other' is selected for question 1.23 [SurveyType], OR 'At a pre-school, school or university' is selected for question 1.23 [SurveyType] and 'Yes' is selected for question 1.25 [startEd], OR 'At a medical facility' is selected for question 1.23 [SurveyType] and 'Yes' is selected for question 1.26 [startMed]
		[start_choices]	1	Yes	
		[start_choices]	0	No	
1.28	select_one [RespGender_choices]	RespGender		Choose one specific person as your respondent. Tell them that you would like them to answer all of your questions. Now mark the gender of that person.	If 'Yes' is selected for question 1.27 [start]
		[RespGender_choices]	1	Male	
		[RespGender_choices]	2	Female	

		[RespGender_ choices]	3	Third gender	
1.29	acknowledge	Polite		Ask their name but do not record it anywhere	If 'Yes' is selected for question 1.27 [start]
1.30	text	last_name		What is your family last name?	If 'Yes' is selected for question 1.27 [start]
1.31	text	first_name		What is your first name?	If 'Yes' is selected for question 1.27 [start]
	end group				
	begin group	**FacInfo**		**Section 2: Facilities Information**	**If 'Yes' is selected for question 1.27 [start]**
2.1	select_multiple [TitlePT_choices]	TitlePT		What is your association with the PT?	If 'Yes' is selected for question 1.27 [start], AND 'In a public toilet' is selected for question 1.23 [SurveyType]
		[TitlePT_choices]	1	Manager	
		[TitlePT_choices]	2	Attendent	
		[TitlePT_choices]	3	Cashier	
		[TitlePT_choices]	4	Cleaner	
		[TitlePT_choices]	99	Other	
		[TitlePT_choices]	999	Don't know/don't wish to say	
2.2	text	TitlePT_oth		Specify "other"	If 'other' is selected
2.3	select_multiple [TitleCT_choices]	TitleCT		What is your association with the CT?	If 'Yes' is selected for question 1.27 [start], AND 'In a community toilet' is selected for question 1.23 [SurveyType]
		[TitleCT_choices]	1	Manager	
		[TitleCT_choices]	2	Attendent	
		[TitleCT_choices]	3	User/Member	
		[TitleCT_choices]	4	Cleaner	
		[TitleCT_choices]	99	Other	

		[TitleCT_choices]	999	Don't know/don't wish to say	
2.4	text	TitleCT_oth		Specify "other"	If 'other' is selected
2.5	integer	CoveragePT		What is the approximate number of households, or number of people, covered by this PT or CT? (put '999' if don't know)	If 'Yes' is selected for If 'Yes' is selected for question 1.27 [start], AND 'In a community toilet' or 'In a public toilet' is selected for questions 1.23 [SurveyType]
2.6	select_one [CoverageUnitPT_choices]	CoverageUnitPT		What was the unit used?	If 'Yes' is selected for question 1.27 [start], AND 'In a community toilet' is selected for question 1.23 [SurveyType], AND 'Don't know' is not entered for question 2.5 [CoveragePT]
		[CoverageUnitPT_choices]	1	number of households	
		[CoverageUnitPT_choices]	2	number of people	
2.7	integer	UsersPT		What is the average number of users? ___ *per day/week/month (put '999' if don't know)*	If 'Yes' is selected for question 1.27 [start], AND 'In a community toilet' or 'In a public toilet' is selected question 1.23 [SurveyType]
2.8	select_one [UsersUnitPT_choices]	UsersUnitPT		What was the unit used?	If 'Yes' is selected for question 1.27 [start], AND 'In a community toilet' or 'In a public toilet' is selected for question 1.23 [SurveyType], AND 'Don't know' is not entered for question 2.7 [UsersPT]
		[UsersUnitPT_choices]	1	per day	
		[UsersUnitPT_choices]	2	per week	

		[UsersUnitPT_choices]	3	per month	
2.9	integer	UsersGender		What percentage of these users are women and girls?	If 'Yes' is selected for question 1.27 [start], AND 'In a community toilet' or 'In a public toilet' is selected for question 1.23 [SurveyType], AND 'Don't know' is not entered for question 2.7 [UsersPT]
2.10	select_one [EdType_choices]	EdType		What kind of education center is this?	If 'Yes' is selected for question 1.27 [start], AND 'At a pre-school, school or university' is selected for question 1.23 [SurveyType]
		[EdType_choices]	1	pre-school	
		[EdType_choices]	2	primary school (including children of ages <10)	
		[EdType_choices]	3	secondary school (including children of ages 10+	
		[EdType_choices]	4	university	
		[EdType_choices]	99	Other	
		[EdType_choices]	999	Don't know/don't wish to say	
2.11	text	EdType_oth		Specify "other"	If 'other' is selected
2.12	select_one [EdTitle_choices]	EdTitle		What is your association with this education center?	If 'Yes' is selected for question 1.27 [start], AND 'At a pre-school, school or university' is selected for question 1.23 [SurveyType]
		[EdTitle_choices]	1	Principal	
		[EdTitle_choices]	2	Teacher	
		[EdTitle_choices]	3	Student	
		[EdTitle_choices]	4	Cleaner	

		[EdTitle_choices]	99	Other	
		[EdTitle_choices]	999	Don't know/don't wish to say	
2.13	text	EdTitle_oth		Specify "other"	If 'other' is selected
2.14	text	TitleEd		What is the name of your education center?	If 'Yes' is selected for question 1.27 [start], AND 'At a pre-school, school or university' is selected for question 1.23 [SurveyType]
2.15	integer	Students		How many students attend this school?	If 'Yes' is selected for question 1.27 [start], AND 'At a pre-school, school or university' is selected for question 1.23 [SurveyType]
2.16	integer	StudentsGender		What percentage of these students are girls?	If 'Yes' is selected for question 1.27 [start], AND 'At a pre-school, school or university' is selected for question 1.23 [SurveyType]
2.17	select_one [MedType_choices]	MedType		What kind of health center is this?	If 'Yes' is selected for question 1.27 [start] AND 'At a medical facility' is selected for question 1.23 [SurveyType]
		[MedType_choices]	1	Small, community clinic	
		[MedType_choices]	2	Large, community clinic	
		[MedType_choices]	3	Hospital	
		[MedType_choices]	99	Other	
		[MedType_choices]	999	Don't know/don't wish to say	
2.18	text	MedType_oth		Specify "other"	If 'other' is selected
2.19	select_one [MedTitle_choices]	MedTitle		What is your association with the health center?	If 'Yes' is selected for question 1.27 [start] AND 'At a medical facility' is selected for question 1.23 [SurveyType]

		[MedTitle_choices]	1	Doctor	
		[MedTitle_choices]	2	Nurse	
		[MedTitle_choices]	3	Administration	
		[MedTitle_choices]	4	Cleaner	
		[MedTitle_choices]	99	Other	
		[MedTitle_choices]	999	Don't know/don't wish to say	
2.20	text	MedTitle_oth		Specify "other"	If 'other' is selected
2.21	text	TitleMed		What is the name of your health center?	If 'Yes' is selected for question 1.27 [start] AND 'At a medical facility' is selected for question 1.23 [SurveyType]
		[TitleMed_choices]	1	per day	
		[TitleMed_choices]	2	per week	
		[TitleMed_choices]	3	per month	
2.22	select_one [Workers_choices]	Workers		Are there any persons whose primary job responsibility is dedicated to maintaining this toilet facility? Note: this might include part-time cleaners, attendants or managers	If 'Yes' is selected for question 1.27 [start]
		[Workers_choices]	1	yes	
		[Workers_choices]	2	no	
		[Workers_choices]	999	Don't know	
2.23	integer	Attendants_M		How many male toilet attandents work here (total on staff)? (put '999' if don't know)	If 'Yes' is selected for question 2.22 [Workers]

2.24	integer	AttendantsTime_M		What is the average number of hours worked per week for men in this position? *(put '999' if don't know)*	If 'Yes' is selected for question 2.22 [Workers], AND 'Don't know' or 'zero' is entered for question 2.23 [Attendants_M]
2.25	integer	AttendantsEarn_M		What is the average earnings per week for men in this position? If they earn tips, include the average amount with tips as well (put '999' if don't know)	If 'Yes' is selected for question 2.22 [Workers], AND 'Don't know' or 'zero' is entered for question 2.23 [Attendants_M]
2.26	integer	Attendants_F		How many female toilet attandents work here (total on staff)? (put '999' if don't know)	If 'Yes' is selected for question 2.22 [Workers]
2.27	integer	AttendantsTime_F		What is the average number of hours worked per week for women in this position? *(put '999' if don't know)*	If 'Yes' is selected for question 2.22 [Workers], AND 'Don't know' or 'zero' is entered for question 2.26 [Attendants_F]
2.28	integer	AttendantsEarn_F		What is the average earnings per week for women in this position? If they earn tips, include the average amount with tips as well (put '999' if don't know)	If 'Yes' is selected for question 2.22 [Workers], AND 'Don't know' or 'zero' is entered for question 2.26 [Attendants_F]
2.29	integer	Cleaners_M		How many male toilet facilities cleaners work here? (put '999' if don't know)	If 'Yes' is selected for question 2.22 [Workers]
2.30	integer	CleanersTime_M		What is the average number of hours worked per week for men in this position? *(put '999' if don't know)*	If 'Yes' is selected for question 2.22 [Workers], AND 'Don't know' or 'zero' is entered for question 2.29 [Cleaners_M]
2.31	integer	CleanersEarn_M		What is the average earnings per week for men in this position? If they earn tips, include the average amount with tips	If 'Yes' is selected for question 2.22 [Workers], AND 'Don't know' or 'zero' is entered for question 2.29 [Cleaners_M]

				as well (put '999' if don't know)	
2.32	integer	Cleaners_F		How many female toilet facilities cleaners work here? (put '999' if don't know)	If 'Yes' is selected for question 2.22 [Workers]
2.33	integer	CleanersTime_F		What is the average number of hours worked per week for women in this position? *(put '999' if don't know)*	If 'Yes' is selected for question 2.22 [Workers], AND 'Don't know' or 'zero' is entered for question 2.32 [Cleaners_F]
2.34	integer	CleanersEarn_F		What is the average earnings per week for women in this position? If they earn tips, include the average amount with tips as well (put '999' if don't know)	If 'Yes' is selected for question 2.22 [Workers], AND 'Don't know' or 'zero' is entered for question 2.32 [Cleaners_F]
2.35	select_one [OtherWorkers_choices]	OtherWorkers		Are there any other types of workers dedicated for this toilet facility?	If 'Yes' is selected for question 2.22 [Workers]
		[OtherWorkers_choices]	1	yes	
		[OtherWorkers_choices]	2	no	
		[OtherWorkers_choices]	999	Don't know	
2.36	text	WorkersOtherName		What is the job title for these other workers?	If 'Yes' is selected for question 2.35 [OtherWorkers]
2.37	integer	OthWork_M		How many male ${WorkersOtherName} work here (total on staff)? (put '999' if don't know)	If 'Yes' is selected for question 2.35 [OtherWorkers]
2.38	integer	OthWorkTime_M		What is the average number of hours worked per week for men in this position? *(put '999' if don't know)*	If 'Yes' is selected for question 2.35 [OtherWorkers], AND 'Don't know' or 'zero' is not entered for question 2.37 [OthWork_M]

2.39	integer	OthWorkEarn_M		What is the average earnings per week for men in this position? If they earn tips, include the average amount with tips as well (put '999' if don't know)	If 'Yes' is selected for question 2.35 [OtherWorkers], AND 'Don't know' or 'zero' is not entered for question 2.37 [OthWork_M]
2.40	integer	OthWork_F		How many female ${WorkersOtherName} work here (total on staff)? (put '999' if don't know)	If 'Yes' is selected for question 2.35 [OtherWorkers]
2.41	integer	OthWorkTime_F		What is the average number of hours worked per week for women in this position? *(put '999' if don't know)*	If 'Yes' is selected for question 2.35 [OtherWorkers], AND 'Don't know' or 'zero' is not entered for question 2.40 [OthWork_F]
42	integer	OthWorkEarn_F		What is the average earnings per week for women in this position? If they earn tips, include the average amount with tips as well (put '999' if don't know)	If 'Yes' is selected for question 2.35 [OtherWorkers], AND 'Don't know' or 'zero' is not entered for question 2.40 [OthWork_F]
	end group				
	begin group	**SanAcc**		**Section 3: Sanitation Access**	**If 'Yes' is selected for question 1.27 [start]**
3.1	select_one [ToiletFee_choices]	ToiletFee		Does this toilet charge any kind of fees? This could be a per use fee, a membership fee or a maintenance fee	**If 'Yes' is selected for question 1.27 [start],** AND 'In a community toilet' or 'In a public toilet' is selected for question 1.23 [SurveyType]
		[ToiletFee_choices]	1	Yes	
		[ToiletFee_choices]	0	No	
		[ToiletFee_choices]	999	Don't know / don't wish to say	
3.2	decimal	ToiletFeeAmount		What is the amount paid? *(put '999' if don't know)*	If 'Yes' is selected for the question 3.1 [ToiletFee]

3.3	select_one [ToiletFeeType_choices]	ToiletFeeType		What type of fee is this?	If 'Yes' is selected for the question 3.1 [ToiletFee], AND 'Don't know' is not entered for question 3.2 [ToiletFeeAmount]
		[ToiletFeeType_choices]	1	per use	
		[ToiletFeeType_choices]	2	per month	
		[ToiletFeeType_choices]	99	other	
3.4	text	ToiletFeeType_oth		Specify "other"	If 'other' is selected
3.5	integer	WaitTimeWomen		What is the average wait time for women between 6am-10am and 6pm-10pm (in minutes)? Please answer in minutes *(put '999' if don't know)*	If 'Yes' is selected for question 1.27 [start], AND 'In a community toilet' or 'In a public toilet' is selected for question 1.23 [SurveyType]
3.6	integer	WaitTimeMen		What is the average wait time for men between 6am-10am and 6pm-10pm (in minutes)? Please answer in minutes *(put '999' if don't know)*	If 'Yes' is selected for question 1.27 [start], AND 'In a community toilet' or 'In a public toilet' is selected for question 1.23 [SurveyType]
3.7	select_one [LightPT1_choices]	LightPT1		Is the path to these facilities well-lit at night?	If 'Yes' is selected for question 1.27 [start], AND 'In a community toilet' or 'In a public toilet' is selected for question 1.23 [SurveyType]
		[LightPT1_choices]	1	yes	
		[LightPT1_choices]	2	no	
		[LightPT1_choices]	999	Don't know	
3.8	select_one [LightPT2_choices]	LightPT2		Are the facilities well-lit at night?	If 'Yes' is selected for question 1.27 [start], AND 'In a community toilet' or 'In a public toilet' is selected for

					question 1.23 [SurveyType]
		[LightPT2_choices]	1	yes	
		[LightPT2_choices]	2	no	
		[LightPT2_choices]	999	Don't know	
3.9	select_one [FacilityGender_choices]	FacilityGender		Are there separate facilities for different genders?	If 'Yes' is selected for question 1.27 [start]
		[FacilityGender_choices]	1	yes	
		[FacilityGender_choices]	2	no	
		[FacilityGender_choices]	999	Don't know	
3.10	select_one [Entrance1_choices]	Entrance1		Is there a visible entrance, with clear signage?	If 'Yes' is selected for question 1.27 [start]
		[Entrance1_choices]	1	yes	
		[Entrance1_choices]	2	no	
		[Entrance1_choices]	999	Don't know	
3.11	select_one [Entrance2_choices]	Entrance2		Are there separate entrances for each gender, with clear signage?	If 'Yes' is selected for question 1.27 [start], AND 'Yes' is selected for question 3.9 [FacilityGender]
		[Entrance2_choices]	1	yes	
		[Entrance2_choices]	2	no	
		[Entrance2_choices]	999	Don't know	
3.12	acknowledge	Access		For the next few questions, we are referring to the path leading up to the entrance, the entrance itself, and inside the toilet/latrine facilities.	If 'Yes' is selected for question 1.27 [start]

3.13	select_one [EntranceStairs_choices]	EntranceStairs		Are there any stairs or steps?	If 'Yes' is selected for question 1.27 [start]
		[EntranceStairs_choices]	1	yes	
		[EntranceStairs_choices]	2	no	
		[EntranceStairs_choices]	999	Don't know	
3.14	select_one [EntranceRamp1_choices]	EntranceRamp1		Are there any sloped ramps?	If 'Yes' is selected for question 1.27 [start]
		[EntranceRamp1_choices]	1	yes	
		[EntranceRamp1_choices]	2	no	
		[EntranceRamp1_choices]	999	Don't know	
3.15	select_one [EntranceRamp2_choices]	EntranceRamp2		Is the slope of the ramp gradual enough for easy access for wheelchair users and elderly people with canes or walkers?	If 'Yes' is selected for question 1.27 [start], , AND 'Yes' is selected for question 3.14 [EnteranceRamp1]
		[EntranceRamp2_choices]	1	yes	
		[EntranceRamp2_choices]	2	no	
		[EntranceRamp2_choices]	999	Don't know	
3.16	select_one [EntranceRamp_choices]	EntranceRamp		Are railings along all stairs, steps and ramps?	If 'Yes' is selected for question 1.27 [start], AND 'Yes' is selected for question 3.13 [EntranceStairs] or 'Yes' is selected for question 3.14 [EnteranceRamp1]
		[EntranceRamp_choices]	1	yes	
		[EntranceRamp_choices]	2	no	
		[EntranceRamp_choices]	999	Don't know	
3.17	integer	ToiletAll		How many total separate toilet stalls are available? (put '999' if don't know)	If 'Yes' is selected for question 1.27 [start]

3.18	integer	ToiletMen		How many separate toilet stalls are available for boys and men? (put '999' if don't know)	If 'Yes' is selected for question 3.9 [FacilityGender]
3.19	integer	Urinals		How many separate urinals are available for boys and men? (put '999' if don't know)	If 'Yes' is selected for question 3.9 [FacilityGender]
3.20	select_one [UrineFlush_choices]	UrineFlush		Do all urinals have either a flush valve or an odor trap?	If 'Yes' is selected for question 3.9 [FacilityGender]
		[UrineFlush_choices]	1	yes	
		[UrineFlush_choices]	2	no	
		[UrineFlush_choices]	999	Don't know	
3.21	integer	ToiletWomen		How many separate toilet stalls are available for women and girls? (put '999' if don't know)	If 'Yes' is selected for question 3.9 [FacilityGender]
3.22	select_multiple [PrivacyW_choices]	PrivacyW		Do these facilities provide adequate privacy for women and girls? If so, please indicate the features provided. *Note: mark all that apply*	If 'Yes' is selected for question 1.27 [start]
		[PrivacyW_choices]	1	Occluded stall entrances (the stall entrances cannot be seen from outside the facilities).	
		[PrivacyW_choices]	2	No gaps in the stalls through which the users can be seen	
		[PrivacyW_choices]	3	All doors and stalls have operational locking mechanisms	
		[PrivacyW_choices]	0	None of the above	
		[PrivacyW_choices]	999	Don't know	
3.23	integer	ToiletThirdGender		How many separate toilet stalls are available third-gender/transgender? (put '999' if don't know)	If 'Yes' is selected for question 3.9 [FacilityGender]

3.24	select_multiple [PrivacyT_choices]	PrivacyT		Do these facilities provide adequate privacy for third-gender/transgender? If so, please indicate the features provided. *Note: mark all that apply*	If 'Yes' is selected for question 1.27 [start]
		[PrivacyT_choices]	1	Occluded stall entrances (the stall entrances cannot be seen from outside the facilities).	
		[PrivacyT_choices]	2	No gaps in the stalls through which the users can be seen	
		[PrivacyT_choices]	3	All doors and stalls have operational locking mechanisms	
		[PrivacyT_choices]	0	None of the above	
		[PrivacyT_choices]	999	Don't know	
3.25	select_multiple [DAbleAccess_choices]	DAbleAccess		Is there at least one stall which is designed to be used for differently abled users? If so, please indicate the features provided. *Note: mark all that apply*	If 'Yes' is selected for question 1.27 [start]
		[DAbleAccess_choices]	1	Space to maneuver a wheelchair inside the stall	
		[DAbleAccess_choices]	2	Grab bars inside the stall	
		[DAbleAccess_choices]	3	Non-slippery floor	
		[DAbleAccess_choices]	4	Wash basin near the entrance	
		[DAbleAccess_choices]	0	None of the above	
		[DAbleAccess_choices]	999	Don't know	
3.26	select_multiple [DAbleAccessMen_choices]	DAbleAccessMen		Is there at least one male stall which is designed to be used for differently abled users? If so, please indicate the features	If 'Yes' is selected for question 3.9 [FacilityGender]

				provided. *Note: mark all that apply*	
		[DAbleAccessMen_choices]	1	Space to maneuver a wheelchair inside the stall	
		[DAbleAccessMen_choices]	2	Grab bars inside the stall	
		[DAbleAccessMen_choices]	3	Non-slippery floor	
		[DAbleAccessMen_choices]	4	Wash basin near the entrance	
		[DAbleAccessMen_choices]	0	None of the above	
		[DAbleAccessMen_choices]	999	Don't know	
3.27	select_multiple [DAbleAccessWom_choices]	DAbleAccessWom		Is there at least one female stall which is designed to be used for differently abled users? If so, please indicate the features provided. *Note: mark all that apply*	If 'Yes' is selected for question 3.9 [FacilityGender]
		[DAbleAccessWom_choices]	1	Space to maneuver a wheelchair inside the stall	
		[DAbleAccessWom_choices]	2	Grab bars inside the stall	
		[DAbleAccessWom_choices]	3	Non-slippery floor	
		[DAbleAccessWom_choices]	4	Wash basin near the entrance	
		[DAbleAccessWom_choices]	0	None of the above	
		[DAbleAccessWom_choices]	999	Don't know	
3.28	select_multiple [DAbleAccessTrans_choices]	DAbleAccessTrans		Is there at least one third-gender/transgender stall which is designed to be used for differently abled users? If so, please indicate the features provided. *Note: mark all that apply*	If 'Yes' is selected for question 3.9 [FacilityGender]
		[DAbleAccessTrans _choices]	1	Space to maneuver a wheelchair inside the stall	

		[DAbleAccessTrans _choices]	2	Grab bars inside the stall	
		[DAbleAccessTrans _choices]	3	Non-slippery floor	
		[DAbleAccessTrans _choices]	4	Wash basin near the entrance	
		[DAbleAccessTrans _choices]	0	None of the above	
		[DAbleAccessTrans _choices]	999	Don't know	
3.29	select_one [WatSeal_choices]	WatSeal		Do these toilets have a water seal?	If 'Yes' is selected for question 1.27 [start]
		[WatSeal_choices]	1	yes	
		[WatSeal_choices]	2	no	
		[WatSeal_choices]	999	Don't know	
3.30	select_one [Squat_choices]	Squat		Do these toilets have squat plates that can be kept clean and does not break easily?	If 'No' is selected for question 3.29 [WatSeal]
		[Squat_choices]	1	yes	
		[Squat_choices]	2	no	
		[Squat_choices]	999	Don't know	
3.31	select_one [Water1_choices]	Water1		Is water available at the toilet/latrine facilities?	If 'Yes' is selected for question 1.27 [start]
		[Water1_choices]	1	yes	
		[Water1_choices]	2	no	
		[Water1_choices]	999	Don't know	
3.32	select_one [Water2_choices]	Water2		When water is available at the facility, is it made available inside the stalls? This might be an operational tap or a bucket/barrel. *Note: Probe a bit in order to find the correct answer*	If 'Yes' is selected for questions 3.31 [Water1]

		[Water2_choices]	1	Water is available at the facility, but not inside any of the stalls	
		[Water2_choices]	2	Water is available inside one or more of the stalls, but not all of the stalls	
		[Water2_choices]	3	Water is available inside all of the stalls	
		[Water2_choices]	999	Don't know	
3.33	select_one [Water3_choices]	Water3		Is there a wash basin available for washing?	If 'Yes' is selected for question 1.27 [start],
		[Water3_choices]	1	yes	
		[Water3_choices]	2	no	
		[Water3_choices]	999	Don't know	
3.34	select_one [Soap_choices]	Soap		Is there soap available?	If 'Yes' is selected for question 1.27 [start],
		[Soap_choices]	1	yes	
		[Soap_choices]	2	no	
		[Soap_choices]	999	Don't know	
3.35	select_multiple [MHM_PT_choices]	MHM_PT		Are there adequate facilities for Menstrual Hygiene Management (MHM)? *Note: mark all that apply*	If 'Yes' is selected for question 1.27 [start],
		[MHM_PT_choices]	1	A place for the discrete and private disposal of MHM products is available	
		[MHM_PT_choices]	2	A discrete and private place where women and girls can wash themselves or their clothes is available	
		[MHM_PT_choices]	3	MHM products are available and can be obtained at this facility	
		[MHM_PT_choices]	0	None of the above	
		[MHM_PT_choices]	999	Don't know	

3.36	select_one [PTClean_choices]	PTClean		Are these facilities clean and well maintained?	If 'Yes' is selected for question 1.27 [start],
		[PTClean_choices]	1	yes	
		[PTClean_choices]	2	no	
		[PTClean_choices]	999	Don't know	
	end group				
	begin group	**Cont**		**Section 4: Containment and Collection**	**If 'Yes' is selected for question 1.27 [start],**
4.1	acknowledge	ContNote		The next few questions are regarding the discharge of wastewater and the handling of fecal sludge.	If 'Yes' is selected for question 1.27 [start],
4.2	select_one [BlackWDisposal_choices]	BlackWDisposal		To where does this toilet/latrine discharge? *Note: if they know it is a pit, but they are not sure if it is a soakpit or a pit, mark 'pit'*	If 'Yes' is selected for question 1.27 [start],
		[BlackWDisposal_choices]	1	Septic Tank	
		[BlackWDisposal_choices]	2	Pit	
		[BlackWDisposal_choices]	3	Soakpit	
		[BlackWDisposal_choices]	4	Nearby underground sewer	
		[BlackWDisposal_choices]	5	Nearby drain	
		[BlackWDisposal_choices]	99	Other	
		[BlackWDisposal_choices]	999	I don't know	
4.3	select_one [OpenDrain1_choices]	OpenDrain1		Is the drain open or closed (covered)?	If 'Nearby drain' is selected for question 4.2 [BlackWDisposal]
		[OpenDrain1_choices]	1	Closed/covered	
		[OpenDrain1_choices]	2	Open	
		[OpenDrain1_choices]	999	I don't know	

4.4	select_one [LinedDrain1_choices]	LinedDrain1		Is the drain lined with cement (bottom and both sides)?	If 'Nearby drain' is selected for question 4.2 [BlackWDisposal]
		[LinedDrain1_choices]	1	Yes	
		[LinedDrain1_choices]	0	No	
		[LinedDrain1_choices]	999	I don't know	
	begin group	**SepPit**		**Septic Tanks and Pits**	**If 'Septic Tank', 'Pit' , or 'Soakpit' is selected for question 4.2 [BlackWDisposal]**
4.5	integer	AgeSeptic		Age of the Septic Tank / Pit / Soakpit (Years) (put 999 if 'don't know')	
4.6	select_one [AgeSepticUnits_choices]	AgeSepticUnits		Units Used:	
		[AgeSepticUnits_choices]	1	months	
		[AgeSepticUnits_choices]	2	years	
4.7	select_one [ToiletWasteTechnical1_choices]	ToiletWasteTechnical1		Shape of Septic Tank / Pit / Soakpit (Select any one)	
		[ToiletWasteTechnical1_choices]	1	Round / Cylindrical	
		[ToiletWasteTechnical1_choices]	2	Rectangular	
		[ToiletWasteTechnical1_choices]	999	I don't know	
4.8	select_one [ToiletWasteTechnical2_choices]	ToiletWasteTechnical2		Area of land taken by Septic tank/ Pit / Soakpit (Select any one)	
		[ToiletWasteTechnical2_choices]	1	20 sq ft (2 m2) or less	

		[ToiletWasteTechnical2_choices]	2	more than 20 sq ft (2 m2) but less than or equal to 40 sq ft (4 m2)	
		[ToiletWasteTechnical2_choices]	3	more than 40 sq ft (4 m2)	
		[ToiletWasteTechnical2_choices]	999	I don't know	
4.9	select_one [ToiletWasteTechnical3_choices]	ToiletWasteTechnical3		What is the wall material of your septic tank / pit?	
		[ToiletWasteTechnical3_choices]	1	Pre-fabricated cement/concrete	
		[ToiletWasteTechnical3_choices]	2	Cast in-situ concrete	
		[ToiletWasteTechnical3_choices]	3	Reinforced cement concrete (RCC)	
		[ToiletWasteTechnical3_choices]	4	Bricks	
		[ToiletWasteTechnical3_choices]	5	Stone masonry	
		[ToiletWasteTechnical3_choices]	6	Pre-fabricated plastic	
		[ToiletWasteTechnical3_choices]	999	Other	
4.10	text	ToiletWasteTechnical3_other		specify "other"	If 'other response' is selected
4.11	select_one [ToiletWasteTechnical4_choices]	ToiletWasteTechnical4		Bottom material of Septic Tank / Pit (Select any one)	
		[ToiletWasteTechnical4_choices]	1	Gravel	

		[ToiletWasteTechnical4_choices]	2	Concrete	
		[ToiletWasteTechnical4_choices]	3	Plastic	
		[ToiletWasteTechnical4_choices]	99	Other	
		[ToiletWasteTechnical4_choices]	999	I don't know	
4.12	select_one [ToiletWasteTechnical5_choices]	ToiletWasteTechnical5		What is the structure of your septic tank / pit?	
		[ToiletWasteTechnical5_choices]	1	Completely water tight walls and bottom	
		[ToiletWasteTechnical5_choices]	2	Water tight walls, but open/gravel bottom	
		[ToiletWasteTechnical5_choices]	3	Perforated walls and bottom	
		[ToiletWasteTechnical5_choices]	999	I don't know	
4.13	select_one [SeptictankOutlet_choices]	SeptictankOutlet		Wastewater from septic tank/ pit is released into? (Select any one)	
		[SeptictankOutlet_choices]	1	It does not have outfall	
		[SeptictankOutlet_choices]	2	Overflows into a nearby drain	
		[SeptictankOutlet_choices]	3	Overflows into a nearby underground sewer	
		[SeptictankOutlet_choices]	4	Overflows into a soak pit/trench specifically made for this purpose	
		[SeptictankOutlet_choices]	5	Overflows into a cow manure pit	
		[SeptictankOutlet_choices]	6	Release it into the ground	

		[SeptictankOutlet_choices]	7	Outfalls directly to surface water or temporary wetland/pool	
		[SeptictankOutlet_choices]	99	I don't know	
		[SeptictankOutlet_choices]	999	Other	
4.14	select_one [OpenDrain2_choices]	OpenDrain2		Is the drain closed (covered) or open ?	If 'Overflows into a nearby drain' is selected question 4.13 [SeptictankOutlet]
		[OpenDrain2_choices]	1	Closed (covered)	
		[OpenDrain2_choices]	2	Open	
		[OpenDrain2_choices]	999	I don't know	
4.15	select_one [LinedDrain2_choices]	LinedDrain2		Is the drain lined with cement (bottom and both sides)?	If 'Overflows into a nearby drain' is selected for question 4.13 [SeptictankOutlet]
		[LinedDrain2_choices]	1	Yes	
		[LinedDrain2_choices]	0	No	
		[LinedDrain2_choices]	999	I don't know	
4.16	select_one [fill_vol_choices]	fill_vol		How full is your septic tank/ pit / soakpit? *Note: Read all the answer options and allow them to choose one.*	
		[fill_vol_choices]	1	Over-flowing	
		[fill_vol_choices]	2	Full	
		[fill_vol_choices]	3	Close to full	
		[fill_vol_choices]	4	More than half full	
		[fill_vol_choices]	5	Half full	
		[fill_vol_choices]	6	Less than half full	

		[fill_vol_choices]	7	Almost empty	
		[fill_vol_choices]	8	Empty	
		[fill_vol_choices]	99	I don't know/I'd rather not say	
4.17	select_one [pittfill_before_choices]	pittfill_before		Has this septic tank/ pit / soakpit ever been full before?	
		[pittfill_before_choices]	1	Yes	
		[pittfill_before_choices]	0	No	
		[pittfill_before_choices]	99	I don't know/I'd rather not say	
4.18	integer	pitfillfreq		How often does your septic tank/ pit / soakpit system fill? *Once every ___ months/years* *(type '999' if 'don't know')*	
4.19	select_one [pitfillfreq_units_choices]	pitfillfreq_units		What is the time period mentioned?	If 'Don't know' is not entered for question 4.18 [pitfillfreq]
		[pitfillfreq_units_choices]	1	month	
		[pitfillfreq_units_choices]	2	year	
4.20	select_one [emptypract1_choices]	emptypract1		When your septic tank/ pit / soakpit is full, what do you do? *Note: Don't read the options to them.*	
		[emptypract1_choices]	1	seal it	
		[emptypract1_choices]	2	empty it	
		[emptypract1_choices]	3	do nothing, use a neighbor's toilet/latrine	
		[emptypract1_choices]	4	do nothing, instead do open defecation	
		[emptypract1_choices]	5	use detergent/chemical reagent to decrease sludge volume	
		[emptypract1_choices]	6	do nothing, call the landlord	

		[emptypract1_choices]	99	other	
		[emptypract1_choices]	999	I don't know/I'd rather not say	
4.21	text	emptypract1_oth		specify "other"	If 'other' is selected
4.22	select_one [emptypract2_choices]	emptypract2		Who emptied it?	If 'empty it' is selected for question 4.20 [emptypract1]
		[emptypract2_choices]	1	We did it ourselves	
		[emptypract2_choices]	2	We hired an informal worker to empty it	
		[emptypract2_choices]	3	We hired a private company to empty it	
		[emptypract2_choices]	4	We hired the government service to empty it	
		[emptypract2_choices]	99	other	
		[emptypract2_choices]	999	I don't know/I'd rather not say	
4.23	text	emptypract2_oth		specify "other"	If 'other' is selected
4.24	select_one [emptypract3_choices]	emptypract3		How did they empty it?	If 'empty it' is selected for question 4.20 [emptypract1]
		[emptypract3_choices]	1	Only using simple tools (shovels, picks, buckets etc)	
		[emptypract3_choices]	2	Pumped out with a gulper	
		[emptypract3_choices]	3	Pumped out with a vacuum truck	
		[emptypract3_choices]	99	Other	
		[emptypract3_choices]	999	I don't know/I'd rather not say	
4.25	select_one [emptypract4_choices]	emptypract4		Were they using any of the following safety equipment? This includes: - Full Body suits - Face masks - Gumboots - Hand gloves	If 'empty it' is selected for question 4.20 [emptypract1]

				- Helmets - Goggles/safety glasses	
		[emptypract4_ choices]	1	Yes, all were worn	
		[emptypract4_ choices]	2	Some were worn	
		[emptypract4_ choices]	3	None were worn	
		[emptypract4_ choices]	999	I don't know/I'd rather not say	
5.26	select_one [emptypract5 _choices]	emptypract5		What did you/they do with the fecal sludge?	If 'empty it' is selected for question 4.20 [emptypract1]
		[emptypract5_ choices]	1	Dump contents in the environment/wetland	
		[emptypract5_ choices]	2	Dump contents in an open drain	
		[emptypract5_ choices]	3	Dump contents into an underground sewer	
		[emptypract5_ choices]	4	Bury the contents in a hole dug on our compound	
		[emptypract5_ choices]	5	Bury the contents in a hole dug outside of our compound	
		[emptypract5_ choices]	6	It is brought to a treatment plant	
		[emptypract5_ choices]	7	It is used in a nearby garden	
		[emptypract5_ choices]	8	It is added to a nearby cow manure pit	
		[emptypract5_ choices]	9	It is brought to farms, treated and then mixed with the soil	
		[emptypract5_ choices]	10	It is brought to farms, not treated and then mixed with the soil	
		[emptypract5_ choices]	99	other	
		[emptypract5_ choices]	999	I don't know/I'd rather not say	

4.27	text	emptypract5_oth		specify "other"	If 'other' is selected
4.28	integer	cost_empty		How much did you pay to empty your latrine or septic tank? *(type '99' if 'don't know')*	If 'We hired an informal worker to empty it', 'We hired a private company to empty it', or 'We hired the government service to empty it' is selected for question 4.22 [emptypract2]
	end group				
4.29	select_one [see_toilet_choices]	see_toilet		May I take a look at your toilet/latrine?	If 'Yes' is selected for question 1.27 [start]
		[see_toilet_choices]	1	Yes	
		[see_toilet_choices]	0	No	
4.30	select_one [Aesthetic_choices]	Aesthetic		Does the toilet have a good aesthetic appearance?	If 'Yes' is selected for question 4.29 [see_toilet]
		[Aesthetic_choices]	1	Yes	
		[Aesthetic_choices]	2	No	
		[Aesthetic_choices]	999	I don't know/I'd rather not say	
4.31	select_one [Clean_choices]	Clean		Is the toilet clean and well maintained?	If 'Yes' is selected for question 4.29 [see_toilet]
		[Clean_choices]	1	Yes	
		[Clean_choices]	2	No	
		[Clean_choices]	999	I don't know/I'd rather not say	
4.32	select_one [latrineobs_type_choices]	latrineobs_type		What kind of toilet/latrine is it?	If 'Yes' is selected for question 4.29 [see_toilet]
		[latrineobs_type_choices]	1	VIP Pit Latrine	
		[latrineobs_type_choices]	2	Pit Latrine, No ventilation	
		[latrineobs_type_choices]	3	Double Pit, VIP	

		[latrineobs_type_choices]	4	Flush/pour flush latrine	
		[latrineobs_type_choices]	5	Latrine with Drainage to a stream/body of water	
		[latrineobs_type_choices]	6	Latrine connected to a septic tank	
		[latrineobs_type_choices]	7	Latrine connected to a burrow hole	
		[latrineobs_type_choices]	99	Other	
		[latrineobs_type_choices]	999	I don't know	
4.33	text	latrineobs_type_oth		Specify "other" type of toilet/latrine	If 'Other' is selected
4.34	select_multiple [latrineobs_slab_choices]	latrineobs_slab		Observe all slab features and check all that apply	If 'Yes' is selected for question 4.29 [see_toilet]
		[latrineobs_slab_choices]	1	sitting slab	
		[latrineobs_slab_choices]	2	squatting slab	
		[latrineobs_slab_choices]	3	No slab	
		[latrineobs_slab_choices]	99	Other	
		[latrineobs_slab_choices]	999	I don't know	
4.35	text	latrineobs_slab_oth		Specify other slab features	If 'Other' is selected
	end group				
	begin group	**End**		**Section 5: End**	
5.1	select_one [questions_choices]	questions		Do you have any remaining questions? *(If yes, try to answer their questions. If you cannot answer their questions, refer them to the phone number on the contact card).*	If 'Yes' is selected for question 1.27 [start]
		[questions_choices]	1	Yes	
		[questions_choices]	0	No	

5.2	text	remaining_doubt		(Note: Write a brief summary of their question here. Try to answer their question. If you can't, kindly suggest to them that they can call the contact phone number)	If 'Yes' is selected for question 5.1 [questions]
5.3	text	comment		If you, the enumerator, have any general comments, you can write them here.	If 'Yes' is selected for question 1.27 [start]
5.4	geopoint	GEOpoint		Lat/Long of toilet/latrine facilities	
	calculate	latitude1			
	calculate	longitude1			
	calculate	accuracy1			
5.5	note	output1		Accuracy: ${accuracy1} m	If the error margin of the GPS reading [accuracy1] is greater than 20 meters
5.6	select_one [Complete_choices]	Complete		Is this a complete survey?	
		[Complete_choices]	1	Yes	
		[Complete_choices]	0	No	
5.7	integer	PartialNumber		On what question number did you stop?	If 'No' is selected for question 5.6 [Complete]
5.8	note	end		This is the end of the survey. If you have completed the survey, press "save and finalize".	
	end group				

3. Desludging Services Survey

#	type	list_name	name	label::English	Skip Logic: These questions only appear when the stated conditions are satisfied
	begin group	**Intro**		**Section 1: Introduction**	
1.1	start	start_time		Start Time	
1.2	end	end_time		End Time	
1.3	today	auto_date		Date of Survey	
1.4	deviceid	deviceid		Device ID	
1.5	simserial	simserial		SIM Serial Number	
1.6	phonenumber	phone		Enumerator's phone number	
1.7	integer	day		Please enter the current day (numeric)	
1.8	integer	month		Please enter the current month (numeric)	
1.9	select_one [EnumName_choices]	EnumName		Enter Enumerator Name	
		[EnumName_choices]	1	first Enumerator	
		[EnumName_choices]	2	second Enumerator	
		[EnumName_choices]	3	third Enumerator	
		[EnumName_choices]	4	Other	
1.10	text	EnumName_oth		Specify "other"	If 'Other' is selected
1.11	calculate	HHIDsMin			
1.12	calculate	HHIDsMax			
1.13	integer	Resp_ID		Input your desludging operator survey id	

1.14	select_one [district_choices]	district		What is the name of the [sector/district]?	
		[district_choices]	1	First District	
		[district_choices]	2	Second District	
		[district_choices]	3	Third District	
		[district_choices]	4	Fourth District	
1.15	select_one [village1_choices]	village1		What is the name of the [cell/village/ward]?	If district '1' is selected
		[village1_choices]	1	First Village - First District	
		[village1_choices]	2	Second Village - First District	
		[village1_choices]	3	Third Village - First District	
		[village1_choices]	4	Fourth Village - First District	
1.16	select_one [village2_choices]	village2		What is the name of the [cell/village/ward]?	If district '2' is selected
		[village2_choices]	1	First Village - Second District	
		[village2_choices]	2	Second Village - Second District	
		[village2_choices]	3	Third Village - Second District	
		[village2_choices]	4	Fourth Village - Second District	
1.17	select_one [village3_choices]	village3		What is the name of the [cell/village/ward]?	If district '3' is selected
		[village3_choices]	1	First Village - Third District	
		[village3_choices]	2	Second Village - Third District	
		[village3_choices]	3	Third Village - Third District	

		[village3_choices]	4	Fourth Village - Third District	
1.18	select_one [village4_choices]	village4		What is the name of the [cell/village/ward]?	If district '4' is selected
		[village4_choices]	1	First Village - Fourth District	
		[village4_choices]	2	Second Village - Fourth District	
		[village4_choices]	3	Third Village - Fourth District	
		[village4_choices]	4	Fourth Village - Fourth District	
1.19	text	pop_loc_name		What is the popular name of this area called? *Note: you may write the name of a landmark, popular person or any other reference point. If none, leave blank.*	
1.20	select_one [SlumArea_choices]	SlumArea		Is this survey being conducted in a slum area? (don't ask this question, just observe)	
		[SlumArea_choices]	1	Yes	
		[SlumArea_choices]	0	No	
		[SlumArea_choices]	999	Don't know	
1.21	note	approach		You may now approach the prospective respondent.	
1.22	note	consent		Introduction: My name is _____. [Add in study explanation and informed consent text here]	
1.23	select_one [DesludgeYN1_choices]	DesludgeYN1		Does your primary source of income come from the provision of desludging services? *Note: if they work for*	

				a business that provides desludging services, but they themselves do not do the work of collecting fecal sludge, you should still mark 'yes'	
		[DesludgeYN1_choices]	1	Yes	
		[DesludgeYN1_choices]	0	No	
1.24	select_one [DesludgeYN2_choices]	DesludgeYN2		Do you own a business that provides desludging services?	
		[DesludgeYN2_choices]	1	Yes	
		[DesludgeYN2_choices]	0	No	
1.25	select_one [start_choices]	start		Do you consent to participate in our survey?	If 'Yes' is selected for the Section 1 - question 24 [DesludgeYN2], OR Section 1 - question 23 [DesludgeYN1]
		[start_choices]	1	Yes	
		[start_choices]	0	No	
1.26	select_one [RespGender_choices]	RespGender		Choose one specific person as your respondent. Tell them that you would like them to answer all of your questions. Now mark the gender of that person.	If 'Yes' is selected for Section 1 - question 25 [start]
		[RespGender_choices]	1	Male	
		[RespGender_choices]	2	Female	
		[RespGender_choices]	3	Third gender	

1.27	acknowledge	Polite		Ask their name but do not record it anywhere	If 'Yes' is selected for question 1.25 [start]
1.28	text	last_name		What is your family last name?	If 'Yes' is selected for question 1.25 [start]
1.29	text	first_name		What is your first name?	If 'Yes' is selected for question 1.25 [start]
	end group				
	begin group	**WorkEnv**		**Section 2: Work Environment**	
2.1	select_one [Business_choices]	Business		What is the status of your employment? *Note: Read all answer options to them, then allow them to choose one. If they work one full-time and another part-time, answer for the full-time employment only.*	If 'Yes' is selected for question 1.25 [start], AND question 1.23 [DesludgeYN1]
		[Business_choices]	1	I work full-time for a business which has at least one other employee, besides myself	
		[Business_choices]	2	I work part-time for a business which has at least one other employee, besides myself	
		[Business_choices]	3	I work full-time as an individual, independent service provider	
		[Business_choices]	4	I work part-time as an individual, independent service provider	
		[Business_choices]	999	Don't know/don't wish to say	

	begin group	Employment		Employees	If 'I work part-time for a business which has at least one other employee, besides mysef' or 'I work full-time for a business which has at least one other employee, besides myself' is selected for question 2.1 [Business], OR if 'Yes' is selected for question 1.24 [DesludgeYN2]
2.2	select_one [BusinessFam_choices]	BusinessFam		Is this a family business? *Note: a family business means that the majority of the employees are related to the owner*	
		[BusinessFam_choices]	1	Yes	
		[BusinessFam_choices]	2	No	
		[BusinessFam_choices]	999	Don't know/don't wish to say	
2.3	select_one [BusinessForm_choices]	BusinessForm		Is this a registered business?	
		[BusinessForm_choices]	1	Yes	
		[BusinessForm_choices]	2	No	
		[BusinessForm_choices]	999	Don't know/don't wish to say	
2.4	integer	Emp		How many people, including yourself, are employed by this business? (put '999' if don't know)	
2.5	note	Inclusion		For the next few questions I will ask you about the men and women working for this business.	

				You should include yourself where appropriate.	
2.6	integer	EmpFTW		How many women are employed full-time by this business? *Note: Full-time is defined as averaging 30 hrs or more per week* *(put '999' if don't know)*	
2.7	integer	EmpFTW_Hrs		What is the average number of hours worked per week by full-time women? *(put '999' if don't know)*	If 'Don't know' or 'zero' is not entered for question 2.6 [EmpFTW]
2.8	integer	EmpFTW_Wage		What is the average earnings per week for full-time women? *(put '999' if don't know)*	If 'Don't know' or 'zero' is not entered for question 2.6 [EmpFTW]
2.9	integer	EmpPTW		How many women are employed part-time by this business? Note: part-time is defined as averaging below 30 hrs per week *(put '999' if don't know)*	
2.10	integer	EmpPTW_Hrs		What is the average number of hours worked per week by part-time women? *(put '999' if don't know)*	If 'Don't know' or 'zero' is not entered for question 2.9 [EmpPTW]
2.11	integer	EmpPTW_Wage		What is the average earnings per week for part-time women?	If 'Don't know' or 'zero' is not entered for question 2.9 [EmpPTW]

				(put '999' if don't know)	
2.12	integer	EmpFTM		How many men are employed full-time by this business? *Note: Full-time is defined as averaging 30 hrs or more per week* *(put '999' if don't know)*	
2.13	integer	EmpFTM_Hrs		What is the average number of hours worked per week by full-time men? *(put '999' if don't know)*	If 'Don't know' or 'zero' is not entered for question 2.12 [EmpFTM]
2.14	integer	EmpFTM_Wage		What is the average earnings per week for full-time men? *(put '999' if don't know)*	If 'Don't know' or 'zero' is not entered for question 2.12 [EmpFTM]
2.15	integer	EmpPTM		How many men are employed part-time by this business? *Note: part-time is defined as averaging below 30 hrs per week* *(put '999' if don't know)*	
2.16	integer	EmpPTM_Hrs		What is the average number of hours worked per week by part-time men? *(put '999' if don't know)*	If 'Don't know' or 'zero' is not entered for question 2.15 [EmpPTM]
2.17	integer	EmpPTM_Wage		What is the average earnings per week for part-time men? *(put '999' if don't know)*	If 'Don't know' or 'zero' is not entered for question 2.15 [EmpPTM]
	end group				

2.18	select_multiple [PPE_choices]	PPE		What gear is normally used while emptying septic tanks/ pits/ soakpits?	If 'Yes' is selected for question 1.25 [start]
		[PPE_choices]	1	Full body suit	
		[PPE_choices]	2	Face mask	
		[PPE_choices]	3	Gumboots	
		[PPE_choices]	4	Hand gloves	
		[PPE_choices]	5	Helmet	
		[PPE_choices]	6	Safety glasses/goggles	
		[PPE_choices]	0	None of the above	
		[PPE_choices]	999	I don't know/ I'd rather not say	
2.19	select_one [PPEFBodysuit_choices]	PPEFBodysuit		When emptying a pit/septic tank, how often are full body suit worn?	If 'Full body suit' is selected for question 2.18 [PPE]
		[PEFBodysuit_choices]	1	Always	
		[PPEFBodysuit_choices]	2	Most of the time	
		[PPEFBodysuit_choices]	3	Often	
		[PPEFBodysuit_choices]	4	Sometimes	
		[PPEFBodysuit_choices]	5	Never	
		[PPEFBodysuit_choices]	999	I don't know/ I'd rather not say	
2.20	select_one [PPEMasks_choices]	PPEMasks		When emptying a septic tank/ pit/ soakpit, how often are facemasks worn?	If 'Face mask' is selected for question 2.18 [PPE]
		[PPEMasks_choices]	1	Always	

		[PPEMasks_choices]	2	Most of the time	
		[PPEMasks_choices]	3	Often	
		[PPEMasks_choices]	4	Sometimes	
		[PPEMasks_choices]	5	Never	
		[PPEMasks_choices]	999	I don't know/ I'd rather not say	
2.21	select_one [PPEGumBoots_choices]	PPEGumBoots		When emptying a pit/septic tank, how often are gumboots worn?	If 'Gumboots' is selected for question 2.18 [PPE]
		[PPEGumBoots_choices]	1	Always	
		[PPEGumBoots_choices]	2	Most of the time	
		[PPEGumBoots_choices]	3	Often	
		[PPEGumBoots_choices]	4	Sometimes	
		[PPEGumBoots_choices]	5	Never	
		[PPEGumBoots_choices]	999	I don't know/ I'd rather not say	
2.22	select_one [PPEHandGloves_choices]	PPEHandGloves		When emptying a septic tank/ pit/ soakpit, how often are hand gloves worn?	If 'Hand gloves' is selected for question 2.18 [PPE]
		[PPEHandGloves_choices]	1	Always	
		[PPEHandGloves_choices]	2	Most of the time	

		[PPEHandGloves_choices]	3	Often	
		[PPEHandGloves_choices]	4	Sometimes	
		[PPEHandGloves_choices]	5	Never	
		[PPEHandGloves_choices]	999	I don't know/ I'd rather not say	
2.23	select_one [PPEHelmet_choices]	PPEHelmet		When emptying a septic tank/ pit / soakpit, how often is a helmet worn?	If 'Helmet' is selected for question 2.18 [PPE]
		[PPEHelmet_choices]	1	Always	
		[PPEHelmet_choices]	2	Most of the time	
		[PPEHelmet_choices]	3	Often	
		[PPEHelmet_choices]	4	Sometimes	
		[PPEHelmet_choices]	5	Never	
		[PPEHelmet_choices]	999	I don't know/ I'd rather not say	
2.24	select_one [PPEGlasses_choices]	PPEGlasses		When emptying a pit/septic tank, how often are safety glasses/goggles worn?	If 'Safety glasses/goggles' is selected for question 2.18 [PPE]
		[PPEGlasses_choices]	1	Always	
		[PPEGlasses_choices]	2	Most of the time	
		[PPEGlasses_choices]	3	Often	
		[PPEGlasses_choices]	4	Sometimes	
		[PPEGlasses_choices]	5	Never	
		[PPEGlasses_choices]	999	I don't know/ I'd rather not say	
	end group				

	begin group	**Collection**		**Section 3: Collection Practices**	**If 'Yes' is selected for question 1.25 [start]**
3.1	select_multiple [HowTransport_choices]	HowTransport		What is normally used to empty pits and transport the fecal sludge? *Note: select all that apply*	If 'Yes' is selected for question 1.25 [start]
		[HowTransport_choices]	1	Buckets	
		[HowTransport_choices]	2	Shovels, picks	
		[HowTransport_choices]	3	A wheelbarrow	
		[HowTransport_choices]	4	Barrels	
		[HowTransport_choices]	5	A hose and a pump	
		[HowTransport_choices]	6	A gulper	
		[HowTransport_choices]	7	A flatbed truck	
		[HowTransport_choices]	8	A vacuum truck	
		[HowTransport_choices]	99	Other	
		[HowTransport_choices]	999	I don't know/ I'd rather not say	
3.2	text	HowTransport_oth		Specify "other"	If 'other' is selected
3.3	select_one [TruckMaintenance_choices]	TruckMaintenance		Is the truck brought in for maintenance at least once per year? This includes: checking the tires, checking the fluids (coolant, oil, oil pressure, temperature, air pressure gauges), vacuum pump	If 'A flatbed truck', or 'A vaccum truck' is selected for question 3.1 [HowTransport]

				check, brakes, electrical system (lights, warning lights, brake lights), engine.	
		[TruckMaintenance_choices]	1	Yes	
		[TruckMaintenance_choices]	2	No	
		[TruckMaintenance_choices]	999	Don't know/ don't wish to say	
3.4	select_one [FSVolUnit1_choices]	FSVolUnit1		We would like to know the volume of FS removed during a single empty. Which of the following units are you able to give? (only one is necessary)	If 'Yes' is selected for question 1.25 [start]
		[FSVolUnit1_choices]	1	Liters per empty	
		[FSVolUnit1_choices]	2	m^3 per empty	
		[FSVolUnit1_choices]	3	Number of buckets per empty	
		[FSVolUnit1_choices]	4	Number of barrels per empty	
		[FSVolUnit1_choices]	5	Number of empties per truckload	
		[FSVolUnit1_choices]	999	I don't know/ I'd rather not say	

3.5	integer	FSVol		What is the average volume of fecal sludge removed during a single empty? *You can answer in number of liters, m3, buckets or barrels. (put '999' if don't know)*	If 'Litres per empty', 'm3 per empty', 'Number of buckets per empty', or 'Numbers of barrels per empty' is selected for the question 3.4 [FSVolUnit1]
3.6	select_one [FSVolUnit2_choices]	FSVolUnit2		What was the unit used?	If 'Litres per empty', 'm3 per empty', 'Number of buckets per empty', or 'Numbers of barrels per empty' is selected for the question 3.4 [FSVolUnit1], AND 'Don't know' is selected question 3.5 [FSVol]
		[FSVolUnit2_choices]	1	Liters	
		[FSVolUnit2_choices]	2	m^3	
		[FSVolUnit2_choices]	3	buckets	
		[FSVolUnit2_choices]	4	barrels	
		[FSVolUnit2_choices]	999	I don't know/ I'd rather not say	
3.7	integer	FSVolTruck1		What is the volume, in liters, of a single truckload?	If 'Number of empties per truckload' is selected for question 3.4 [FSVolUnit1]
3.8	integer	FSVolTruck2		How many empties can usually fit in a single truckload?	If 'Number of empties per truckload' is selected for question 3.4 [FSVolUnit1]
3.9	select_one [DryPit_choices]	DryPit		What portion of empties are performed on dry pit latrines?	If 'Yes' is selected for question 1.25 [start]
		[DryPit_choices]	1	Roughly 100%	

		[DryPit_choices]	2	Less than 100% but more than 50%	
		[DryPit_choices]	3	Less than 50% but more than 0%	
		[DryPit_choices]	5	None	
		[DryPit_choices]	999	I don't know/ I'd rather not say	
3.10	integer	TrashVol		What is the average volume of trash removed during a single empty of a dry pit latrine? *You can answer in number of liters, m3, buckets or barrels. (put '999' if don't know)*	If 'Roughly 100%', 'Less than 100% but more than 50%', or "Less than 50% but more than 0%' is selected for the question 3.9 [DryPit]
3.11	select_one [TrashVolUnit2_choices]	TrashVolUnit2		What was the unit used?	If 'Don't know' is not selected for question 3.10 [TrashVol]
		[TrashVolUnit2_choices]	1	Liters	
		[TrashVolUnit2_choices]	2	m^3	
		[TrashVolUnit2_choices]	3	buckets	
		[TrashVolUnit2_choices]	4	barrels	
		[TrashVolUnit2_choices]	999	I don't know/ I'd rather not say	
3.12	integer	FSVolBucket		What is the volume, in liters, of a single bucket?	If 'buckets' is selected for question 3.6 [FSVolUnit2], OR for question 3.11 [TrashVolUnit2]
3.13	integer	FSVolBarrel		What is the volume, in liters, of a single barrel?	If 'buckets' is selected for question 3.6 [FSVolUnit2], OR for question 3.11 [TrashVolUnit2]

3.14	integer	EmptiesInd		What is the average number of empties performed by you in a single day?	If 'I work full-time as an individual, independent service provider', or 'I work part-time as an individual, independent service provider' is selected for the question 2.1 [Business]
3.15	begin group	EmptiesIndRange		What is the typical range on the number of empties performed by you in a single day?	If 'I work full-time as an individual, independent service provider', or 'I work part-time as an individual, independent service provider' is selected for the question 2.1 [Business]
	integer	EmptiesIndMin		Minimum	
	integer	EmptiesIndMax		Maximum	
	end group				
3.16	integer	EmptiesIndDays		How many days per month are you emptying pits, on average?	If 'I work full-time as an individual, independent service provider', or 'I work part-time as an individual, independent service provider' is selected for the question 2.1 [Business]
3.17	integer	EmptiesBus		What is the average number of empties performed by your business in a single day?	If 'I work full-time as an individual, independent service provider', or 'I work part-time as an individual, independent service provider' is selected for the question 2.1 [Business], OR if 'Yes' is selected for Section 1 - question 1.24 [DesludgeYN2]

3.18	begin group	EmptiesBusRange		What is the typical range on the number of empties performed by your business in a single day?	If 'I work full-time for a business which has at least one other employee, besides myself', or 'I work part-time for a business which has atleast one other employee, besides myself' is selected for question 2.1 [Business], OR if 'Yes' is selected for question 1.24 [DesludgeYN2]
	integer	EmptiesBusMin		Minimum	
	integer	EmptiesBusMax		Maximum	
	end group				
3.19	integer	EmptiesBusDays		How many days per month is your business emptying pits, on average?	If 'I work full-time for a business which has at least one other employee, besides myself', or 'I work part-time for a business which has atleast one other employee, besides myself' is selected for question 2.1 [Business], OR if 'Yes' is selected for question 1.24 [DesludgeYN2]
	end group				
	begin group	**DispGrp**		**Section 4: Disposal**	**If 'Yes' is selected for question 1.25 [start]**
4.1	select_multiple [Disposal_choices]	Disposal		What are all of the disposal methods used for fecal sludge by you/your business: *Read all options to the respondent. Mark all that apply.*	If 'Yes' is selected for question 1.25 [start]
		[Disposal_choices]	1	Dump contents in the environment or a wetland	
		[Disposal_choices]	2	Dump contents in an open drain	

		[Disposal_choices]	3	Dump contents into an underground sewer	
		[Disposal_choices]	4	Bury contents	
		[Disposal_choices]	5	Bring contents to a treatment plant or a decanting station/ transfer station	
		[Disposal_choices]	6	Use contents in a nearby garden	
		[Disposal_choices]	7	Add contents to a nearby cow manure pit	
		[Disposal_choices]	8	Bring contents to a farm	
		[Disposal_choices]	99	other	
		[Disposal_choices]	999	I don't know/I'd rather not say	
4.2	text	Disposal_oth		specify "other"	If 'other' is selected
4.3	begin group	Disp		What portion of empties are: *(Make sure the total = 100)*	
	integer	Env		dumped into the environment / a wetland?	If 'Dump contents in the environment or a wetland' is selected for question 4.1 [Disposal]
	integer	Open		dumped into an open drain?	If 'Dump contents in the environment or a wetland' is selected for question 4.1 [Disposal]
	integer	Sewer		dumped into an underground sewer?	If 'Dump contents in the environment or a wetland' is selected for question 4.1 [Disposal]
	integer	Bury		buried?	If 'Bury contents' is selected for question 4.1 [Disposal]
	integer	FSTP		brought to a treatment plant or a decanting station/ transfer station?	If 'Bring contents to a treatment plant' is selected for question 4.1 [Disposal]

	integer	Garden		used in a garden?	If 'Use contents in a nearby garden' is selected for question 4.1 [Disposal]
	integer	Manure		dumped into a cow manure pit?	If 'Add contents to a nearby cow manure pit' is selected for question 4.1 [Disposal]
	integer	Farm		are used on a farm?	If 'Bring contents to a farm' is selected for question 4.1 [Disposal]
	end group				
4.4	select_one [Treatment_choices]	Treatment		Before the fecal sludge is used in a garden or on a farm, is it treated? If yes, how often?	If 'Use contents in a nearby garden', or 'Bring contents to a farm' is selected for question 4.1 [Disposal]
		[Treatment_choices]	1	Always	
		[Treatment_choices]	2	Most of the time	
		[Treatment_choices]	3	Often	
		[Treatment_choices]	4	Sometimes	
		[Treatment_choices]	5	No, Never	
		[Treatment_choices]	999	I don't know/I'd rather not say	
4.5	integer	ServicesInd		To the best of your knowledge, how many independent, individual emptiers are providing services in this [neighborhood, city]? *(put '999' if don't know)*	If 'Yes' is selected for question 1.25 [start]
4.6	integer	ServicesBus		To the best of your knowledge, how many independent businesses are providing services in this [neighborhood,	If 'Yes' is selected for question 1.25 [start]

				city]? *(put '999' if don't know)*	
4.7	integer	Trucks		To the best of your knowledge, how many vacuum trucks are in operation in this [neighborhood, city]? *(put '999' if don't know)*	If 'Yes' is selected for question 1.25 [start]
	end group				
	begin group	**End**		**Section 5: End**	
5.1	select_one [questions_choices]	questions		Do you have any remaining questions? *(If yes, try to answer their questions. If you cannot answer their questions, refer them to the phone number on the contact card).*	If 'Yes' is selected for question 1.25 [start]
		[questions_choices]	1	Yes	
		[questions_choices]	0	No	
5.2	text	remaining_doubt		(Note: Write a brief summary of their question here. Try to answer their question. If you can't, kindly suggest to them that they can call the contact phone number)	If 'Yes' is selected for question 5.1 [questions]
5.3	text	comment		If you, the enumerator, have any general comments, you can write them here.	If 'Yes' is selected for question 1.25 [start]
5.4	geopoint	GEOpoint		Lat/Long of Survey Location	
	calculate	latitude1			

	calculate	longitude1			
	calculate	accuracy1			
5.5	note	output1		Accuracy: ${accuracy1} m	If the error margin of the GPS reading [accuracy1] is greater than 20 meters
5.6	select_one [Complete_choices]	Complete		Is this a complete survey?	
		[Complete_choices]	1	Yes	
		[Complete_choices]	0	No	
5.7	integer	PartialNumber		On what question number did you stop?	If 'No' is selected for - question 5.6 [Complete]
5.8	note	end		This is the end of the survey. If you have completed the survey, press "save and finalize".	
	end group				

4. Sanitation Service Authority KII Guide – Service Outcome Component

#	Questions	Answer type (Yes, No, Don't know)	Narrative	Skip Logic: These questions only appear when the stated conditions are satisfied
	Section 1: Sanitation Workers' Rights			
1.1	Do sanitation workers in your city mostly work exclusively in sanitation, such as desludging, or do many of them also work in solid waste management?			
1.2	Compared to the overall city population, is there a high concentration of certain social or ethnic groups (caste, ethnic minority etc.) among sanitation workers?			
1.3	Is any training or certification required to be a sanitation worker in your city?			
1.4	Does the training cover: a. labor rights and recourse			If 'yes' is selected for question 1.3
	b. occupational safety, health risks, and Standard Operating Procedures (SOP			If 'yes' is selected for question 1.3
1.5	Is there a formal channel for sanitation workers to file complaints and cases?			
1.6	Do sanitation workers have the right to unionize?			
1.7	Are there operational workers' unions?			If 'yes' is selected for question 1.6
1.8	How many are there and what are their sizes?			If 'yes' is selected for question 1.7
1.9	Are there any rules that forbid or discourage sanitation workers from forming unions?			If 'no' is selected for question 1.6
1.10	Does the city/ utility also offer support to workers to run the unions?			
1.11	What types of support are provided? This can include but is not limited to financial support.			If 'yes' is selected for question 1.10

1.12	Do sanitation workers belonging to each of the following employment categories have social security? (This is work related safety nets, such as pension funds, retirement packages, etc.) a. permanent government employee			
	b. government contractors			
	c. private contractors			
1.13	Who provides the social security in each case?			If 'yes' is selected for question 1.12
1.14	Do sanitation workers belonging to each of the following employment categories have health insurance? a. permanent government employee b. government contractors c. private contractors			
1.15	Who provides the health insurance in each case?			If 'yes' is selected for question 1.14
Section 2: Sanitation Workers' Safety				
2.1	Are there clear Standard Operating Procedures (SOP) that protect sanitation workers' health and safety for : a. Sludge emptying			
	b. Sludge transportation			
	c. Maintenance of the sewer/ storm drains			
	d. Treatment i. Faecal Sludge ii. Wastewater			
	e. Disposal i. Faecal Sludge ii. Wastewater			
	f. Reuse i. Faecal Sludge ii. Wastewater			
2.2	Is there a government authority that monitors and regulates compliance with workers' safety per the			If 'yes' is selected for question 2.1

	legislation/SOPs? Can you please provide the name of this authority?			
2.3	Are all the desludging vehicles in the city registered and licensed for use in desludging?			
2.4	Does licensing require compliance with practices that protect the health and safety of workers?			If 'yes' is selected for question 2.3
2.5	Are there government funded health checkups available to sanitation workers?			
2.6	a. What do these checkups cover? b. What is the frequency at which workers can avail these checkups? c. How many health check-ups have been organized so far? d. How many workers availed the service the last time (or last year)?			If 'yes' is selected for question 2.5
Section 3: Community and Environment Safety				
3.1	Is the treatment system designed to allow reuse (effluent or biosolids)?			
3.2	What is the total volume of treated effluent that is generated (kiloliter per day, KLD)?			
3.3	What is the amount of treated effluent that is reused (KLD)?			
3.4	What is the total volume of treated biosolids that is generated (KLD)?			
3.5	What is the amount of treated biosolids that is reused (KLD)?			
3.6	Is the quality of the treated liquid/ effluent tested regularly?			
3.7	What standards (set by the central government, state government or the utility themselves) are followed for monitoring treated liquid/effluent? This includes quality standards and monitorting standards (test frequency).			If 'yes' is selected for question 3.6

3.8	To whom are the testing results of the treated effluent reported?			If 'yes' is selected for question 3.6
3.9	Is the quality of the treated sludge/biosolids tested regularly?			
3.10	What standards (standards set by the central government, state government or the utility themselves) are followed for monitoring treated sludge/biosolids, includes quality standards and the monitorting standards (test frequency)??			If 'yes' is selected for question 3.9
3.11	To whom are the testing results of the treated biosolids reported?			If 'yes' is selected for question 3.9
3.12	Are there any penalties or actions taken if the testing results don't meet standards?			
3.13	Is there a lab facility at the treatment plant where the testing is done?			
3.14	Where is the testing (for effluent and biosolids respectively) done?			If 'no' is selected for question 3.13
3.15	In the last year, how many samples were taken from the larger environment, including surface water and groundwater, to be tested?			
3.16	What is the number of water samples (surface water, groundwater, treated effluent) that tested negative for fecal coliform?			If at least one was answered in question 3.15
3.17	What is the number of excreta related diseases, such as diarrhea and cholera, occurring among the population (year)?			
3.18	Does the treated wastewater and biosolids need to be certified prior to reuse?			
3.19	What does the certification cover? How often does the certification and recertification happen?			If 'yes' is selected for question 3.18
Section 4: Gender in Sanitation				
4.1	What is the total number of employees in the sanitation service authorities, such as city government/corporation or utilities? Note- While counting the			

	number of employees, consider all employes (both full time and on contractual basis) at all levels.			
4.2	What is the total number of women in in the sanitation service authorities, such as city government/corporation or utilities? Note- While counting the number of employees, consider all employes (both full time and on contractual basis) at all levels.			
4.3	What is the total number of employees in leadership positions (functional heads, managerial heads etc.) within the sanitation service authorities, such as city government/corporation or utilities?			
4.4	What is the total number of women in leadership positions (functional heads, managerial heads etc.) within the sanitation service authorities, such as city government/corporation or utilities?			
4.5	Have you conducted a survey of sanitation workers' wage levels across all categories of public and private workers? This includes workers at the treatment plant (e.g. plant manager, engineers, and maintenance staff), decanting station, sewer cleaners, and private emptiers.			
4.6	What is the average salary of sanitation workers in your city?			If 'yes' is selected for questions 4.5
4.7	Do you have the disaggregated salary data for men and women?			
4.8	What is the average salary of all wommen in the sanitation workforce?			If 'yes' is selected for questions 4.7
4.9	What is the average salary of all men in the sanitation workforce?			If 'yes' is selected for questions 4.7
Section 5: Sanitation Finance				
5.1	What is the CAPEX for all the existing treatment infrastructure, including centralized and decentralized, in the city? When was the treatment infrastructure constructed? If there are			

	multiple investments, please list the amount and construction year for each.			
5.2	How much of this amount is covered by city governments own budget? If there are multiple investments, please list the own budget amount for each.			
5.3	How much of this amount is covered by state or central government transfers? If there are multiple investments, please list the transferred amount for each. **Note**: please exclude IFI/donor funds wired through the central government if known to you. If uncertain, please say "not sure" and we will check this against publicly available information from IFI/donor websites.			
5.4	What is the total CAPEX for the existing communal and public toilets (CT/PTs)? When were these CT/PTs constructed? If there are multiple investments, please list the amount and construction year for each.			
5.5	How much of this amount is covered by city governments own revenue? If there are multiple investments, please list the own budget amount for each.			
5.6	How much of this amount is covered by state or central government transfers? If there are multiple investments, please list the transferred amount for each. **Note**: please exclude IFI/donor funds wired through the central government if known to you. If uncertain, please say "not sure" and we will check this against publicly available information from IFI/donor websites.			
5.7	Does the utility/ government operate and maintain any public or community toilet (CT/PTs)?			
5.8	What is the total (annual) O&M cost for all CT/PTs operated and maintained by the utility/ government			If 'yes' is selected for question 5.7

5.9	What is the total (annual) revenue (for service authorities) generated from CT/PTs (through user fees)			If 'yes' is selected for question 5.7
5.10	What is the total annualized CAPEX for the existing desludging vehicles owned by the service authority.			
5.11	What is the total CAPEX for other sanitation related investments? When were theses investments made?			
5.12	How much of this amount is covered by city governments own budget? If there are multiple investments, please list the own budget amount for each.			
5.13	How much of this amount is covered by state or central government transfers? If there are multiple investments, please list the transferred amount for each. **Note**: please exclude IFI/donor funds wired through the central government if known to you. If uncertain, please say "not sure" and we will check this against publicly available information from IFI/donor websites.			
5.14	What is the total annual revenue (for service authorities) generated across FSM value chain and from sewerage charges/tariffs/sanitation levy			
5.15	What is the total O&M cost across sanitation service chain incurred by service authorities			

Annex II: Full List of CWIS Indicators

The table below presents the full list of CWIS indicators corresponding to the CWIS Service Framework—Equity, Safety, Sustainability, Responsibility, Accountability, Resource Planning and Management. There are 34 indicator areas, and 89 first and second level sub-indicators that further define the specifics of some of the indicator areas. The list was last updated in March, 2021.

No.	Indicator Area	First Level Sub-Indicator	Second Level Sub-Indicator	Answer Type
Equity				
EQ-1	% of LIC population with access to 'safe' individual toilets / % of total population with access to 'safe' individual toilets			Quantitative
EQ-2	% safe management LIC/% safe management citywide (IHHL+CT)			Quantitative
EQ-3	Subidy amount paid to NSS/SS (non-sewered sanitation / sewered sanitation) *Applicable to cities which have a combination of both sewered and non-sewered sanitation systems.			Quantitative
EQ-4	% of women in sanitation related decision-making bodies (service authorities)			Quantitative
		% of women in leadership positions within sanitation related decision-making bodies		Quantitative
EQ-5	Gender pay gap in the sanitation workforce			Quantitative
EQ-6	Sanitation worker equity	Training/ certification is required to be a sanitation worker		Yes; No
			Training covers labor rights and recourse	Yes; No
			Training covers occupational safety, health risks, and Standard Operating Procedures (SOP)	Yes; No
		All sanitation workers, regardless of employment formality, have a formal channel for legal recourse		Yes; No
		Workers have the right to unionize		Yes; No
			Operational worker unions exist	Yes; No
			Support is offered by the city/ utility to run the union	Yes; No
		All workers are covered by social security		Yes; No
		All workers are covered by health insurance		Yes; No
Safety				
SF-1	% safely managed sanitation (citywide IHHL)			Quantitative
		% of population with access to safe individual toilets		Quantitative

		% of IHHL OSSs that have been desludged		Quantitative
		% of collected FS disposed at treatment plant or designated disposal site		Quantitative
		FS treatment capacity as a % of total FS generated from non-sewered connections		Quantitative
		FS treatment capacity as a % of current volume desludged		Quantitative
		WW treatment capacity as a % of total WW generated from sewered connections and greywater and supernatant generated from non-sewered connections		Quantitative
		Effectiveness of FS/WW treatment in meeting prescribed standards for effluent discharge and biosolids disposal		Quantitative
SF-2	% safely managed sanitation for LIC IHHL			Quantitative
		% of low income community (LIC) population with access to safe individual toilets		Quantitative
		% of LIC OSSs that have been desludged		Quantitative
		% of FS collected from LIC that is disposed at treatment plant or designated disposal site		Quantitative
SF-3	% of dependent population (without IHHL) with access to safe shared facilities (CT)			Quantitative
		% of CTs where FS/WW generated is safely transported to TP or safely disposed in situ		Quantitative
		% of CTs that adhere to principles of universal design		Quantitative
		% of CT users who are women		Quantitative
		Average waiting time at CT		Quantitative
		Average distance from HH to CT		Quantitative
SF-4	% of public spaces that have adequate sanitation facilities (PT)			Quantitative
		% of PTs where FS/WW generated is safely transported to TP or safely disposed in situ		Quantitative
		% of PTs that adhere to principles of universal design		Quantitative
		Average waiting time at PT		Quantitative
		% of PT users who are women		Quantitative
SF-5	% of educational institutions where FS/WW generated is safely transported to TP or safely disposed in situ			Quantitative
SF-6	% of healthcare facilities where FS/WW generated is safely transported to TP or safely disposed in situ			Quantitative
SF-7	% of desludging services completed mechanically or semi-mechanically (gulper)			Quantitative

SF-8	% of desludging vehicles which comply with maintenance standards			Quantitative
SF-9	% of water contamination compliance (on fecal coliform)			Quantitative
SF-10	Incidence (per 1000) of fecal-oral pathway diseases			Quantitative
SF-11	Sanitation worker safety	Health and safety standards and Standard Operating Procedures exist to protect sanitation workers and others who may engage in emptying on-site systems from occupational hazards		Yes; No
			Compliance with the health and safety standards is monitored and enforced	Yes; No
		All desludging operators are registered and licensed		Yes; No
			Licensing includes compliance with practices that protect the health and safety of workers	Yes; No
		Regular health checkups are available to all sanitation workers regardless of form of employment and are ensured by the government		Yes; No
SF-12	Is there a certification mechanism for which treated wastewater and biosolids have to qualify?			Yes; No
Sustainability				
SS-1	% of treated FS and WW that is reused			Quantitative
SS-2	% of O&M cost recovered for sanitation infrastructure			Quantitative
SS-3	% of sanitation capital investments covered by budget line/ government transfers			Quantitative
Responsibility				
RS-1	Policy mandate for service delivery is clear and inclusive **Evaluated at the national or state level*	Clear and non-overlapping mandate around who is responsible for sanitation service provision-safe containment		Yes; No
		Clear and non-overlapping mandate around who is responsible for sanitation service provision-safe collection & transport		Yes; No
		Clear and non-overlapping mandate around who is responsible for safe treatment & disposal		Yes; No
		Clear and non-overlapping mandate around who is responsible for safe reuse		Yes; No
		Mandate boundaries are free of regressive exclusions and		Yes; No

		covers all densely populated communities		
		Mandate includes explicit responsibility to reach the poor		Yes; No
		Mandate includes explicit responsibility to reach women, girls, and socioeconomically vulnerable groups		Yes; No
		Mandate is inclusive of service delivery in institutional and public places		Yes; No
RS-2	Approved local service authority staff positions within mandated authority areas are sufficient to execute mandate **Context specific. Evaluated at point where staff head count and organogram is determined for mandated authority. e.g. state determines municipal positons in India, central gov't determines municipal staffing models in Bangladesh, utilities tend to determine their own staffing levels and structures*			Yes; No
RS-3	Local service authority staff positions are filled and capable to execute mandate **Evaluated at the local service area level*	All approved staff positions are filled		Yes; No
		Periodic training and capacity building sessions are carried out to equip staff with necessary skills for execution		Yes; No
RS-4	Local service authority sanitation budget is a separate line item independent of water, solid waste management, health, or environment **Evaluated at the local service area level*			Yes; No
RS-5	Local authority's sanitation revenue is ringfenced **Evaluated at the local service area level*			Yes; No
Accountability				
AC-1	National accountability mechanism exists to monitor and regulate service authority performance against KPIs that reflect mandate elements **Evaluated at the national or state level*			Yes; No
		Clear performance targets in sanitation service provision-safe containment		Yes; No
		Clear performance targets in sanitation service provision-safe collection & transport		Yes; No
		Clear performance targets in safe treatment & disposal		Yes; No
		Clear performance targets in safe reuse		Yes; No
		Performance targets are monitored and enforced		Yes; No

		Performance indicators include pro-poor indicators		Yes; No
		Performance indicators include gender intentional indicators		Yes; No
		Performance indicators include citizen grievance redressal		Yes; No
AC-2	Performance data from service authorities are sufficiently collected and reported, representative, and transparent **Evaluated at the national or state level*	System exists to aggregate all data across cities on safely managed sanitation related KPIs (in digital format)		Yes; No
			Information system is used for national or state level decision-making	Yes; No
		Sanitation data is collected regularly		Yes; No
		Sanitation data collected is open to the public		
AC-3	Incentives and/or penalties tied to performance exist for sanitation service authority **Evaluated at the national or state level*			Yes; No
AC-4	Incentives and/or penalties are actively used by national/ state accountability authorities at the service area level **Evaluated at the local service area level*			Yes; No
Resource Planning & Management				
RPM-1	Clear financing framework at the national level to guide allocation of resources (budget) **Evaluated at the national or state level*	A budget line item exists for urban sanitation		Yes; No
		An objective framework exists to allocate financial resources to lower level governments or authorities for sanitation		Yes; No
		Financing framework is followed in practice		Yes; No
		Resources are allocated to meet targets in sanitation service provision-safe containment		Yes; No
		Resources are allocated to meet targets in sanitation service provision-safe collection & transport		Yes; No
		Resources are allocated to meet targets in sanitation service provision-safe treatment & disposal		Yes; No
		Resources are allocated to meet targets in sanitation service provision-safe reuse		Yes; No
		Financing framework allocates resources to prioritize service delivery for the poor		Yes; No
		Financing framework allocates dedicated resources to meet the sanitation needs of vulnerable population groups		Yes; No

		Resources allocated are disbursed		Yes; No
RPM-2	National/ state decision-making process for sanitation budget allocation is transparent, inclusive, and informed by city /service area strategies **Evaluated at the national or state level*	National/state level decision-making process for budget allocation is transparent		Yes; No
		National/state level decision-making for budget allocation is inclusive		Yes; No
		National/state level decision-making for budget allocation is based on city sanitation strategies submitted by the mandated authorities		Yes; No
RPM-3	Quality of investment decision-making **Evaluated at the local service area level*	Sanitation service authority evaluates different investment options to meet service delivery gaps		Yes; No
		While calculating investment costs, sanitation service authority accounts for all project related capital, operations, maintenance, and replacement costs on a full lifecycle cost basis using accounting and monitoring data from service authority		Yes; No
		When planning for new investments, sanitation service authority undertakes an assessment of the impact of the new investments on overall utility system costs and revenues using data from service authorities and other stakeholders		Yes; No
		Feasibility assessment includes considerations of potential ecological and environmental impacts		Yes; No
		Feasibility assessment includes considerations of energy requirements for effective functioning of the system, including energy availability and cost		Yes; No
		Feasibility assessment includes considerations of water requirements for effective functioning of the system, including water availability and cost		Yes; No
RPM-4	Integrated citywide inclusive sanitation strategy **Evaluated at the local service area level*	Existence of a city sanitation strategy		Yes; No
			The city sanitation strategy covers all households, including those in LICs and densely populated peri-urban areas	Yes; No
			The city sanitation strategy is developed based on city service level data	Yes; No
			Sanitation investments are made based on the integrated citywide sanitation plan	Yes; No

			Sanitation budgets are allocated based on a needs assessment	Yes; No
		Sanitation authority has conducted an assessment of the baseline condition of existing infrastructure and service delivery gaps		Yes; No
			Sanitation authority has conducted an assessment of the baseline condition of existing infrastructure and service delivery gaps in informal settlements and low-income service areas	Yes; No
		Sex-disaggregated data is collected for sanitation planning and investment		Yes; No
			Sex-disaggregated data is actively used for sanitation planning and investment	Yes; No
			Budget allocation is responsive to the differential needs of women based on sex-disaggregated data	Yes; No
		Data by income groups is collected for sanitation planning and investment		Yes; No
			Data by income groups is actively used for sanitation planning and investment	Yes; No
		Data by ethnic or social groups is collected for sanitation planning and investment		Yes; No
			Data by ethnic or social groups is actively used for sanitation planning and investment	Yes; No

Annex III: Methodology Note on the Development of the CWIS Indicators

This toolkit was developed through the CWIS-MLE (Monitoring, Learning, and Evidence) program in an interactive approach to reflect the evolving objectives and framework of the urban sanitation programs supported by the Bill & Melinda Gates Foundation. This Annex details the evolution of the indicators and the sources and methods used to develop the final set of indicators.

Table 1: Overview of indicator development phases

	Phase I: Urban fecal sludge management (UFSM)	Phase II: Initial CWIS Principles	Phase III: CWIS Framework
Guiding Framework	Benchmark the performance of cities focused on UFSM service delivery outcomes	6 CWIS Principles	7 updated CWIS Principles and the CWIS Service Framework
Indicators	17 outcome indicators developed from reviewing existing monitoring frameworks (quantitative only)	17 indicators mapped onto the 6 CWIS principles	A set of qualitative and quantitative indicators added to 17 existing quantitative indicators, and consolidated into 34 indicator areas covering a set of 89 sub-indicators

Phase 1 – Developing the initial list of 17 indicators:

The goal of the MLE (Monitoring, Learning, and Evidence) program when it was kickstarted was to benchmark the performance of cities on urban fecal sludge management (UFSM). In line with this goal, the initial list of indicators were exclusively quantitative, focusing on UFSM service delivery outcomes.

These outcome indicators were developed following a review of frameworks which identified a long list (220+) of relevant indicators. The key frameworks were:

- Global frameworks such as the Joint Monitoring Programme (UN Water, 2017), Shit Flow Diagram (SFD, 2018), City Service Delivery Assessment (Blackett and Hawkins, 2016), FSM Toolbox (2018) and the Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) framework (UN Water and WHO, 2017).
- Sanitation monitoring frameworks such as Technology Options for the Sanitation Value Chain (CSTEP, 2016), Fecal Sludge Management Tools (Blackett and Hawkins, 2016), Water and Sanitation Indicators Measurement Guide (USAID, 1999) and SAN Benchmarks (CEPT University, 2015).

The indicators were identified and classified under three categories – context indicators (defines the characteristics of operating environments in which interventions take place in), intervention indicators (consisting of input and output indicators) and outcome indicators (focused on sectoral outcomes and impact).

Two layers of filters were applied to the full (220+) indicators to arrive at the final shortlist.

- First, indicators that could not be benchmarked were removed from the list. This includes categories of indicators such as sanitation budget allocation and expenditure, number of desludging vehicles used in the city, practices and equipment used in desludging, etc.
- This shortlist was then taken to cities and discussed with partners on perceived criticality and by the end of 2018, for each of the indicator, a decision was made to either retain, alter, or exclude from the shortlist based on consultations with relevant city stakeholders and the CWIS grantees. This resulted in the initial list of the 17 quantitative indicators.

See Table 2 below for a mapping of the convergence between CWIS indicators and selected global frameworks.

Table 2: Alignment of CWIS indicators with selected global frameworks

	JMP	SFD
No. of indicators with CWIS convergence	12/12	16/21
Framework indicators covered	Primary and secondary sanitation indicators (JMP Methodology 2017 Update & SDG Baselines): S1. improved sanitation facilities S2. improved sanitation facilities connected to sewers S3. improved sanitation facilities connected to septic tanks S4. improved pit latrines or other on-site improved facilities S5. unimproved sanitation facilities S6. no sanitation facility (open defecation) S7. improved sanitation facilities which are shared (limited sanitation services) S8. improved sanitation facilities which are not shared (basic sanitation services) S9. sewer connections where wastes reach treatment plants and are treated S10. on-site sanitation facilities where wastes reach treatment plants and are treated S11. on-site sanitation facilities where wastes are disposed of in situ S12. safely managed sanitation services	SFD Master Graphic and quantitative performance indicators (SFD manual): - Fecal sludge contained; - Fecal sludge not contained; - Open defecation; - FS contained – not emptied; - FS contained – emptied; - FS not contained – emptied; - FS not contained – not emptied; - FS delivered to treatment; - FS not delivered to treatment; - FS treated; - FS not treated; - Customer base; - Volume (or %) of on-site sanitation technologies emptied each time; - Quantities of wastewater or fecal sludge received for treatment at each location (pump readings/ flow meters/ volume gauge); - Capacity (design and operating), type and condition of facilities used to treat wastewater and fecal sludge (pump readings/ flow meters); - Quantities of fecal sludge or sewage sludge that get reused.

Phase 2 CWIS Principles

At the Manila Convening in December 2018 of CWIS grantees and city stakeholders, the concept of Citywide Inclusive sanitation (CWIS) was introduced by the Bill & Melinda Gates Foundation with an initial set of six principles. Responding to stakeholders' feedback and inputs at the Manila Convening, the 17 quantitative indicators were mapped to these initial CWIS principles. To reflect the evolution on the program vision since Manila, the MLE program also evolved from "MLE for Urban Fecal Sludge Management" to "MLE for Citywide Inclusive Sanitation".

The six CWIS Principles released at the Manila Convening are as follows:

1. Equitable sanitation services benefit everyone
2. Human waste is safely managed along the entire sanitation service chain
3. Systems enable resource recovery and re-use
4. Diverse and innovative technologies—sewered and/or non-sewered—are deployed
5. Comprehensive long-term planning fosters innovation, pro-poor financing, improved performance
6. Demonstration of political will, accountability and technical and managerial leadership

Phase 3 CWIS Service Framework and expanded set of indicators

The CWIS framework continued to evolve and in April 2019, the Foundation released an updated version of the CWIS framework, where the number of principles were expanded from six to seven, and the CWIS service framework (a 2X3 matrix) was introduced (Figure 2 below). While the CWIS principles remain important, the framework has been effective in communicating the intent and in representing the core CWIS values, as the language of the principles continue to evolve.

CWIS SERVICE FRAMEWORK

CORE CWIS OUTCOMES	**EQUITY**	**SAFETY**	**SUSTAINABILITY**
	Services reflect fairness in distribution and prioritization of service quality, prices, and deployment of public finance/ subsidies.	Services safeguard customers, workers, and communities from safety and health risks—reaching *everyone* with safe sanitation.	Services are reliably and continually delivered based on effective management of human, financial and natural resources.
CORE CWIS FUNCTIONS	**RESPONSIBILITY**	**ACCOUNTABILITY**	**RESOURCE PLANNING AND MANAGEMENT**
	An authority(ies) executes a clear public mandate to ensure safe, equitable, and sustainable sanitation for all.	Authorities' performance against their mandate is monitored and managed with data, transparency and incentives.	Resources—human, financial, natural, assets—are effectively managed to support execution of mandate across time/space.

Figure 2: CWIS Service Framework by Schrecongost et al. (2020)

Following the development of the CWIS service framework, the indicators were reorganized by this service framework. Post this classification, it was observed that the initial list of 17 quantitative indicators were focused on capturing outcomes but not functions, i.e. responsibility, accountability and resources planning and management for effective service delivery. To capture all strands of

the CWIS framework, an additional list of 24 qualitative indicators and 3 quantitative indicators were added to the initial list of 17 indicators.

Under the three outcome areas (Equity, Safety, Sustainability), expert consultations, discussions with BMGF and literature review led us to primarily add indicators on three key topics – sanitation workers, gender and sanitation access/coverage to include institutional (educational/health care) facilities.

- **Sanitation workers**: The main documents consulted are the Decent Work Framework (ILO, 2008) and the Guidelines on Sanitation and Health by World Health Organization (2018). Also, CS Sharada Prasad, an ethnographer who has been working closely on sanitation worker issues has been instrumental in developing the sanitation worker related indicators.
- **Gender**: For selecting the gender related indicators, we have reviewed a few documents that summarize gender sanitation literature, including the conceptual model of women and girls' empowerment (BMGF, 2017), the Female-friendly Public and Community Toilets guide (UNICEF, WaterAid and WSUP, 2018), BMGF's evidence review of Gender and the Sanitation Value Chain (BMGF, 2018), and a draft literature review that Emory University had developed for their ongoing project on Measuring Women's Sanitation Related Empowerment. Bethany Caruso and Sheela Sinharoy from Emory University had also provided expert opinions on the draft gender indicators.
- **Institutional facilities:** In addition, a few more indicators similar to existing ones on household sanitation were created for educational institutions and healthcare facilities, to reflect the expanded scope of inclusive sanitation.

The indicators for the core CWIS functions (Responsibility, Accountability, Resource Management), were identified based on several rounds of discussions with BMGF to best reflect the intent behind each of the areas. Wherever applicable, relevant literature was also referenced. These indicators are included in another toolkit on system design (link).

After a few rounds of iterations with the Foundation, the draft indicator list mapped to the CWIS service framework was first presented to CWIS partners at the MEDS Convening in October 2019. Since then, Athena's country teams have reached out to CWIS partners individually to discuss the indicator list and obtain feedback. All feedback received has been compiled and shared with the CWIS cohort and was used to finalize the indicator list in May 2020. After a round of data collection from the CWIS cities on this full list of outcomes and functions indicators, a few more changes have been made to further clarify the level (national/ state vs. local service area) at which the functions are measured. The indicators were finalized in March 2021.

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Annex IV: Administering Data Collection Protocols

This list of suggestions has been prepared with the goal of improving data collection processes. It is meant to be shared with enumerators during training and has been designed to be user-friendly and easy to remember.

Suggestions for Successful Surveys

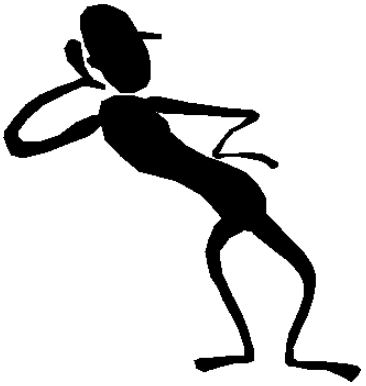
Interacting with Respondents

Remember to **Greet with respect, Request with Respect and Listen with respect.**

Greet with respect. Always greet the people with a smile; they are doing us a favour by giving us their time. Showing respect to the people you talk with will help convince them to cooperate. They will be more likely to participate in the study and answer all questions.

- Be cheerful if you can and show them the maximum respect.
- When asking questions, use the respondent's name, with the appropriate title. This will show respect to them and make them feel more comfortable.
- It is important to dress in a respectful manner. Formal clothing is not required but revealing clothing or very casual clothing is not appropriate.

Request with respect. Request their time and be polite if they refuse; do not demand their time, as their participation should be totally voluntary.



- Do not visit households during meal times, try to go when you know that most people will be available. Be respectful of local holidays or family events such as weddings and funerals.
- If they ask you to leave, either before starting or during the interview, then respectfully leave.
- If they refuse to answer a question, prompt politely. If they still refuse, then enter “don’t know” or “could not observe” and move on.

Listen with respect. Try to make them trust you, and NEVER show judgement towards them.

- Show interest in their opinions, knowledge and beliefs. They are giving us their information, and we are interested to know what they say.
- Do not give your own opinion as a prompt, or show that you disagree with theirs.

- Even if you find their habits unclean, always respectfully listen and record their answers with a smile.

Remember to

Offer them **why**,

Offer them **confidentiality** and

Offer them the **summary report**.

Offer them why. They may be more willing to share personal information if they know that we are doing it for research purposes only.

- We will be asking about their latrines, we will enquire about their poop and we will be asking them to report their asset ownership; these questions are personal and some can cause embarrassment.
- If they know that the information is for research only, they may be willing to cooperate.

Offer them confidentiality. Assure them that their name and address will never be shared with anyone.

- Any information they share will only contribute to report statistics, as a total or average for all households in a group.
- There individual information will never be shared with anyone outside of the research project.

Offer them our summary report. If any of the participating households are interested to know the results of the study, we would like to share the report with them.

- Please take down their mailing address and whether they would like a copy of the report in the local language or in English.
- Please inform them when they are likely to receive the report (at the end of the project).

Suggestions for Successful Surveys

Collecting Accurate Data

What do we really want to know with this survey? We want to know about the sanitation access and safe sanitation practices for all the residents of our city. Unfortunately, we are not surveying every single person who lives here. If we are not speaking to every single person, then how will we know this information is the same for all the people that we haven't talked to?

The answer is: we won't. BUT we CAN get a good approximation of this information with a good SAMPLE. We will randomly select a number of households; these households will represent everyone else. But if these households are representing all the other households, it is important that we take very accurate information from them.

Accurate information depends on you! You hold the power to change people's answers; you must try to use your power to collect accurate data, or all of our efforts will be for nothing. In addition to **Greeting, Requesting** and **Listening** with **Respect** (see Section 1), accuracy will only be achieved if you are **Consistent and Precise**.

1) Precisely asked questions

Some explanation may be necessary for some questions. You will occasionally need to probe for answers. But these need to be limited; if you give a long explanation then they may grow tired. Or worse! Long explanations may be understood differently by different people – which will lead to different answers. Always make sure that your questions and explanations are short and simple.

All enumerators should be giving the same explanation as well. During the training we will all decide on the best explanation to give for each question. Please give your suggestions – we will decide on this as a group!

2) Consistently asked questions

Even small changes in wording will change answers. It would be impossible for a changing survey to collect accurate data. For example, one of the questions asked of households who use PTs or CTs is as follows:

What is the average wait time for women between 6am-10am and 6pm-10pm? (put '999' if don't know)

The above question is from the Households survey. Specifying that the wait time should be between 6am-10am and 6pm -10pm is vital. If the give the wait time at noon, or an average across the day, the wait time might be much smaller than during peak times. Imagine, if you made the following change: simply deleting, or forgetting to say, "between 6am-10am and 6pm-10pm"?

What is the average wait time for women? (put '999' if don't know)

If we forget to tell them the time period, then they may assume across the whole day. The answer would change – and that would be the wrong answer!

We must be careful that we always read the entire question, exactly as it is worded in the survey – otherwise we may end up with wrong answers. Forgetting, changing or adding any wording to any question will change the answers; this will lead to inaccurate data, and must be avoided at all costs.

3) Consistently ordered questions

Make sure to ask the questions in the order that they are presented. If you need to go back and correct a previous answer, that is fine, but the order in which the questions are asked should not be changed. Changing the order of the questions may also change people's answers. Just as the wording should not be changed in the questions, the order in which the questions are asked should not be changed.

Just remember the following:

Same simple order;

same simple wording;

same simple information!

Annex V: Detailed Instruction on ODK Survey Collection Tool

About the ODK system, including troubleshooting

To learn more about the ODK system, please see https://docs.getodk.org/. In addition, there is a wealth of information available from other ODK users, accessible through an active online community message board. Searching questions on that board will often yield solutions for any challenges faced when using ODK or designing surveys. And if no solution can be found, the data collection team can always post a new question and wait for the community of users to offer a response. They usually respond in less than 24 hours. See more at this link: https://forum.getodk.org/. There is a wealth of information available online which can explain how to set up the ODK system.

Data management and security

Typically, the app is used to collect individual surveys, those individual surveys are uploaded to the cloud, where they are combined into one dataset, then the aggregated dataset is downloaded directly to a designated laptop as a single, or multiple, csv file(s). If data security is not an issue, then ODK collect can upload individual surveys to an online google sheet, dedicated for that purpose. The data can then be downloaded as a csv. But confidentiality of the data cannot be assured in such a system, as no data encryption is involved. If encryption is needed, the data can be encrypted on the Android device used to collect the data. But encrypted surveys cannot be uploaded to a google sheet. Instead, a dedicated ODK aggregate account can be set up, which is password protected and accepts encrypted files. These files can then be downloaded by ODK suitcase, and once on the dedicated project computer, the encryption removed. These are just examples; it will be incumbent on the data collection team to decide on what features are needed for their data collection purposes. More information on encryption in ODK can be found at https://docs.getodk.org/encrypted-forms/.

Creating ODK survey forms

ODK collect accepts blank survey forms as XML files, containing all of the programming for the survey, including question types, text, constraints and skip logics. Surveys can be programmed directly in a blank XML file, but this requires advanced knowledge of Java and Python programming languages. Alternatively, the creators of ODK have made an online converter, which can convert a simple excel file into an XML file, ready to use in ODK collect. In order for the converter to work properly, the survey must be designed as an XLS form, according to a strict set of rules. More on these rules can be found on the XLS form webpage, for anyone who wishes to create an entirely new survey https://docs.getodk.org/xlsform/.

ODK survey form layout and details useful for supporting editing

If the data collection team needs to edit the three surveys covered in this manual, a bit more understanding is necessary for how they are designed. All three surveys have three sheets: 'survey', 'choices' and 'settings.' The survey sheet has all of the text for the questions themselves, and the programming which determines the question types, constraints and skip logic. The choices sheet

has all of the answer options for multiple choice and single select questions. The settings sheet has the form title, form id, encryption key (if any at all), and submission URL.

The survey sheet has 12 column headings: type, name, label::English, hint, constraint, constraint_message, required, relevant, calculation, accuracyThreshold, repeat_count, and appearance.

The type column defines the question type. The five most common question types include: text, integer, decimal, select_one and select_multiple. Note that text answers are limited to 255 characters. In addition to these, our surveys have questions which automatically record the start time and end time of the survey (called start and end), as well as the date, the device ID, the serial number of the SIM card in the PDA (if there is one), and the phone number. We have also added a question for collecting GIS information (the question type is called 'geopoint'). For more information on question types, please see https://getodk.org/xlsform/. The name column lists the name given to the variable associated with each question: it is the column heading which will appear in the aggregated dataset after data collection has completed. Each name entry must unique in the survey, and must not have spaces nor special characters. In general it is good practice to keep them as succinct as possible. The label column will have the text of the question as it will appear on the screen. English is the default, but additional languages can be added as additional columns. The hint column contains any text which will appear on the screen, just below and slightly smaller than the text in the label column. We have not used the hint column much in our surveys.

The constraint column puts limits on what the enumerator is allowed to enter for the associated question. This might be a restriction that integer entries be greater or equal to zero, or that the entry remain between zero and 100 for a question asking for a percentage. The required column has 'yes' if the question must be answered before advancing to the next question while administering the survey; if it is left blank, then the question is not required. The relevant column determines skip logic; this column can be the most tricky, and any changes to this column should be tested afterwards to ensure that they are working as intended. The calculation column performs simple math in order to create constraints on questions – in our case, for example, a calculation is made in order to create the range of numbers allowed for the respondent ID, based on the enumerator name selected (see questions 9-12 of all three surveys). The accuracyThreshold column is only used during the recording of GIS data. The repeat_count is used in the Household Survey to repeat a set of questions for each member of the family (the number of repetitions is set to the number of household members reported). The appearance column was used in a few instances to allow multiple integer questions appear on the screen simultaneously (see Desludging Services Survey, Sections 3 and 4).

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