Plan Overview

A Data Management Plan created using DMPonline

Title: Occupational Health and Environmental Risks associated with faecal sludge management in humanitarian settings: A case of Imvepi refugee settlement, Uganda and Cox’s Bazar refugee camp in Bangladesh

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Template: TU Delft Data Management Plan template (2025)

Project abstract:

Introduction: Faecal sludge management (FSM) in humanitarian settings remains a significant public and environmental health challenge, particularly in refugee camps and settlements where non-sewered onsite sanitation systems are predominantly used. Inadequate containment, unsafe emptying and transportation, and poorly functioning treatment plants expose sanitation workers and the community to hazards and contribute to environmental degradation. Despite efforts to improve FSM, limited attention has been paid to the health and environmental risks associated with faecal sludge management in refugee contexts.

Objectives: This study aims to: (1) assess occupational health risks among sanitation workers across the sanitation value chain using the sanitation safety planning approach; (2) To assess the contribution of individual FSTP units to the reduction of health and environmental risks by analyzing their pollutant removal performance and comparing it across seasons; (3) evaluate the environmental risks associated with discharges from FSTPs using an Environmental Risk Assessment (ERA) framework; and (4) examine the appropriateness and effectiveness of the SSP and ERA frameworks in identifying, assessing, and managing sanitation-related risks in humanitarian contexts.

Methods: The study will apply the SSP tool to identify, assess, and manage risks across the SVC n Imvepi refugee settlement (Uganda) and Cox’s Bazar refugee camp (Bangladesh). The study will describe the sanitations system; perform structured observations, photovoice and key informant interviews to identify hazards and hazardous events and exposure pathways across the SVC; and semi-quantitative risk assessment (SQRA) and quantitative microbial risk assessment (QMRA) to ascertain occupational risk. A mass balance approach will be used to ascertain the contribution of individual FSTP units to the reduction of health and environmental risks and examine the overall treatment efficiency of the 5 selected FSTPs during wet and dry seasons. The study will apply both the Risk Quotient (RQ) and Synthetical Risk Factor (SRF) frameworks to determine ecological risks posed by physicochemical pollutants and heavy metals in effluent and sludge samples. A Delphi study involving sanitation practitioners will be conducted to evaluate the appropriateness of the SSP and ERA frameworks for humanitarian contexts. Findings from qualitative and quantitative methods will be analyzed independently, then integrated through comparison to identify convergence, complementarity, or divergence across objectives.

Expected outcomes: The study will generate evidence on occupational and environmental risks associated with FSM in refugee contexts, treatment performance during wet and dry seasons, and the applicability of risk-based planning tools. The outcomes of this study will feed into the overall aim of the RISK-WASH project, which is to improve WASH decision-making and provisions in humanitarian settings by collaboratively developing a health-risk impact framework.

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Occupational Health and Environmental Risks associated with faecal sludge management in humanitarian settings: A case of Imvepi refugee settlement, Uganda and Cox’s Bazar refugee camp in Bangladesh

0. Administrative questions

1. Provide the name of the data management support staff consulted during the preparation of this plan and the date of consultation. Please also mention if you consulted any other support staff.

The following support staff were consulted on 28th April 2026:

1. Sophie Tschirpke, *Data steward at the Faculty of applied sciences*
2. Lieke Font Freide, *Privacy officer*
3. Thijs Slot, *HREC Secretary, Integrity Office*.

2. Is TU Delft the lead institution for this project?

- No – please provide details of the lead institution below and TU Delft's role in the project

IHE Delft Institue for Water Education is the lead institution for the project, and overall controller of the data. TU Delft participates as a partner through academic staff involved in supervision of PhD students, methodological development, and participatory research components. TU Delft’s contribution is mainly linked to tool adaptation, data analysis, and co-supervision of PhD research. TU Delft therefore only manage and store the data and code that they directly generate or process during these activities, in line with TU Delft policies.

I. Data/code description and collection or re-use

3. Provide a general description of the types of data/code you will be working with, including any re-used data/code.

Sub-study 1: Semi-structured Interviews

Data type	Format	How will data/code be collected?	Purpose of processing	Storage location	De-identification	Level of access	Will the data be shared?	If shared, who will receive the data?
Informed consent form (name, signature)	Original hard copies docx, pdf (scanned copies)	Signed by participants before interviews; paper forms collected in the field and digitized by the researcher by scanning	To obtain and document informed consent	1. Paper copies stored in a locked cabinet during fieldwork and then transferred to a locked cabinet at Makerere University School of Public Health, Uganda (RISK-WASH project partner) at the end of fieldwork. These will be destroyed after scanning. 2. Scanned copies stored separately on TU Delft Project Data Storage (U: drive).	Stored separately from all interview data. File names will use study codes, but the forms themselves remain identifiable because they contain names/signatures.	Restricted to PhD student (Aisha Nalugya) and supervisors only (Dr. Claire Furlong and Prof. Damir Brdjanovic)	No	N/A

Occupation/role, work location	docx, pdf	Collected from the study participants during the interviews	To interpret occupational risk exposure by worker group, role, and sanitation value-chain stage.	TU Delft Project Data Storage (U: drive)	**Pseudonymized**: Roles and work locations replaced with study codes. Role and location details will be generalized in outputs where needed to reduce re-identification risk.	Restricted to PhD student (Aisha Nalugya) and supervisors only (Dr. Claire Furlong and Prof. Damir Brdjanovic)	Only in aggregated or de-identified form.	Aggregated summaries may be included in publications, reports, presentations, and manuscript drafts
Interview field notes/memos	docx, pdf	Generated by the researcher during and after interviews	Contextual interpretation and qualitative analysis	TU Delft Project Data Storage (U: drive)	**Pseudonymized**: Notes will use study codes rather than participant names. Direct identifiers will be removed.	Restricted to PhD student (Aisha Nalugya) and supervisors only (Dr. Claire Furlong and Prof. Damir Brdjanovic)	No	N/A
Audio recordings	MP3, WAV, M4A	Recorded during interviews with participant permission	To support accurate transcription and qualitative analysis	TU Delft Project Data Storage (U: drive)	Recordings will be named using study codes, but voices may still identify participants. Audio files will be deleted after transcription	Restricted to PhD student (Aisha Nalugya) and supervisors only (Dr. Claire Furlong and Prof. Damir Brdjanovic)	No	N/A
Transcribed interview text	docx, pdf	Generated from recordings by the researcher	Qualitative analysis of experiences, perceptions, hazards and risk management practices	TU Delft Project Data Storage (U: drive)	**Pseudonymized**: Study code will be used to name the file. Personal identifiers removed from transcription	Restricted to PhD student (Aisha Nalugya) and supervisors only (Dr. Claire Furlong and Prof. Damir Brdjanovic)	No raw identifiable data shared. Selected de-identified quotations may be shared.	De-identified quotations may be used in reports, publications, presentations, and manuscript drafts.
Qualitative coding files	.xlsx, docx	Generated by the researcher during thematic coding and anlysis	To organize and analyze interview data	TU Delft Project Data Storage (U: drive)	**Pseudonymized**: Study code will be used to name the file.	Restricted to PhD student (Aisha Nalugya) and supervisors only (Dr. Claire Furlong and Prof. Damir Brdjanovic)	No	N/A

Professional views (on risks, working conditions, factors affecting faecal sludge management)	docx, pdf	Generated during qualitative data analysis	To understand occupational health risks along the sanitation value chain and treatment efficiency of faecal sludge treatment plants	TU Delft Project Data Storage (U: drive)	Views will be linked to study codes during analysis; identifying details will be removed or generalized in outputs.	Restricted to PhD student (Aisha Nalugya) and supervisors only (Dr. Claire Furlong and Prof. Damir Brdjanovic)	Yes	Only de-identified quotations or aggregated themes will be shared in publications, reports, presentations, or manuscript drafts. They will also be shared in a data repository such as 4TU.ResearchData

Sub-study II: Observations

Data type	Format	How will data/code be collected?	Purpose of processing	Storage location	Identifiability / de-identification status	Level of access	Will the data be shared?	If shared, who will receive the data?
Informed consent forms containing name and signature/thumbprint	Paper originals; scanned PDF copies	Signed by participants before observations. Paper forms will be collected in the field and digitized by the researcher by scanning.	To obtain and document informed consent.	Paper copies stored in a locked cabinet during fieldwork and then transferred to a locked cabinet at Makerere University School of Public Health, Uganda (RISK-WASH project partner) at the end of fieldwork. These will be destroyed after scanning. Scanned copies stored separately on TU Delft Project Data Storage (U: drive).	Stored separately from observation data. File names willuse study codes, but the forms themselves remain identifiable because they contain names/signatures.	Restricted to PhD student (Aisha Nalugya) and supervisors only (Dr. Claire Furlong and Prof. Damir Brdjanovic)	No.	N/A
Occupation/role and work location	DOCX, PDF, XLSX	Collected before or during observations.	To interpret observed risks by worker group, role, site, and sanitation value-chain stage.	TU Delft Project Data Storage (U: drive).	Pseudonymized: Linked to study code. Role and location details will be generalized in outputs where needed to reduce re-identification risk.	Access restricted to PhD student and supervisors only.	Only in aggregated or de-identified form.	Aggregated summaries may be included in publications, reports, presentations, and manuscript drafts.

Observation notes	DOCX, PDF; handwritten notes where needed	Generated by the researcher during structured/non-participant observations of sanitation work activities.	To document work practices, working conditions, hazards, exposure situations, safety measures, and use of protective equipment.	TU Delft Project Data Storage (U: drive).	Pseudonymized and de-identified where possible. Notes will use study codes rather than participant names. Direct identifiers will be removed.	Access restricted to PhD student and supervisors only.	No raw observation notes will be publicly shared.	N/A
Observation checklists	XLSX, DOCX, PDF	Completed by the researcher during observations using a structured tool.	To systematically record observed hazards, hazardous events, exposure pathways, safety practices, and control measures across the sanitation value chain.	TU Delft Project Data Storage (U: drive).	Pseudonymized. Records will use study codes and site/activity codes rather than participant names.	Access restricted to PhD student and supervisors only.	Only aggregated or de-identified summaries may be shared.	Aggregated summaries may be included in publications, reports, presentations, manuscript drafts and a data repository
Contextual information on observed activity, site, equipment, and environmental conditions	DOCX, PDF, XLSX	Recorded during observations by the researcher.	To interpret how site conditions, equipment, weather, terrain, and work organization influence occupational risk.	TU Delft Project Data Storage (U: drive).	Linked to activity/site codes. Details will be generalized in outputs where needed to reduce re-identification risk.	Access restricted to PhD student and supervisors only.	Only in aggregated or de-identified form.	Aggregated or generalized descriptions may be used in reports, publications, presentations, manuscript drafts, and a data repository.
Observation findings	DOCX, XLSX, PDF	Generated during data analysis from observation notes and checklists.	To summarize observed hazards, risk patterns, and safety practices across the sanitation value chain.	TU Delft Project Data Storage (U: drive); selected de-identified summaries may be shared through RISK-WASH SURFdrive for collaboration.	De-identified and/or aggregated. Direct identifiers removed; contextual details generalized where needed.	Restricted access for working files; selected de-identified summaries may be accessible to authorized project collaborators.	Yes, but only in de-identified or aggregated form.	Authorized project collaborators, publications, reports, presentations, and manuscript drafts.

Sub-study III: Photovoice

Data type	Format	How will data/code be collected?	Purpose of processing	Storage location	Identifiability / de-identification status	Level of access	Will the data be shared?	If shared, who will receive the data?

Informed consent forms containing name and signature	Paper originals; scanned PDF copies	Signed by participants before the Photovoice activity. Paper forms will be collected in the field and digitized by the researcher by scanning.	To obtain and document informed consent for participation, photo sharing, follow-up discussion, audio-recording, and any optional future use of images.	Paper copies stored in a locked cabinet during fieldwork and then transferred to a locked cabinet at Makerere University School of Public Health, Uganda (RISK-WASH project partner) at the end of fieldwork. These will be destroyed after scanning. Scanned copies stored separately on TU Delft Project Data Storage (U: drive).	Directly identifiable. Stored separately from Photovoice data. File names will use study codes, but the forms themselves remain identifiable because they contain names/signatures.	Access restricted to PhD student and supervisors only.	No.	N/A
Participant role, work location	DOCX, XLSX, PDF	Collected before or during the Photovoice activity.	To interpret photographs and narratives by worker group, site, and sanitation value-chain stage.	TU Delft Project Data Storage (U: drive).	**Pseudonymized:** Linked to study code. Role and location details will be generalized in outputs where needed.	Access restricted to PhD student and supervisors only.	Only in aggregated or de-identified form.	Aggregated summaries may be used in reports, publications, presentations, manuscript drafts, and a data repository.
Photovoice photographs selected and shared by participants	JPEG, PNG	Taken by participants during the Photovoice activity and shared with the researcher after participant selection.	To visually document work-related hazards, safety measures, work environments, and contextual conditions that affect occupational health and safety.	TU Delft Project Data Storage (U: drive), in a restricted-access folder for visual data.	**Pseudonymized:** Stored using study codes; reviewed for privacy risks before analysis/use.	Access restricted to PhD student and supervisors only.	Not as raw identifiable images. Only de-identified images may be shared if the participant has given separate consent. Faces and identifying features blurred/cropped; contextual details generalized.	De-identified images may be used in publications, reports, presentations, or teaching materials only with separate permission. Raw identifiable photographs will not be shared with partners or publicly.
Photovoice image log / photo inventory	XLSX, DOCX	Created by the researcher to record study code, image code, date, broad topic, and participant-selected description.	To organize photographs, link selected images to narratives, and track consent/permissions for each image.	TU Delft Project Data Storage (U: drive).	**Pseudonymized**. Uses study and image codes rather than names; may still be indirectly identifiable if descriptions are specific.	Access restricted to PhD student and supervisors only.	No raw inventory will be publicly shared.	N/A

Audio recordings of Photovoice follow-up discussions	MP3, WAV, M4A	Recorded during individual photo-discussion sessions only with participant permission.	To accurately capture participants' explanations of selected photographs.	TU Delft Project Data Storage (U: drive), stored separately from consent forms and image files where possible.	Recordings will be named using study codes, but voices may still identify participants. Audio files will be deleted after transcription	Access restricted to PhD student and supervisors only. Audio files will be deleted after transcription and verification, where no longer needed.	No.	N/A
Photovoice discussion transcripts / image narratives	DOCX, PDF	Generated from audio recordings or detailed notes from follow-up discussions.	To analyze participants' interpretations of images, perceived hazards, safety conditions, and suggested improvements.	TU Delft Project Data Storage (U: drive).	Pseudonymized and de-identified where possible. Names/direct identifiers removed; study/image codes used. Some contextual details may remain indirectly identifiable.	Access restricted to PhD student and supervisors only.	Raw transcripts will not be publicly shared. Selected de-identified quotations may be shared.	De-identified quotations may be used in reports, publications, presentations, and manuscript drafts.
De-identified Photovoice outputs	JPEG/PNG, DOCX, PDF	Created by the researcher after reviewing images and narratives and applying de-identification measures where possible.	To support publications, reports, presentations, teaching, and dissemination where participants have consented.	TU Delft Project Data Storage (U: drive); selected approved outputs may be shared through RISK-WASH SURFdrive for collaboration.	De-identified where possible. Faces and identifying features blurred/cropped; contextual details generalized. Complete anonymity cannot always be guaranteed.	Restricted access for working files; selected approved outputs may be accessible to authorized project collaborators.	Yes, but only where participant permission has been given.	Authorized project collaborators, publications, reports, presentations, or teaching materials, data repository according to the participant's consent choice.

Sub-study IV: Semi-quantitative risk assessment workshop

Data type	Format	How will data/code be collected?	Purpose of processing	Storage location	Identifiability / de-identification status	Level of access	Will the data be shared?	If shared, who will receive the data?

Data type	Format	How will data/code be collected?	Purpose of processing	Storage location	Identifiability / de-identification status	Level of access	Will the data be shared?	If shared, who will receive the data?
Informed consent forms containing name and signature	Paper originals; scanned PDF copies	Signed by participants before the workshop. Paper forms will be collected in the field and digitized by the researcher by scanning.	To obtain and document informed consent for workshop participation.	Paper copies stored in a locked cabinet during fieldwork and then transferred to a locked cabinet at Makerere University School of Public Health, Uganda (RISK-WASH project partner) at the end of fieldwork. These will be destroyed after scanning. Scanned copies stored separately on TU Delft Project Data Storage (U: drive).	Stored separately from workshop data. File names may use study codes, but the forms themselves remain identifiable because they contain names/signatures.	Access restricted to PhD student and supervisors only	No.	N/A
Workshop attendance list	Paper, XLSX, PDF	Recorded by the researcher at the workshop for participation tracking.	To document participation and manage workshop logistics.	Stored separately from workshop outputs on TU Delft Project Data Storage (U: drive); paper copies kept in locked storage.	Directly identifiable if names/signatures are included. Stored separately from workshop data.	Access restricted to PhD student and supervisors only	No.	N/A
Facilitator notes / workshop field notes	DOCX, PDF; handwritten notes where needed	Generated by the researcher during and after the workshop.	To document discussion points, contextual explanations, disagreements, and reasoning behind risk rankings.	TU Delft Project Data Storage (U: drive).	Pseudonymized and de-identified where possible. Notes will use study/workshop codes and avoid participant names. Some role-based comments may remain indirectly identifiable.	Access restricted to PhD student and supervisors only	No	N/A

Data type	Format	How will data/code be collected?	Purpose of processing	Storage location	Identifiability / de-identification status	Level of access	Will the data be shared?	If shared, who will receive the data?
Hazard identification lists	DOCX, XLSX, PDF; flipchart photos/scans where needed	Generated during participatory workshop exercises.	To identify hazards and hazardous events across the sanitation value chain.	TU Delft Project Data Storage (U: drive).	This will be group-level data.	Access restricted to PhD student and supervisors only	Yes, but only in aggregated form.	De-identified hazard lists or summaries may be used in reports, publications, presentations, and manuscript drafts.
Risk scoring/ranking sheets	XLSX, PDF; paper forms; flipchart scans/photos where needed	Completed during the workshop through group scoring of likelihood, severity, and risk level.	To generate semi-quantitative risk scores and prioritize risks across the sanitation value chain.	TU Delft Project Data Storage (U: drive).	Group-level and pseudonymized. No participant names included in analysis files; workshop/site codes used.	Access restricted to PhD student and supervisors only	Yes, but only in aggregated form.	Aggregated risk scores, rankings, and heat maps may be shared in publications, reports, presentations, and manuscript drafts.
Workshop analysis files	XLSX, DOCX, PDF; statistical/visualization files if used	Generated by the researcher during cleaning, synthesis, and preparation of risk matrices/heat maps.	To analyze and present semi-quantitative risk assessment results.	TU Delft Project Data Storage (U: drive); selected de-identified outputs may be shared through RISK-WASH SURFdrive.	Aggregated/de-identified. Direct identifiers removed; outputs organized by site, SVC stage, and hazard category.	Restricted access for working files; selected de-identified outputs may be accessible to authorized project collaborators.	Yes, but only in aggregated form.	Authorized project collaborators, reports, publications, presentations, manuscript drafts and data repository

Sub-study V: Delphi study

Data type	Format	How will data/code be collected?	Purpose of processing	Storage location	Identifiability / de-identification status	Level of access	Will the data be shared?	If shared, who will receive the data?
Online consent record	Digital survey record; PDF/CSV export	Participants will provide electronic consent before completing the first Delphi questionnaire.	To document informed consent for online participation.	TU Delft Project Data Storage (U: drive); exported consent records stored separately from survey responses.	Stored separately from response data where possible.	Access restricted to PhD student and supervisors only.	No.	N/A
Participant name and email address	XLSX, CSV	Collected for invitation, communication, reminders, and follow-up across Delphi rounds.	To manage recruitment and communication across the three Delphi rounds.	TU Delft Project Data Storage (U: drive), stored separately from questionnaire responses.	Kept separate from response data and linked only through a study code.	Access restricted to PhD student and supervisors only.	No.	N/A

Data type	Format	How will data/code be collected?	Purpose of processing	Storage location	Identifiability / de-identification status	Level of access	Will the data be shared?	If shared, who will receive the data?
Professional role, organization, country/region, and area of expertise	XLSX, CSV	Collected through the Delphi recruitment form or first questionnaire.	To describe the expert panel and interpret responses by expertise area where appropriate.	TU Delft Project Data Storage (U: drive).	Pseudonymized: Linked to study code. Details will be generalized in outputs where needed to reduce re-identification risk.	Access restricted to PhD student and supervisors only.	Only in aggregated form.	Aggregated summaries may be included in publications, reports, presentations, manuscript drafts and data repository
Round 1 open-ended questionnaire responses	XLSX, CSV, DOCX	Collected through the online Delphi questionnaire.	To identify expert views on the applicability, strengths, limitations, and adaptation needs of SSP and ERA in humanitarian settings.	TU Delft Project Data Storage (U: drive).	Pseudonymized and de-identified where possible. Responses linked to study codes; names/emails stored separately.	Access restricted to PhD student and supervisors only.	Raw responses will not be publicly shared. Selected de-identified quotations may be shared.	De-identified quotations and synthesized themes may be used in publications, reports, presentations, manuscript drafts, and data repository
Round 2 rating responses	XLSX, CSV	Collected through the online Delphi questionnaire based on statements developed from Round 1.	To assess levels of agreement and emerging consensus among experts.	TU Delft Project Data Storage (U: drive).	Pseudonymized. Linked to study codes; direct identifiers stored separately.	Access restricted to PhD student and supervisors only.	Only aggregated results will be shared.	Aggregated statistics and consensus summaries may be included in publications, reports, presentations, manuscript drafts, and data repository
Round 3 re-rating responses	XLSX, CSV	Collected through the online Delphi questionnaire for items where consensus was not reached in Round 2.	To reassess agreement and determine final consensus or disagreement.	TU Delft Project Data Storage (U: drive).	Pseudonymized. Linked to study codes; direct identifiers stored separately.	Access restricted to PhD student and supervisors only.	Only aggregated results will be shared.	Aggregated statistics and consensus summaries may be included in publications, reports, presentations, manuscript drafts, and data repository
Delphi analysis files	XLSX, CSV, DOCX, statistical files	Generated by the researcher during cleaning, coding, synthesis, and consensus analysis.	To calculate agreement levels, summarize consensus, and synthesize expert recommendations.	TU Delft Project Data Storage (U: drive).	Pseudonymized or aggregated, depending on stage of analysis.	Access restricted to PhD student and supervisors only.	Aggregated outputs will be shared.	Aggregated tables, consensus summaries, and manuscript outputs may be shared with supervisors, authorized collaborators, and in publications.
Delphi summary feedback between rounds	PDF, DOCX	Prepared by the researcher and shared with Delphi participants between rounds.	To provide participants with anonymized/de-identified group-level feedback for subsequent rating rounds.	TU Delft Project Data Storage (U: drive); shared directly with Delphi participants by email or survey platform.	De-identified and aggregated. No names or directly identifiable responses included.	Shared with Delphi participants and research team.	Yes.	Delphi participants receive group-level summaries only; no identifiable individual responses shared.

Data type	Format	How will data/code be collected?	Purpose of processing	Storage location	Identifiability / de-identification status	Level of access	Will the data be shared?	If shared, who will receive the data?
Final aggregated Delphi findings	DOCX, PDF, XLSX	Generated after analysis of all Delphi rounds.	To report final consensus, areas of disagreement, and recommendations for applying SSP and ERA in humanitarian settings.	TU Delft Project Data Storage (U: drive); selected outputs may be shared through RISK-WASH SURFdrive.	Aggregated and de-identified.	Research team and authorized project collaborators.	Yes.	Publications, presentations, manuscript drafts, and project dissemination outputs, and data repository

Sub-study VI: Environmental Risk Assessment and mass balance assessments

Data type	Format	How will data/code be collected?	Purpose of processing	Storage location	Identifiability / de-identification status	Level of access	Will the data be shared?	If shared, who will receive the data?
Faecal sludge treatment plant sampling records	XLSX, CSV, DOCX, PDF	Generated by the researcher during sample collection at influent, intermediate treatment units, final effluent, sludge drying beds, discharge points, or receiving environments.	To document sampling date, sampling point, treatment unit, sample type, and field conditions.	TU Delft Project Data Storage (U: drive).	Non-personal data. Site-coded where needed.	Researcher, supervisors, authorized research team; selected cleaned outputs may be made public.	Yes, openly, after checking for sensitive facility identifiers or exact locations.	Public access through a data repository such as 4TU.ResearchData; also publications, reports, presentations, and manuscript drafts.
Laboratory results for physicochemical and microbial parameters	XLSX, CSV, PDF	Generated from laboratory analysis of faecal sludge, effluent, sludge, and/or environmental samples.	To assess treatment performance and environmental risk from FSTP discharges.	TU Delft Project Data Storage (U: drive).	Non-personal data. Site-coded where needed.	Researcher, supervisors, authorized research team; cleaned datasets may be made public.	Yes, openly.	Public access through 4TU.ResearchData; publications, reports, presentations.
Field measurements and environmental observations	XLSX, CSV, DOCX, PDF	Recorded during sampling visits, including weather, visible discharge conditions, receiving environment, and site observations.	To support interpretation of treatment performance and environmental risk.	TU Delft Project Data Storage (U: drive).	Non-personal data. Site-coded where needed.	Researcher, supervisors, authorized research team; cleaned outputs may be made public.	Yes, openly, after removing sensitive facility identifiers where necessary.	Public repository, publications, reports, presentations, and manuscript drafts.
Figures, risk maps, summary tables, and environmental risk outputs	PNG, JPEG, PDF, DOCX, PPTX	Generated from analyzed environmental and treatment performance data.	To communicate environmental risk levels, pollutant pathways, and risk characterization findings.	TU Delft Project Data Storage (U: drive); selected outputs may be shared through RISK-WASH SURFdrive.	Aggregated, site-coded, or non-personal outputs.	Researcher, supervisors, authorized collaborators; final outputs may be public.	Yes, openly.	Publications, reports, presentations, repository outputs, and project dissemination materials.
Operational records from FSTPs	XLSX, CSV, DOCX, PDF	Obtained from FSTP operators or partner organizations, including treatment logs, desludging volumes, sludge loading, maintenance records, or routine monitoring reports.	To contextualize mass balance calculations and interpret treatment-unit performance.	TU Delft Project Data Storage (U: drive).	Non-personal operational data. Provider restrictions will be checked before sharing.	Researcher, supervisors, authorized research team.	Yes, where provider permission allows; otherwise only summarized or derived outputs will be shared.	Public repository for permitted cleaned/derived data; publications, reports, presentations, and manuscript drafts.
Analysis scripts / statistical code	R, Rmd, Python, XLSX formulas	Generated by the researcher during data cleaning, analysis, and visualization.	To support reproducibility of calculations, removal efficiencies, and figures.	TU Delft Project Data Storage (U: drive).	Non-personal code.	Researcher, supervisors, authorized research team; final cleaned scripts may be public.	Yes, openly.	Public repository, supplementary materials, or project repository where appropriate.

II. Storage and backup during the research process

4. How much data/code storage will you require during the project lifetime?

- < 250 GB

5. Where will the data/code be stored and backed-up during the project lifetime? (Select all that apply.)

- Project Data Storage (U:) drive at TU Delft
- SURFdrive

The PhD student will request Project Data Storage drive through the TU self-service portal. This drive will be restricted to the PhD student and her supervisors. That drive will serve as the main secure storage location for the study during the project lifetime. Data including interview transcripts, observation notes, coded datasets, analysis files, and other research materials will be stored on the drive. Identifiable information, such as signed consent forms, contact details, audio recordings, and potentially identifiable photographs, will be stored separately with restricted access and only on secure TU Delft-approved systems.

The RISK-WASH consortium has an existing SURFdrive project folder, which will be used only for sharing working documents and selected aggregated or non-identifiable research materials needed for collaboration within the project team for example draft manuscripts, analysis plans. No directly identifiable personal data will be uploaded to SURFdrive. Access to the SURFdrive folder will be restricted to authorized project members**.**

Data will be backed up through the security and backup systems associated with the TU Delft storage environment and SURF infrastructure. During fieldwork, any data temporarily stored on recording devices or password-protected laptops will be transferred to secure TU Delft-approved storage as soon as possible and then removed from the local device when safe transfer has been confirmed.

III. Data/code documentation

6. What documentation will accompany data/code? (Select all that apply.)

- Software – Usage documentation (README file, docstrings, and in-line comments)
- Metadata – I will adhere to the metadata standards used by the data repository where the data will be shared (see section V)
- Procedure – A description of data processing procedure(s) (such as laboratory setup, simulation workflows).
- Data – Data dictionary explaining the variables used
- Data – README file or other documentation explaining how data are organised
- Data – Codebook describing the contents, structure, layout, and variable definitions of the data
- Data – Methodology of data collection

IV. Legal and ethical requirements, code of conducts

7. Does your research involve human subjects or third-party datasets collected from human participants?

If you are working with a human subject(s), you will need to obtain the HREC approval for your research project.

- Yes – please provide details in the additional information box below

The study will collect primary data from sanitation workers, faecal sludge treatment plant (FSTP) operators, and other stakeholders in humanitarian settings (Imvepi Refugee Settlement in Uganda and Cox’s Bazar in Bangladesh). Participants will provide informed consent, and ethical approval will be obtained from the relevant Institutional Review Boards (IRBs) in both Uganda and Bangladesh. I have applied for for ethical approval from the TU HREC, with application number [6270].

8. Will you work with personal data? (This is information about an identified or identifiable natural person, either for research or project administration purposes.)

- Yes

9. Will you work with any other types of confidential or classified data or code as listed below? (Select all that apply and provide additional details below.)

If you are not sure which option to select, ask your Faculty Data Steward for advice.

- Yes, data which could lead to reputation/brand damage (for example, animal research, climate change)

This study involves the collection and analysis of data that may be considered sensitive and potentially impact reputations or public perception. Specifically, the research includes data from stakeholders on faecal sludge management practices, operational efficiency of treatment plants, and community health-related behaviors in Uganda and Bangladesh. While this information is not classified or restricted by law, its disclosure could influence public opinion, community trust, or the perceived performance of partner organizations. Discussing sanitation work or risks may unintentionally reveal sensitive information that affects participants' livelihoods or relationships with supervisors.

10. How will ownership of the data and intellectual property rights to the data be managed?

For projects involving commercially-sensitive research or research involving third parties, seek advice of your Faculty Contract Manager when answering this question.

In line with TU Delft student guidance, intellectual property created by a student is not assumed to belong to another party unless this is specified in a written agreement. Because this research is conducted within a broader consortium and as part of a PhD project, rights of ownership, access, use, publication, and any transfer of intellectual property will be governed by the relevant agreement.

IHE Delft is the lead institution of the RISK-WASH consortium, while this study also forms part of the researcher's PhD trajectory at TU Delft. Collaborating partners may support access to sites, participants, contextual information, logistics, or translation, but such support does not by itself confer ownership of the research data. Directly identifiable personal data will remain under restricted control of the authorized research team. Any sharing or reuse of pseudonymized or non-identifiable materials will be subject to the consortium agreement, participant consent, ethical approvals, and applicable data protection requirements.

Authorship, publication rights, and use of outputs arising from the study will be discussed and agreed in writing with supervisors and collaborators in accordance with the consortium agreement and standard academic practice.

11. Which personal data or data from human participants do you work with? (Select all that apply.)

- Free text fields (for instance, in questionnaires) in which participants could unintentionally share personal data
- Audio recordings
- Proof of consent (such as signed consent materials which contain name and signature)
- Photographs
- Job title and/or employer
- Gender
- Names and/or geolocation information as part of research data
- Names as contact details for administrative purposes

12. Please list the categories of data subjects and their geographical location.

Categories of data subjects

- Sanitation workers (e.g., emptiers, transporters, treatment plant workers)
- Health and WASH officers (e.g., from NGOs like BRAC, Uganda redcross society)
- Camp and plant managers
- Humanitarian practitioners globally

Geographical locations:

- Imvepi Refugee Settlement, Terego District, Uganda
- Cox's Bazar Refugee Camp, Bangladesh

13. Will you be receiving personal data from or transferring personal data to third parties (groups of individuals or organisations)?

- No

Any collaboration within the project team will involve only agreggated or non-identifiable materials.

16. What are the legal grounds for personal data processing?

- Informed consent

17. Please describe the informed consent procedure you will follow below.

Informed consent will be obtained separately for each study method using method-specific participant information sheets and consent forms. Separate consent materials will be used for semi-structured interviews (sub-study 1), observations (sub-study 2), Photovoice (sub-study 3), the online Delphi survey (sub-study 5) and the semi-quantitative risk assessment workshop (sub-study 4). Before any data collection begins, prospective participants will be given clear information about the purpose of the study, why they are being invited, what participation involves, the types of data that will be collected, any potential risks and benefits, how confidentiality will be protected, how their data will be stored and used, and their right to refuse or withdraw without penalty.

Written consent will be obtained by signature or thumbprint before interviews, discussions and observations. Separate opt-in consent will be sought for specific components where relevant, such as audio-recording of interviews, participation in Photovoice discussions, and the use of pseudonymized quotations or photographs in publications or presentations.

For sub-study 3 (Photovoice), participants will first receive an orientation on the activity, including safe and ethical photography, what kinds of photographs are relevant, and the need to avoid identifiable third parties wherever possible. Consent will cover participation in the activity, sharing selected photographs with the research team, the follow-up discussion about the photographs, audio-recording of that discussion if applicable, and any separate permission for future use of anonymized or de-identified photographs in dissemination materials.

For sub-study 5 (Delphi study), consent will be obtained electronically before participants begin the first online questionnaire. The online participant information sheet will explain the study and the Delphi process, and participants will indicate their consent by ticking the appropriate consent box before proceeding.

Because some participant groups are small and potentially identifiable through their role, work setting, or visual data, the study will rely on pseudonymization rather than claiming full anonymization of raw data. Names and contact details will be stored separately from research responses, and only authorized members of the research team will have access to information that could directly identify participants.

18. Where will you store the physical/digital signed consent forms or other types of proof of consent (such as recording of verbal consent)?

Physical signed consent forms will be stored separately from the research data in a locked cabinet accessible only to the researcher and, destroyed after scanning. During fieldwork, they will be kept in a secure location and transferred as soon as possible to secure institutional storage arrangements. Digital copies of signed consent forms (scanned PDFs) will be stored on secure TU Delft-approved storage with restricted access, separate from the main research dataset. For online consent, such as in the Delphi study, proof of consent will be stored digitally through the secure online survey system and in exported records saved on TU Delft-approved secure storage.

19. Does the processing of the personal data result in a high risk to the data subjects? (Select all that apply.)

If the processing of the personal data results in a high risk to the data subjects, it is required to perform a Data Protection Impact Assessment (DPIA). In order to determine if there is a high risk for the data subjects, please check if any of the options below that are applicable to the processing of the personal data in your research project.

If any category applies, please provide additional information in the box below. Likewise, if you collect other type of potentially sensitive data, or if you have any additional comments, include these in the box below.

If one or more options listed below apply, your project might need a DPIA. Please get in touch with the Privacy team (privacy-tud@tudelft.nl) to get advice as to whether DPIA is necessary.

- None of the above apply

23. What will happen with the personal data used in the research after the end of the research project?

- Anonymised or aggregated data will be shared with others

24. For how long will personal research data (including pseudonymised data) be stored?

- Personal data will be deleted at the end of the research project

Personal data will be deleted one year after the end of the research project (June 2030). Physical copies of the consent forms will be deleted immediately after scanning and upload.

25. How will your study participants be asked for their consent for data sharing?

- In the informed consent form: participants are asked to give their explicit consent for sharing their (pseudonymised) personal data with restricted access with specific recipients for specific purpose(s)

V. Data sharing and long term preservation

27. Apart from personal data mentioned in question 23, will any other data be publicly shared?

Please provide a list of data/code you are going to share under 'Additional Information'.

- All other non-personal data/code underlying published articles/reports/theses

29. How will you share research data/code, including those mentioned in question 23?
Select all that apply and provide additional details below.

- The data/code can't be shared in a data repository, but the metadata will be registered in 4TU.ResearchData with a persistent identifier (a DOI), and all research publications resulting from the project have a statement explaining: what additional datasets/materials exist, why access is restricted, who can use the data and under what circumstances
- All anonymised or aggregated data, and/or all other non-personal data/code will be uploaded to 4TU.ResearchData with public access
- Only anonymous & aggregated data will be shared.

30. How much of your data/code will be shared in a research data repository?

- < 100 GB

31. When will the data/code be shared?

- As soon as corresponding results (papers, theses, reports) are published

32. Under what licence(s) will the data/code be released?

- CC BY

VI. Data management responsibilities and resources

33. If you leave TU Delft (or are unavailable), who is going to be responsible for the data/code resulting from this project?

My supervisor Prof.Dr. Damir Brdanovic, department of Environmental Biotechnology (D.Brdanovic@tudelft.nl)

34. What resources (for example financial and time) will be dedicated to data management and ensuring that data will be FAIR (Findable, Accessible, Interoperable, Re-usable)?

4TU.ResearchData is able to archive 1TB of data/code per researcher per year free of charge for all TU Delft researchers. We do not expect to exceed this and therefore there are no additional costs of long term preservation.

35. Which faculty do you belong to?

- Faculty of Applied Sciences (AS)